H2Teesside Project

Planning Inspectorate Reference: EN070009

Land within the boroughs of Redcar and Cleveland and Stockton-on-Tees, Teesside and within the borough of Hartlepool, County Durham

The H2 Teesside Order

Document Reference: 5.1: Consultation Report

The Planning Act 2008 – Section 37(3)(c)
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



Applicant: H2 Teesside Limited

Date: May 2024

Rev: 1

DOCUMENT HISTORY

DOCUMENT REF	**5.1**		
REVISION	1		
AUTHOR	DWD		
SIGNED	CN	**DATE**	13.05.24
APPROVED BY	GB		
SIGNED	GB	**DATE**	13.05.24
DOCUMENT OWNER	DWD		

GLOSSARY

ABBREVIATION	DESCRIPTION
AGI	Above Ground Installation - installations used to support the safe and efficient operation of a pipeline; above ground installations are needed at the start and end of a cross-country pipeline and at intervals along the route.
APFP Regulations	The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended).
Applicant	H2 Teesside Limited.
CCUS	Carbon Capture, Usage and Storage - is group of technologies designed to reduce the amount of carbon dioxide (CO_2) released into the atmosphere from coal and gas power stations as well as heavy industry including cement and steel production. Once captured, the CO_2 can be either re-used in various products, such as cement or plastics (usage), or stored in geological formations deep underground (storage).
CO_2	Carbon Dioxide - an inorganic chemical compound with a wide range of commercial uses.
DCLG	Department for Communities and Local Government.
DESNZ	Department for Energy Security and Net Zero.
DCO	Development Consent Order - an order made by the relevant Secretary of State pursuant to The Planning Act 2008.
ECC	East Coast Cluster.
EIA	Environmental Impact Assessment, as defined by the EIA Regulations. - a term used for the assessment of environmental consequences (positive or negative) of a plan,

ABBREVIATION	DESCRIPTION
	policy, program or project prior to the decision to move forward with the proposed action.
EIA Regulations	The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended).
ES	Environmental Statement - a report that documents the process and results of an EIA.
GW	Gigawatt – a unit of measurement for power, equal to 1,000 megawatts.
GWth	Gigawatts thermal.
H2T	The H2Teesside Project.
Ha	Hectare - a metric unit of measurement for area. There are 10,000 square metres in a hectare. One hectare is equal to 2.471 acres.
HBC	Hartlepool Borough Council.
HSE	Health and Safety Executive.
ICZ	Inner Consultation Zone.
Km	Kilometre - a metric unit of measurement for distance, equal to 1,000 metres.
MHCLG	Ministry of Housing, Communities and Local Government.
MLWS	Mean Low Water Springs - the average height obtained by the two successive low waters during those periods of 24 hours when the range of the tide is at its greatest.
MMO	Marine Management Organisation - an executive, non-departmental body in the UK with the responsibility of licencing, regulating and planning marine activities in the seas around England so that they are carried out in a sustainable way.
MWth	Megawatts thermal.
NEP	Northern Endurance Partnership.
NPS	National Policy Statement - a statement produced by Government under the Planning Act 2008 providing the policy framework for Nationally Significant Infrastructure Projects and Projects of National Significance. They include the Government's view of the need for and objectives for the development of Nationally Significant Infrastructure Projects

ABBREVIATION	DESCRIPTION
	and Projects of National Significance in a particular sector such as energy and are used to determine applications for such development.
NTS	Non-Technical Summary of the PEIR.
NZT	The Net Zero Teesside Project.
OCZ	Outer Consultation Zone.
OHID	Office of Health Improvement and Disparities.
Order	The DCO that grants development consent for H2T.
PA 2008	The Planning Act 2008 (as amended).
PEI	Preliminary Environmental Information - information compiled on the likely significant effects of a development.
PEIR	The Preliminary Environmental Information Report - an initial statement of the main environmental information available for a study area.
PINS	The Planning Inspectorate - an executive agency of the Department for Housing, Levelling Up and Communities responsible for administering DCO applications on behalf of the relevant Secretary of State.
Proposed Development	The H2Teesside Project**Error! Reference source not found.Error! Reference source not found.**.
RCBC	Redcar and Cleveland Borough Council.
RFI	Request for Information - a form issued by a land referencing company to landowners to obtain information on their landownership interests.
RSPB	The Royal Society for the Protection of Birds.
SoS	Secretary of State - the decision maker for DCO applications and responsible for a UK Government department, in the case of the Proposed Development, being the Secretary of State for Energy Security and Net Zero.
SoCC	Statement of Community Consultation - a statement setting out how an applicant proposes to consult the local community living within the vicinity of a proposed NSIP.
STDC	South Tees Development Corporation - a Mayoral Development Corporation responsible for approximately 400

ABBREVIATION	DESCRIPTION
	hectares of land south of the River Tees in the borough of Redcar and Cleveland.
STBC	Stockton-on-Tees Borough Council.
TVCA	The Tees Valley Combined Authority.

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

1.1.1 This Consultation Report (Document Ref. 5.1) has been prepared on behalf of H2 Teesside Limited (the 'Applicant'). It forms part of the application (the 'Application') that has been submitted to the Secretary of State (the 'SoS') for the Department for Energy Security and Net Zero ('DESNZ'), under Section 37 of 'The Planning Act 2008' (the 'PA 2008'), seeking development consent for the H2Teesside Project.

1.1.2 The Applicant, a bp company, will be the lead developer of the H2Teesside Project and bp will be appointed as the operator of H2Teesside.

1.1.3 The Applicant is seeking development consent for the construction, operation and maintenance of H2Teesside, which includes associated development (together the 'Proposed Development') on land on either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees, Teesside and within the borough of Hartlepool, County Durham.

1.1.4 Development consent is required for the Proposed Development as it is the subject of a Direction dated 22 December 2022 made by the SoS under Sections 35(1) and 35ZA of the PA 2008. If development consent is granted by the SoS, it will be made in the form of a Development Consent Order (a 'DCO'), and be known as 'The H2 Teesside Order'.

1.2 Consultation requirements

1.2.1 The PA 2008 consenting regime places an emphasis on pre-application consultation and publicity. Government guidance explains this is designed to ensure a more transparent and efficient examination process. In this way the planning of infrastructure of national significance is a 'front-loaded' process whereby the applicant's proposals are the subject of statutory consultation and engagement before making an application for development consent.

1.2.2 Prior to the submission of an application, the applicant must carry out the consultation, notification and publicity activities prescribed by Sections 42, 46, 47 and 48 of the PA 2008 and related regulations, and have regard to relevant guidance. This includes consulting with certain prescribed persons and bodies and the local community within the vicinity of the land to which the application for development consent relates.

1.2.3 Section 37 of the PA 2008 requires an application for development consent to be accompanied by a 'consultation report' explaining how the applicant has complied with the statutory consultation requirements. The report must also set out (in accordance with Section 49) how the applicant has had regard to the responses received to the consultation. This document is the 'Consultation Report' for the purposes of Section 37.

1.2.4 The Consultation Report has been prepared in accordance with Section 37 of the PA 2008, relevant guidance and advice. It provides information in respect of the

Applicant's pre-application consultation on the Proposed Development and the analysis of the comments and feedback that has been received to that consultation.

1.3 Consultation objectives and strategy

1.3.1 At the outset, the Applicant set a number of clear objectives for the pre-application consultation on the Proposed Development. These were to:

- Ensure public understanding of the design and decision-making processes for the Proposed Development, addressing any misinformation around the proposals.
- Create a clear understanding of the Proposed Development's identity, given the number of low carbon and net zero projects in the area, and also provide engaging messaging to help avoid confusion with other projects.
- Reach silent and/or seldom heard audiences by using varied communications methods.
- Explain the benefits of the Proposed Development, including in terms of job creation, protection of existing industry and decarbonisation.
- Provide stakeholders with the opportunity to submit comments and feedback while the proposals are still at a formative stage, and to provide them with a different way in which to do so.
- Provide a mechanism to review the comments and feedback received and show how these have been taken into account in finalising the proposals and the application for development consent.

1.3.2 These objectives were to be achieved by:

- Developing a stakeholder engagement and communications strategy early in the pre-application process to provide a framework to guide the pre-application consultation, including the areas and people to be consulted and the consultation activities and methods to be employed.
- Reflecting upon and taking account of recent pre-application consultation exercises undertaken within the area, notably those for the Net Zero Teesside ('NZT') Project, the consultation methods deployed and levels and types of engagement and responses received from stakeholders.
- Deploying and carrying out a wide range of consultation activities and methods to publicise the Proposed Development to a wide audience and to receive comments and feedback.
- Adopting an open and flexible approach to pre-application consultation by keeping under review the need for further stages of consultation and targeted consultation prior to the submission of the Application.

1.3.3 As part of developing the stakeholder engagement and communications strategy the Applicant sought to define an appropriate consultation area for the purposes of the pre-application consultation. The defined consultation area comprised two

consultation zones – an Inner Consultation Zone ('ICZ') and an Outer Consultation Zone ('OCZ'), which are further explained in Section 5.0 and shown in Figures 5.1 and 5.2.

1.3.4 Section 47 of the PA 2008 requires applicants to consult *"people living in the vicinity of the land"*, however, *"vicinity"* is not defined in the PA 2008. Paragraph 36 of the 'Department for Communities and Local Government: Planning Act 2008: Guidance on the pre-application process (March 2015)' indicates that in defining a consultation area, applicants should give consideration to the fact that a development may have impacts that could be wider than a single local authority's area and that there might be a need to consult people living within a wider area who could be affected (e.g. though visual or environmental impacts, or through increased traffic flow). Paragraph 56 of the guidance goes onto encourage applicants to consult beyond those living within the vicinity of the land where they think doing so may provide more information on the impacts of their proposals.

1.3.5 The ICZ represents the area within which the Applicant considers there is the greatest potential for local communities to be affected by/interested in the Proposed Development. The ICZ extends approximately 1 to 2 kilometres ('km') from the then Site boundary/the proposed Order Limits to take in the areas immediately surrounding the Main Site for the Proposed Development and its connections corridors, and includes over 37,000 residential and business addresses, encompassing the nearby settlements of Warrenby, Dormanstown, Lazenby, Lazenby, Lackenby, Coatham, the western part of Redcar, Grangetown, Eston, Normanby, South Bank, the eastern part of Billingham and Greatham.

1.3.6 The approach to defining the ICZ for the Proposed Development was broadly the same as the approach taken for the NZT Project. The Main Site for the NZT Project is also located at the Foundry within Teesworks, adjacent to the Main Site for the Proposed Development, and its connections corridors extend either side of the Tees and which are in many cases across a broadly similar area.

1.3.7 The OCZ was defined with reference to the early Environmental Impact Assessment ('EIA') work and extends to approximately 25 km from the Site boundary. The OCZ was considered to represent the likely maximum geographical extent within which it could be predicted that most likely significant environmental effects could occur.

1.3.8 Section 4.0 of this Report describes the approach taken to the pre-application consultation on the Proposed Development by the Applicant and also the preparation of the stakeholder engagement and communications strategy.

1.4 Pre-application consultation publicity

1.4.1 The Applicant subsequently prepared a draft Statement of Community Consultation ('SoCC') setting out how it intended to consult people living within the vicinity of the land to which the proposed application for development consent relates about the Proposed Development, pursuant to Section 47(1) of the PA 2008. The preparation of the SoCC was informed by the stakeholder engagement and communications strategy.

1.4.2 The Applicant consulted the relevant local authorities on the draft SoCC pursuant to Section 47(2) and it was subsequently finalised and publicised in accordance with Section 47(6) and made available for inspection in advance of the start of the statutory pre-application consultation on the Proposed Development. The SoCC confirmed the consultation area for the community consultation and set out the various consultation methods that would be employed.

1.4.3 The preparation of and consultation on the SoCC is set out at Section 6.0.

1.4.4 The Applicant proposed to undertake one main stage of consultation on the Proposed Development. This was statutory consultation in accordance with Sections 42, 47 and 48 of the PA 2008 and related regulations. This decision was reflected in the stakeholder engagement and communications strategy and in the published SoCC.

1.4.5 The decision to progress with one main stage of consultation for the Proposed Development took account of bp's recent experience of consultation on the adjacent NZT Project. The consultation for NZT had covered a similar area and had attracted relatively low levels of comments and feedback, with the majority of responses being broadly supportive of the project, which was considered reflective of the communities in the area being generally comfortable with industrial and energy related developments and their interest in seeing economic development and job creation come forward. The Applicant was also mindful of avoiding consultation overload with the local community. Given this context, the understanding of issues and environmental considerations from the local area built up through NZT Project, and the wide range of consultation methods to be employed, a single stage of consultation was considered to be sufficient.

1.4.6 In advance of the start of the statutory pre-application consultation and during the first half of 2023, the Applicant engaged with stakeholders. This involved briefing local political representatives; starting to raise awareness of the Proposed Development with the local community through press/media releases, social media and advance newspaper notices; engagement with key technical consultees over the environmental work being undertaken for the pre-application consultation and application for development consent; and engagement with potentially affected landowners, including issuing Request for Information ('RFI') letters to landownership interests.

1.4.7 The statutory consultation commenced on 14 September and ran to 26 October 2023. This included consulting prescribed persons, relevant local authorities, and potentially affect landownership interests pursuant to Section 42 of the PA 2008; consulting the local community pursuant to Section 47 and in accordance with the published SoCC; and publicity pursuant to Section 48 (this involved publishing a notice in various newspapers and publications). A number of consultation methods were used, including a virtual consultation room, webinars and in-persons consultation events, and a range of consultation documents and materials were provided (this included a Preliminary Environmental Information Report and its Non-Technical Summary). People were also able to submit comments and feedback in a number of different ways. A total of 38 responses were received to the Section

42 consultation and 69 responses (including 60 feedback forms) to the Section 47 consultation.

1.4.8 The Applicant had intended to notify PINS of the Section 42 consultation pursuant to Section 46 on 11 September 2023, however, due to an administrative error the Section 46 notification was not sent. After becoming aware of the error, the Applicant wrote to PINS on 28 November 2023 to explain the position and set out the actions to be taken. PINS issued a letter on 29 November 2023 acknowledging receipt of the Applicant's letter and confirming that the Applicant had notified PINS of the proposed application for development consent for the purposes of Section 46.

1.4.9 Sections 9.0 to 12.0 of this Report provides more information on the statutory consultation undertaken in September and October 2023.

1.4.10 As confirmed above, the Applicant adopted an open and inclusive approach to pre-application consultation on the Proposed Development and throughout the pre-application process kept under review the need for further stages of consultation and targeted consultation prior to the submission of the application for development consent.

1.4.11 Following the statutory consultation undertaken in September/October 2023 (from now on referred to as the 'First Consultation'), the Applicant identified the need to undertake further consultation on the Proposed Development in respect of a number of changes to the proposed the proposed Order Limits following further design development and technical assessments and also responses received to the First Consultation. These changes resulted in a substantial reduction in the proposed Order Limits from 1,350 to 508 hectares, but also involved the addition of some new areas of land. The Applicant considered it important to undertake this further consultation (from here referred to as the 'Second Consultation') to ensure that interested parties and key stakeholders had adequate opportunity to review and comment upon the changes.

1.4.12 The Second Consultation took place between 13 December 2023 and 23 January 2024. This included further statutory consultation and publicity pursuant to Sections 42 and 48 of the PA 2008. In addition, an update letter was sent to the local community living within the vicinity of the Site providing information on the changes. The information provided for the First Consultation, including the Preliminary Environmental Information Report was again made available along with documents and plans explaining the changes. The Applicant notified PINS of the Second Consultation pursuant to Section 46 on 12 December 2023 prior to it starting. A total of 39 responses were received to the Section 42 consultation and 36 responses to the community update (including 12 feedback forms).

1.4.13 The Second Consultation is described in detail at Section 13.0.

1.4.14 The Applicant also undertook additional and targeted consultation from late January 2024 through to early March 2024.

1.4.15 The additional consultation involved consulting additional parties, including landownership interests who had been identified following the Second

Consultation. The parties were provided with the same information as for the Second Consultation. A total of 2 responses were received to the additional Section 42 consultation.

1.4.16 The targeted consultation involved Section 42 consultation with a number of landowners and non-statutory consultation of the local community within the vicinity of Cowpen Bewley Village, near Billingham, relating to changes to the hydrogen pipeline corridor in this location (in response to comments received from residents of Cowpen Bewley Village) and also proposals to provide replacement open space land within the vicinity of Cowpen Bewley Woodland Park. No responses were received to the additional Section 42 consultation and 11 responses to the community consultation.

1.4.17 The additional and targeted consultation is detailed at Section 14.0.

1.4.18 The consultation that was undertaken by the Applicant in the lead up to the submission of the application for development consent is summarised below:

- **First Consultation (statutory consultation)** – in accordance with Sections 42, 47 and 48 of the PA 2008 – 14 September to 26 October 2023.
- **Second Consultation (statutory and non-statutory)** – in accordance with Sections 42 and 48 of the PA 2008 and including a non-statutory community update – 13 December 2023 to 23 January 2024.
- **Additional Consultation (statutory)** – in accordance with Section 42 of the PA 2008 – mid-January to early March 2024.
- **Targeted Cowpen Bewley Consultation (statutory and non-statutory)** – in accordance with Section 42 of the PA 2008 and including non-statutory consultation of the community within the vicinity of Cowpen Bewley – early February to early March 2024.

1.5 Taking account of consultation responses

1.5.1 Section 49 'Duty to take account of responses to consultation and publicity' requires applicants to have regard to any 'relevant responses' received to the statutory consultation and publicity carried out in accordance with Sections 42, 47 and 48 of the PA 2008. A relevant response is one received by the applicant before the deadline set in relation to the statutory consultation and publicity. There is no statutory duty for an applicant to take account of responses received after the relevant deadline.

1.5.2 Despite the fact that the PA 2008 does not require applicants to take account of responses received after the deadline set for statutory consultation and publicity, the Applicant did take account of responses received after the close of the First and Second Consultations.

1.5.3 The Applicant has considered and provided responses to the comments and feedback received from Section 42 consultees (and non-prescribed persons). In the main, the responses received from these consultees have tended to relate to landownership, the design and technical aspects of the Proposed Development,

and the scope of the environmental and other assessments being carried out to support the Application.

1.5.4 The approach taken by the Applicants to responding to the comments received to the Section 47 consultation and other community consultation has been to review these and identify the key theme/topic headings and then to provide a summary of the main issues raised in respect of those theme/topic headings and provide a response to those issues.

1.5.5 The Applicant's responses to the consultation, and how it has had regard to consultation is set out in the tables at Section 15.0. The tables identify where the Applicant has made changes to the DCO Application or Proposed Development in response to the consultation.

1.6 EIA consultation

1.6.1 The Applicant carried out the following EIA consultation activities:

- Notifying PINS of its intention to carry out an EIA and produce an Environmental Statement ('ES'); applying to PINS for an EIA scoping opinion as to the topics to be covered by the EIA.
- Consultation with the local authorities and key technical consultees on the preparation of the Preliminary Environmental Information Report ('PEIR').
- Notifying EIA consultation bodies in accordance with EIA Regulation 13 (sending them a copy of the Section 48 notice).
- Consultation with the local authorities and key technical consultees on the preparation of the ES.

1.6.2 EIA related consultation is dealt with at Section 16.0.

1.7 Next steps

1.7.1 The Applicant is committed to continued engagement with consultees and key stakeholders such as the local community, following the submission of the application for development consent, as well as throughout the construction and operation of the Proposed Development, should a DCO be made by the SoS.

1.7.2 The Applicant will issue updates on the Proposed Development and the development consent application process via the project website, press releases and social media as appropriate.

1.7.3 In addition to the above, there are statutory notification and publicity requirements pursuant to Section 56 of the PA 2008 that the Applicant will need to fulfil following acceptance of the Application for examination by the SoS. This will provide an opportunity for people to register as an interested party and be involved in the examination of the Application.

2.0 INTRODUCTION

2.1 Background

2.1.1 This Consultation Report (Document Ref. 5.1) has been prepared on behalf of H2 Teesside Limited. It forms part of the application (the 'Application') for a Development Consent Order (a 'DCO'), that has been submitted to the Secretary of State (the 'SoS') for the Department for Energy Security and Net Zero ('DESNZ'), under Section 37 of 'The Planning Act 2008' (the 'PA 2008') in respect of the H2Teesside Project (the 'Proposed Development').

2.1.2 The Applicant is H2 Teesside Limited, a bp company. H2 Teesside Limited will be the lead developer of the Proposed Development and bp will be appointed as the operator of the Proposed Development. The Proposed Development will support the decarbonisation of UK-produced natural gas by converting it to low carbon hydrogen in Teesside for use in industrial applications, thus helping to achieve national targets in relation to net zero. It will also contribute to restoring manufacturing jobs in the Tees Valley. The Proposed Development will export carbon dioxide (CO_2) to the Northern Endurance Partnership ('NEP') offshore storage facility via NEP infrastructure on the adjacent Net Zero Teesside ('NZT') site, including the high-pressure compression facility and the CO_2 export pipeline

2.1.3 The Applicant is seeking development consent for the construction, operation and maintenance of the Proposed Development, which includes associated development, on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees, Teesside and within the borough of Hartlepool, County Durham.

2.1.4 Development consent is required for the Proposed Development as it is the subject of a Direction dated 22 December 2022 made by the SoS under Sections 35(1) and 35ZA of the PA 2008. The DCO, if made by the SoS, would be known as 'The H2 Teesside Order' (the 'Order').

2.1.5 The PA 2008 consenting regime has an emphasis on pre-application consultation and publicity. Government guidance[1] explains this is designed to ensure a more transparent and efficient examination process. In this way the planning of infrastructure of national significance is a 'front-loaded' process whereby the applicant's proposals are the subject of statutory consultation and engagement before making an application.

2.1.6 Prior to the submission of an application for development consent, the applicant must carry out the consultation, notification and publicity activities prescribed by Sections 42, 46, 47 and 48 of the PA 2008 and related regulations and have regard to relevant guidance[2]. This includes consulting with certain prescribed persons and bodies (prescribed by regulations, such as local authorities and technical consultees

[1] Planning Act 2008: guidance on the pre-application process, DCLG March 2015: paragraph 6 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/418009/150326_Pre-Application_Guidance.pdf]
[2] Planning Act 2008: guidance on the pre-application process, DCLG March 2015

and affected and potentially affected land interests) and the local community within the vicinity of the land to which the application for development consent relates.

2.1.7 Section 37 of the PA 2008 requires an application for development consent to be accompanied by a 'consultation report' explaining how the promoter has complied with the statutory, regulatory and policy requirements. The report must also set out (in accordance with Section 49) how the applicant has had regard to the responses received to the consultation. This document is the 'Consultation Report' for the purposes of Section 37.

2.1.8 The Consultation Report has been prepared in accordance with Section 37 of the PA 2008 relevant guidance and advice[3][4]. It provides information in respect of the Applicant's pre-application consultation on the Proposed Development and the analysis of the comments and feedback that has been received to that consultation.

2.2 Overview of the Proposed Development

2.2.1 The Proposed Development will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

2.2.2 The onshore elements of the NEP infrastructure on Teesside are part of the NZT Project and have been the subject of an application for development consent. The Secretary of State for DESNZ approved the development consent application for the NZT Project on 16 February 2024. The NZT DCO came into force on 11 March 2024.

2.2.3 The Proposed Development and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture. In March 2023, the Proposed Development was selected by DESNZ as one of the first three projects to connected to the ECC.

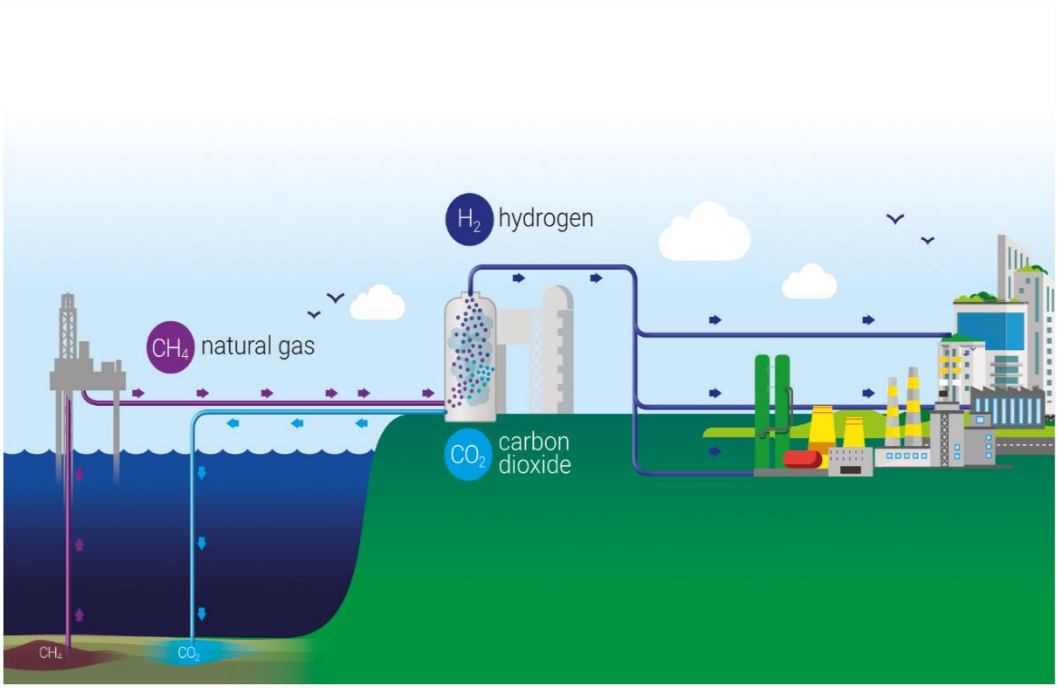
2.2.4 The low-carbon hydrogen produced by the Proposed Development will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Proposed development will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emissions by 2050.

[3] Advice Note Three: EIA consultation and notification (Republished August 2017, version 7), The Planning Inspectorate
[4] Advice Note Fourteen: Compiling the consultation report (February 2021, Version 3), The Planning Inspectorate

2.2.5 The Proposed Development will be one of the UK's largest blue hydrogen production facilities with a capacity of up to approximately 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

2.2.6 The infographic below in Figure 2.1 provides an overview of the 'blue' hydrogen processes.

Figure 2.1: Blue Hydrogen Processes



2.3 Proposed Development Description

2.3.1 The Proposed Development comprises the following main elements:

- **Work Number ('No.') 1** – a carbon capture enabled hydrogen production facility of up to approximately 1.2 gigawatts thermal ('GWth') lower heating value, including two hydrogen units each of 600 Megawatts Thermal ('MWth'), including a water and effluent treatment plant; above ground hydrogen storage; administration, control room and stores; gas and power connections; above ground installations; and ancillary works.
- **Work No. 2** – a natural gas supply connection for the transport of natural gas to Work No. 1.
- **Work No. 3** – electrical connection works for the import of electricity from the electricity transmission network to Work No. 1.
- **Work No. 4** – water supply connection works to provide cooling and make-up water to Work No. 1.

- **Work No. 5** – wastewater disposal works in connection with Work No. 1.
- **Work No. 6** – a hydrogen distribution network (the 'Hydrogen Pipeline Corridor', for the transport of hydrogen gas from Work No. 1, comprising underground and overground pipelines to supply hydrogen to the above ground storage and offtakers across Teesside. The hydrogen pipelines will run up to tie-in points with the relevant offtaker (likely to be, but not necessarily having to be) at the offtakers' site boundaries. Any works beyond this tie-in point will be progressed separately by the relevant offtaker.
- **Work No. 7** – a high pressure carbon dioxide export pipeline for the export of the captured CO_2 from Work No. 1 to the adjacent NEP infrastructure.
- **Work No. 8** – gas connections being works for the transport of oxygen and nitrogen to Work No. 1.
- **Work No. 9** – temporary construction and laydown areas and contractor compounds.
- **Work No. 10** – access and highways improvement works.
- **Work No. 11** – replacement land relating to Work No. 6.

2.3.2 There will also be further development works associated with the above elements of the Proposed Development.

2.3.3 It is envisaged that the Hydrogen Production Facility will be constructed in two phases.

2.3.4 A description of the elements of the Proposed Development and the Works Nos. is set out at Schedule 1 of the draft DCO (Document Ref. 4.1). The ancillary and further development required in connection with and subsidiary to the above elements of the Proposed Development is also detailed at Schedule 1 of the draft DCO.

2.3.5 A more detailed description of the Proposed Development and how it will operate is provided at Chapter 4 'Proposed Development' of Environmental Statement ('ES') Volume I (Document Ref. 6.2) and the areas within which each of the main elements of the Proposed Development are to be built are denoted by the coloured and hatched areas on the Works Plans (Document Ref. 2.4).

2.4 The Proposed Development Site

2.4.1 The Proposed Development Site (the 'Site') lies within the administrative boundaries of the boroughs of Redcar and Cleveland south of the River Tees and Stockton-on-Tees north of the Tees on Teesside and within the borough of Hartlepool in County Durham, also north of the Tees.

2.4.2 The Site extends to a total area of approximately 507 hectares ('ha').

2.4.3 The Hydrogen Production Facility and its ancillary development (also referred to as the 'Main Site'), including its carbon capture and compression facilities, will be located on part of the Foundry Site, which forms part of Teesworks, within the borough of Redcar and Cleveland and which is adjacent to the NEP infrastructure.

Teesworks is a major brownfield industrial site and Freeport, part of which was formerly occupied by the Redcar Steel Works.

2.4.4 The CO_2 captured from the hydrogen production processes will be transported by pipeline to the NEP infrastructure for onward transport and storage within the Endurance storage site. The Main Site extends to 86 ha.

2.4.5 The natural gas, electrical and water connections will be located to the east and south-east of the Main Site within the borough of Redcar and Cleveland. The hydrogen distribution network will extend either side of the River Tees to several potential industrial offtakers, including north of the Tees into the boroughs of Stockton-on-Tees and Hartlepool.

2.4.6 A more detailed description of the Site and its surroundings is provided at Chapter 3 'Description of the Existing Area' of ES Volume I (Document Ref. 6.2).

2.5 Summary of Pre-application Consultation on the Proposed Development

2.5.1 In accordance with Planning Inspectorate Advice Note Fourteen 'Compiling the Consultation Report' (February 2021, Version 3) Table 2.1 below provides a timeline and summary of the pre-application consultation undertaken on the Proposed Development, explains the relationship between the different stages of engagement and consultation and confirms the scale and nature of responses received.

Table 2.1: Summary of pre-application consultation

STAGE/TYPE OF CONSULTATION	DATES	DESCRIPTION OF CONSULTATION	LEVEL OF RESPONSE
Early Engagement	Q1 and Q2 2023	This was not consultation but involved the Applicant engaging with potentially interested parties with regard to the Proposed Development. This involved: - briefing local political representatives; - starting to raise awareness of the Proposed Development with the local community through press/media releases, social media and advance newspaper notices;	n/a

STAGE/TYPE OF CONSULTATION	DATES	DESCRIPTION OF CONSULTATION	LEVEL OF RESPONSE
		- engagement with potentially affected landowners, including issuing Request for Information ('RFI') letters to landownership interests; and - engagement with key technical consultees over the environmental work being undertaken for the pre-application consultation and DCO application.	
Statement of Community Consultation ('SoCC')	Non-statutory consultation – 24 April to 5 May 2023	The Applicant consulted the relevant local authorities on the draft SoCC. This included Redcar and Cleveland Borough Council ('RCBC'), Stockton-on-Tees Borough Council ('STBC') and Hartlepool Borough Council ('HBC'). Although not local authorities for the purposes of Section 43(1) the Applicant also consulted the Tees Valley Combined Authority ('TVCA') and the South Tees Development Corporate ('STDC') on the draft SoCC. The Applicant undertook a non-statutory (informal) consultation on a draft of the SoCC followed by statutory consultation. The SoCC was published on 14 September 2023, with a SoCC	Responses were received from STBC and HBC on 25 April and 9 May 2023 respectively to the non-statutory consultation (see Table 6.1). A response was received from STBC on 6 June 2023 to the statutory consultation, which confirmed the authority had no comments.

STAGE/TYPE OF CONSULTATION	DATES	DESCRIPTION OF CONSULTATION	LEVEL OF RESPONSE
		notice being published in local newspapers and the SoCC being made available on the Project Website and also at a number of publicly accessible locations within the vicinity of the Site.	
First Consultation (statutory consultation pursuant to Sections 42, 46, 47 and 48 of the PA 2008). This was the Applicant's first statutory consultation on the proposed DCO application.	Section 42 consultation: 14 September to 26 October 2023	Section 42 'Duty to consult': Consultation with prescribed persons, the Marine Management Organisation ('MMO'), relevant local authorities, potentially affect landownership interests and non-prescribed consultees. Section 42 letters issued on 14th September 2023.	A total of 38 responses were received to the Section 42 consultation.
	Section 46 notification: 28 November 2023	The Applicant intended to notify PINS of the Section 42 consultation on 11 September 2023 but due to an administrative error the Section 46 notification was not sent. The Applicant wrote to the Inspectorate on 28 November 2023 to explain the position. PINS responded on 29 November confirming that the Applicant had notified the SoS of the proposed application for the purposes of Section 46.	n/a
	Section 47 consultation: 14 September to 26 October 2023	Section 47 'Duty to consult local community': consultation of the local community in accordance with the published SoCC.	A total of 69 responses. 60 completed feedback forms and 9 email/written responses were received to the Section 47 consultation.

STAGE/TYPE OF CONSULTATION	DATES	DESCRIPTION OF CONSULTATION	LEVEL OF RESPONSE
			A total of 66 people attended the in-person consultation events and seven people attended the public webinar. the Section 47 community consultation.
	Section 48 publicity: 14 September to 26 October 2023	Section 48 'Duty to publicise': A combined Section 42, 47 and 48 notice was published in the Telegraph, London Gazette, Lloyds List and Fishing News on 14 September 2023 and local newspapers circulating within the vicinity of the Site for two consecutive weeks (Northern Echo 14 and 21 September; Teesside Gazette 14 and 21 September; and Darlington and Stockton Times 15 and 22 September 2023).	n/a
Second Consultation (statutory pursuant to Sections 42, 46 & 48 of the PA 2008 and a non-statutory community update). This consultation related to a number of changes to the proposed Order Limits as a result of further design development and technical work undertaken and also	Section 42 consultation: 13 December 2023 to 23 January 2024.	Section 42 'Duty to consult': Consultation with prescribed persons, the MMO, relevant local authorities, affected landownership interests and non-prescribed consultees. Section 42 letters issued on 13 December 2023.	A total of 39 responses were received to the Section 42 consultation.
	Section 46 notification: 12 January 2023.	The Applicant notified PINS of the Section 42 consultation on 12 December 2023. PINS acknowledged the Applicant's Section 46 notification on the same day and confirmed that the Applicant had notified the SoS of the proposed	n/a

STAGE/TYPE OF CONSULTATION	DATES	DESCRIPTION OF CONSULTATION	LEVEL OF RESPONSE
responses received to the First Consultation.		application for the purposes of Section 46.	
	Section 48 publicity: 13 December 2023 to 23 January 2024.	Section 48 'Duty to publicise': A Section 48 notice was published in the Telegraph, London Gazette, Lloyds List and Fishing News on 14 December 2023 and local newspapers circulating within the vicinity of the Site for two consecutive weeks (Northern Echo 14 and 21 December; Teesside Gazette 14 and 21 December; and Darlington and Stockton Times 15 and 22 December 2023).	
	Non-statutory community update: 13 December 2023 to 23 January 2024.	A community update letter was sent out to residential and business addresses within the Inner Consultation Zone of the Consultation Area.	A total of 36 responses were received to the community update consultation. Of these, 17 responses were submitted via the online response form and 7 responses were submitted via email/letter. 12 feedback forms were also received.
Additional consultation (statutory pursuant to Section 42). This was additional Section 42 consultation of additional parties, including landownership interests, who had	Section 42 consultation: 18 January to 11 March 2024.	Section 42 'Duty to consult': Consultation of additional parties, including landownership interests, who has been identified during or following the Second Consultation.	A total of 2 responses were received to the Section 42 consultation.

STAGE/TYPE OF CONSULTATION	DATES	DESCRIPTION OF CONSULTATION	LEVEL OF RESPONSE
been identified during or following the Second Consultation. They were provided with the same information as for the Second Consultation.			
Targeted consultation (statutory pursuant to Section 41 and non-statutory community consultation). This was targeted consultation of a number of landowners and the local community within the vicinity of Cowpen Bewley Village, near Billingham, relating to changes to the hydrogen pipeline corridor in this location and proposals to provide replacement open space land within the vicinity of Cowpen Bewley Woodland Park.	Section 42 consultation: 8 February to 10 March 2024.	Section 42 'Duty to consult': Consultation of landownership interests in respect of the land at Cowpen Bewley.	No responses were received to the Section 42 consultation.
	Non-statutory community consultation: 9 February to 10 March 2024.	A letter was sent to residents living within the vicinity of Cowpen Bewley.	A total of 11 email/written responses were received to the targeted community consultation.

2.6 The purpose and structure of this Consultation Report

2.6.1 Section 37(3)(c) of the PA 2008 requires an application for development consent to be accompanied by a 'consultation report'. Section 37(7) defines a consultation report as a report giving details of:

- what has been done by the applicant to comply with Sections 42 to 45 ('Duty to consult'); 46 ('Duty to notify Secretary of State of proposed application'); 47 ('Duty to consult local community'); and 48 ('Duty to publicise') of the PA 2008 in relation to the Proposed Development;
- any 'relevant responses' to the consultation under Sections 42, 47 and 48; and
- the account taken of consultation responses as required by Section 49 ('Duty to take account of responses to consultation and publicity').

2.6.2 This Consultation Report describes the approach taken in respect of the pre-application consultation process for the Proposed Development, including the methods employed. It sets out what was done for the pre-application consultation, including the statutory consultation required by the PA 2008 and related regulations.

2.6.3 The structure of the Consultation Report is set out in Table 2.2 below.

Table 2.2: Structure of the Consultation Report

SECTION	TITLE	OVERVIEW
Section 1.0	**Executive Summary**	Provides a summary of the approach to and pre-application consultation undertaken by the Applicant.
Section 2.0	**Introduction**	Provides background information on the Proposed Development, a summary of the pre-application consultation undertaken by the Applicant and sets out the structure of the Consultation Report.
Section 3.0	**Legislative Context and Relevant Guidance**	Provides an overview of the legislative requirements of the PA 2008 and relevant regulations and lists relevant guidance and advice.
Section 4.0	**The Applicant's Approach to Pre-Application Consultation**	Describes the approach taken to the pre-application consultation for the Proposed Development.
Section 5.0	**Stakeholder Engagement and Communications Strategy**	Describes the preparation of the Stakeholder Engagement and Communications Strategy to guide the pre-application consultation on the Proposed Development and explains how the Consultation Area was defined.

SECTION	TITLE	OVERVIEW
Section 6.0	**Statement of Community Consultation: Preparation and Consultation**	Sets out the approach taken by the Applicant to the preparation of the Statement of Community Consultation ('SoCC') as required by Section 47 of the PA 2008 and the consultation that took place with the relevant local authorities in relation to the preparation of the document.
Section 7.0	**Identification of Consultees**	Explains how the Applicant identified those persons whom there was a statutory duty to consult in accordance with Sections 42, 43 and 44 of the PA 2008 for its Statutory Consultation (the 'Section 42 Consultees') and confirms who was consulted. It also lists other persons that the Applicant considered should be consulted, even though they were not a 'Section 42 Consultee,' as they may be interested in the Proposed Development (the 'non-prescribed persons'.
Section 8.0	**Early Engagement**	Provides a summary of the early engagement that took place in advance of the Applicant's pre-application consultation.
Section 9.0	**First Consultation: Section 46 'Duty to Notify Secretary of State of Proposed Application'**	Explains the position with regard to the Applicant's notification of the SoS of the Section 42 consultation for the First Consultation.
Section 10.0	**First Consultation: Section 42 'Duty to Consult'**	Describes how the Applicant consulted the Section 42 consultees as part of the First Consultation in September and October 2023, including prescribed persons, relevant local authorities (Section 43) and land ownership interests and potentially affected land interests (Section 44) as well as the non-prescribed persons; provides a summary of the responses received to the consultation

SECTION	TITLE	OVERVIEW
		and how the consultation carried out complied with Section 42.
Section 11.0	**First Consultation: Section 47 'Duty to Consult Local Community'**	Sets out the Section 47 consultation that the Applicant carried out with the local community for the First Consultation; provides a summary of the responses received to the consultation and how the consultation carried out complied with the published SoCC.
Section 12.0	**First Consultation: Section 48 'Duty to Publicise'**	Explains how the Applicant publicised the Proposed Development for the First Consultation in accordance with Section 48 of the PA 2008, including the newspapers that the Section 48 Notice was published in and the notification of EIA consultees under EIA Regulation 13.
Section 13.0	**Second Consultation**	Sets out what the Applicant did for the Second Consultation in December 2023 and January 2024 relating to a number of changes made to the Site following the First Consultation and provides a summary of the responses received.
Section 14.0	**Additional/Targeted Consultation**	Sets out the additional and targeted consultation that the Applicant undertook following the Second Consultation and prior to the submission of the application for development consent, including a summary of the responses received.
Section 15.0	**Section 49 'Duty to Take Account of Response to Consultation and Publicity'**	Sets out how the Applicant has had regard to the responses received to the consultation undertaken. This section includes information on any changes made to the proposed application for development consent as a result of consultation.

SECTION	TITLE	OVERVIEW
Section 16.0	**EIA Related Consultation**	Provides a summary of the EIA related consultation carried out by the Applicant in accordance with the EIA Regulations in order facilitate the EIA process and the preparation of the ES for the Proposed Development.
Section 17.0	**Next Steps**	Sets out how the Applicant intends to continue to engage with consultees following the submission of the Application and during the examination process.

2.6.4 The appendices to the Consultation Report have been numbered so as to correspond with the relevant section of the Consultation Report where they are first referred to. So, for example, the appendices that are first referred to in Section 6.0 are numbered as Appendices 6.1, 6,2 and so on. This makes clear which section of the Consultation Report the appendices relate to.

2.6.5 The full versions of the responses received from all consultees have not been included within the appendices to the Consultation Report as these contain personal information. The Applicant can however make the responses available to PINS if required.

3.0 LEGISLATIVE CONTEXT AND RELEVANT GUIDANCE

3.1 Introduction

3.1.1 This section provides a summary of the legislative context for applications for development consent, including the legislative requirements and relevant guidance relating to pre-application consultation and publicity.

3.2 The Development Consent Order ('DCO') regime

3.2.1 As noted above, the Applicant is seeking development consent for the construction, operation and maintenance of the Proposed Development on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees, Teesside and within the borough of Hartlepool, County Durham.

3.2.2 A DCO is required for the Proposed Development as it is the subject of a Direction dated 22 December 2023 under Sections 35(1) and 35ZA of the PA 2008. PINS is responsible for examining applications for development consent and making a recommendation to the relevant SoS, in this case for the DESNZ, who then takes the decision as to whether a DCO should be made. A DCO grants planning consent but can also include a range of other consents and licences as well as powers of compulsory acquisition over land and rights in land.

3.2.3 Under the DCO regime, the primary policy framework for examining and determining applications is provided by National Policy Statements ('NPSs'). Updated NPSs for energy (dated November 2023) came into force on 17 January 2024, and represent the relevant policy for the determination of applications for development consent involving energy infrastructure, including the Proposed Development.

3.2.4 Where a relevant NPS has been designated, Section 104 requires the SoS to determine applications for development consent in accordance with the relevant NPSs unless this would:

- lead to the UK being in breach of its international obligations;
- lead to the SoS being in breach of any duty imposed on the SoS by or under any enactment;
- be unlawful by virtue of any enactment;
- result in the adverse impacts of the development outweighing the benefits; or
- result in any condition that is prescribed for deciding an application not being in accordance with the NPS.

3.2.5 The updated NPSs for energy designated in January 2024, which are considered to be of relevance to the Proposed Development are as follows:

- The Overarching NPS for Energy (EN-1).
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4).
- The NPS for Electricity Networks Infrastructure (EN-5).

3.2.6 The Overarching NPS for Energy (EN-1) makes clear at paragraph 1.3.10 that it, alongside the relevant technology specific NPSs, applies to developments brought into the DCO regime by a Section 35 Direction. As such, the Application should be determined under Section 104 of the PA 2008.

3.2.7 In making decisions on applications for development consent, Section 104 of the PA 2008 states that the SoS must, in addition to any NPSs, also have regard to any "local impact report" submitted by a relevant local authority, any relevant matters prescribed in regulations, and any other matters that the SoS thinks are both *"important and relevant"*. The Applicant considers these matters further in the Planning Statement (Document Ref. 5.2).

3.3 Legislative requirements for pre-application consultation and publicity

3.3.1 The preparation of applications for development consent under the PA 2008 is a front loaded process, whereby applicants are required to carry out pre-application consultation on their proposals and set out how they have had regard to the responses received to consultation. The legislative requirements relating to pre-application consultation for such applications are provided by:

- The Planning Act 2008 (the 'PA 2008').
- The Infrastructure Planning (Applications: Prescribed Forms and Procedure Regulations 2009) (as amended) (the 'APFP Regulations').
- The Infrastructure Planning (Publication and Notification of Applications etc.) (Coronavirus) (Amendment) Regulations 2020 (the '2020 Regulations').
- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations').

3.3.2 The legislative requirements for applicants to follow in relation to pre-application consultation and publicity are summarised in Table 3.1 below.

Table 3.1: Requirements for pre-application consultation & publicity

SECTION OF PA 208/RELEVANT REGULATION	LEGISLATIVE REQUIREMENT
Section 37: Applications for orders granting development consent	Section 37(3) requires that any application for development consent must be accompanied by a Consultation Report, which provides details of what has been done to comply with Sections 42, 47 and 48 of the PA 2088, any relevant responses received to that consultation and the account taken of those responses.
Section 47: Duty to consult local community	The applicant must prepare a Statement of Community Consultation ('SoCC') explaining how they intend to consult the people living within the vicinity of the land to which the proposed development relates about the proposed application for development consent.

SECTION OF PA 208/RELEVANT REGULATION	LEGISLATIVE REQUIREMENT
	Before preparing the SoCC the applicant must consult the relevant local authorities about what is to be included within it, providing a period for comments of at least 28 days starting with the day after the day the SoCC is received. The applicant must have regard to any comments received before the deadline. The applicant must: - make the statement available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land; - publish a SoCC notice in a newspaper circulating within the vicinity of the land to which the proposed development relates, stating where and when the statement can be inspected; and - publish the statement in a prescribed manner. The Section 47 consultation must be carried out in accordance with the SoCC. Where there are any inconsistences between the SoCC and the consultation carried out this should be clearly explained and justified in the Consultation Report.
Section 42: Duty to consult	The applicant must consult the following parties about the proposed application for development consent at least 28 days starting with the day after the day the consultation documents are received (Section 45): *"Section 42(a) such persons as may be prescribed;* *Section 42(aa) the Marine Management Organisation, in any case where the proposed development would affect, or would be likely to affect, any of the areas specified in subsection (2) (relevantly, being waters in or adjacent to England up to the seaward limits of the territorial sea);* *Section 42(b) each local authority that is within Section 43;* *Section 42 (c) 'the Greater London Authority if the land is in Greater London; and*

SECTION OF PA 208/RELEVANT REGULATION	LEGISLATIVE REQUIREMENT
	Section 42(d) each person who is within one or more of the categories set out in Section 44 (i.e. people who are known to own, lease occupy, have an interest in, or has power to sell and convey the land or to release the land; affected and potentially affected people).”
Section 46: Duty to notify Secretary of State of proposed application	The applicant must notify and provide the SoS (via PINS) with the same information as they intend to send to the Section 42 consultees either at the same time as, or before, commencing the Section 42 consultation.
Section 48: Duty to publicise	The applicant must publicise the proposed application in the prescribed manner (by a Section 48 notice), in accordance with APFP Regulation 4(2), once in a national newspaper, once in the London Gazette, once in the Lloyds List and once in an appropriate fishing journal where offshore/marine development is involved, and for two consecutive weeks in one or more local newspapers circulating in the vicinity of the land to which the proposed development relates. The deadline for the receipt of responses stated in the Section 48 notice must not be less than 28 days starting with the day after the notice is last published. This was amended to 30 days by Regulation 36(4)(c)(ii) of the EIA Regulations in the case of where a prescribed person (a Section 42 consultee) is an EIA consultation body (as defined by Regulation 3 of those regulations). A copy of the notice must also be provided in accordance with Regulation 13 of the EIA Regulations (see below) to the EIA Consultation bodies. A Section 48 notice must include the following information (APFP Regulation 4(3)): *“… the name and address of the applicant;* *a statement that the applicant intends to make an application for development consent to the Secretary of State;* *a statement as to whether the application is EIA development;*

SECTION OF PA 208/RELEVANT REGULATION	LEGISLATIVE REQUIREMENT
	a summary of the main proposals, specifying the location or route of the proposed development; *a statement that the documents, plans and maps showing the nature and location of the proposed development are available for inspection free of charge on a website maintained by or on behalf of the applicant* *the address of the website where the documents, plans and maps may be inspected;* *the place on the website where the documents, plans and maps may be inspected;* *a telephone number which can be used to contact the applicant for enquiries in relation to the documents, plans and maps;* *the latest date on which those documents, plans and maps will be available for inspection on the website;* *whether a charge will be made for copies of any of the documents, plans or maps and the amount of any charge;* *details of how to respond to the publicity; and* *a deadline for receipt of those responses by the applicant, being not less than 28 days following the date when the notice is last published."*
EIA Regulation 12: Consultation statement requirements	The consultation statement (the SoCC) prepared under Section 47(1) ('Duty to consult local community') must set out whether the development for which the applicant proposes to make an application for an order granting development consent is EIA development; and if that development is EIA development, how the applicant intends to publicise and consult on the preliminary environmental information.
EIA Regulation 13: Pre-application publicity under	Where the proposed application is for EIA development, the applicant must, at the same time as publishing notice of the proposed application under Section 48(1), send a copy of the Section

SECTION OF PA 208/RELEVANT REGULATION	LEGISLATIVE REQUIREMENT
Section 48 (duty to publicise)	48 notice to all the consultation bodies ('consultation bodies' means for the purposes of the EIA Regulations a body prescribed under Section 42(1)(a)) and listed in column 1 of the table set out in Schedule 1 of the APFP Regulations where the circumstances set out in Schedule 2 are satisfied in respect of that body); each local authority within Section 43 'Local authorities for the purposes of Section 42(1)(b),'; where the land to which the proposed application relates is in Greater London or any part of that land is in Greater London, the Greater London Authority; and any person notified to the applicant by PINS in accordance with EIA Regulation 11(1)(c)).
Section 49: Duty to take account of responses to consultation and publicity	The applicant must have regard to any 'relevant responses' received to the Section 42, 47 and 48 consultation and publicity. A relevant response means a response received to the Section 42, 47 and 48 consultation and publicity before any deadline imposed in accordance with the relevant section of the PA 2008.
Section 50: Guidance about pre-application procedure	The applicant must have regard to any pre application procedural guidance issued under this section by the SoS. The principal pre-application guidance is 'Planning Act 2008: guidance on the pre-application process' (Department for Communities and Local Government, March 2015). This provides advice on a wide range of pre application activities. This guidance is referred to below.

3.4 Relevant guidance

3.4.1 Relevant guidance relating to pre-application consultation and publicity is provided by the following documents:

- Department for Communities and Local Government ('DCLG'): Planning Act 2008: Guidance on the pre-application process (March 2015).
- Ministry of Housing, Communities and Local Government ('MHCLG'): Guidance on procedural requirements for major infrastructure projects (22 July 2020, updated 31 December 2020).
- Redcar and Cleveland Borough Council: Statement of Community Involvement (Adopted February 2021).

- Stockton-on-Tees Local Plan Statement of Community Involvement (Adopted November 2016).
- Hartlepool Borough Council: Statement of Community Involvement (September 2019).

3.4.2 In addition, PINS publishes a series of advice notes setting out recommendations for applicants, consultees, the public and others about a range of process matters including:

- Advice Note Three: EIA consultation and notification (Republished August 2017, Version 7).
- Advice Note Eleven: Working with public bodies in the infrastructure planning process (Republished November 2017, Version 4).
- Advice Note Fourteen: Compiling the Consultation Report (Republished February 2021, Version 3).

3.4.3 The Applicant has had regard to the above guidance and advice notes in preparing the SoCC, undertaking the pre-application consultation and preparing the Consultation Report for the Proposed Development. In particular, the Consultation Report in terms of its structure and content takes account of PINS Advice Note Fourteen.

3.5 Legislative compliance

3.5.1 The checklist in Table 3.2 (below) sets out how the pre-application consultation and publicity for the Proposed Development has complied with the legislative requirements of the PA 2008 and related regulations relating to pre-application consultation. This compliance exercise has been carried out against the PINS 'Section 55 Application Acceptance Checklist' and the acceptance criteria that are relevant to pre-application consultation.

Table 3.2: Compliance with PINS Section 55 'Application Acceptance Checklist'

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
Section 55(3)(e): The Applicant in relation to the application made has made has complied with Chapter 2 of Part 5 (pre-application procedure)		
In accordance with the EIA Regulations, did the applicant (prior to carrying out consultation in accordance with s42) either (a) request the Planning Inspectorate adopt a Screening Opinion in respect of the development to which the application relates, or (b) notify the Planning Inspectorate in writing that it proposed to provide an Environmental Statement in respect of that development?	The Applicant notified the SoS pursuant to EIA Regulation 8(1)(b) 'Notification of Intention to Provide an Environmental Statement' and requested a scoping opinion under EIA Regulation 10(1) 'Request for a Scoping Opinion' on 30 March 2023. PINS issued the scoping opinion on 17 May 2023. The Section 42 consultation for the First Consultation commenced on 14 September 2023. Section 16 of the Consultation Report describes how the Applicant carried out consultation in accordance with the EIA Regulations.	**Section 16 'EIA Related Consultation'**
Have any Adequacy of Consultation Representations been received from 'A', 'B', 'C' and 'D' local authorities; and if so, do they confirm that the Applicant has complied with the duties under s42, s47 and s48?	These will be provided by the relevant local authorities to PINS following submission of the application to development consent.	n/a

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
Section 42: Duty to consult **Did the Applicant consult the applicable persons set out in s42 of the PA2008 about the proposed application?**		
Section 42(1)(a) persons prescribed?	Yes – persons as prescribed were consulted by letter. A list of the prescribed persons is provided at Appendix 7.1 of the Consultation Report. Letters were issued by Royal Mail First Class Post on 14 September 2023 for the First Consultation and were also emailed (where email addresses were available) on the same date. The letters included a secure fileshare link to the consultation documents and materials and a copy of the combined Section 42, 47 and 48 notice. A small number of letters were returned. Where this happened they were re-issued to an alternative address where possible. Letters were issued by Royal Mail First Class post on 13 December 2023 for the Second Consultation. The letters were emailed on 14 December 2023 where email addresses were available. The letters included a fileshare link to the consultation documents and materials and a copy of the Section 48 notice.	**Section 7 'Identifying Consultees'** **Appendix 7.1** **Section 12 'First Consultation: Section 42 'Duty to consult'** **Section 13 'Second Consultation'** **Section 14 'Additional and Targeted Consultation'**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	Again, a small number of letters were returned. Where this happened they were re-issued to an alternative address where possible. On a precautionary basis, and taking account of experience from another project, the Applicant issued a Section 42 letter to the Office of Health Improvement and Disparities ('OHID'), care of the Department of Health and Social Care on 31 January 2024. The OHID were issued with the same Section 42 letter and information that had been issued for the Second Consultation. The letter was sent by First Class post and asked for any comments or representations by 1 March 2024. Sections 12, 13 and 14 of the Consultation Report describe how the Applicant has consulted the Section 42(1)(a) persons as prescribed.	
Section 42(1) (aa) the Marine Management Organisation?	Yes – a letter was sent to the Marine Management Organisation ('MMO') by Royal Mail First Class Post on 14 September 2023 for the First Consultation. The letter included a secure fileshare link to the consultation documents and materials and included the combined Section 42, 47 and 48 notice.	**Section 12 'First Consultation: Section 42 'Duty to consult'**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	A letter was issued by Royal Mail First Class post on 13 December 2023 to the MMO for the Second Consultation. The letters included a fileshare link to the consultation documents and materials and a copy of the Section 48 notice. Sections 12 and 13 of the Consultation Report (Document Ref. 5.1) describe how the Applicant has carried out consultation with the Section 42(1)(aa) persons.	
Section 42(1)(b) each local authority within s43?	Yes – each local authority within Section 43 was consulted by letter sent by Royal Mail First Class post and email on 14 September 2023. The letter included a fileshare link to the consultation documents and materials and included the combined Section 42, 47 and 48 notice. The local authorities consulted were Redcar and Cleveland Borough Council, Stockton-on-Tees Borough Council, Hartlepool Borough Council, Middlesbrough Council, Hambleton District Council, Scarborough Borough Council, North York Moors National Park Authority, North Yorkshire Council, Durham County Council and Darlington Borough Council.	**Section 7 'Identifying Consultees'** **Table 7.1.** **Section 12 'First Consultation: Section 42 'Duty to consult'** **Section 13 'Second Consultation'**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	Although not local authorities for the purposes of Section 43, the Tees Valley Combined Authority ('TVCA') and South Tees Development Corporation ('STDC') were consulted in the same manner on 14 September 2023 and provided with the same information. The local authorities and TVCA and STDC were consulted by letter (sent by Royal Mail First Class post on 13 December 2023) and email for the Second Consultation. The letters included a fileshare link to the consultation documents and materials and a copy of the Section 48 notice. Sections 7, 12 and 13 of the Consultation Report describes how the Applicant has carried out consultation with the Section 42(1)(b) local authorities.	
Section 42(1)(c) the Greater London Authority (if in Greater London area)?	No – the Greater London Authority was not consulted as the Proposed Development does not involve land within Greater London.	n/a
Section 42(1)(d) each person in one or more of s44 categories?	Yes – Letters were issued by Royal Mail First Class post on 14 September 2023 for the First Consultation and were also emailed (where email addresses were available) on the same date. The letters included a secure fileshare link to the	**Section 7 'Identifying Consultees'** **Table 7.1.**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	consultation documents and materials and a copy of the combined Section 42, 47 and 48 notice. A small number of letters were returned. Where this happened they were re-issued to an alternative address where possible. Letters were issued by Royal Mail First Class post on 13 December 2023 for the Second Consultation. The letters were emailed on 14 December where email addresses were available. The letters included a fileshare link to the consultation documents and materials and a copy of the Section 48 notice. Again, a small number of letters were returned. Where this happened they were re-issued to an alternative address where possible. Section 42 site notices were erected by the Applicant's Land Referencers around the proposed Order Limits at the beginning of the First and Second Consultations. The site notices were inspected at intervals (each week) throughout the consultation periods and replaced if damaged or removed.	**Section 12 'First Consultation: Section 42 'Duty to consult'** **Section 13 'Second Consultation'** **Section 14 'Additional and Targeted Consultation'**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	Where the Applicant was unable to establish the owner of land or an interest in it, unknown landowner notices were erected on or close to the land in question and these were checked and maintained during the consultation period. The Applicant issued a number of letters pursuant to Section 42 in January and February 2024 to additional landownership interests who had been identified. These parties were provided with the same information as had been issued for the Second Consultation. The Applicant also undertook targeted consultation pursuant to Section 42 in February 2024 in respect of a number of landowners within the vicinity of Cowpen Bewley Village, near Billingham in respect of changes to pipeline routing and replacement open space. Sections 7, 12, 13 and 14 of the Consultation Report describe how the Applicant has carried out consultation with the Section 42(1)(d) persons.	
Section 45: Timetable for s42 consultation		
Did the applicant notify s42 consultees of the deadline for receipt of consultation responses;	Yes – Each of the letters issued pursuant to Section 42 clearly stated a deadline for the receipt of responses.	**Section 12.0 'First Consultation: Section 42 'Duty to consult'**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
and if so was the deadline notified by the applicant 28 days or more starting with the day after receipt of the consultation documents?	The letters issued for the First Consultation on 14 September 2023 provided a deadline for comments of 11.59pm on 26 October 2023, therefore allowing in excess of 28 days to provide comments. The letters issued for the Second Consultation on 13 December 2023 and provided a deadline for comments of no later than 11.59pm on 23 January 2024, again, in excess of 28 days to provide. All of the Section 42 letters issued for the additional and targeted consultation in January and February 2024 clearly stated the deadline for comments and provided a period of more than 28 days for the submission of these.	**Section 13 'Second Consultation'** **Section 14 'Additional and Targeted Consultation'**
Section 46: Duty to notify the Planning Inspectorate of proposed application		
Did the applicant supply information to notify the Planning Inspectorate of the proposed application; and if so, was the information supplied to the Planning Inspectorate on or before the date it was sent to the s42 consultees? Was this done on or	<u>First Consultation</u> The Applicant did supply information to notify the SoS of the proposed application for development consent. The Applicant had intended to notify the SoS of the First Consultation pursuant to Section 46 on 11 September 2023, however, due to an administrative error the Section 46 notification was not sent. After becoming aware of the error, the Applicant wrote to PINS on 28 November 2023 to explain	**Section 9 'First Consultation: Section 46 'Duty to Notify Secretary of State on Proposed Application'** **Appendices 9.1 and 9.2** **Section 13 'Second Consultation'**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
before commencing consultation under s42?	the position, provide PINS with the same information that was made available to the Section 42 consultees as part of the First Consultation and set out the actions to be taken. PINS issued a letter on 29 November 2023 acknowledging receipt of the Applicant's letter dated 28 November 2023 and the accompanying Section 46 notification dated 11th September 2023 and the combined Section 42, 47 and 48 notice. The letter confirmed that the Applicant had notified PINS of the proposed application for an Order granting development consent for the purposes of Section 46. Copies of the letter dated 28 November 2023, in addition to the Section 46 notification dated 11 September 2023 and PINS acknowledgement letter are provided at Appendices 9.1 and 9.2 of the Consultation Report. <u>Second Consultation</u> The Applicant notified the SoS of the Second Consultation pursuant to Section 46 on 12 December 2023 in advance of that consultation starting on 13 December 2023. The SoS was provided with the same information that was being made available to the Section 42 consultees, which also included the PEIR and its NTS (the PEIR and NTS had been made available at the First Consultation). PINS acknowledged the Applicant's Section 46 notification on 12 December 2023 and confirmed that the Applicant had notified PINS for the purposes of	**Appendix 13.2**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	Section 46. A copy of the letter sent to PINS is provided at Appendix 13.2 of the Consultation Report.	
Section 47: Duty to consult local community		
Did the applicant prepare a Statement of Community Consultation (SoCC) on how it intended to consult people living in the vicinity of the land?	Yes – The Applicant prepared a SoCC. The SoCC defined a Consultation Area for the local community consultation pursuant to Section 47 and also set out the consultation methods to be employed. The Applicant's approach to preparation of the SoCC is described in Section 6 of the Consultation Report.	**Section 6 'Statement of Community Consultation ('SoCC')'**
Were 'B' and (where relevant) 'C' authorities consulted about the content of the SoCC; and if so, was the deadline for receipt of responses 28 days beginning with the day after the day that 'B' and (where applicable) 'C' authorities received the consultation documents	Yes – The statutory consultation on the content of the draft SoCC took place with Redcar and Cleveland Borough Council ('RCBC'), Stockton-on-Tees Borough Council ('STBC') and Hartlepool Borough Council between the 17 May and 15 June 2023, a period of more than 28 days. Letters and emails were sent to the three local authorities on 17 May 2023 accompanied by a copy of the draft SoCC. Although not local authorities for the purposes of Section 43, the Applicant also consulted the Tees Valley Combined Authority ('TVCA') and the South Tees Development Corporation ('STDC') on the draft SoCC at the same time.	**Section 6 'Statement of Community Consultation ('SoCC')'** **Appendices 6.3 and 6.4**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	Emails were sent to the local authorities and the TVCA and the STDC on the 20 June 2023 confirming that consultation on the SoCC had closed and that the document was being finalised and published. The Applicant's approach to consultation on the content of the draft SoCC is described in Section 6 of the Consultation Report. Copies of the emails, letter and the draft SoCC are provided at Appendix 6.3 of the Consultation Report.	
Has the applicant had regard to any responses received when preparing the SoCC?	Yes – Although no comments were received to the statutory consultation on the draft SoCC, the Applicant did have regard to the comments received from HBC in response to the prior non-statutory consultation on the SoCC, as set out in Table 6.1 of the Consultation Report.	**Section 6 'Statement of Community Consultation ('SoCC')'** **Table 6.1**
Has the SoCC been made available for inspection in a way that is reasonably convenient for people living in the vicinity of the land; and has a notice been published in a newspaper circulating in the vicinity of the land which states where and when the SoCC can be inspected?	Yes – The SoCC was publicised by the combined Section 42, 47 and 48 notice that was published by the Applicant in three local newspapers circulating within the vicinity of the land to which the Proposed Development relates. The notice was published as follows: • Northern Echo 14 & 21 September; • Teesside Gazette 14 & 21 September; and • Darlington and Stockton Times 15 & 22 September 2023.	**Section 6 'Statement of Community Consultation ('SoCC')'** **Tables 6.2 & 6.3** **Appendix 6.6** **Section 11 'First Consultation: Section 47 'Duty to consult local community'**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	The notice stated where and when the SoCC could be inspected. This included three inspection locations within the Consultation Area where hard/paper and digital copies of the SoCC could be inspected and also the Project Website. A copy of the SoCC was also posted to approximately 37,000 residential and business addresses within the Inner Consultation Area at the start of the First Consultation. A copy of the notice and a screenshot of the download links to the SoCC and notice from the Project Website are provided at Appendix 6.6 of the Consultation Report.	
Does the SoCC set out whether the development is EIA development; and does it set out how the applicant intends to publicise and consult on the Preliminary Environmental Information?	Yes – The SoCC (paragraphs 1.20 to 1.21) confirms that the Proposed Development is EIA development and sets out how the Applicant intends to publicise and consult on the Preliminary Environmental Information Report as part of the First Consultation.	**Section 6 'Statement of Community Consultation ('SoCC')** **Appendix 6.6**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
Has the applicant carried out the consultation in accordance with the SoCC?	Yes – The commitments set out in the SoCC have been fulfilled as set out in Table 11.3 at Section 11 of the Consultation Report. The Applicant has carried out the following in accordance with the published SoCC: • Carried out a stage of statutory consultation in accordance with the stated timescale. • Provided environmental information in the form of a Preliminary Environmental Information Report ('PEIR') and its Non-Technical Summary ('NTS'). • Issued press and media releases and used social media to publicise the consultation. • Produced and issued a Consultation Leaflet and produced a Consultation Brochure. • Published newspaper notices and placed posters on community notice boards. • Erected site notices. • Arranged and held webinars. • Provided a virtual consultation room. • Arrange and held a number of in-person public consultation events.	**Section 11 'First Consultation: Section 47 'Duty to consult local community''** **Table 11.3** **Section 13 'Second Consultation'** **Section 14 'Additional and Targeted Consultation'**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	• Arranged for consultation documents and materials to be available at a number of inspection locations. • Made consultation documents and materials available in a number of ways. • Maintained a Project Website throughout the pre-application consultation process. • Set up and managed a Freephone number. • Provided a Freepost address. • Made a Feedback Form available both in paper/hard copy and digital form. • Recorded, analysed and reported on consultation responses. The Applicant also provided a non-statutory community update as part of the Second Consultation and a targeted community consultation in respect of changes to pipeline routing and replacement open space in the vicinity of Cowpen Bewley Village near Billingham.	
Section 48: Duty to publicise the proposed application		
Did the applicant publicise the proposed application in the	Yes – For the First Consultation a combined Section 42, 47 and 48 notice was published as follows:	**Section 12 'First Consultation: Section 48 'Duty to publicise''**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
prescribed manner set out in Regulation 4(2) of the APFP Regulations? At least two successive weeks in one or more local newspapers circulating within the vicinity of the land? Once in a national newspaper. Once in the London Gazette and if the land in Scotland, the Edinburgh Gazette? Where the proposed development relates to offshore development: Once in the Lloyds List; and Once in the appropriate fishing trade journal.	• Telegraph 14 September 2023 (national newspaper); • London Gazette 14 September 2023; • Lloyds List 14 September 2023 (as the Proposed Development involves works within the tidal River Tees); • Fishing News (a fishing trade journal) 14 September 2023 (as the Proposed Development involves works within the tidal River Tees); • Northern Echo 14 and 21 September 2023 (local newspaper circulating within the vicinity of the land to which the Proposed development relates); • Teesside Gazette 14 and 21 September 2023 (local newspaper circulating within the vicinity of the land to which the Proposed development relates); and • Darlington and Stockton Times 15 and 22 September 2023 (local newspaper circulating within the vicinity of the land to which the Proposed development relates).	**Table 12.1** **Section 13 'Second Consultation'** **Table 13.1**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	The Applicant also published a Section 48 notice for the Second Consultation as follows: • Telegraph 14 December 2023; • London Gazette 14 December 2023; • Lloyds List 14 December 2023; • Fishing News 14 December 2023; • Northern Echo 14 and 21 December 2023; • Teesside Gazette 14 and 21 December 2023; and • Darlington and Stockton Times 15 and 22 December 2023.	
Did the s48 notice include the required information set out in Regulation 4(3) of APFP Regulations: the name and address of the applicant. A statement that the applicant intends to make an application for development consent to the Secretary of State.	Yes – The combined Section 42, 47 and 48 notice for the First Consultation and the Section 48 Notice for the Second Consultation provided the following: • the name and address of the Applicant; • a statement that the Applicant intends to make an application for development consent; • a statement that the Proposed Development is EIA development and that an ES will form part of the application;	**Section 12 'First Consultation: Section 48 'Duty to publicise''** **Appendix 12.1** **Section 13 'Second Consultation'** **Appendix 13.6**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
A statement as to whether the application is EIA development. A summary of the main proposals, specifying the location or route of the Proposed Development. A statement that the documents, plans and maps showing the nature and location of the Proposed Development are available for inspection free of charge at the places (including at least one address in the vicinity of the Proposed Development) and times set out in the notice. The latest date on which those documents, plans and maps will be available for inspection. Whether a charge will be made for copies of any of the documents,	• a summary of the Proposed Development, including its location and National Grid References defining the extent of the proposed Order Limited; • a statement that the consultation documents and materials, including plans and maps could be inspected free of charge at three publicly accessible venues (including details of the hours when those venues would be open) within the vicinity of the Proposed Development and could also be downloaded free of charge from the Project Website. The notices also provided information on how hard/paper copies of the consultation documents (or a USB device containing them) could be obtained from the Applicant. • Both notices confirmed a date up to which the consultation documents and materials would be available for inspection. For the First Consultation this was 26 October 2023. For the Second Consultation this was 23 January 2024. • Both notices confirmed that hard/paper copies would be provided free of charge with the	

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
plans or maps and the amount of any charge. Details of how to respond to the publicity. A deadline for receipt of those responses by the applicant, being not less than 28 days following the date when the notice is last published	exception of the PEIR, which would be charged at a maximum of £250.00 per copy. • Both notices set out the different ways people could respond to the publicity. This included by email; the Freepost address; Freephone telephone number; or Project Website. • Both notices clearly stated a deadline/latest date for the submission of comments and feedback. For the First Consultation this was 11.59pm on 26 October 2023. The last date the notice was published was 22 September 2023, so the deadline provided more than 28 days. For the Second Consultation this was 11.59pm on 23 January 2024. The last date the notice was published was 22 December 2023, so again, the deadline provided more than 28 days. A copy of the final combined Section 42, 47 and 48 notice (First Consultation) and a copy of the final Section 48 notice (Second Consultation), in additions to copies of the published notices from the various newspapers and publications are provided at Appendices 12.1 and 13.6 of the Consultation Report.	

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
Has a copy of the s48 notice been sent to the EIA consultation bodies and to any person notified to the applicant in accordance with the EIA Regulations	Yes: <u>First Consultation</u> For the First Consultation a copy of the combined Section 42, 47 and 48 notice was sent to the EIA consultation bodies at the same time as the Section 42 letters on 14 September 2023. All of the Section 42 letters sent to prescribed persons, the MMO, local authorities and landownership interests referenced EIA Regulation 13 and included a copy of the notice. The letters sent to non-prescribed consultees also included the Section 48 notice. Copies of the letters sent (Letters 1 and 2) are provided at Appendix 10.1 of the Consultation Report. The list of consultees is provided at Appendix 7.1 of the Consultation Report. <u>Second Consultation</u> For the Second Consultation a copy of the Section 48 notice was sent to the EIA consultation bodies at the same time as the Section 42 letters (Letter 1) on 13 December 2023. As for the First Consultation, all of the Section 42 letters for the Second Consultation sent to prescribed persons, the MMO, local authorities and landownership interests referenced EIA Regulation 13 and included a copy of the Section 48 notice. The letters sent to non-prescribed consultees also included the Section 48 notice. Copies of the letters sent (Letters 1 to	**Section 10 'First Consultation: Section 42 'Duty to Consult'** **Appendix 7.1** **Appendix 10.1** **Section 13' Second Consultation'** **Appendix 13.3** **Section 16 'EIA Consultation'** **Appendices 16.1 and 16.2**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	4) are provided at Appendix 13.3 of the Consultation Report. The list of consultees is provided at Appendix 7.1 of the Consultation Report.	
Section 49: Duty to take account of responses to consultation and publicity		
Has the Applicant had regard to any relevant responses to the s42, s47 and s48 consultation?	Yes – The Applicant has had regard to any relevant responses received to the First Consultation, the Second Consultation, the additional Section 42 consultation and the targeted Cowpen Bewley consultation. How the Applicant has had regard to the consultation responses is set out in the tables at Section 15 of the Consultation Report.	**Section 15 'Section 49 'Duty to take account of responses to consultation and publicity'** **Tables 15.1 to 15.6**
Guidance about pre-application procedure		
To what extent has the Applicant had regard to statutory guidance 'Planning Act 2008: Guidance on the pre-application process'?	Yes – The Applicant has complied with the requirements of the PA 2008 (and related regulations) as confirmed above. In formulating their consultation approach and strategy, preparing the SoCC, undertaking the pre-application consultation and publicity and preparing the Consultation Report, the Applicant has had regard to the PA 2008 and related regulations, the DCLG 'Planning Act 2008: Guidance on the pre-application process', the statements of community	**Section 3 'Legislative Context and Relevant Guidance'** **Table 3.1**

ACCEPTANCE CHECKLIST CRITERIA	EVIDENCE OF COMPLIANCE	WHERE ADDRESSED IN THE CONSULTATION REPORT
	involvement of the host local authorities, and PINS Advice Notes 3, 4, 11 and 14. Section 3 'Legislative Context and Relevant Guidance' of the Consultation Report lists the legislation, guidance and advice notes that the Applicant has had regard to in formulating its consultation proposals and carrying out the pre-application consultation. In addition, Table 3.2 of the Consultation Report demonstrates how the Applicant has complied with relevant pre-application consultation requirements.	

4.0 THE APPLICANT'S APPROACH TO PRE-APPLICATION CONSULTATION

4.1 Introduction

4.1.1 This section of the Consultation Report describes the approach that has been taken to pre-application consultation in respect of the Proposed Development.

4.2 Responsibility for the pre-application consultation

4.2.1 The Applicant was responsible for undertaking the pre-application consultation on the Proposed Development. In undertaking the consultation the Applicant was supported by a team comprising:

- bp communications and public affairs.
- AECOM – Environmental Consultants.
- DWD – Planning Consultants.
- Dalcour Maclaren – Land Agents.
- Ardent – Land Referencing.

4.3 Consultation Objectives

4.3.1 At the outset, the Applicant set a number of clear objectives for the pre-application consultation on the Proposed Development. These were to:

- Ensure public understanding of the design and decision-making processes for the Proposed Development, addressing any misinformation around the proposals.
- Create a clear understanding of the Proposed Development's identity, given the number of low carbon and net zero projects in the area, and also provide engaging messaging to help avoid confusion with other projects.
- Reach silent and/or seldom heard audiences by using varied communications methods.
- Explain the benefits of the Proposed Development, including in terms of job creation, protection of existing industry and decarbonisation.
- Provide stakeholders with the opportunity to submit comments and feedback while the proposals are still at a formative stage, and to provide them with a different ways in which to do so.
- Provide a mechanism to review the comments and feedback received and show how these have been taken into account in finalising the proposals and the DCO Application.

4.3.2 These objectives were to be achieved by:

- Developing a stakeholder engagement and communications strategy early in the pre-application process to provide a framework to guide the pre-

application consultation, including the areas and people to be consulted and the consultation activities and methods to be employed.

- Reflecting upon and taking account of recent pre-application consultation exercises undertaken within the area, notably those for the NZT Project, the consultation methods deployed and levels and types of engagement and responses received from stakeholders.
- Deploying and carrying out a wide range of consultation activities and methods to publicise the Proposed Development to a wide audience and to receive comments and feedback.
- Adopting an open and flexible approach to pre-application consultation by keeping under review the need for further stages of consultation and targeted consultation prior to the submission of the DCO Application.

4.4 Consultation Stages

4.4.1 Government guidance recommends that applicants undertake two (or more) stages of pre-application consultation, depending on the scale of a project[5].

4.4.2 The Applicant proposed to undertake one main stage of consultation on the Proposed Development. This was statutory consultation in accordance with Sections 42, 47 and 48 of the PA 2008 and related regulations. This decision was reflected in the Stakeholder Engagement and Communications Strategy that was developed early in the pre-application process and in the Statement of Community Consultation (the 'SoCC') that was subsequently prepared and agreed with the relevant local authorities.

4.4.3 The decision to progress with one main stage of consultation for the Proposed Development took account of bp's recent experience of consultation on the adjacent NZT Project. The consultation for NZT had covered a similar area and had attracted relatively low levels of comments and feedback, with the majority of responses being broadly supportive of the project, which was considered reflective of the communities in the area being generally comfortable with industrial and energy related developments and their interest in seeing economic development and job creation come forward. The Applicant was also mindful of avoiding consultation overload with the local community. Given this context, the understanding of issues and environmental considerations from the local area built up through NZT Project, and the wide range of consultation methods to be employed, a single stage of consultation was considered to be sufficient.

4.4.4 In advance of the statutory consultation, during the first half of 2023, the Applicant undertook engagement with local political representatives, the local community, potentially affect landowners and key technical consultees. This early engagement was intended to raise awareness of the Proposed Development and forthcoming statutory consultation and also informed the EIA work being undertaken.

[5] Department for Communities and Local Government, "Planning Act 2008: Guidance on the pre-application process", (March 2015): paragraph 70

4.4.5 The statutory consultation took place between 14 September and 26 October 2023. Further information on this consultation and what it entailed is provided at Sections 10.0 to 12.0 of this Report.

4.4.6 As confirmed above, the Applicant adopted an open and flexible approach to pre-application consultation on the Proposed Development and throughout the pre-application process kept under review the need for further stages of consultation and targeted consultation prior to the submission of the DCO application.

4.4.7 Following the statutory consultation undertaken in September/October 2023 (from now on referred to as the 'First Consultation'), the Applicant identified the need to undertake further consultation on the Proposed Development in respect of a number of changes that had resulted to the proposed Site boundary (the proposed Order Limits) following further design development and technical assessments and also responses received to the First Consultation. The Applicant considered it important to undertake this further consultation (from now on referred to as the 'Second Consultation') to ensure that interested parties and key stakeholders had adequate opportunity to review and comment upon the changes.

4.4.8 The Second Consultation took place between 13 December 2023 and 23 January 2024. This included further statutory consultation and publicity pursuant to Section 42 and 48 of the PA 2008. In addition, an update letter was sent to the local community living within the vicinity of the Site providing information on the changes. Further information on the Second Consultation is provided at Section 13.0 of this Report.

4.4.9 The Applicant undertook additional consultation from late January 2024. This involved consulting additional parties, including landowners/interests, who had been identified following the Second Consultation.

4.4.10 In addition, the Applicant consulted landowners and the local community within the vicinity of Cowpen Bewley Woodland Park, with the administrative area of Stockton-on-Tees Borough Council, relating to changes to the hydrogen pipeline corridor in this location (in response to comments from residents of Cowpen Bewley village following the Second Consultation) and proposals to provide replacement open space land.

4.4.11 The additional and targeted consultation is summarised at Section 14.0.

4.4.12 The consultation and engagement that has been undertaken by the Applicant in the lead up to the submission of the application for development consent is summarised below:

- **Early engagement with stakeholders (non-statutory)** – Quarters 1 and 2 2023.
- **First Consultation (statutory consultation)** – in accordance with Sections 42, 47 and 48 of the PA 2008 – 14 September to 26 October 2023.
- **Second Consultation (statutory and non-statutory)** – in accordance with Sections 42 and 48 of the PA 2008 and including a non-statutory community update – 13 December 2023 to 23 January 2024.

- **Additional Consultation (statutory)** – in accordance with Section 42 of the PA 2008 – mid-January to early March 2024.
- **Targeted Cowpen Bewley Consultation (statutory and non-statutory)** – in accordance with Section 42 of the PA 2008 and including non-statutory consultation of the community within the vicinity of Cowpen Bewley – early February to early March 2024.

5.0 STAKEHOLDER ENGAGEMENT AND COMMUNICATIONS STRATEGY

5.1 Introduction

5.1.1 This section of the Consultation Report provides and overview of the stakeholder engagement and communications strategy that was developed by the Applicant to guide to pre-application consultation on the Proposed Development.

5.2 Preparation of the stakeholder engagement and communications strategy

5.2.1 Early in the pre-application process the Applicant started to develop a stakeholder engagement and communications strategy in order to provide a clear a framework for the pre-application consultation to be undertaken on the Proposed Development, including the areas and people to be consulted and the consultation activities and methods to be employed.

5.2.2 The stakeholder engagement and communications strategy (from now on referred as the 'strategy') was based on the consultation objectives set out a Section 4.0 of this Report. The strategy was also prepared on the basis that one main stage of statutory consultation would be undertaken for the reasons set out in Section 4.0.

5.2.3 The strategy set out the following:

- The consultation objectives.
- The approach to be taken to engagement, communication and consultation.
- Key messaging.
- The approach to stakeholder mapping and who would be consulted.
- Proposed consultation and engagement methods.
- The programme for consultation and engagement.
- How consultation and engagement would be documented, analysed and reported.

5.2.4 The strategy set out how the overall approach to engagement, communication and consultation on the Proposed Development would be informed by a number of core principles. These are:

- **Proactive** – engage early and secure community and political buy-in for the approach to consultation.
- **Wide-reaching** – engage as widely as possible and ensure all communication and consultation activity is accessible to all constituent parts of the local community.
- **Educate and inform** – be clear with stakeholders on what is being presented and how their comments will be considered.
- **Always learn, never defend** – the community and stakeholders are experts in the local area, so it is vital to listen and learn from their experience and knowledge.

- **Feedback** – provide clear feedback to the community on what has been said and how it has informed the emerging proposals and eventual design submission.

5.2.5 In preparing the strategy, the Applicant took account of relevant legislation and guidance (referred to in Section 3.0 of this Report) and also drew upon the experience of its project team in developing and implementing consultation strategies on a large number of DCO applications and other major planning projects, including the NZT Project.

5.2.6 The strategy was used to inform the preparation of the draft Statement of Community Consultation ('SoCC') in advance of consulting the relevant local authorities on that document.

5.3 Definition of the consultation area

5.3.1 As part of developing the strategy the Applicant sought to define an appropriate consultation area for the purposes of the pre-application consultation. The defined consultation area comprised two consultation zones – an Inner Consultation Zone ('ICZ') and an Outer Consultation Zone ('OCZ').

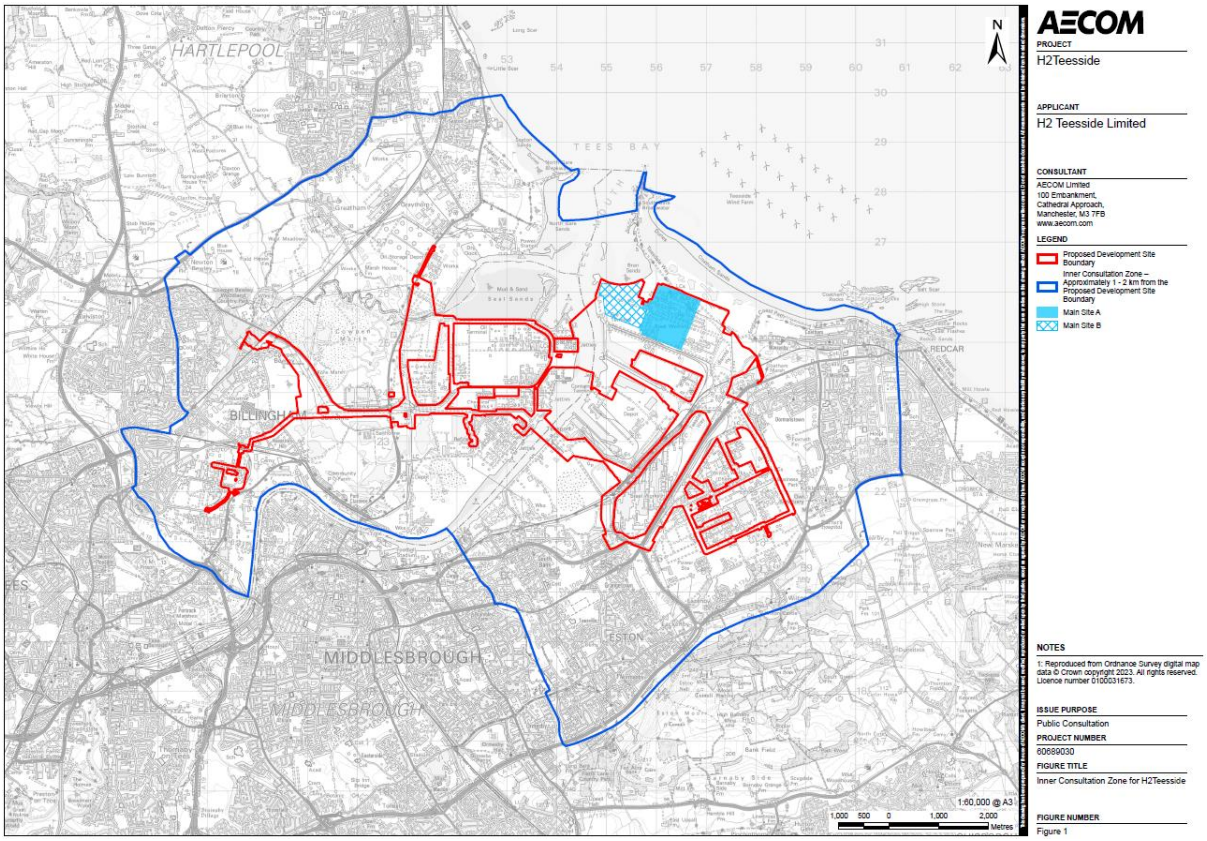
5.3.2 Section 47 of the PA 2008 requires applicants to consult *"people living in the vicinity of the land"*, however, *"vicinity"* is not defined in the PA 2008. Paragraph 36 of the 'DCLG: Planning Act 2008: Guidance on the pre-application process (March 2015)' indicates that in defining a consultation area, applicants should give consideration to the fact that a development may have impacts that could be wider than a single local authority's area and that there might be a need to consult people living within a wider area who could be affected (e.g. though visual or environmental impacts, or through increased traffic flow). Paragraph 56 of the guidance goes onto encourage applicants to consult beyond those living within the vicinity of the land where they think doing so may provide more information on the impacts of their proposals.

5.3.3 The ICZ is defined by the blue line on Figure 5.1 below. The Site (the proposed Order Limits) is shown by the red line. The ICZ represents the area within which the Applicant considered there was the greatest potential for local communities to be affected by/interested in the Proposed Development. The ICZ extends approximately 1 to 2 km from the Main Site and the connections corridors for the Proposed Development. The Applicant sought to ensure that the ICZ did not cut across communities and where appropriate, main roads and natural features were used to define the edge of the ICZ. The ICZ includes over 37,000 residential and business addresses and includes the nearby settlements of Warrenby, Dormanstown, Lazenby, Lazenby, Lackenby, Coatham, the western part of Redcar, Grangetown, Eston, Normanby, South Bank, the eastern part of Billingham and Greatham.

5.3.4 The approach to defining the ICZ for the Proposed Development was broadly the same as the approach taken for the NZT Project. The Main Site for the NZT Project is also located at the Foundry within Teesworks, adjacent to the Main Site for the

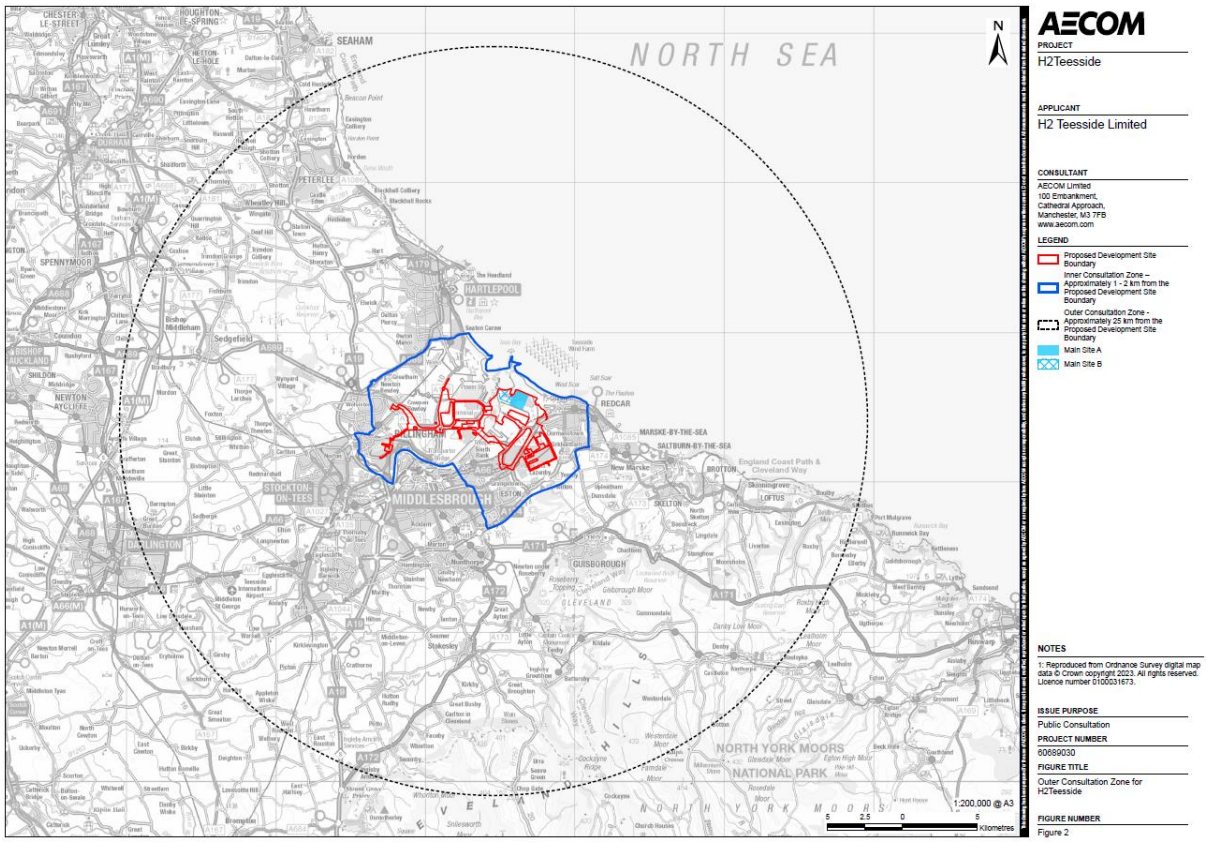
Proposed Development, and its connections corridors extend either side of the Tees and which are in many cases across a broadly similar area.

Figure 5.1: Site Boundary and Inner Consultation Zone



5.3.5 The OCZ is shown by the dotted line radius in Figure 5.2 below. The OCZ was defined with reference to the early EIA work and extends to approximately 25 km from the Site boundary. The OCZ was considered to represent the likely maximum geographical extent within which it could be predicted that most likely significant environmental effects could occur.

Figure 5.2: Site Boundary and Outer Consultation Zones



5.4 Consultation methods

5.4.1 The strategy identified a number of potential consultation methods. These are summarised in Table 5.1 below.

Table 5.1: Consultation methods

CONSULTATION METHOD	DETAILS
Project Website	A project website/webpage for publishing information and updates on the Proposed Development, including details of consultation events and how to submit comments and feedback.
Press /media releases	Press/media releases to publicise the Proposed Development to be issued to local and regional press at the start of the consultation. Press releases would also provide information on the timing and venues for public consultation events.
Consultation leaflet and brochure	A consultation leaflet to be sent to residents and businesses within the ICZ providing information on the Proposed Development and how to submit comments and feedback. Also

CONSULTATION METHOD	DETAILS
	a consultation brochure to be made available on the website, at the in-person consultation events and within the virtual consultation room.
Newspaper notices/site notices/posters	Publication of notices in local and (as appropriate) national newspapers and other publications to publicise the consultation, the consultation events and how to submit comments and feedback. Site notices would be erected at points around the Site boundary and posters placed on public notice boards (e.g. council offices and libraries) where possible.
Elected member briefings	Briefings to elected members (e.g. local MPs, ward and any parish/town councillors) and other key stakeholders.
Public consultation events	In-person consultation events within the vicinity of the Site to provide an opportunity for the local community (and others) to view the consultation documents and materials and learn about the Proposed Development and speak with members of the project team.
Virtual consultation room	A virtual consultation room hosted online that simulates a public consultation event for those unable to attend in-person consultation events.
Webinars	Webinars to provide information on the Proposed Development and an opportunity for people unable to attend in-person consultation events to ask questions of members of the project team.
Inspection locations	Public inspection locations such as local libraries, council offices, leisure centres or other public venue where people can inspect the consultation documents and materials.
Freephone number	Freephone number so people, including those without internet access, can contact the project team to leave questions about the Proposed Development, provide comments and feedback and request information.

CONSULTATION METHOD	DETAILS
Freepost	A Freepost address to allow people to submit comments by post without charge.
Feedback form	A feedback form made available during the consultation for people to use to submit comments and feedback. The feedback form would be available online and also in hard copy form at in-person consultation events.

5.5 Recording and taking account of consultation

5.5.1 The strategy confirmed that consultation responses would be recorded and securely stored. The comments and feedback received would be analysed and grouped under specific topic or theme headings. The Applicant would then prepare responses to the comments and feedback received.

5.5.2 A consultation report would be prepared documenting what has been done for the pre-application consultation, the comments and feedback received and how the Applicant has taken account of/had regard to these. The consultation report would form part of the DCO application.

6.0 STATEMENT OF COMMUNITY CONSULTATION ('SOCC')

6.1 Introduction

6.1.1 This section of the Consultation Report sets out the approach that was taken to the preparation of the Statement of Community Consultation ('SoCC'), the non-statutory and statutory consultation that took place with the relevant local authorities, Redcar and Cleveland Borough Council ('RCBC'), Stockton-on-Tees Borough Council ('STBC') and Hartlepool Borough Council ('HBC') and also the South Tees Development Corporation ('STDC') and the Tees Valley Combined Authority ('TVCA'), on the draft SoCC (the statutory consultation being in accordance with Section 47(2) of the PA 2008), the feedback received, and the changes made to the SoCC prior to its publication pursuant to Section 47(6).

6.1.2 As confirmed in Section 5.0, the preparation of the SoCC was informed by the stakeholder engagement and communications strategy developed early in the pre-application process to guide the Applicant's pre-application consultation on the Proposed Development.

6.2 Legislative requirements

6.2.1 Section 47 of the PA 2008 places a duty on applicants for development consent to consult the local community. Subsection (1) requires the applicant to prepare a SoCC setting out how it proposes to consult, about the proposed development, people living within the vicinity of the land to which the application relates.

6.2.2 Subsection (2) goes on to state that in preparing the SoCC, an applicant must consult each local authority that is within Section 43(1) about what is to be in the statement. Section 43(1) states that a local authority is within this section if the land (to which the application relates) is in the authority's area.

6.2.3 The Site lies within the administrative boundaries of the boroughs of Redcar and Cleveland south of the River Tees and Stockton-on-Tees north of the Tees on Teesside and within the borough of Hartlepool in County Durham, also north of the Tees. Accordingly, the following are the relevant local authorities for the purposes of Section 43(1) to be consulted under Section 47(2) on the draft SoCC for the Proposed Development:

- RCBC.
- STBC.
- HBC.

6.2.4 Although not local authorities for the purposes Section 43(1), the Applicant also took the decision to include STDC and TVCA in the consultation on the draft SoCC. This related to the Proposed Development involving land in the STDC area (Teesworks) and TVCA's role within the Tees Valley.

6.2.5 Section 47, subsection (3) states that an applicant must provide the Section 43(1) authorities with a period of 28 days beginning with the day after the day that the authority receives the draft SoCC in which to respond to the consultation.

Subsection (5) requires an applicant to have regard to any response received before this deadline.

6.2.6 Following the end of the consultation, applicants must make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land and also publish a notice in a newspaper circulating within the vicinity of the land to which the application relates, stating where and when the SoCC can be inspected (subsection (6)).

6.2.7 Subsection (7) requires the consultation on the proposed application for development consent to be carried out in accordance with the proposals set out in the SoCC.

6.3 Scope of the SoCC

6.3.1 Section 47 of the PA 2008 requires applicants to consult people living within the vicinity of the land to which the application relates. As noted earlier, the PA 2008 does not, however, define what is meant by living within the vicinity.

6.3.2 The consultation area adopted for the purposes of the draft SoCC prepared by the Applicant was based upon that defined at the time of developing the stakeholder engagement and communications Strategy. The rationale for the consultation area has already been set out in Section 5.0 and the ICZ and OCZ are shown in Figures 5.1 and 5.2.

6.3.3 The consultation area clearly covers people living within the vicinity of the land and significantly beyond and is therefore considered to be appropriate for the purposes of Section 47.

6.3.4 The draft SoCC prepared set out the consultation methods that the Applicant proposed to use during the pre-application consultation on the Proposed Development. This included a wide range of consultation methods as defined in the stakeholder engagement and communications strategy (see Section 5.0, Table 5.1).

6.3.5 The draft SoCC confirmed that certain consultation methods would be more focused on the ICZ. This included the consultation leaflet that was to be sent to residents and businesses within the ICZ.

6.3.6 The draft SoCC confirmed that the pre-application consultation would provide information on the following:

- What H2Teesside is and what it will do.
- The practical uses of hydrogen and its benefits.
- The role of carbon capture, usage and storage ('CCUS') in enabling H2Teesside.
- Decisions made with regard to the design and layout of the Proposed development and the options under consideration.

- The findings of the environmental assessment work undertaken at the time of the consultation, presented in the form of the Preliminary Environmental Information Report ('PEIR').
- The proposals for avoiding, minimising and/or mitigating any likely environmental effects of the Proposed Development, to the extent defined and known at that stage.
- An update on the timeline for the Proposed Development and the key milestones, including the anticipated submission date for the development consent application.
- How comments and feedback can be provided and the deadline for the receipt of these.

6.4 Non-statutory consultation on the draft SoCC

6.4.1 The Applicant took the decision to carry out non-statutory consultation on a draft of the SoCC prior to carrying out statutory consultation on it. This mirrored the approach taken on the NZT Project and was considered to be beneficial in terms of providing the relevant local authorities with an opportunity to review and comment on the draft SoCC prior to the statutory consultation.

6.4.2 On 24 April 2023 the Applicant submitted a draft of the SoCC to RCBC, STBC and HBC for informal (non-statutory) consultation. The SoCC was issued by email. Copies of the emails and the draft SoCC are provided at Appendix 6.1.

6.4.3 Although there was no requirement to do so, the Applicant also included STDC and TVCA in the informal consultation on the draft SoCC. Emails were sent to STDC and TVCA on the same date (24 April). The emails are also provided at Appendix 6.1.

6.4.4 The authorities were asked to provide comments by close of business on 5 May 2023. The responses received to the non-statutory consultation of the draft SoCC are set out in Table 6.1 below and are provided at Appendix 6.2.

Table 6.1: Responses received to non-statutory consultation on draft SoCC

AUTHORITY/DATE RECEIVED	AUTHORITY RESPONSE SUMMARY	APPLICANT'S RESPONSE
RCBC	No response.	n/a
STBC – 25 April 2023	Confirmed no comments and that the approach set out in the draft SoCC was acceptable.	n/a
HBC – 9 May 2023	Referred the Applicant to HBC's Statement of Community Involvement and also advised that the Applicant should consult the	The Applicant had already had regard to the HBC Statement of Community Involvement in developing the Stakeholder Engagement

AUTHORITY/DATE RECEIVED	AUTHORITY RESPONSE SUMMARY	APPLICANT'S RESPONSE
	following on the Proposed Development: • Hartlepool Rural Neighbourhood Plan Working Group. • The newly established Hartlepool Mayoral Development Corporation through TVCA. • The Royal Society for the Protection of Birds ('RSPB'). • Teesmouth Bird Club. • Health and Safety Executive (HSE). • Cleveland Fire Brigade. • EDF (Hartlepool Nuclear Power Station). • Environment Agency. • Natural England.	and Communications Strategy and draft SoCC. The Applicant reviewed its list of prescribed and non-prescribed consultees against the parties listed by HBC and added the additional parties to the list.
STDC	No response.	n/a
TCVA	No response.	n/a

6.5 Statutory consultation on the draft SoCC

6.5.1 On 17 May 2023 the Applicant submitted an updated draft of the SoCC to RCBC, STBC and HBC for statutory consultation in accordance with Section 47(2). The draft SoCC was issued by email and letter. Copies of the emails, letter and the draft SoCC are provided at Appendix 6.3.

6.5.2 Although there was no requirement to do so, the Applicant again included STDC and TVCA in the statutory consultation on the draft SoCC. Emails and letters were sent to STDC and TVCA on the same date (17 May). These emails and letters are also provided at Appendix 6.3.

6.5.3 The authorities were asked to provide comments by 15 June 2023. The authorities were therefore provided with a period of 30 days to comment on the draft SoCC (the statutory requirement is 28 days).

6.5.4 The only response received to the statutory consultation on the draft SoCC was from STBC (dated 6 June 2023), which confirmed it had no comments to make. The response is provided at Appendix 6.3.

6.5.5 The Applicant sent 'end of consultation' emails to the authorities on 20 June 2023, advising them that the consultation on the draft SoCC had ended on 15 June. Copies of the emails are provided at Appendix 6.4. No further responses were received to the consultation on the draft SoCC.

6.6 Publication of the final SoCC

6.6.1 The SoCC was finalised following the conclusion of the statutory consultation on 15 June 2023. A copy of the final SoCC is provided at Appendix 6.5.

6.6.2 Notice of the publication of the final SoCC was published as part of a combined Section 42, 47 and 48 notice at the start of the First Consultation as follows (Table 6.2 below):

Table 6.2: Notice of publication of SoCC

NEWSPAPER	DATES
The Telegraph	14 September 2023
London Gazette	14 September 2023
Lloyds List	14 September 2023
Fishing News	14 September 2023
Northern Echo	14 & 21 September 2023
Teesside Gazette	14 & 21 September 2023
Darlington and Stockton Times	15 & 22 September 2023

6.6.3 The SoCC and notice were also published on the project website.

6.6.4 A copy of the notice and a screenshot of the download links to the SoCC and notice from the project website are provided at Appendix 6.6.

6.6.5 The notice confirmed that the SoCC and notice were available to download and view free of charge from the project website and that they could also be inspected at the face-to-face consultation events being held during September and October 2023. The notice also provided an email address and telephone number by which people could contact the project team and request a paper copy of the SoCC or a USB device containing the SoCC.

6.6.6 In addition, the notice advised that paper and digital copies of the SoCC and notice would be available to view free of charge (see Table 6.3 below) at the following inspection locations until 26 October 2023:

Table 6.3: SoCC inspection locations

INSPECTION LOCATION	OPENING TIMES
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

7.0 IDENTIFYING CONSULTEES

7.1 Introduction

7.1.1 This section explains how the Applicant identified consultees, including those persons ('prescribed persons') who there was a 'Duty to consult' pursuant to Section 42 of the PA 2008, in addition to other persons and bodies, who while there was no statutory duty to consult them, were consulted, as it was considered they may be interested in the Proposed Development ('non-prescribed persons').

7.1.2 Early in the pre-application process the Applicant commenced a stakeholder mapping exercise in order to identify consultees. This was informed by and included the following:

7.1.3 Drawing upon the stakeholder mapping work for the adjacent NZT Project, notably the list compiled for the Section 56 notifications for the NZT DCO application.

- Reviewing Schedule 1 of the APFP Regulations and PINS Advice Note 3 'EIA consultation and notification' (Version 7, August 2017).
- Discussions and enquiries with the relevant local authorities in order to identify stakeholders and any 'hard to reach groups'.
- Reviewing the EIA Regulation 11(1)(a) list of consultation bodies provided by PINS on 17 May 2023 with the EIA scoping opinion for the Proposed Development.

7.1.4 Diligent inquiries by the Applicant's land referencers to identify relevant landownership interests.

7.1.5 The consultee lists compiled as a result of the stakeholder mapping exercise for the First Consultation in September/October 2023, were reviewed and updated prior to the Second Consultation taking place in December 2023/January 2024.

7.2 Section 42 'Duty to consult'

7.2.1 Section 42 of the PA 2008 states that applicants must consult the following about a proposed application for development consent:

- Section 42(a) – such persons as may be prescribed.
- Section 42 (aa) – the Marine Management Organisation, in any case where the project would affect, or would be likely to affect, any of the areas specific in subsection (relevant to the Proposed Development as it involves the tidal River Tees).
- Section 42(b) – each local authority that is within Section 43.
- Section 42(c) – the Greater London Authority if the land is in Greater London (not relevant to the Proposed Development as it does not involve land in Greater London).
- Section 42(d) – each person who is within one or more of the categories set out in Section 44.

Section 42(a) & (aa) – Such persons as may be prescribed & the Marine Management Organisation

7.2.2 'Such persons as may be prescribed' were identified by reference to Schedule 1 of the APFP Regulations, which lists all prescribed persons and other bodies and the circumstances when they must be consulted about a proposed DCO application.

7.2.3 In reviewing Schedule 1 of the APFP Regulations, the Applicant also had regard to PINS Advice Note 3 'EIA consultation and notification' (Version 7, August 2017), which provides advice and guidance on the identification of prescribed persons. In identifying those to consult, the Applicant applied the 'Circumstances Test' set out at Annex 1 of Advice Note 3. Where there was any uncertainty as to whether or not to include a person, the Applicant took a precautionary approach and included that person on the list of those to be consulted.

7.2.4 The Applicant also reviewed and took account of the EIA Regulation 11(1)(a) list of consultation bodies provided by PINS on 17 May 2023 with the EIA scoping opinion for the Proposed Development. The Regulation 11(1)(a) list includes at Tables 1 to 4 prescribed consultation bodies, relevant statutory undertakers, relevant local authorities and three non-prescribed consultation bodies (STDC, TVCA and the Royal National Lifeboat Institution).

7.2.5 In addition, the Applicant's land referencers undertook diligent inquiries, including issuing 'Request for Information' ('RFI') letters to identify statutory undertakers with apparatus and/or interests in land within the then proposed Order Limits.

7.2.6 Lists of all the persons identified under Section 42(a) and 42(aa) of the PA 2008, and who were consulted for the First Consultation and the Second Consultation are provided at Appendix 7.1.

Section 42(b) – Each local authority that is within Section 43

7.2.7 The relevant local authorities to consult were identified by applying Section 43, subsections (1), (2) and (2A).

7.2.8 Section 43, subsection (1) confirms that a local authority is within Section 43 if the land to which the proposed application relates is in that authority's area.

7.2.9 Section 43, subsection (2) goes on to state that a local authority (the 'A' authority) is within the section if:

- (a) the land is in the area of another authority (the 'B' authority);
- (aa) 'B' is a unitary council or a lower tier district council; and
- (b) any part of the boundary of 'A's' area (including another unitary or National Park Authority) is also part of the boundary of B's area.

7.2.10 Subsection (2A) states that if the land is within the area of an upper-tier county council (a 'C' authority), a local authority (a 'D' authority) is within the section if:

- (a) 'D' is not a lower-tier district council[6]; and
- (b) any part of the boundary of 'D's' area is also part of the boundary of 'C's' area.

7.2.11 Table 7.1 below lists all relevant local authorities who were consulted for the purposes of the First and Second Consultations and the dates upon which they were consulted. These are also listed at Appendix 7.1 for both consultations.

Table 7.1: Local authorities within Section 43

	FIRST CONSULTATION		SECOND CONSULTATION	
LOCAL AUTHORITY	**CATEGORY OF AUTHORITY**	**DATE CONSULTED**	**CATEGORY OF AUTHORITY**	**DATE CONSULTED**
Stockton-on-Tees Borough Council	B	14 September 2023	B	13 December 2023
Redcar and Cleveland Borough Council	B	14 September 2023	B	13 December 2023
Hartlepool Borough Council	B	14 September 2023	B	13 December 2023
Middlesborough Council	A	14 September 2023	A	13 December 2023
Hambleton District Council	A	14 September 2023	A	13 December 2023
Scarborough Borough Council	A	14 September 2023	A	13 December 2023
North York Moors National Park	D	14 September 2023	D	13 December 2023
North Yorkshire Council	A	14 September 2023	A	13 December 2023
Durham County Council	A	14 September 2023	A	13 December 2023
Darlington Borough Council	A	14 September 2023	A	13 December 2023

7.2.12 Plans showing the boundaries of the above local authorities relative to the location of the proposed Order Limits are provided at Appendix 7.2.

[6] That is, a district council in England for an area for which there is a county council. This means that under this section a D authority includes county councils unitary authorities and National Park authorities.

7.2.13 It should be noted that while neither STDC or TVCA are local authorities for the purposes of Section 43, they were consulted in the same manner (provided with the same consultation documents) and on the same dates as the local authorities listed in Table 7.1, for the both the First and Second Consultations.

Section 42(d) – Each person in one or more of the categories set out in Section 44

7.2.14 Section 44 defines the categories of persons to be consulted for the purposes of Section 42(d). These are as follows:

- Category 1 – an owner, lessee, tenant (whatever the tenancy period) or occupier of the land.
- Category 2 – a person interested in the land, or who has the power to sell and convey the land, or to release the land.
- Category 3 – if the applicant thinks that, if the DCO were to be made and fully implemented, the person would or might be entitled (a) as a result of the implementing of the DCO, (b) as a result of the DCO having been implemented, or (c) as a result of use of the land once the DCO has been implemented, to make a relevant claim.

7.2.15 A 'relevant claim' is defined by Section 44(6) as meaning:

- (a) a claim under Section 10 of the Compulsory Purchase Act 1965 (compensation where satisfaction not made for the taking, or injurious affection, of land subject to compulsory purchase);
- (b) a claim under Part 1 of the Land Compensation Act 1973 (compensation for depreciation of land value by physical factors cause by use of public works); and
- (c) a claim under Section 152(3) of the PA 2008 (compensation in case where no right to claim in nuisance).

7.2.16 Section 44 places a duty on applicants to make 'diligent inquiry' as to the identification of Category 1, 2, or 3 persons (the 'Section 44 persons'). The term 'diligent inquiry' is not defined in the PA 2008 but it sets a threshold of inquiry to allow the termination of that inquiry when reasonable and recognised avenues of research have been exhausted.

7.2.17 The Applicant's land referencers employed a number of methods to identify Section 44 persons taking account of best practice and relevant guidance, including PINS Advice Note 4 'Section 52' (Version 6, March 2017). Methods included the issue of RFI letters and confirmation schedules to potentially affected landowners/occupiers; searches at the Land Registry; review of legal title reports; Companies House and Electoral Roll searches; searches for registered correspondence to the relevant address (where appropriate); site visits; and discussions with known owners/occupiers, amongst others.

7.2.18 The land referencers also issued bespoke unregistered land letters on 2 June 2023, along with an accompanying plan, to landowners whom it was believed owned unregistered land. Where an interest remained in 'unknown' ownership or where it was not clear whether an interest existed or not (in each case following diligent

inquiry), a site notice was erected on or close to the land in question for both the First and Second Consultations. The other consultation methods used during the First and Second Consultations, including national and local newspaper notices, also had the potential to notify those interested in the relevant land of the Proposed Development.

7.2.19 The Applicant's land referencers continued with diligent enquiries seeking to identify Section 44 persons throughout the pre-application process, including prior to and following the Second Consultation, in order to ensure the greatest possible chance of identifying people who may be relevant. Where additional Section 44 persons were identified they were consulted in accordance with Section 42. Further information on this is provided at Section 14.0 of this Report.

7.2.20 Based on the identification of sensitive receptors (including residential properties) by the Applicant's environmental consultants in the vicinity of the proposed Order Limits (as proposed prior to the First Consultation – with the changes to the Order Limits/Site, including the additions, consulted upon in the Second Consultation not considered to change the extent of those sensitive receptors), together with an appraisal of potential nuisance effects such as noise, vibration and dust generation during construction and operation of the Proposed Development, no potential claimants have been identified who could potentially make a 'relevant claim' (such as pursuant to Part 1 of the Land Compensation Act 1973).

7.2.21 The Applicant's land referencers identified various parties with interests in land who have potential Category 3 interests, in particular parties who rely on roads which are within the Site and whose access could be affected by the Proposed Development. Examples include parties who use Seal Sands Road, Huntsman Drive, Foundry Way and private access roads within Wilton Works. These parties have been included in relevant plots in the Book of Reference (Document Ref. 3.1) in Parts 1 and 2 (as relevant) as occupiers (in respect of access) or parties benefitting from a right of access.

7.2.22 The Section 44 persons consulted for the First and Second Consultations are also included on the lists for both consultation at Appendix 7.1. As confirmed above, the Applicant's land referencers continued to keep the Section 44 persons under review, including after the Second Consultation, and any additional parties identified were consulted pursuant to Section 42 (see Section 14.0).

'Non-prescribed' persons

7.2.23 As confirmed above, the Applicant took the decision to consult a number of non-prescribed persons, who, although there was no statutory duty to consult, it was considered may wish to be consulted on the Proposed Development as they were involved in or present within the local area surrounding the Site.

7.2.24 Non-prescribed persons were identified through the stakeholder mapping exercise (including a review of the work undertaken for the NZT Project), having regard to comments from the relevant local authorities (including in relation to the draft SoCC), and the EIA Regulation 11(1)(a) list provided by PINS with the EIA scoping opinion.

7.2.25 The non-prescribed persons were consulted in the same manner as the prescribed persons for the First and Second Consultations and provided with the same consultation documents and materials.

7.2.26 Any non-prescribed or additional persons consulted for the First and Second Consultations are included on the lists for both consultations at Appendix 7.1.

7.3 Section 47 'Duty to consult local community'

7.3.1 Section 47 of the PA 2008 places a duty on applicants to consult the local community, that is, the people living within the vicinity of the land to which the proposed application for development consent relates.

7.3.2 As confirmed in Section 5.0, in developing the Stakeholder Engagement and Communications Strategy early in the pre-application process, the Applicant sought to define an appropriate consultation area for the purposes of consulting the local community. The defined consultation area comprised two Consultation Zones – an Inner Consultation Zone ('ICZ') and an Outer Consultation Zone ('OCZ').

7.3.3 The ICZ (Figure 5.1) represents the area within which the Applicant considered there was the greatest potential for local communities to be affected by/interested in the Proposed Development. The ICZ extends approximately 1 to 2 km from the Main Site and the connections corridors for the Proposed Development. The Applicant sought to ensure that the ICZ did not cut across communities and where appropriate, main roads and natural features were used to define the edge of the ICZ. The ICZ includes over 37,000 residential and business addresses and includes the nearby settlements of Warrenby, Dormanstown, Lazenby, Lazenby, Lackenby, Coatham, the western part of Redcar, Grangetown, Eston, Normanby, South Bank, the eastern part of Billingham and Greatham.

7.3.4 The approach to defining the ICZ for the Proposed Development was broadly in line with that taken for the NZT Project, which was consulted upon with the relevant local authorities through the preparation of the SoCC for that project. It is also notable that the Main Site for the NZT Project is also located at the Foundry within Teesworks (adjacent to the Main Site for the Proposed Development), and its connections corridors extend either side of the River Tees across a broadly similar area.

7.3.5 The ICZ is considered to represent the area within the vicinity of the land to which the proposed DCO application relates.

7.3.6 The OCZ (Figure 5.2) was defined with reference to the early EIA work and extends to approximately 25 km from the Site boundary. The OCZ was considered to represent the likely maximum geographical extent within which it could be predicted that most likely significant environmental effects could occur.

7.3.7 A mailing company was used by the Applicant to identify residential and business addresses within the ICZ in order to assist with sending them information during the First and Second Consultations.

7.3.8 The Applicant's approach to consulting the local community is described within Sections 4.0 and 6.0 of this report and is also set out within the published SoCC (Appendix 6.5).

7.3.9 The Applicant also compiled a list of local political representatives as part of the stakeholder mapping exercise. The local political representatives were contacted in advance of the start of the First and Second Consultations. The lists of political stakeholders contacted for both consultations are provided at Appendix 7.3.

7.4 Section 48 'Duty to publicise'

7.4.1 Section 48 of the PA 2008 places a duty on applicants to publicise a proposed application for development consent in the 'prescribed manner' as set out by APFP Regulation 4.

7.4.2 Notices were published pursuant to Section 48 for both the First and Second Consultations as set out in Table 7.2 below:

Table 7.2: Notices published pursuant to Section 48

NEWSPAPER	FIRST CONSULTATION	SECOND CONSULTATION
The Telegraph	14 September 2023	14 December 2023
London Gazette	14 September 2023	14 December 2023
Lloyds List	14 September 2023	14 December 2023
Fishing News	14 September 2023	14 December 2023
Northern Echo	14 & 21 September 2023	14 & 21 December 2023
Teesside Gazette	14 & 21 September 2023	14 & 21 December 2023
Darlington and Stockton Times	15 & 22 September 2023	15 & 22 December 2023

7.4.3 No additional persons, prescribed or non-prescribed, were identified or came forward as a result of the notices published for the First and Second Consultations pursuant to Section 48.

8.0 EARLY ENGAGEMENT

8.1 Introduction

8.1.1 This section of the Consultation Report briefly describes the early engagement that the Applicant undertook with stakeholders in the first half of 2023, in advance of the start of the statutory pre-application consultation.

8.2 Local political representatives

8.2.1 The Applicant engaged with local political representatives to build awareness of emerging proposals by bp within the Teesside area.

8.3 Local community

8.3.1 The Applicant started to raise awareness of the Proposed Development with the local community through press/media releases, social media and newspaper notices.

8.3.2 A notice was published in the Darlington and Stockton Times and the Hartlepool Mail on 1 and 2 June 2023 providing advance notice of the pre-application consultation to the local community. Copies of the notice are provided at Appendix 8.1.

8.3.3 The Proposed Development was advertised at Darlington Train Station and Teesside Airport. Details of the advertisements are provided at Appendix 8.2.

8.3.4 Social media adverts were placed to advertise the Proposed Development. Details of the carousel are provided at Appendix 8.2.

8.4 Landownership interests

8.4.1 The Applicant's land referencers and land agents engaged with potentially affected landowners within the vicinity of the Site/proposed Order limits, including issuing Request for Information ('RFI') letters to landownership interests.

8.4.2 This engagement helped inform the identification of Section 44 persons as part of compiling the list of consultees for the statutory consultation (see Section 6.0).

8.5 Technical consultees

8.5.1 The Applicant's environmental consultants sought to engage with key technical consultees on the scope of environmental work and surveys.

8.5.2 This engagement helped to inform the Environmental Impact Assessment ('EIA') scoping process and also fed into the preparation of the Preliminary Environmental Report ('PEIR') for the statutory pre-application consultation.

9.0 FIRST CONSULTATION: SECTION 46: 'DUTY TO NOTIFY SECRETARY OF STATE OF THE PROPOSED APPLICATION'

9.1.1 The Applicant's intention had been to notify the SoS in accordance with Section 46 of the PA 2008 on 11 September 2023, in advance of the Section 42 consultation (for the First Consultation) commencing on 14 September 2023. However, due to an administrative error, the Section 46 notification was not submitted to the SoS on or before the start of the Section 42 consultation on 14 September 2023, as it should have been.

9.1.2 After becoming aware of the error, the Applicant wrote to PINS on 28th November 2023 to explain the position. The letter was accompanied by the Section 46 notification dated 11 September 2023 and a copy of the combined Section 42, 47 and 48 notice. Copies of the letter dated 28 November, in addition to the Section 46 notification dated 11 September (which should have been issued to the SoS) are provided at Appendix 9.1.

9.1.3 The Applicant's letter of 28 November 2023 stated that whilst Section 46 of the PA 2008 has not been complied with at the time of the First Consultation, it was not considered that any persons had been prejudiced as a result of a Section 46 notification not having been submitted to the SoS for the following reasons:

9.1.4 Section 46 only requires an applicant to supply the SoS with the same information that is to be provided to the Section 42 consultees on or before commencing the Section 42 consultation. There is no requirement for the SoS to review or approve that information (and the practice is not to issue comments on it), nor is there a requirement for the SoS to consent to the start of the Section 42 consultation. In addition, Section 46 does not require the applicant to notify the SoS before commencing the Section 47 community consultation or being sent any information that is required to be sent pursuant to a published SoCC. Neither does Section 46 require the applicant to notify any other persons of the start of the consultation.

- The Applicant consulted the relevant persons pursuant to Section 42(a), (aa), (b) and (d) on the Proposed Development as part of the First Consultation. Letters were sent to the Section 42 consultees on 14 September 2023 providing details of how to access the consultation documents and accompanied by a copy of the combined Section 42, 47 and 48 notice. The letters were also emailed to the Section 42 consultees where email addresses were available. The letters confirmed that comments should be submitted by 26 October 2023, therefore providing more than the required 30 days.
- A Section 42 site notice was erected at points around the proposed Order limits. The notices were in place for the start of the Section 42 consultation and were inspected periodically throughout the consultation period to ensure that they remained in place.
- The combined Section 42, 47 and 48 notice was published in the Telegraph, London Gazette and Fishing News on 14 September 2023; Lloyds List on 15 September 2023; Northern Echo on 15 and 22 September 2023; Teesside

Gazette on 14 and 21 September 2023; and Darlington and Stockton Times on 14 and 21 September 2023.

- The community consultation was carried out over the period 14 September to 26 October 2023 in accordance with the published SoCC pursuant to Section 47(6). A range of consultation methods, as set out in the SoCC, were employed for the community consultation, including a newsletter and consultation brochure, social media, project website, virtual consultation room and face-to-face consultation events.

9.1.5 The Applicant therefore carried out a comprehensive and robust statutory consultation exercise in accordance with Sections 42, 48 and 47 of the PA 2008 for the First Consultation during September and October 2023.

9.1.6 In addition, the Applicant's letter of 28 November 2023 confirmed that it would be carrying out a Second Consultation (including Section 42 consultation, Section 48 publicity and non-statutory community consultation) on the Proposed Development from mid-December 2023 until late January 2024. The Second Consultation was required in order to consult people upon a number of changes to the proposed Order Limits resulting from further design development and technical work and in response to comments received to the First Consultation. The Applicant's letter set out what the Second Consultation would comprise, and confirmed that the Preliminary Environmental Information Report ('PEIR') and other consultation documents made available for the First Consultation would be made available for the Second Consultation.

9.1.7 PINS issued a letter on 29 November 2023 acknowledging receipt of the Applicant's letter dated 28 November 2023 and the accompanying Section 46 notification dated 11 September 2023 and the combined Section 42, 47 and 48 notice. The letter confirmed that the Applicant had notified PINS of the proposed application for a DCO for the purposes of Section 46. A copy of the PINS letter is provided at Appendix 9.2.

10.0 FIRST CONSULTATION: SECTION 42: 'DUTY TO CONSULT'

10.1 Introduction

10.1.1 This section sets out the consultation carried out by the Applicant for the First Consultation in accordance with Section 42 'Duty to consult' of the PA 2008.

10.1.2 The First Consultation commenced on 14 September 2023 and ran to 26 October 2023, a period well in excess of 30 days.

10.2 Who was consulted?

10.2.1 The following persons were consulted on the Proposed Development pursuant to Section 42:

- such persons as may be prescribed (Section 42(a);
- the Marine Management Organisation (Section 42(aa));
- each local authority that is within Section 43 (Section 42(b); and
- each person who is within one or more of the categories set out in Section 44 (Section 42(d).

10.2.2 In addition, as confirmed in Section 7.0, the Applicant took the decision to consult a number of non-prescribed persons, who, although there was no statutory duty to consult under Section 42, it was considered may wish to be consulted on the Proposed Development as they were involved in or present within the local area surrounding the proposed Order Limits/Site and may be interested in the Proposed Development.

10.2.3 A list of those who were consulted pursuant to Section 42 for the First Consultation, including the non-prescribed persons, is provided at Appendix 7.1.

10.2.4 In total, 195 prescribed persons (Section 42(a) were consulted; along with the MMO (Section 42(aa)); 10 local authorities (Section 42(b)); over 200 landownership interests (Section 42(d); 3 'additional parties' who it was considered may be landownership interests; and 22 non-prescribed consultees; in total over 420 consultees. In some cases, where consultees had multiple addresses, they were sent more than one copy of the letter.

10.3 How were they consulted?

10.3.1 The Section 42 letters were issued by Royal Mail First Class Post on 14 September 2023. The letters were also emailed on 14 September 2023 where email addresses were available. Two types of letters were posted and emailed:

- Letter 1 – sent to prescribed persons, the MMO, local authorities and landownership interests (including the 'additional parties').
- Letter 2 – sent to non-prescribed persons.

10.3.2 It was not possible to post a letter to one of the non-prescribed consultees, Save Our Steel Group, as an address could not be identified. The letter was therefore

sent by email to an email address that had been found for the Save Our Steel Group on 14 September 2023.

10.3.3 Copies of Letters 1 and 2 are provided at Appendix 10.1.

10.3.4 A small number of Section 42 letters were returned by Royal Mail. The letters were returned at different times. In most cases there was not a significant delay in the letters being returned. Those returned along with the action taken, are listed below:

- The Executor of Ernest Binns – The letter was returned by Royal Mail stating that the addressee had gone away. The Applicant's land referencers contacted the people at the address that the letter had been issued to, who advised that Ernest Binns had passed away. The Applicant's land referencers were unable to identify any alternative contact details for Ernest Binns.
- Office of Road and Rail – Section 42 letter sent to new address on 19 September 2023. The original letter had also been emailed to the Office of Road and Rail email address on 14 September 2023, so no further action was taken.
- Highfield Environmental Limited c/o Hackwood Secretaries Limited – the Section 42 letter had been issued to a second address, and that letter was not returned, so no further action was taken.
- Norpipe Oil AS – the Section 42 letter had also been issued to a UK address for the company (one letter had been sent to an address for the company in Norway), and as that letter had not been returned, no further action was taken.
- TDG (UK) Limited – the Section 42 letter had also been issued to an address for the company in England (one letter has been sent to an address for the company in Northern Ireland), and that letter was not returned, so no further action was taken.
- Team Valve and Rotating Services Limited – the Section 42 letter had been issued to two addresses for the company. As only one letter was returned no further action was taken.
- UK Wood Recycling Limited – Section 42 letter issued to an updated address on 19 September 2023.
- Ineos Nitriles (UK) Limited – Section 42 letter issued to an updated address and emailed to contact at Ineos (as advised by the Applicant's land referencers) on 21 September 2023.
- Seneca Global Energy Limited – all information available to the Applicant's land referencers (including from Companies House) suggested Seneca Global Energy Limited were at the original address used and no alternative address was identified. A Section 42 letter was hand delivered to the address by the Applicant's land referencers on 4 October 2023. Due to the time that had passed since the original Section 42 letter had been issued, Seneca was given to 3 November 2023 to respond to the consultation.

- Seafibre Networks – Section 42 letter re-issued to an updated address on 4 October 2023. Due to the time that had passed since the original Section 42 letter had been issued, Seafibre Networks was given to 3 November 2023 to respond.
- SNF (UK) Limited & SNF Gas and Oil – advised that had not received the original letter and that it may have been lost at their Head Office. Section 42 letters were forwarded via email by the Applicant's land referencers on 11 October 2023. Due to the time that had passed since the original Section 42 letter had been issued, SNF (UK) Limited & SNF Gas and Oil were given to 3 November 2023 to respond.
- Interoute Vtesse Limited – Section 42 letter re-issued to updated address on 20 October 2023. Due to the delay in receiving the returned letter from Royal Mail and the fact that the letter could only be re-issued on 20 October 2023, Interoute Vtesse Limited were given until 20 November 2023 to respond.

10.3.5 Section 42 site notices were erected by the Applicant's land referencers around the proposed Order limits on 15 September 2023. The notices were therefore in place early in the consultation period and at the time the first Section 42 letters would have been received. The site notices included plans showing the extent of the proposed Order Limits and were inspected once per week throughout the consultation period and replaced if damaged or removed.

10.3.6 A copy of the Section 42 site notice, along with a plan showing the locations where it was erected are provided at Appendix 10.2. Photographs of the notices in-situ can be provided.

10.4 What were they consulted on/what information was provided?

10.4.1 The Section 42 letters confirmed and provided the following information to the consultees:

- The background to the H2Teesside Project.
- Why they (the consultee) were being consulted.
- Who the Applicant is.
- A description of the Site (the proposed Order Limits) and the Proposed Development.
- The newspapers/publications that the combined Section 42, 47 and 48 notice would be published in and the dates that the notice would be published.
- The consultation document that were being made available during the consultation.
- The deadline for comments to be submitted (by 11.59pm on 26 October 2023).
- How comments could be submitted.

10.4.2 The letters confirmed that the consultation documents included:

- plans showing the extent of the then Site boundary (the proposed Order Limits) edged in red and the main development areas of the Site;
- a Preliminary Environmental Information Report ('PEIR') and its Non-Technical Summary ('NTS') setting out the environmental information available on the Proposed Development at the time of the First Consultation;
- a consultation brochure; and
- the consultation leaflet being sent to people living within the vicinity of the Site.

10.4.3 Copies of the above consultation documents are included at Appendix 10.3.

10.4.4 The letters were also accompanied by a copy of the combined Section 42, 47 and 48 notice that was being published.

10.4.5 The letters included a link to a secure fileshare site from which the consultation documents could be downloaded and also confirmed that the documents could be downloaded from the project website. In addition, the letters explained the arrangements for obtaining hard/paper copies of the documents.

10.5 How could comments/feedback be provided/what was the deadline for comments?

10.5.1 The Section 42 letters confirmed that comments could be submitted in the following ways:

- Post: Freepost H2TEESSIDE
- Email: info@h2teesside.net
- Telephone: Freephone 0800 080 3028
- Project website: www.h2teesside.co.uk

10.5.2 The letters clearly stated that all comments and feedback must be submitted no later than 11.59pm on 26 October 2023. The consultation period therefore ran for a period of 6 weeks (43 days), well in excess of the statutory 30 day period.

10.6 Response to the consultation

10.6.1 A total of 38 responses were received in response to the Section 42 letters. Three late responses were received (after the close of the consultation on 26 October 2023).

10.6.2 The main topics raised in the Section 42 consultation responses received to the First Consultation included:

- Amount of land included within the proposed Order Limits.
- Landownership/negotiations.
- Protection of plant and apparatus.
- Potential impact on existing land use/operations.

- Potential impact on planned developments.
- Lack of design detail.
- Construction phase duration.
- Construction methods and mitigation measures.
- Use of local employment and suppliers.
- Safety.
- Access arrangements and potential impacts of the highway network and public transport.
- Public health.
- Aviation safeguarding.
- Ecology/nature conservation and potential impacts on protected sites.
- Biodiversity net gain.
- Agricultural land and soils.
- Air emissions.
- Flood risk and water quality.
- Need for further consultation.

10.6.3 Copies of the responses received (with personal details redacted) will be provided to PINS on request.

10.6.4 More information on the feedback received and how the Applicant has had regard to the comments and feedback received in response to the First Consultation in accordance with Section 49 of the PA 2008 is set out in the tables at Section 15.0.

11.0 FIRST CONSULTATION: SECTION 47 'DUTY TO CONSULT LOCAL COMMUNITY'

11.1 Introduction

11.1.1 This section sets out the consultation carried out by the Applicant as part of the First Consultation in accordance with Section 47 'Duty to consult local community' of the PA 2008. This consultation involved the local community and was undertaken in accordance with the published SoCC.

11.1.2 As confirmed above, the First Consultation, including the Section 47 consultation, commenced on 14 September 2023 and ran to 26 October 2023.

11.2 Who was consulted?

11.2.1 The Section 47 consultation during the First Consultation involved the Applicant directly consulting approximately 37,000 residential and business addresses within the Inner Consultation Zone ('ICZ') through the delivery of a consultation leaflet, with a range of other consultation methods being used to reach people within the Outer Consultation Zone ('OCZ').

11.2.2 The Applicant also consulted local political representatives (including local councillors, parish councillors and relevant MPs) at the start of the First Consultation.

11.3 How were they consulted?

11.3.1 The local community were consulted in a number of ways:

Email to local political representatives

11.3.2 The Applicant emailed a number of local political representatives on 7 September 2023 in advance of the start of the consultation to make them aware of it and also to invite them to a webinar on 14 September 2023. The email had the consultation leaflet attached which provided details of the consultation, how information could be obtained and the dates for the public consultation events being held.

11.3.3 Examples of the emails are provided at Appendix 11.1.

Press/media releases

11.3.4 The consultation was communicated through the following press and media releases:

- Northern Echo – 15 September 2023
- Oil Store – 21 September 2023

11.3.5 A copy of the press/media release and evidence of publication are provided at Appendix 11.2.

Social media

11.3.6 The consultation was also communicated through social media. X (formerly Twitter) was used. The first post was uploaded on 18 September 2023 with a second post uploaded on 3 October 2023.

11.3.7 Screenshots of the posts are provided at Appendix 11.3.

Consultation leaflet

11.3.8 A consultation leaflet was sent to approximately 37,000 residential and business addresses within the ICZ. The consultation leaflet was mailed out by LBox Communications (by Royal Mail First Class Post) on 12 September 2023 and was accompanied by a Feedback Form and the SoCC. The consultation leaflet provided information on the Proposed Development; how the consultation documents and materials could be accessed, including via the project website and at a number of information points/inspection locations; details of the face-to-face public consultation events being held and an online webinar; how to submit comments and feedback and the deadline for doing so.

11.3.9 The email from LBox Communications confirming that the mailout had been completed is provided at Appendix 11.4. The consultation leaflet can be viewed at Appendix 10.3.

Newspaper notices

11.3.10 A combined Section 42, 47 and 48 notice was published in a number of national and local newspapers and other publications at the start of the consultation on 14 September 2023 in order to publicise the consultation (please refer to Section 12.0 for further information on the notices). The newspapers and publications used were in circulation across the consultation area. The notice also provided information on the Proposed Development; how the consultation documents and materials could be accessed, including via the project website and at a number of information points/inspection locations; and how to submit comments and feedback and the deadline for doing so.

Poster

11.3.11 A poster was prepared and placed in a number of publicly accessible locations within the consultation area, including community and leisure centres and libraries. The locations are listed in Table 11.1 below:

Table 11.1 Poster locations

VENUE	ADDRESS
25K Community Centre	Ayton Dr, Redcar TS10, UK
Blackhall Community Centre	Hesleden Rd, Blackhall Colliery, Hartlepool TS27 4LG

VENUE	ADDRESS
Blackhall Library	14 Middle St, Blackhall Colliery, Hartlepool TS27 4EA
Brotton Library	Linden Rd, Brotton, Saltburn-by-the-Sea TS12 2SJ
Dormanstown Library	3 Farndale Square, Redcar TS10 5HQ
Egglescliffe Community Centre	Durham Ln., Eaglescliffe, Stockton-on-Tees TS16 0EH
Eston Leisure Centre	Normanby Rd, South Bank, Middlesbrough TS6 9AE
Fishburn Youth and Community Centre	Butterwick Rd, Fishburn, Stockton-on-Tees TS21 4ED
Horden Library	Sunderland Rd, Darlington Ave, Horden, Peterlee SR8 4PF
Ingleby Barwick Community Hall	Haresfield Way, Beckfields Ave, Thornaby, Stockton-on-Tees TS17 0YL
International Community Centre	7 Abingdon Rd, Middlesbrough TS1 2DP
Laburnum Library	338 Laburnum Rd, Redcar TS10 3QR
Loftus Community Hub CIC	Loftus West Road Social Club, West Rd, Loftus, Saltburn-by-the-Sea TS13 4RG
Loftus Library	Hall Grounds, Loftus, Saltburn-by-the-Sea TS13 4HJ
Marske Library	Windy Hill Ln, Marske-by-the-Sea, Redcar TS11 7BL
Middleton St George Community Centre	Station Rd, Middleton St George, Darlington DL2 1JG
Redcar Leisure Centre	Ridley St, Redcar TS10 1TD

VENUE	ADDRESS
Redcar Library	Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT
Saltburn Library	Windsor Rd, Saltburn-by-the-Sea TS12 1AT
Sedgefield Community Association	Ceddesfield Hall, Rectory Row, Sedgefield, Stockton-on-Tees TS21 2AE
Skelton Library	4 Coniston Rd, Skelton-in-Cleveland, Saltburn-by-the-Sea TS12 2HP
Stokesley Leisure Centre	Great Broughton Road, Stokesley, Middlesbrough TS9 5JJ
Trimdon Grange Community Association	Salters Ln, Trimdon Grange, Trimdon Station TS29 6PB

11.3.12 The poster provided information on how the consultation documents and materials could be accessed, including via the project website and at a number of information points/inspection locations; details of the face-to-face public consultation events being held and an online webinar; how to submit comments and feedback and the deadline for doing so.

11.3.13 A copy of the poster is provided at Appendix 11.5 along with details of the poster locations.

Webinars

11.3.14 At the start of the consultation the Applicant held a webinar for local political representatives on 14 September 2023. They had been notified of the webinar in advance on 7 September. In total two people attended the webinar.

11.3.15 A webinar was held for members of the public on 28 September 2023. This had been publicised through the consultation leaflet, newspaper notice, poster and on the project website. The project website included a link for people to join via Microsoft Teams. The webinar included a presentation on the Proposed Development and provided an opportunity for people to ask questions of the project team and provide comments and feedback. Seven people attended the public webinar.

11.3.16 A copy of the presentation given at the public webinar is provided at Appendix 11.6.

Virtual consultation room

11.3.17 A virtual consultation room was hosted on the project website. This replicated a public consultation event for people who were unable to attend an in-person event.

The virtual consultation room was publicised through the consultation leaflet and poster.

11.3.18 The virtual consultation room provided user-friendly access to all of the consultation documents and materials. Users were able to explore and look around the virtual consultation room by dragging their curser 360 degrees and selecting icons next to various Information Boards, documents such as a consultation brochure and the Preliminary Environmental Information Report ('PEIR'), videos and other signposts. All information contained in the virtual consultation room was displayed on the user's browser via embedded PDFs and YouTube videos. A screenshot of the virtual consultation room landing page is provided at Appendix 11.7.

11.3.19 The virtual consultation room included:

- welcome and information pages describing the Proposed Development and how to navigate the room.
- a virtual desk at the centre of the room containing three clear links to the following project information:
  - the SoCC;
  - Section 42, 47 and 48 notice;
  - consultation brochure;
  - consultation leaflet;
  - Question and answer document;
  - Site boundary and development areas plans; and
  - the PEIR and its Non-Technical Summary ('NTS');
- Information Boards; and
- a function for users to submit their comments and feedback.

11.3.20 Copies of the information boards and question and answer document are provided at Appendix 11.8. The other consultation documents and materials can be found at Appendix 10.3.

<u>Public consultation events</u>

11.3.21 The Applicant held a number of in-person public consultation events within the consultation area. In total six events where held. The events were timed to run from mid-afternoon to early evening to provide people who were busy during the day the opportunity to attend. One of the events was also held on a Saturday. Details of the events are provided in Table 11.2 below:

Table 11.2: In-person consultation events

VENUE	DATE/TIME
Seaview Business Centre, Redcar	Thursday 21 September 2023 – 15.00 to 19.00 Saturday 23 September 2023 – 13.00 to 17.00
St Aidan's Church Hall, Billingham	Monday 25 September 2023 – 15.00 to 19.00 Friday 6 October 2023 – 15.00 to 19.00
Inspire2Learn, South Bank	Thursday 5 October 2023 – 15.00 to 19.00
TunedIn, Redcar	Thursday 12 October 2023 – 15.00 to 19.00

11.3.22 The in-person consultation events were publicised through the consultation leaflet, poster and project website.

11.3.23 All of the consultation documents and materials, including the information boards, were available at the in-person consultation events.

11.3.24 At the events people were able to speak with and ask questions of members of the project team and also complete a feedback form if they wished to.

11.3.25 In total 66 people attended across the six events.

11.3.26 Some photographs of the events are provided at Appendix 11.9.

Project website

11.3.27 The project website was used to host the public webinar and also the virtual consultation room. All of the consultation document and materials were made available on the project website and included downloadable copies. The website was regularly updated throughout the pre-application process. Some pageviews statistics for each main consultation stage are set out below:

- First Consultation Pageviews – 2,896
- First Consultation Unique pageviews – 2,463
- Second Consultation Pageviews – 2,703
- Second Consultation Unique pageviews – 2,229

11.3.28 Example screenshots taken from the consultation page of the project website, including the content available to view/download, are provided at Appendix 11.10.

Document inspection locations

11.3.29 The Applicant arranged for hard/paper copies of the consultation documents, including the consultation leaflet, consultation brochure, PEIR and its Non-Technical Summary, plans and maps and also the SoCC and combined Section 42, 47 and 48

notice (see Section 12.0), to be available for people to inspect free of charge throughout the consultation period at a number of publicly accessible locations within the consultation area.

11.3.30 The document inspection locations were publicised by the consultation leaflet, newspaper notice, poster and project website. The consultation documents could also be viewed free of charge on a publicly accessible computers at these inspection locations. Details of the inspection locations are provided in Table 11.3 below:

Table 11.3: Document inspection locations

INSPECTION LOCATION	OPENING TIMES
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 09:00 to 18:00 Thursday 09:00 to 17:00 Friday 09:00 to 18:00 Saturday 09:30 to 12:30
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday to Wednesday 08:30 to 18:00 Thursday 08:30 to 20:00 Friday 08:30am to 18:00 Saturday 09:30 to 16:00
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Monday to Thursday 09:00 to 17:00 Friday 09:00 to 16:30

Freephone number

11.3.31 A freephone number was operated during the consultation to provide a means for people to request consultation documents and materials and also leave comments and feedback. The freephone number was publicised via the consultation leaflet, newspaper notice, poster and project website). It was aimed at ensuring that digitally disadvantaged members of the local community had another means by which to access the consultation.

11.4 What were they consulted on/what information was provided?

11.4.1 The Section 47 consultation involved consulting the local community through a variety of consultation methods and providing a wide range of information and material on the Proposed Development. In particular, the consultation was used to provide information to the local community on the following:

- What H2Teesside is and what it will do.
- The practical uses of hydrogen and its benefits.
- The role of carbon capture, usage and storage ('CCUS') in enabling H2Teesside.
- Decisions made on the design and layout of the Proposed Development and the options under consideration.

- The findings of the environmental assessment work undertaken at the time of the consultation, presented in the PEIR and its Non-Technical Summary.
- The proposals for avoiding, minimising and/or mitigating any likely environmental effects of the Proposed Development, to the extent they were defined and known at that stage.
- An update on the timeline for the Proposed Development and the key milestones, including the anticipated submission date for the application for development consent.
- How comments and feedback could be provided and the deadline for the receipt of these.

11.4.2 The following consultation documents and materials were provided during the consultation:

- the SoCC;
- Section 42, 47 and 48 notice;
- consultation brochure;
- consultation leaflet;
- question and answer document;
- site boundary and development areas plans; and
- the PEIR and its NTS;
- information boards; and
- a feedback form.

11.5 How could comments/feedback be provided/what was the deadline for comments?

11.5.1 The consultation documents, including the newspaper notice, posters and project website, confirmed that comments and feedback could be provided in the following ways:

- Post: Freepost H2TEESSIDE
- Email: info@h2teesside.net
- Telephone: Freephone 0800 080 3028
- Project website: www.h2teesside.co.uk

11.5.2 A feedback form was produced for the consultation. The feedback form was posted out with the consultation leaflet and made available in hard copy/paper form at the in-person public consultation events. An online version of the feedback form was also available to complete on the project website and the virtual consultation room included a function for users to submit their comments and feedback. The feedback form asked a number of questions about the Proposed Development and provided

space for people to leave comments. A copy of the feedback form is provided at Appendix 11.11.

11.5.3 All of the consultation documents and materials clearly stated that the deadline for submitting comments and feedback as 11.59pm on the 26 October 2023. The consultation period therefore ran for a period of 6 weeks (43 days) well in excess of the statutory 30 day period.

11.6 Compliance with the SoCC

11.6.1 Table 11.4 below sets out how the consultation complied with the SoCC.

Table 11.4: Comparison of SoCC activities/methods with what was done for the First Consultation

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
Consultation stages & timescale	n/a	The SoCC confirmed that taking account of the level and type of public engagement on recent projects on Teesside, notably the NZT Project, the decision had been taken by the Applicant for the pre-application public consultation for the Proposed Development to take place as one main stage of statutory consultation in accordance with the relevant requirements of the PA 2008, notably Sections 42, 47 and 48. The SoCC confirmed that the statutory consultation will run for a period of six weeks.	The Applicant carried out one main stage of statutory public consultation in accordance with Section 47 in September/October 2023. The consultation ran for a period of six weeks. The Applicant subsequently took the decision to carry out non-statutory public consultation in the form of a community update for the Second Consultation on changes to the Proposed Development and also undertook targeted consultation in respect of changes within the vicinity of Cowpen Bewley Village.
Consultation area	n/a	The SoCC defined a consultation area comprising of an Inner Consultation Zone ('ICZ') and an Outer Consultation Zone ('OCZ'). The ICZ was defined as the area within which the Applicant	The Applicant consulted across the consultation area using a range of consultation methods. A consultation leaflet was sent to approximately 37,000 residential and businesses addressed within the ICZ and the consultation was

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
		considered there was the greatest potential for local communities to be most affected/interest by the Proposed Development. The OCZ was based on the maximum extent of the area within which environmental effects could occur.	publicised across the consultation area using notices in newspapers and other publications, posters, press/media releases, social media and the project website. In-person public consultation events were also publicised and held within the consultation area.
Environmental information	Production of Preliminary Environmental Information Report ('PEIR')	Environmental information will be made available during the pre-application consultation. This will take the form of a PEIR and a Non-Technical Summary ('NTS'). There will be an opportunity to comment upon the PEIR during the pre-application consultation and the comments received will be considered in the preparation for the Environmental Statement ('ES').	A PEIR and NTS were produced and made available for the First Consultation. The consultation documents and materials confirmed that the PEIR and NTS were available to inspect free of charge on the project website and also at a number of inspection locations within the consultation area. The PEIR and NTS were also available to view free of charge at the in-person public consultation events. The PEIR was also made available during the Second Consultation and

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
			for the additional and targeted consultations. The tables at Section 15.0 set out how the comments received on the PEIR were taken into account by the Applicant.
Press/media releases	Local and regional press within the consultation area.	Press/media releases will be used to publicise the Proposed Development. A press release will be issued to the local and regional press at the start of the statutory consultation. Press releases will also provide information on how the local community can find out about the proposals and the ways in which people can provide comments and feedback.	The consultation was publicised through the press/media release. The outlets used included: • The Northern Echo – 15 September 2023 • Oil Store – 21 September 2023 The press and media releases provided information on how people could find out about the proposals and provide comments and feedback.
Social media	X (formerly Twitter) posts	The Applicant may use other forms of media, such as social media, to further publicise the consultation, as considered appropriate.	X (formerly Twitter) was used to publicise the consultation. The first post was uploaded on 18 September 2023 and a second post was uploaded on 3 October 2023.

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
Consultation leaflet & consultation brochure	Printed and online documents and materials.	A consultation leaflet will be sent to all residents and businesses within the ICZ prior to the start of the statutory consultation. This will provide information on the Proposed Development, the ways in which information is being provided and presented, how further information and consultation materials can be requested, and how comments and feedback can be made as well as the deadline for the submission of these. In addition to local residents and businesses, the leaflet will be sent to local political representatives, including local MPs, district councillors and parish and town councils. A consultation brochure will also be made available during the statutory consultation within the virtual consultation room, at the public consultation events and also on the project website.	A consultation leaflet was produced and sent to approximately 37,000 residential and business addresses within the ICZ. The consultation leaflet was mailed out on 12 September 2023 by Royal Mail First Class Post on and was accompanied by the feedback form and the SoCC. The consultation leaflet provided information on the Proposed Development; how the consultation documents and materials could be accessed, including via the project website and at a number of information points/inspection locations; details of the in-person public consultation events being held and an online webinar; how to submit comments and feedback and the deadline for doing so. A more detailed consultation brochure was also produced for the consultation and made available on the project website, at the

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
			inspection locations and also at the in-person public consultation events. The consultation documents and materials provided information on how hard/paper copies of the consultation leaflet and consultation brochure could be obtained.
Newspaper notices/posters	Notices in national and local newspapers and other publications	The statutory consultation will be advertised by placing a notice in local newspapers circulating across the consultation area for two consecutive weeks. The local newspapers that will be used are the Northern Echo, Teesside Gazette and Darlington and Stockton Times. Posters will also be circulated to identified community groups and stakeholders across the consultation area, along with a request for them to be shared via their channels and displayed in public places. In accordance with Section 48 of the PA 2008, the notice will also be published in the Telegraph, London Gazette, Lloyds List and Fishing News for one week.	A notice was published In the Hartlepool Mail and Stockton and Darlington Times on 1 and 2 June 2023 providing advance notice of the consultation to the local community. A combined Section 42, 47 and 48 notice was published in the Telegraph, London Gazette, Lloyds List, Fishing News and for two consecutive weeks in local newspapers (Northern Echo, Teesside Gazette and Darlington and Stockton Times) at the start of the consultation in order to publicise it. The newspapers and publications used were in circulation across the consultation area. The notice

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
			provided information the Proposed Development; how the consultation documents and materials could be accessed, including via the project website and at a number of information points/inspection locations; and how to submit comments and feedback and the deadline for doing so. A poster was designed and placed on a number of community notice boards within the consultation area (see Table 11.1). The poster provided information on how the consultation documents and materials could be accessed, including via the project website and at a number of information points/inspection locations; details of the face-to-face public consultation events being held and an online webinar; how to submit comments and feedback and the deadline for doing so.

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
Site notices	Notices placed around the Site/proposed Order Limits.	The Applicant will erect site notices at appropriate intervals around the Site boundaries, including at intervals along the route corridors for the various connections. The site notices will notify the local community of the consultation and provide information on how to participate.	As confirmed in Section 10.0 site notices were erected by the Applicant's land referencers around the proposed Order Limits on 15 September 2023. The notices were therefore in place early in the consultation period. The site notices were inspected once a week throughout the consultation period and replaced if damaged or removed.
Webinars/video conferences	Virtual webinars held via Microsoft Teams on specific dates advertised to the local community.	The Applicant will offer webinars or video conferences to the local community, community groups and representatives, and local political representatives, in order to provide another means by which people can learn about the Proposed Development, ask questions and provide comments and feedback.	At the start of the consultation the Applicant held a webinar for local political representatives on 14 September 2023. They had been notified of the webinar in advance on 7 September. A webinar was held for members of the public on 28 September 2023. This had been publicised through the consultation leaflet, newspaper notice, poster and on the project website. The project website

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
			included a link for people to join via Microsoft Teams. The webinar included a presentation on the Proposed Development and provided an opportunity for people to ask questions of the project team and provide comments and feedback.
Virtual consultation room	Virtual consultation room hosted on the project website where all consultation documents and materials can be accessed.	The Applicant will run an online virtual consultation room that simulates the typical approach used in public consultation events. As part of the virtual consultation room, information boards/banners will be displayed online providing information on the Proposed Development.	A virtual consultation room was hosted on the project website. This replicated a public consultation event for people who were unable to attend an in person event. The virtual consultation room was publicised through the consultation leaflet and poster. The room was available throughout the consultation. The virtual consultation room provided user friendly access to all of the consultation documents and materials. Users were able to explore and look around the virtual consultation room by dragging their

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ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
			curser 360 degrees and selecting icons next to various information boards, documents such as a consultation brochure and the PEIR, videos and other signposts. All information contained in the virtual consultation room was displayed on the user's browser via embedded PDFs and YouTube videos.
Public consultation events	In-person public consultation events at publicly accessible venues within the consultation area.	The Applicant will hold six public consultation events within the consultation area during September and October 2023. These will be held at suitable public venues at a variety of times, including during the day, evening and at least one event on a Saturday, to provide a range of opportunities for people to attend.	The Applicant held six in-person public consultation events at four different publicly accessible venues within the consultation area. The events were timed to run from mid-afternoon to early evening to provide people who were busy during the day the opportunity to attend. One of the events was also held on a Saturday. Details of the events are set out in Table 11.2 above.
Inspection locations	Provision of consultation documents and materials for inspection at publicly accessible venues within the consultation area.	Copies of the consultation documents and materials including the PEIR, its NTS, consultation leaflet and consultation brochure, will be accessible at locations within the	The Applicant arranged for copies of the consultation documents, including the consultation leaflet, consultation brochure, PEIR and its NTS, plans and maps and also the

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
		consultation area (e.g. local authority offices and libraries) for inspection by the public. Details will be available on the newspaper and site notices and on the project website.	SoCC and newspaper notice, to be available for people to inspect free of charge throughout the consultation period at three publicly accessible locations (Council offices and libraries) within the consultation area. The inspection locations were publicised by the consultation leaflet, newspaper notice, poster and project website. The hard/paper copies of the consultation documents and materials could be viewed free of charge at these locations and also on publicly accessible computers. Details of the inspection locations are provided in Table 11.3 above.
Provision of consultation documents and materials	Provision of hard/paper copies of consultation documents/materials and USB devices containing copies of the documents and materials.	n/a	Although it was not a requirement of the SoCC, the newspaper and site notices provided details of how people could request hard/paper copies of the consultation documents and materials or a USB

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
			device containing the documents and materials.
Project website	Set up of project website.	A project website has been established and will be used to host all the consultation materials and to provide information on how people can provide comments and feedback and request copies. People will also be able to complete the feedback form on the Website.	The project website established early in the pre-application process and well in advance of the start of the First Consultation. The project website was used to host all of the consultation documents, in addition to the virtual consultation room and Microsoft Teams link to the public webinar. It provided information on how people could provide comments and feedback and request copies of documents and materials. The website also hosted an online version of the feedback form. The project website was updated throughout the pre-application process.
Freephone	Set up of freephone number.	The Applicant will operate a freephone number so people, including those without internet access, can contact the project team	A freephone number was set up before and operated during the First Consultation to provide a means for people to request consultation

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
		to leave questions about the Proposed Development, provide comments and feedback and also request hard/paper copy consultation documents and materials or a USB device containing these. The freephone service will operate 24 hours a day.	documents and materials and also leave comments and feedback. The Freephone number was publicised via the consultation leaflet, newspaper notice, poster and project website. It was aimed at ensuring that digitally disadvantaged members of the local community had another means by which to access the consultation. The freephone number was also available or use during the Second Consultation.
Freepost	Set up of freepost address.	The Applicant will provide a Freepost address (Freepost H2TEESSIDE) to allow people to submit comments and completed feedback forms by post.	The 'Freepost H2TEESSIDE' address was set up prior to the start of the First Consultation and maintained up to the submission of the application for development consent. Details of the freepost addressed were publicised in the consultation leaflet, by the newspaper and site notices and poster, and also on the project website.
Feedback form	Provision of hard/paper copy and online versions of feedback form.	A feedback form will be made available during the consultation for people to use to submit comments	A feedback form was produced for the consultation. The feedback form was posted out with the

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
		and feedback. The feedback form will be available to complete via the virtual consultation room and also on the project website. feedback forms will also be available at the public consultation events. In addition, people will be able to request hard copies of the feedback form by email, post or telephone. The Applicant will provide a freepost address (Freepost H2TEESSIDE) to allow people to submit comments and completed feedback forms by post.	consultation leaflet and made available in hard copy/paper form at the in-person public consultation events. An online version of the feedback form was also available to complete on the project website and the virtual consultation room included a function for users to submit their comments and feedback. The feedback form included details of the freepost address and project email address and clearly stated the deadline for the submission of comments and feedback.
Recording, analysis and reporting	Consultation Report.	Comments and feedback will be recorded and entered into a response tracker and reviewed and analysed. The Applicant will have regard to the issues/matters raised and identify where these have resulted in changes to the Proposed Development and application for development consent. This will be documented in a consultation	The Applicant has produced a consultation report and this forms part of the application for development consent. The consultation report details the pre-application consultation undertaken, the responses received to that consultation and also how those responses have been taken into account.

ACTIVITY/METHODS	METHOD(S) AVAILABLE	APPROACH SET OUT IN THE SOCC	WHAT WAS DONE
		report, which will form part of the application for development consent.	

11.7 Response to the consultation

11.7.1 A total of 60 completed feedback forms were received in response to the Section 47 consultation undertaken as part of the First Consultation. Of these, 5 were feedback forms submitted via the freepost address or at the in-person public consultation events and 55 were submitted online.

11.7.2 In addition, 9 emails and written responses were received during the First Consultation.

11.7.3 The feedback form asked a number of questions under the following headings:

- Our proposals:
  - Q1 – Do you support our aims to help Teesside decarbonise its industry?
  - Q2 – Do you support our proposals for H2Teesside?
  - Q3 – Do you have any comments on our proposed blue hydrogen production facility?
  - Q4 – Do you have any comments on our proposed pipeline and connection corridors?
- Minimising our impact:
  - Q5 – Do you have any comments on the Preliminary Environmental Information Report, its Non-Technical Summary or the environmental mitigation measures proposed in these documents?
  - Q6 – We will be producing an Outline Construction Traffic Management Plan and a Framework Construction Environmental Management Plan. Is there anything you would like us to consider as part of this?
- Local Community benefits:
  - Q7 – Do you have any comments on our plans, or any further ideas or suggestions on how could support the local community?

11.7.4 The feedback form also asked if people wanted to provide any other comments or feedback and gave people with the option of providing their personal details in order that they could be provide with updates and also to describe their interest in the Proposed Development. People could also provide comments and feedback anonymously.

11.7.5 The feedback form responses to Q1 indicated broad support for the decarbonisation of Teesside as follows:

RESPONSE	NUMBER OF RESPONSES
Strongly support	36
Support	8
Strongly oppose	6
Oppose	2
Neither support nor oppose	5

11.7.6 With regard to Q2 and support for the Proposed Development itself the responses from the feedback forms were as follows:

RESPONSE	NUMBER OF RESPONSES
Strongly support	20
Support	5
Strongly oppose	12
Oppose	2
Neither support nor oppose	6

11.7.7 Some of the main topics raised in the Section 47 consultation responses received to the First Consultation included:

- Principle of development.
- Decarbonisation of Teesside.
- Pipeline routing
- Local employment and apprenticeship opportunities/use of local suppliers.
- Use industrial land and existing infrastructure.
- Heritage.
- Air quality.
- Noise and vibration.
- Water.
- Public access.
- Impact on the local community.
- Safety.

11.7.8 Copies of the feedback forms can be provided to PINS on request.

11.7.9 A summary of the feedback forms that were returned is provided at Appendix 11.12.

11.7.10 How the Applicant has had regard to the comments and feedback received in response to the First Consultation in accordance with Section 49 of the PA 2008 is set out in the tables at Section 15.0.

12.0 FIRST CONSULTATION: SECTION 48 'DUTY TO PUBLICISE'

12.1.1 Section 48 'Duty to publicise' of the PA 2008 requires applicants to publicise a proposed application for development consent in the 'prescribed manner'. This is set out in APFP Regulation 4 'Publicising a proposed application' (as amended by the 2020 Regulations). APFP Regulation 4(2) states that applicants must publish a notice of the proposed application:

- for at least two successive weeks in one or more local newspapers circulating in the vicinity in which the proposed development would be situated;
- once in a national newspaper;
- once in the London Gazette, and, if land in Scotland is affected, the Edinburgh Gazette; and
- where the proposed application relates to offshore development once in Lloyd's List; and once in an appropriate fishing trade journal.

12.1.2 APFP Regulation 4(3) goes on to state what the notice must include statements that:

- the applicant intends to make an application for development consent;
- whether that application is EIA development;
- a summary of the main proposals;
- how the consultation documents can be inspected free of charge;
- and how to respond to publicity and by which date.

12.1.3 As confirmed in Section 7.0, for the First Consultation, a combined Section 42, 47 and 48 notice was published. The notice complied with all of the requirements of APFP Regulation 4(3). While there was no requirement for hard/paper copies of the consultation documents to be deposited at inspection locations within the vicinity of the land to which the proposed application for development consent related (the 2020 Regulations amended the APFP Regulation to remove this requirement), the Applicant did deposit paper/hard copies of the consultation documents (and published SoCC) at three inspection locations, and details of these were provided within the notice.

12.1.4 In accordance with Section 48 and APFP Regulation 4(2), the notice was published in the Telegraph (a national newspaper), the London Gazette and the three local newspapers circulating within the vicinity of the Site and within the consultation area. In addition, as the Proposed Development involves parts of the tidal River Tees (and therefore includes an area within the UK marine area), the notice was published in the Lloyds List and Fishing News.

12.1.5 Details of the publication of the notice are provided in Table 12.1 below.

Table 12.1: Publication of Section 42, 47 and 48 notice for First Consultation

VENUE	DATE
The Telegraph	14 September 2023
London Gazette	14 September 2023
Lloyds List	14 September 2023
Fishing News	14 September 2023
Northern Echo	14 & 21 September 2023
Teesside Gazette	14 & 21 September 2023
Darlington and Stockton Times	15 & 22 September 2023

12.1.6 A copy of the final combined Section 42, 47 and 48 notice, in addition to copies of the published notices from the various newspapers and publications are provided at Appendix 12.1.

12.1.7 EIA Regulation 13 places a requirement on applicants, where the application for development consent is for EIA development (as is the case for the Proposed Development) to, at the same time as publishing a notice pursuant to Section 48, send a copy of that notice to the relevant consultation bodies (the 'EIA consultation bodies') and any person notified to them by PINS in accordance with EIA Regulation 11(1)(c).

12.1.8 The EIA scoping opinion issued by the SoS for the Proposed Development included a list of consultation bodies that were notified of the Applicant's EIA scoping opinion request under EIA Regulation 11(1)(a). The Applicant had regard to this list in compiling the list of consultees to be notified pursuant to Section 42. All of the Section 42 letters (Letter 1) sent to prescribed persons, the MMO, local authorities and landownership interests (Sections 42(a),(aa),(b),(c) and (d) referenced EIA Regulation 13 and included a copy of the notice. The letters sent to non-prescribed consultees also included the notice. Copies of the letters sent (Letters 1 and 2) are provided at Appendix 10.1. The list of consultees is provided at Appendix 7.1 of the Consultation Report. The EIA consultation bodies were therefore notified pursuant to EIA Regulation 13.

12.1.9 The Applicant was not notified by PINS of any persons pursuant to EIA Regulation 11(1)(c). A copy of the letter from PINS dated 17 May 2023, which accompanied the EIA scoping opinion, and which confirms that PINS had not identified any persons under EIA Regulation 11(1)(c) is provided at Appendix 12.2.

12.1.10 The Applicant has therefore complied with Section 48 of the PA 2008, APFP Regulation 4 and EIA Regulation 13 for the First Consultation.

13.0 SECOND CONSULTATION

13.1 Introduction

13.1.1 This section sets out the consultation and publicity carried out by the Applicant for the Second Consultation on the Proposed Development.

13.1.2 The Second Consultation related to a number of changes to the Order limits for the Proposed Development as a result of further design development and technical work undertaken and also responses received to the First Consultation. Due to the scale and number of changes proposed the Applicant took the decision to consult on them, in advance of submitting the application for development consent.

13.1.3 The Applicant consulted the prescribed persons, relevant local authorities and landownership interests in accordance with Section 42 of the PA 2008 and, as was the case for the First Consultation, also consulted a number of non-prescribed persons (who there was no statutory duty to consult). In addition, the Applicant carried out a non-statutory community update as part of the Second Consultation and published a Section 48 notice.

13.1.4 The Second Consultation ran from 13 December 2023 to 23 January 2024.

13.1.5 The Applicant contacted the host local authorities (RCBC, STBC and HBC) by email on 28 November 2023 to advise them of the intention to carry out the Second Consultation. Copies of the emails are provided at Appendix 13.1.

13.1.6 PINS were notified pursuant to Section 46 of the PA 2008, in advance (on 12 December 2023) of the Second Consultation commencing.

13.2 Overview of the proposed changes

13.2.1 As confirmed above, the Second Consultation related to a number of changes to the Order Limits for the Proposed Development. The changes were a result of further design development and technical work undertaken and also responses received to the First Consultation. These changes allowed for some of the flexibility and optionality that had been included at the time of the First Consultation to be removed from the Proposed Development. This resulted in a significant overall reduction in the proposed Order Limits from approximately 1,350 to 508 hectares.

13.2.2 While there was a significant overall reduction in the proposed Order Limits as a result of the changes, a number of additions were made to the proposed Order limits to accommodate works and changes to works required for the Proposed Development. The new areas added totalled approximately 28.6 hectares. The areas that were added are listed below:

- Area at Venator – installation of an Above ground Installation ('AGI') within the Venator site.
- North of Seal Sands roundabout – required for the natural gas distribution network connection and the installation of the trenchless crossing to the National Grid Gas AGI.

- North-west of the A174/A102 roundabout – installation of an AGI.
- Area at SNF Oil and Gas Limited – installation of an AGI.
- Area at Furatom (UK) Limited on the B1275 – installation of an AGI.
- Area west of A1185/East of Cowpen Bewley – amendment to pipeline routing to avoid ponds and other areas of habitat creation within an RSPB reserve.
- Area north of Redcar British Steel train station – amendment to cover rerouting of water connection taking into account feedback received from STDC/Teesworks Limited.

13.3 Section 46 Notification

13.3.1 The Applicant notified PINS on 12 December 2023 of its intention to undertake the Section 42 consultation for the Second Consultation on 13 December 2023. The letter was emailed to PINS on 12 December 2023 and confirmed the following:

- Why the consultation was being undertaken.
- The date the consultation would commence and the deadline for comments to be submitted.
- The newspapers/publications that the Section 48 notice would be published in and the dates that the notice would be published.
- The information that was being made available during the consultation.

13.3.2 The letter included a link to a secure fileshare site from which PINS could download all of the consultation documents being made available.

13.3.3 A copy of the email and letter sent to PINS is provided at Appendix 13.2.

13.3.4 PINS acknowledged the Applicant's Section 46 notification on 12 December 2023 and confirmed that the Applicant had notified PINS for the purposes of Section 46. A copy of the email and letter received from PINS is also provided at Appendix 13.2.

13.3.5 The Second Consultation commenced on the following day, 13 December 2023, in accordance with what was stated in the Section 46 notification.

13.4 Section 42 Consultation

13.4.1 The Section 42 letters were issued by Royal Mail First Class Post on 13 December 2023. The letters were also emailed on 13 and 14 December 2023 where email addresses were available. Four types of letters were posted and emailed:

- Letter 1 – sent to prescribed persons (Section 42(a), (aa) and (b) parties.
- Letter 2 – sent to non-prescribed persons.
- Letter 3 – sent to those with landownership interests (Section 42(d) and Section 44 parties) within the proposed Order limits, including any new landownership interests.

- Letter 4 – sent to landownership interests whose land had been removed from the Order Limits as a result of the changes.

13.4.2 Copies of Letters 1 to 4 are provided at Appendix 13.3.

13.4.3 In advance of issuing the Section 42 letters, the list of consultees used for the First Consultation was reviewed and updated to take account of any changes that had taken place or been identified since that consultation, notably in relation to landownership interests. The list of consultees used for the Second Consultation can be found at Appendix 7.1.

13.4.4 The Section 42 letters confirmed:

- Why the consultation was being undertaken.
- The deadline for comments to be submitted (by 11.59pm on 23 December).
- The newspapers/publications that the Section 48 notice would be published in and the dates that the notice would be published.
- The information that was being made available during the consultation.
- How comments could be submitted.

13.4.5 The letters confirmed that the consultation documents included:

- a plan showing the extent of the current Site boundary edged in red and the areas that have been removed and those that have been added since the first consultation;
- a H2Teesside Project update brochure that included information on whether the conclusions of the PEIR produced for the first consultation are affected by the changes to the Proposed Development that are the subject of the Second Consultation, which was also being sent to people living within the vicinity of the Site;
- the PEIR and its NTS produced for the First Consultation and accompanying plans and maps;
- the consultation brochure produced for the First Consultation; and
- the consultation leaflet produced for the First Consultation, which was sent to people living within the vicinity of the Site; and

13.4.6 A copy of the plan and the H2Teesside Project update brochure is provided at Appendix 13.4.

13.4.7 The letters sent to those with landownership interests (Section 42(d) and Section 44 parties) within the proposed Order Limits, including any new landownership interests, were accompanied by plans showing their landownership relative to the proposed Order Limits.

13.4.8 Letter 1 (Section 42(a), (aa) and (b)), Letter 3 (Section 42(d)) and Letter 4 (Section 42(d)) all referenced EIA Regulation 13 and were accompanied by a copy of the Section 48 notice. The EIA consultation bodies were therefore notified pursuant to

EIA Regulation 13. Letter 2 sent to the non-prescribed persons was also accompanied by a copy of the Section 48 notice.

13.4.9 The letters included a link to a secure fileshare site from which the consultation documents could be downloaded and also confirmed that the documents could be downloaded from the project website. In addition, the letters explained the arrangements for obtaining hard/paper copies of the documents.

13.4.10 In total over 480 Section 42 letters were posted and more than 150 emails were sent.

13.4.11 It was not possible to post a letter to one prescribed consultees (Active Travel England) and two non-prescribed consultees (Save Our Steel Group and Hartlepool Rural Neighbourhood Plan Working Group) as postal addresses could not be found for them. The letters where therefore emailed to them at email addresses that could be identified for them.

13.4.12 A small number of Section 42 letters were returned. Those returned, along with the action taken, are listed below:

- Ministry of Defence Safeguarding Department (Statutory & Offshore) – Section 42 letter issued to new address. The letter had also been emailed.
- P&O Teesport – the company does not exist and it is believed this was an error on the list of consultees (confused with PD Teesport Limited who had been consulted) so no further action was considered necessary. The letter had also been emailed to a PD Teesport email address.
- GTC Infrastructure Limited – Section 42 letter issued to new address. The letter had also been emailed.
- Interoute Vtesse Limited – Section 42 letter issued to new address. The letter had been sent to a number of addresses.
- Ineos Nitriles (UK) Limited – letter returned from registered address but a Section 42 letter had already been issued to an alternative address so no further action was considered necessary.
- Seneca Global Energy Limited – as with the First Consultation the letter was returned. All information available to the Applicant's land referencers (including from Companies House) suggested Seneca Global Energy Limited were at the original address used and no alternative address was identified. The Section 42 letter was therefore hand delivered to that address.

13.4.13 Section 42 site notices were erected by the Applicant's land referencers around the proposed Order limits for the start of the consultation on 13 December 2023. The site notice were inspected once a week throughout the consultation period and replaced if damaged or removed.

13.4.14 A copy of the Section 42 site notice along with a plan showing the locations where it was erected are provided at Appendix 13.5. Photographs of the notice in-situ can be provided.

13.5 Section 48 Notice/Publicity

13.5.1 Although there was no statutory requirement to do so, as a Section 48 notice had been published for the First Consultation, the Applicant decided to publish a Section 48 notice for the Second Consultation in view of the scale and number of changes to the proposed Order Limits.

13.5.2 As confirmed above, Letters 1, 3 and 4 referenced EIA Regulation 13 and were accompanied by a copy of the Section 48 notice. The EIA consultation bodies were there notified in accordance with EIA Regulation 13.

13.5.3 The Section 48 notice was published as follows (Table 13.1):

Table 13.1: Section 48 notice published for Second Consultation

VENUE	DATE
The Telegraph	14 December 2023
London Gazette	14 December 2023
Lloyds List	14 December 2023
Fishing News	14 December 2023
Northern Echo	14 & 21 December 2023
Teesside Gazette	14 & 21 December 2023
Darlington and Stockton Times	15 & 22 December 2023

13.5.4 Copies of the Section 48 notice and the published notices are provided at Appendix 13.6.

13.6 Community Update

13.6.1 At the same time as carrying out the Section 42 consultation and the Section 48 publicity, the Applicant provided an update to the local community living within the vicinity of the proposed Order Limits. This was non-statutory consultation and was additional to the community consultation set out within the published SoCC.

13.6.2 A community update letter was issued by Royal Mail First Class post to approximately 37,000 residential and business addresses within the ICZ of the consultation area that had been defined within the stakeholder engagement and communications strategy and which was detailed within the published SoCC. A copy of the letter is provided at Appendix 13.7.

13.6.3 The community update letter was also emailed to local political representatives and other local stakeholders at the same time.

13.6.4 The letter confirmed that the consultation ran between 13 December 2023 and 23 January 2024. It directed people to the H2Teesside Project update brochure and other consultation documents on the project website and also confirmed that the

consultation documents could be viewed free of charge during the consultation on a publicly accessible computer at the following locations:

- Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT
- Stockton Central Library, Church Road, Stockton, TS18 1TU
- Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY

13.6.5 The letter confirmed that people could find out more about the Proposed Development by phoning the freephone number and that they could respond to the consultation in the following ways:

- Online by filling in the feedback form at www.h2teesside.co.uk (the project website)
- Emailing a response to info@h2teesside.net
- Posting a response to FREEPOST H2Teesside

13.7 Response to the Second Consultation

13.7.1 A total of 39 responses to the Second Consultation were received in response to the Section 42 letters.

13.7.2 36 responses were received in respect of the local community update.

13.7.3 A feedback form had been prepared and used for the First Consultation. The feedback form asked a number of questions about the Proposed Development, including in relation to the PEIR. To allow a range of ways for people to provide feedback, the online version of the feedback form on the project website was reactivated for the Second Consultation. 12 completed feedback forms were received. The Applicant reviewed the feedback forms and took account of them in their responses to the Second Consultation. Copies of the feedback forms can be provided to PINS on request.

13.7.4 How the Applicant has had regard to the responses to the Second Consultation is set out in the tables at Section 15.0.

14.0 ADDITIONAL & TARGETED CONSULTATION

14.1 Introduction

14.1.1 The Applicant undertook some additional and also targeted consultation from late January 2024. This involved consulting additional parties, including landownership interests, who had been identified during and following the Second Consultation.

14.1.2 In addition, the Applicant undertook a targeted consultation of landowners and the local community within the vicinity of Cowpen Bewley Woodland Park, with the administrative area of Stockton-on-Tees Borough Council ('STBC'), relating to changes to the hydrogen pipeline corridor in this location (in response to comments from residents of Cowpen Bewley village) and proposals to provide replacement open space land in this area.

14.1.3 The additional and targeted consultation that was undertaken is set out below.

14.2 Additional Section 42 letters – issued 18 January 2024

14.2.1 During the Second Consultation a number of additional landownership interests who were required to be consulted under Section 42 were identified by the Applicant's land agents and land referencers. The landownership interests are listed below:

- Legal & General Assurance (Pensions Management) Limited.
- Tesco Distribution Limited.
- Tesco Blue (Nominee 1) Limited.
- Tesco Blue (Nominee 2) Limited.
- Subcoal Production TSP Limited.
- Kemira Chemicals (UK) Limited.
- Asda Stores Limited.

14.2.2 The above parties were issued with the same Section 42 letter and information that had been issued for the Second Consultation, including the Section 48 notice. The letters were sent by Royal Mail First Class post on 18 January 2024 and the parties were asked to provide any comments or representations by 19 February 2024 (a period of more than 30 days).

14.2.3 Copies of the letters that were posted are provided at Appendix 14.1.

14.2.4 No responses were received from any of the above parties.

14.3 Additional Section 42 letter – issued 31 January 2024

14.3.1 On a precautionary basis, and taking account of experience from another project, the Applicant issued a Section 42 letter to the Office of Health Improvement and Disparities ('OHID'), care of the Department of Health and Social Care on 31 January 2024.

14.3.2 The OHID were issued with the same Section 42 letter and information that had been issued for the Second Consultation, including the Section 48 notice. The letter was sent by First Class post and asked for any comments or representations by 1 March 2024 (a period of 30 days).

14.3.3 A copy of the letter that was posted to the OHID is provided at Appendix 14.2.

14.3.4 No response was received from the OHID.

14.4 Additional Section 42 letters – issued 5 February 2024

14.4.1 Following the Second Consultation the Applicant's Land Referencers identified further land that was required for the Proposed Development. This comprised a small slither of land in between two plots that had been mistakenly excluded from the proposed Order Limits for the Second Consultation. The affected landownership interests are listed below:

- PD Teesport Limited
- Ineos Nitriles (UK) Limited

14.4.2 Both PD Teesport Limited and Ineos Nitriles (UK) Limited had already been consulted as part of the Second Consultation.

14.4.3 The above parties were issued with a Section 42 letter on 5 February 2024 by Royal Mail First Class post. The letter was accompanied by a copy of the original Section 42 letter, Section 48 notice and the same information that they had been issued with for the Second Consultation. Each letter was accompanied by a plan showing the relevant party's land interest relative to the proposed Order Limits. The letters asked for any comments or representations to be submitted by 7 March 2024 (a period of more than 30 days).

14.4.4 Letters were sent to Ineos Nitriles (UK) Limited at two addresses. The letters were also emailed by the Applicant's land agents to their contact at Ineos on 6 February 2024.

14.4.5 One of the letters to Ineos Nitriles (UK) Limited was returned by the Royal Mail on 12 February 2024. No action was taken on the basis that the other letter had been delivered and the letters had also been emailed to Ineos on 6 February 2024.

14.4.6 Copies of the letters that were posted and the email to Ineos are provided at Appendix 14.3.

14.4.7 Both PD Teesport Limited and Ineos Nitriles (UK) Limited responded. How the Applicant had regard to those responses is set out in the tables at Section 15.0.

14.5 Additional Section 42 letters – issued 8 February 2024

14.5.1 Further land interests were identified by the Applicant's land referencers in early February 2024. These related to subsoil interests in the adopted highway at New Road, Haverton Hill, within Stockton-on-Tees. The landownership interests are listed below:

- Industrialised Limited

- Arrowcruit Holdings Limited

14.5.2 The above parties were issued with a Section 42 letter on 8 February 2024 by Royal Mail First Class post. The letters provided the same information that was made available for the Second Consultation and were accompanied by a copy of the Section 48 notice. Each letter was accompanied by a plan showing the relevant party's land interest relative to the proposed Order Limits. The letters asked for any comments or representations to be submitted by 11 March 2024 (a period of more than 30 days).

14.5.3 Copies of the letters that were posted are provided at Appendix 14.4.

14.5.4 No responses were received from any of the above parties.

14.6 Targeted Consultation (Cowpen Bewley Section 42 letters & community consultation) – 9 February 2024

14.6.1 As confirmed above, the Applicant consulted a number of landowners and the local community within the vicinity of Cowpen Bewley village, near Billingham, within the administrative area of STBC, relating to changes to the hydrogen pipeline corridor in this location and proposals to provide replacement open space land within the vicinity of Cowpen Bewley Woodland Park.

14.6.2 Feedback to the previous rounds of consultation included comments in relation to the proximity of the proposed Order Limits to residential properties in Cowpen Bewley. As a result, the Applicant reviewed the pipeline routing options in this area, taking account of the environmental and technical constraints. Following this work, the Applicant was able to reduce the extent of the proposed Order limits adjacent to the village.

14.6.3 In addition, during the Second Consultation, the Applicant identified an area of land at Cowpen Bewley Woodland Park, currently used as open space, that was required for the Proposed Development. In response to this and taking account of the terms of Sections 131 and 132 of the PA 2008, the Applicant undertook an exercise to identify an area of replacement open space land, close to the Cowpen Bewley Woodland Park, which could be made publicly accessible and if possible be integrated with the Woodland Park. Two potential options for the replacement open space were identified as a result of this exercise.

14.6.4 The Applicant contacted STBC by email on 20 December 2023 to request a meeting to discuss the issue of the works within Cowpen Bewley Woodland Park and the potential replacement open space at Cowpen Bewley. The email identified the land in question and explained why it was necessary to identify replacement open space. The meeting was arranged for 19 January 2024. In order to assist discussions at the meeting, the Applicant sent an email to STBC on 16 January 2024 accompanied by an Open Space Replacement Land Assessment, which assessed the potential options, in addition to plans showing the land parcels in question. Copies of the emails and documents sent to STBC are provided at Appendix 14.5.

14.6.5 At the meeting on 19 January 2024 the potential options were presented to STBC and the Applicant explained that the intention would be to carry out a targeted

consultation in respect of the preferred option (the Applicant's preferred option being Option/Site 2 – Land lying south east of Newton Bewley) involving the affected landowners and the local community. STBC agreed to provide comments on the options for the replacement open space land during the week commencing 5th February.

14.6.6 Following the meeting and further consideration of the options, the Applicant sent an email to STBC on 2 February 2024, confirming that Option/Site 1 had been discounted for a number of reasons, including its location within a Conservation Area and contribution to the historic setting of Cowpen Bewley Village and practical challenges in relation to the rights and crossing of the railway line via the footpath to provide access to the land. The email confirmed that the Applicant intended to progress with Option/Site 2 and outlined the proposed targeted consultation exercise that was to be undertaken. A copy of the email is provided at Appendix 14.6.

14.6.7 An email was received from STBC on 7 February 2024 confirming that the Council had assessed the two options and agreed that Option/Site 2 would be the best choice. STBC's email suggested two alternative sites that it considered may be appropriate and asked if these could be considered. STBC explained that these alternative sites, although not within the vicinity of Cowpen Bewley, could potentially offer greater benefits as the Billingham area is already relatively well provided for in terms of natural and semi-natural open space provision, and that the use of these sites for open space could be justified on the basis of the Borough's 2017 Open Space Assessment Report. A copy of the email and accompanying document is provided at Appendix 14.7.

14.6.8 The Applicant subsequently sent an email to STBC on 8 February 2024 confirming that it would be commencing a targeted consultation in relation to the two changes being made to the proposed Order Limits within the vicinity of Cowpen Bewley Village. The email confirmed these changes were:

- **Hydrogen pipeline routing options** – a reduction in the area required for the hydrogen pipeline to the east of Cowpen Bewley Village and consequent reduction in the proposed Order Limits, meaning that the pipeline would be located further from the eastern edge of the Village.
- **Replacement open space land** – the addition of an area of land (Option/Site 2) to the proposed Order Limits, to be integrated with Cowpen Bewley Woodland Park, as replacement open space land.

14.6.9 With regard to the replacement open space land, the Applicant's email thanked STBC for the information provided on 7 February 2024 in relation to possible alternatives to the replacement open space land at Cowpen Bewley, and confirmed that having considered those alternatives, the Applicant was of the view that the land STBC had suggested (and would be consulting on) was preferable. A key reason for this related to the fact that the land is well related to the existing Cowpen Bewley Woodland Park, and would provide suitable alternative provision for the local community in that area. This is an important aspect of the statutory tests and

related guidance that applies to open space replacement land. The email confirmed that the Applicant was keen to work with STBC to agree how the replacement open space land would be planted and laid out to ensure that it was of at least the same standard as the land required for the Proposed Development. The email was accompanied by a copy of the Section 42 letter being issued to STBC, a plan showing the replacement open space land and a copy of the letter that was to be sent to the local community seeking their comments on the proposed changes. A copy of the email is provided at Appendix 14.8.

14.6.10 The Applicant issued Section 42 letters by Royal Mail First Class post on 8 February 2024 to the following parties who had an interest in the replacement open space land to seek their views:

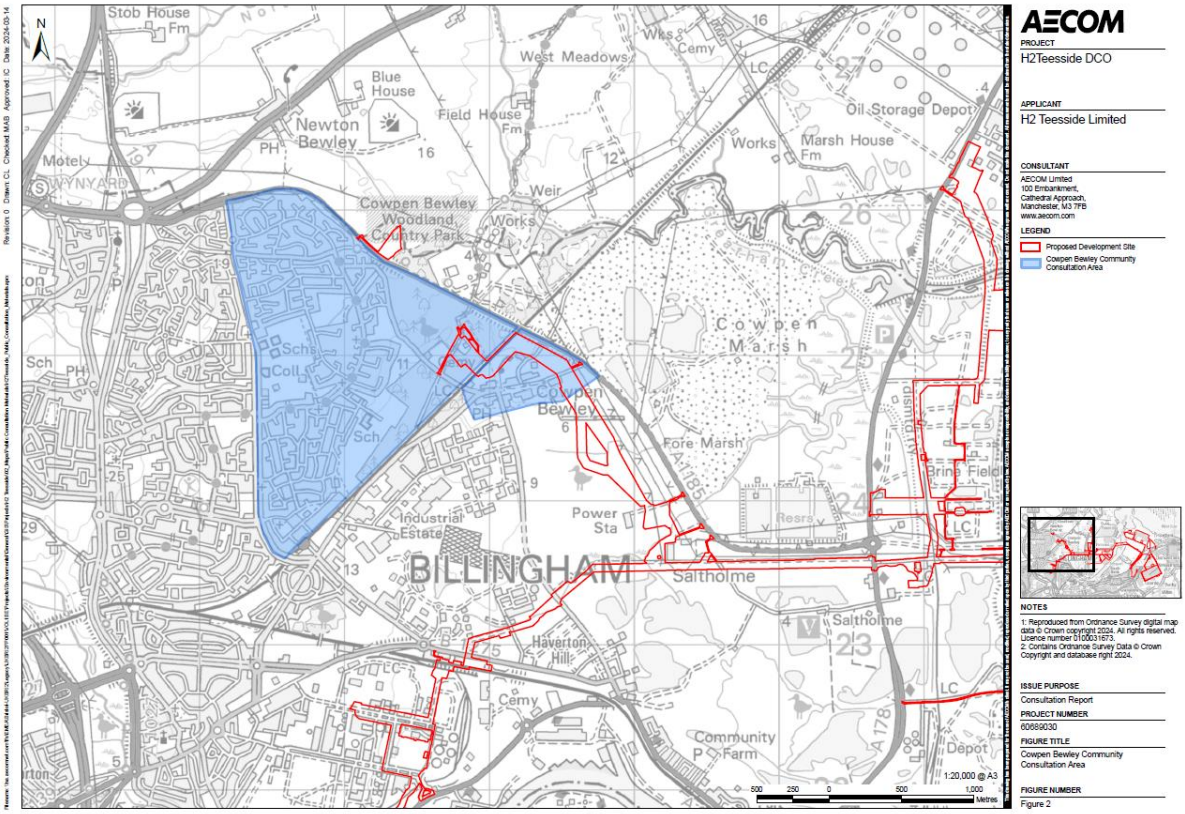
- STBC.
- The Church Commissioners.
- Mr David Martin.

14.6.11 The letters provided information on the Proposed Development, the proposed replacement open space land and how to access the information made available for the previous consultations. Each letter was accompanied by a plan showing the relevant party's land relative to the proposed replacement open space land. The letters asked for any comments or representations to be submitted by 10 March 2024 (a period of more than 30 days).

14.6.12 Copies of the letters that were posted and the plans accompanying them are provided at Appendix 14.9.

14.6.13 On 9 February 2024, the Applicant issued a letter by Royal Mail First Class post to the local community living within the vicinity of Cowpen Bewley, in addition to local political representatives, seeking their views on the proposed changes. The letter was sent to 4,159 residents and businesses within the consultation area shown in Figure 14.1 below. The consultation area was defined so as to include the local community living within the area immediately surrounding the open space land required for the Proposed Development and the replacement open space land.

Figure 14.1: Cowpen Bewley Consultation Area



14.6.14 The letter was accompanied by plans showing the proposed changes and requested any comments or representations be submitted by 10 March 2024 (a period of 30 days). A copy of the letter and plans is provided at Appendix 14.10.

14.6.15 No responses were received to the Section 42 consultation and 11 responses were received to the non-statutory community consultation. How the Applicant has had regard to the consultation responses is set out in the tables at Section 15.0.

15.0 SECTION 49 'DUTY TO TAKE ACCOUNT OF RESPONSES TO CONSULTATION AND PUBLICITY'

15.1.1 Section 49 'Duty to take account of responses to consultation and publicity' requires applicants to have regard to any 'relevant responses' received to the statutory consultation and publicity carried out in accordance with Sections 42, 47 and 48 of the PA 2008. A relevant response is one received by the applicant before the deadline set in relation to the statutory consultation and publicity. There is no statutory duty for an applicant to take account of responses received after the relevant deadline.

15.1.2 Despite the fact that the PA 2008 does not require applicants to take account of responses received after the deadline set for statutory consultation and publicity, the Applicant did take account of any responses received after the close of the consultations.

15.1.3 How the Applicant has taken account of the responses received to the First, Second and additional and targeted consultation, is set out in the following tables (Tables 15.1 to 15.6). Where relevant, any changes made to the Application or Proposed Development as a result of the consultation responses are identified in the tables.

Table 15.1: First Consultation – Section 42 (and non-prescribed) Consultation Responses

CONSULTEE	DATE OF RESPONSE	CONSULTEE RESPONSE	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION
Joint Nature Conservation Committee	14/09/23	JNCC co-ordinates nature conservation advice at a UK-level and advises UK Government on matters relating to nature conservation internationally. Within each UK country the separate statutory bodies are responsible for nature and landscape conservation, these being: Natural England (NE), Natural Resources Wales (NRW), NatureScot (NS) and the Council for Nature Conservation and the Countryside Northern Ireland (CNCCNI). JNCC has responsibility for the provision of nature conservation advice in the offshore area; 'offshore' being defined as beyond 12 nautical miles (nm) from the coastline, to the extent of the United Kingdom Continental Shelf (UKCS). Within territorial limits (<12nm) nature conservation advice is the responsibility of the relevant country bodies. This development proposal is not located within the offshore area, does not have any potential offshore nature conservation issues and is not concerned with nature conservation at a UK-level, therefore JNCC does not have any comments to make on the consultation.	Comment noted	No
NATS	15/09/23	I refer to the consultation sent to the NATS CEO by surface mail, dated 14th September 2023. NATS operates no infrastructure within 10km of the site in question. Accordingly it anticipates no impact from the proposal and has no comments on the Application. We also wish to take this opportunity to respectfully request you update the contact details for NATS Safeguarding as indicated below, and note our preference to receive consultations electronically.	Comment noted	No
GTC Pipelines Limited & GTC Infrastructure Limited	18/09/23	I have read the plans and documents you sent BUUK recently in regard to the H2Teesside Project. Processing your plans and details I have deduced that your works do not fall within the vicinity of GTC assets. Please see the attached the images showing your works locations and no corresponding network drawings within the order limits of your proposed works.	Comment noted	No
Joint Nature Conservation Committee	20/09/23	Thank you for notifying us of the statutory consultation for the H2Teesside Project. Due to JNCC's offshore remit, we won't be looking to comment on this aspect of the project. Please don't hesitate to get in touch if there are offshore elements of the project for which you require our advice.	Comment noted	No

CONSULTEE	DATE OF RESPONSE	CONSULTEE RESPONSE	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION
Marine Management Organisation	21/09/23	**Marine Licensing** Works activities taking place below the mean high water mark may require a marine licence in accordance with the Marine and Coastal Access Act (MCAA) 2009. Such activities include the construction, alteration or improvement of any works, dredging, or a deposit or removal of a substance or object below the mean high water springs mark or in any tidal river to the extent of the tidal influence. Applicants should be directed to the MMO's online portal to register for an application for marine licence:https://www.gov.uk/guidance/make-a-marine-licence-application You can also apply to the MMO for consent under the Electricity Act 1989 (as amended) for offshore generating stations between 1 and 100 megawatts in English waters. The MMO is also the authority responsible for processing and determining Harbour Orders in England, together with granting consent under various local Acts and orders regarding harbours. A wildlife licence is also required for activities that that would affect a UK or European protected marine species. The MMO is a signatory to the coastal concordat and operates in accordance with its principles. Should the activities subject to planning permission meet the above criteria then the applicant should be directed to the follow pages: check if you need a marine licence and asked to quote the following information on any resultant marine licence application: local planning authority name, planning officer name and contact details, planning application reference. Following submission of a marine licence application a case team will be in touch with the relevant planning officer to discuss next steps.	**Marine Licensing** No marine licence applications are anticipated to be required. The Applicant engaged with the MMO regarding marine licensing during February-March 2024 and following discussion the Applicant has made a determination that any activities below the mean high water spring mark would be exempt of the requirements for a Deemed Marine Licence. **Environmental Impact Assessment** This comment is noted, the legislation and guidance highlighted here has been taken into account in the preparation of the Environmental Statement [ES Volume I, EN070009/APP/6.2] where applicable. **Marine Planning** The Applicant has undertaken a marine plan policy assessment and this is included at Appendix 7A (ES Volume III, EN070009/APP/6.4). **Minerals and waste plans and local aggregate assessments** This comment is noted but is not relevant for the Proposed Development.	No

CONSULTEE	DATE OF RESPONSE	CONSULTEE RESPONSE	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION
		Environmental Impact Assessment With respect to projects that require a marine licence the EIA Directive (codified in Directive 2011/92/EU) is transposed into UK law by the Marine Works (Environmental Impact Assessment) Regulations 2007 (the MWR), as amended. Before a marine licence can be granted for projects that require EIA, MMO must ensure that applications for a marine licence are compliant with the MWR. In cases where a project requires both a marine licence and terrestrial planning permission, both the MWR and The Town and Country Planning (Environmental Impact Assessment) Regulations http://www.legislation.gov.uk/uksi/2017/571/contents/made may be applicable. If this consultation request relates to a project capable of falling within either set of EIA regulations, then it is advised that the applicant submit a request directly to the MMO to ensure any requirements under the MWR are considered adequately at the following link https://www.gov.uk/guidance/make-a-marine-licence-application **Marine Planning** Under the Marine and Coastal Access Act 2009 ch.4, 58, public authorities must make decisions in accordance with marine policy documents and if it takes a decision that is against these policies it must state its reasons. MMO as such are responsible for implementing the relevant Marine Plans for their area, through existing regulatory and decision-making processes. Marine plans will inform and guide decision makers on development in marine and coastal areas. Proposals should conform with all relevant policies, taking account of economic, environmental and social considerations. Marine plans are a statutory consideration for public authorities with decision making functions. At its landward extent, a marine plan will apply up to the mean high water springs mark, which includes the tidal extent of any rivers. As marine plan boundaries extend up to the level of the mean high water spring tides mark, there will be an overlap with terrestrial plans which generally extend to the mean low water springs mark.		

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		A map showing how England's waters have been split into 6 marine plan areas is available on our website. For further information on how to apply the marine plans please visit our Explore Marine Plans service. Planning documents for areas with a coastal influence may wish to make reference to the MMO's licensing requirements and any relevant marine plans to ensure that necessary regulations are adhered to. All public authorities taking authorisation or enforcement decisions that affect or might affect the UK marine area must do so in accordance with the Marine and Coastal Access Act and the UK Marine Policy Statement unless relevant considerations indicate otherwise. Local authorities may also wish to refer to our online guidance and the Planning Advisory Service soundness self-assessment checklist. If you wish to contact your local marine planning officer you can find their details on our gov.uk page. **Minerals and waste plans and local aggregate assessments** If you are consulting on a mineral/waste plan or local aggregate assessment, the MMO recommend reference to marine aggregates is included and reference to be made to the documents below; The Marine Policy Statement (MPS), section 3.5 which highlights the importance of marine aggregates and its supply to England's (and the UK) construction industry. The National Planning Policy Framework (NPPF) which sets out policies for national (England) construction minerals supply. The Managed Aggregate Supply System (MASS) which includes specific references to the role of marine aggregates in the wider portfolio of supply. The National and regional guidelines for aggregates provision in England 2005-2020 predict likely aggregate demand over this period including marine supply. The NPPF informed MASS guidance requires local mineral planning authorities to prepare Local Aggregate Assessments, these assessments have to consider the opportunities and constraints of all mineral supplies into their planning regions – including marine. This means that even land-locked counties, may have to consider the role that marine sourced supplies (delivered by rail or river) play – particularly where land based resources are becoming increasingly constrained.		

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Canal and River Trust (Simon Tucker)	21/09/23	Thank you for your consultation on the H2 Teesside Proposals. The Canal & River Trust are Navigation Authority for the River Tees. However, our jurisdiction is upstream of the Tees barrier, and does not include the section of the Tees to be crossed by the proposals. As a result, we do not have any comment to make on the proposals. Should the scheme be amended to include parts of the Tees where we are Navigation Authority, we would request to be re-consulted so we can assess the impact of the proposals on our network.	Comment noted	No
The Coal Authority	21/09/23	Thank you for your notification of 14 September 2023 seeking the views of the Coal Authority on the above. I have checked the site location plan against the information held by the Coal Authority and can confirm that the proposed development site is located outside of the defined coalfield. On this basis, the Planning team at the Coal Authority have no comments to make.	Comment noted	No
Active Travel England	27/09/23	No comment Thank you for your email. In relation to the above planning consultation, Active Travel England has no comment to make as it falls outside of its statutory remit.	Comment noted	No
SP Energy Networks	27/09/23	Please can you update your records, SP Energy Networks would not be responsible. Please check network map at: https://www.energynetworks.org/customers/find-my-network-operator	Comment noted	No
City Fibre	28/09/23	At present, City Fibre records do not hold any network within your area of interest so we are unable to provide you with a C3 estimate. However, it is important to know that City Fibre is building network across the country continuously. Therefore, we insist you carry out regular checks using the below service.	Comment noted	No

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		Please use the City Fibre online enquiry service found at https://plant.cityfibre.com. (Terms and conditions and a user guide can be found on that page).		
National Gas Transmission	19/10/23	I refer to your current statutory consultation for the above proposed DCO. This is a response on behalf of National Gas Transmission Plc (NGT). NGT has the following apparatus located within or in proximity to the Order limits. Details of this infrastructure is as follows: Feeder Main 6 - "Cowpen Bewley to Billingham" Feeder Main 6 - "Cowpen Bewley to Teeside" ▪ Associated cathodic protection apparatus ▪ Ancillary apparatus Billingham AGI Teeside AGI NGT should be made aware of any electrical apparatus being earthed (if required), cathodic protection systems being installed, and any potential sources of ignition which might affect the hazardous area during venting operations. Please note that NGT has existing easements for these pipelines which provides rights for ongoing access and prevents the erection of permanent / temporary buildings/structures, change to existing ground levels or storage of materials etc within the easement strip. You should also be aware of NGT's guidance for working in proximity to its assets, further guidance and links are available as follows. Key Considerations: • NGT has a Deed of Grant of Easement for each pipeline, which prevents the erection of permanent / temporary buildings, or structures, change to existing ground levels, storage of materials etc. • Please be aware that written permission is required before any works commence within the NGT easement strip. Furthermore a Deed of Consent will be required prior to commencement of works within NGT's easement strip subject to approval by NGT's plant protection team.	The Applicant has noted and will adhere to the comments on standards and guidelines provided by National Gas for works in proximity to their infrastructure. The Applicant has engaged with National Gas in relation to Protective Provisions and the seeking of land agreements on a voluntary basis where required.	No

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		• Any large installations which may result in a large population increase in the vicinity of a high-pressure gas pipeline must comply with the HSE's Land Use Planning methodology, and the HSE response should be submitted to National Gas Transmission for review • The below guidance is not exhaustive and all works in the vicinity of NGT's asset shall be subject to review and approval from NGT's plant protection team in advance of commencement of works on site. General Notes on Pipeline Safety: • You should be aware of the Health and Safety Executives guidance document HS(G) 47 "Avoiding Danger from Underground Services", and NGT's Dial Before You Dig Specification for Safe Working in the Vicinity of NGT Assets. There will be additional requirements dictated by NGT's plant protection team. • NGT will also need to ensure that its pipelines remain accessible during and after completion of the works. • Our pipelines are normally buried to a depth cover of 1.1 metres, however actual depth and position must be confirmed on site by trial hole investigation under the supervision of a NGT representative. Ground cover above our pipelines should not be reduced or increased. • If any excavations are planned within 3 metres of NGT High Pressure Pipeline or, within 10 metres of an AGI (Above Ground Installation), or if any embankment or dredging works are proposed then the actual position and depth of the pipeline must be established on site in the presence of a NGT representative. A safe working method agreed prior to any work taking place in order to minimise the risk of damage and ensure the final depth of cover does not affect the integrity of the pipeline. • NGT should be consulted prior to any geotechnical investigations being carried out within the vicinity of its pipelines. • NGT requires that the project complies with the HSE's LUP methodology and any other regulations such as COMAH. • Below are some examples of work types that have specific restrictions when being undertaken in the vicinity of gas assets therefore consultation with NGT's Plant Protection team is essential: ▪ Demolition ▪ Blasting ▪ Piling and boring ▪ Deep mining		

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		▪ Surface mineral extraction ▪ Landfilling ▪ Trenchless Techniques (e.g. HDD, pipe splitting, tunnelling etc.) ▪ Wind turbine installation - minimum separation distance of 1.5x the mast/hub height is required, and any auxiliary installations such as cable or track crossings will require a deed of consent. ▪ Solar farm installation ▪ Tree planting schemes Traffic Crossings: • Where existing roads cannot be used, construction traffic should ONLY cross the pipeline at agreed locations and traffic loading information will need to be reviewed, a Deed of Consent may be required. • Permanent road crossings will require a surface load calculation, and will require a deed of consent. • The pipeline shall be protected, at the crossing points, by temporary rafts constructed at ground level. The third party shall review ground conditions, vehicle types and crossing frequencies to determine the type and construction of the raft required. • The type of raft shall be agreed with NGT prior to installation. • No protective measures including the installation of concrete slab protection shall be installed over or near to the NGT pipeline without the prior permission of NGT • NGT will need to agree the material, the dimensions and method of installation of the proposed protective measure. • The method of installation shall be confirmed through the submission of a formal written method statement from the contractor to NGT. • An NGT representative shall monitor any works within close proximity to the pipeline to comply with NGT specification T/SP/SSW22 New Asset Crossings: • New assets (cables/pipelines etc) may cross the pipeline at perpendicular angle to the pipeline i.e. 90 degrees. • The separation distance for a cable >33kV is 1000mm and pre and post energisation surveys may be required at National Gas Transmission's discretion. A risk assessment/method statement will need to be provided to, and accepted by National Gas Transmission prior to the deed of consent being agreed. Where a new asset is to cross over the pipeline a clearance distance of 0.6 metres between the crown of the pipeline and underside of the service should be maintained. If this cannot be achieved		

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		the service shall cross below the pipeline with a clearance distance of 0.6 metres. • A new service should not be laid parallel within an easement strip • Clearance must be at least 600mm above or below the pipeline • An NGT representative shall approve and supervise any cable crossing of a pipeline. • A Deed of Consent is required for any cable crossing the easement • New assets with proposed cathodic protection systems - cathodic protection design must be provided to NGT for review to ensure that there is no interference with NGT's system Where the promoter intends to acquire land, extinguish rights, or interfere with any of NGT apparatus, protective provisions will be required in a form acceptable to it to be included within the DCO. NGT requests to be consulted at the earliest stages to ensure that the most appropriate protective provisions are included within the DCO application to safeguard the integrity of our apparatus and to remove the requirement for objection. Adequate access to NGT pipelines must be maintained at all times during construction and post construction to ensure the safe operation of our network.		
National Grid Energy Transmission	20/10/23	I refer to your letter dated 14th September 2023 in relation to the above proposed application. This is a response on behalf of National Grid Electricity Transmission PLC (NGET). Having reviewed the consultation documents, NGET would like to make the following comments regarding infrastructure within or in close proximity to the current red line boundary. NGET has high voltage electricity overhead transmission lines, underground cables and a high voltage substation within the scoping area. The overhead lines and substation form an essential part of the electricity transmission network in England and Wales. Substation • Grangetown 66kV Substation • Tod Point 275kV Substation o Buried fibre cables from Tod Point substation	The Applicant has noted and will adhere to the comments on standards and guidelines provided by National Grid for works in proximity to their infrastructure. As a result of the comments provided in relation to the Proposed Development, The Applicant made amendments to the Order Limits in proximity to NGET Apparatus. NGET were consulted on these revisions to the Proposed Development as part of the Applicant's December 2023 consultation. The Applicant has also engaged with National Grid in relation to the seeking of voluntary land agreements where required and has included appropriate Protective Provisions for National Grid's assets within the Proposed Development Order Limits. [EN070009/APP/2.1].	

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		• Associated overhead and underground apparatus including cables Overhead Lines ZZA 400kV OHL Hartlepool – West Boldon Hartlepool – Hartmoor Hartlepool – Saltholme Hartlepool – Tod Point Lackenby – Norton Hartlepool – Tod Point YYJ 400kV OHL Lackenby – Norton 1 Norton – Saltholme YYQ 275kV OHL Hartlepool – Tod Point Lackenby – Tod Point XA 400kV Lackenby – Norton 1 Hartlepool – Tod Point Associated underground apparatus including cables Cable Apparatus • Grangetown - Lackenby 275kV underground cable Specific Comments – Electricity Infrastructure: ▪ NGET's Overhead Line/s is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset. ▪ Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. NGET recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for "overhead line clearances Issue 3 (2004)". Excavation exclusion zones should also be maintained and considered in discussion with NGET. ▪ If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances.		

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		▪ The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's (www.hse.gov.uk) Guidance Note GS 6 "Avoidance of Danger from Overhead Electric Lines" and all relevant site staff should make sure that they are both aware of and understand this guidance. ▪ Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum "sag" and "swing" and overhead line profile (maximum "sag" and "swing") drawings should be obtained using the contact details above. ▪ If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances. ▪ Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or "pillars of support" of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation ("pillar of support") drawings can be obtained using the contact details above. ▪ NGET high voltage underground cables are protected by a Deed of Grant; Easement; Wayleave Agreement or the provisions of the New Roads and Street Works Act. These provisions provide NGET full right of access to retain, maintain, repair and inspect our assets. Hence we require that no permanent / temporary structures are to be built over our cables or within the easement strip. Any such proposals should be discussed and agreed with NGET prior to any works taking place. ▪ Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented. Further Advice We would request that the potential impact of the proposed scheme on NGET's existing assets as set out above and including any proposed		

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		diversions is considered in any subsequent reports, including in the Environmental Statement, and as part of any subsequent application. Where any diversion of apparatus may be required to facilitate a scheme, NGET is unable to give any certainty with the regard to diversions until such time as adequate conceptual design studies have been undertaken by NGET. Further information relating to this can be obtained by contacting the email address below. Where the promoter intends to acquire land, extinguish rights, or interfere with any of NGET apparatus, protective provisions will be required in a form acceptable to it to be included within the DCO. NGET requests to be consulted at the earliest stages to ensure that the most appropriate protective provisions are included within the DCO application to safeguard the integrity of our apparatus and to remove the requirement for objection. All consultations should be sent to the following email address: box.landandacquisitions@nationalgrid.com		
Natural England	20/10/23	Planning consultation: The H2 Teesside Project – Land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton on Tees on Teesside and the borough of Hartlepool in County Durham – Consultation in accordance with Section 42 'Duty to Consult' of the Planning Act 2008 and Regulation 13 'Pre-application publicity under Section 48 (Duty to publicise) of the Infrastructure Planning Environmental Impact Assessment Regulations 2017 Thank you for your consultation on the above dated 14 September 2023, which was received by Natural England on the same day. Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development. Natural England's comments relating to the Public Consultation and the Preliminary Environmental Information Report (PEIR) are given below: **Nationally and Internationally Designated Sites** The proposal is likely to impact directly and indirectly upon the Teesmouth and Cleveland Coast Special Protection Area (SPA), Ramsar Site and Site of	**Nationally and Internationally Designated Sites** The Applicant can confirm a Report to Inform Habitats Regulations Assessment (EN070009/APP/5.10) and a Cumulative and In-Combination Effects Assessment (Chapter 23: Cumulative and Combined Effects (ES Volume I, EN070009/APP/6.2)) have been undertaken and submitted as part of the DCO Application. The Applicant can confirm a Nutrient Neutrality Assessment has been undertaken and is submitted as part of the DCO Application [EN070009/APP/5.13] **Protected species** The Applicant has reviewed the Natural England standing advice for protected species. The results of species-specific surveys are reported in the Environmental Statement [EN070009/APP/6.4]. **Soils and Best and best and most versatile land** The assessment reflects the importance of soil as a resource with reference to the Code of Practice for the Sustainable Management of Soils on Construction Sites.	

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		Special Scientific Interest (SSSI) during construction and operation and has the potential to indirectly impact several other internationally designated sites during operation1. Natural England notes that a 'Report to Inform Habitats Regulations Assessment Screening'2 has been submitted in line with the requirements of the Habitats Regulations, and that these assessments have been made taking account of the Rochdale Envelope approach (worst-case scenarios) in the absence of detailed design information. Natural England acknowledges the intention to carry out an assessment of cumulative and in combination effects as part of the forthcoming Environmental Statement3 and as option selection proceeds. We also note the Nutrient Neutrality Screening Assessment4 in recognition of the Tees catchment's current nutrient neutral status. With regard to the restoration of the SPA as distinct from nutrient neutrality5 the SPA's conservation objectives6 include the 'restore' objective. Natural England welcomes the statement regarding further consideration of the nutrient neutrality theme during the appropriate assessment stage of the project's Habitats Regulations Assessment. Based on the information available to date Natural England agrees with the conclusions of the assessments presented in the PEIR as a whole. **Protected Species** Based on the information provided Natural England advises that the proposal has the potential to impact species protected by UK and EU legislation. We note that further species-specific surveys are being undertaken, and will be used to inform the Environmental Statement, as well as any required protected species licence applications. Natural England has published Standing Advice on protected species. Whilst this advice has been primarily designed to assist Local Planning Authorities better understand the information required when assessing the impacts of developments on protected species, it also contains a wealth of information to help applicants ensure their proposals comply with best practice guidelines and contribute to sustainable development. Notwithstanding our pre-application discussions on suitable ecological survey we would refer you to our standing advice for further guidance on information that may be required in terms of survey and mitigation requirements. The Standing Advice should not, however, be treated as giving any indication or providing any assurance that the proposed development will be unlikely to affect European Protected Species within the scheme's zone	**Landscape** The Applicant has developed an Outline Landscape and Biodiversity Management Plan [EN070009/APP/5.9] with consideration of the identified local landscape character and design guidance also informing the assessment undertaken in Chapter 16: Landscape and Visual Amenity of the Environmental Statement [EN070009/APP/6.2]. **Habitat Enhancement** The Applicant's biodiversity assessment is ongoing and includes assessment of priority habitat layers from the MAGIC database and the ecology surveys. The Applicant is happy to discuss opportunities with Natural England as the biodiversity assessment progresses. **Ongoing Engagement** The Applicant thanks Natural England for their engagement with the project to date. Liaison with Natural England is ongoing has informed preparation of the application and will continue into the examination period as required.	

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		of influence, nor should it be interpreted as meaning that Natural England has reached any views as to whether a licence (or licences) will be required. **Soils and Best and best and most versatile land** Natural England notes the submitted information detailing agricultural land classification7 (ALC) for land affected by the development. We acknowledge the predominantly lower grades of, and non-agricultural, land recorded within the development site. In addition to best and most versatile land considerations for the identified Grade 3 land north of the R.Tees8 we would emphasise the important need for conservation of soil resources more generally. We therefore note and welcome reference to the Code of Practice for the Sustainable Management of Soils on Construction Sites, for example in respect of proposals for horizontal directional drilling (HDD) beneath the R.Tees and Greatham Crook. **Landscape** This proposal does not appear to be either located within, or within the setting of, a nationally designated landscape. All proposals however should complement and where possible enhance local distinctiveness and be guided by Redcar and Cleveland Council's landscape character assessment and local plan policy together with equivalent policy and guidance for those parts of the scheme within Hartlepool and Stockton on Tees Borough Councils' jurisdiction. **Habitat Enhancement** The development site includes and adjoins land supporting a range of priority habitats. We welcome the statement regarding consideration of these in the Environmental Statement, including open mosaic habitat on previously developed land. With regard to Biodiversity Net Gain (BNG) Natural England notes the statement within the PEIR regarding BNG being likely to achieve mandatory status for NSIPs in 2025. We welcome the commitment to a suitable BNG assessment at the relevant time in order to inform the stated objective of an overall net gain across the development site9. We would be happy to work with the applicants to develop this. **Ongoing Engagement** Natural England has welcomed the opportunity to engage at an early stage for this development, to help ensure that all environmental factors have been taken into account. As a result we also welcome the applicant's stated intention to liaise further on matters including nutrient neutrality		

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		screening10. We are happy to continue with this engagement as the application is developed and finalised as well as during the Examination period and to agree any Statements of Common Ground and Letters of No Impediment that may be required. We would be happy to comment further should the need arise but if in the meantime you have any queries relating to the advice in this letter please contact me on 07554 459452 or antony.muller@naturalengland.org.uk . For any new consultations, or to provide further information on this consultation please send your correspondence to consultations@naturalengland.org.uk.		
EXA	23/10/23	EXA, have no plant in this location and will not be affected, please can you remove us from all correspondence.	Comment noted	No
AWE PLC	23/10/23	Thank you for your letter of 14 September 2023 addressed to the Chief Executive of AWE PLC on this matter. He has asked me to reply on his behalf as the Company Secretary. I am sorry for the delay in replying to your letter. We have been reviewing the location of the Project in the context of the location of our deployed infrastructure and this has taken a little longer than had been hoped. I am however pleased to confirm that AWE PLC has no relevant interests in the location of the Project; no further consultation is required in our case. Thank you for making contact with us. We wish you every success in the project.	Comment noted	No
National Highways	23/10/23	Jacobs Systra Joint Venture [JSJV] (on behalf of National Highways) has undertaken a review of the Preliminary Environmental Impact Report [PEIR] (dated September 2023) submitted by H2 Teesside Limited [the Applicant] in reference to the proposed H2 Teesside Project at the former Redcar Steelworks site, Teesside. The H2 Teesside Project application has been classified as a Development Consent Order [DCO] (ref: R/2023/0300/DCO) due to the development being recognised by the Planning Inspectorate as a Nationally Significant Infrastructure Project. This JSJV Technical Memorandum [TM] comments on the suitability of the Traffic and Transport chapter of the PEIR documentation with discussion provided in relation to whether the document suitably considers the impact of the development proposals upon the Strategic Road Network [SRN] across both the operational and construction phases of the development. Reference is also made to JSJV DevTV0162 TM001 (28th	The Applicant thanks National Highways for their detailed input and looks forward to continued engagement. In relation to the specific points highlighted in the conclusion of their review the Applicant would respond as follows: As set out in Section 15-A.4 of the Transport Assessment (Appendix 15A-1, ES Volume III, EN070009/APP/6.4), updated traffic count data from 2022 and 2023 has been obtained for the following links from the Webtris database and the DfT database: •11 A1053 Greystone Road •12 A174 (West of Greystone Roundabout); •13 A1046 Haverton Hill Road •14 A1185 (west of A178 Seaton Carew Road)	No

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		April 2023), which considered and reviewed the initial project scoping prepared by the Applicant prior to the PEIR submission. The development site, located at the former Redcar Steelworks site, is composed of two proposed main sites, sites A and B, as detailed on Figure 1 below. Proposed Development The proposed development comprises the construction, operation and maintenance of a 1.2 GWth Lower Heating Valve Carbon Capture and Storage [CSS] enabled Hydrogen Production Facility located in the Teesside industrial cluster area. The Production Facility and associated infrastructure which form part of the proposed development will be located on the 'Main Site'. There are currently two Main Site options – Main Sites A and B. Main Site A would be located within land owned by Teesworks known as 'The Foundry'. Main Site B would be located to the west of Main Site A within land owned by Redcar Bulk Terminal, known as 'RBT'. Both Main Sites are located within the Redcar and Cleveland Borough, with the connection corridors extending further into Stockton-on-Tees and Hartlepool, all within Teesside. At this stage in the design of the proposed development, there are still options being considered for various components. The design of the proposed development incorporates a necessary degree of flexibility to allow for the future selection of the preferred layout at the Main Site, as well as routing of the hydrogen pipeline and other connections. Baseline Traffic Flows & Assessment Existing Traffic Flows A number of highway links across the local highway network [LHN] and SRN are identified within the PEIR as links of interest for the wider highway assessment of the development. Baseline 24 hour Annual Average Daily Traffic [AADT] two-way link flows for these identified links are presented within the PEIR, with total vehicles broken down between LGVs and HGVs. The PEIR confirms that baseline flows have been captured via a series of 7-day ATC counts between 29th November 2019 and 25th November 2019, in addition to complimentary Webtris data for the month of September 2019 and 2019 annual DfT Road Traffic Statistics where ATC counts were not undertaken. In response, as identified within JSJV TM001, National Highways require the impact of the proposed development at the SRN over both the	A comparison has then been undertaken with the previous 2019 Webtris and DfT data and with reference to Table 15-A-20 of the TA the data from 2019 is still considered to be valid as there has been no material change in the traffic flow between 2019 and 2022/23. 2. A full review of the most recent accident data has been included within Section 15-A-4 of the Transport Assessment (Appendix 15A (ES Volume III, EN070009/APP/6.4)), with a summary being included within Section 15.4 of Chapter 15: Traffic and Transport (ES Volume I, EN070009/APP/6.2). 3. Section 15-A-5 of the Transport Assessment (Appendix 15A (ES Volume III, EN070009/APP/6.4)), has included an assessment of the likely level of operational traffic, including the potential impacts during the weekday AM and PM peak hours on the SRN. 4. An average of 2 construction workers per vehicle is considered a realistic assumption given that the mode of arrival of construction workers can be controlled through travel planning measures and that construction workers would want to minimise their travel expenditure, particularly if having to pay for temporary accommodation. It is proposed that this level of traffic generation can be managed and maintained through Travel Plan measures and the availability of on-site parking spaces. In addition, a figure of 2.33 workers per car was agreed as part of the adjacent NZT assessment, and as such an assumption of 2 workers per car is considered to be acceptable. 5. A worst-case assessment of 1,300 construction workers has been used in the assessment, which based upon a car sharing of 2 workers pre car results in 650 construction worker vehicles arriving and 650 construction worker vehicles departing each day at the peak of construction. 6. A Framework Outline Construction Traffic Management Plan (CTMP) (EN070009/APP/5.17) and Framework Construction Worker Travel Plan (CWTP) (EN070009/APP/5.16) is included in this submission.	

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		operational and construction phase to be understood in terms of absolute two-way flows over both the morning / evening network peak hours. This is opposed to either total daily flows or proportional flows (percentage increase) in relation to baseline flows at any specific junction. As such, the appropriateness of the baseline flows considered within the PEIR will only necessitate further discussion by JSJV at the point at which any detailed junction modelling is considered necessary as a result of the agreed development impact (operation and / or construction) at the SRN. Personal Injury Collision Data The PEIR confirms that a full analysis of the most recent Personal Injury Collision [PIC] will be reported within any forthcoming Transport Assessment prepared as part of the DCO. In addition, JSJV note that a high level PIC analysis has been presented within the PEIR, which considers the accident severity of collision data within two distinct study areas, north and south of the River Tees. In response, JSJV note that PIC data applicable to the SRN will only necessitate further discussion and review in instances where the proposed development is considered to have a material impact at a specific SRN junction, once construction / development flows are agreed. Until this point, PIC data will not be commented on in detail by JSJV. TEMPro Factors 2019 to 2026 TEMPro growth factors applicable to the AM and PM peak periods are presented within the PEIR in order to predict future baseline traffic flows at the estimated year of peak construction. In response, as noted above by JSJV with reference to the acceptability of baseline network flows, the appropriateness of the baseline / future year flows and the associated growth rates considered within the PEIR will only necessitate further discussion by JSJV at the point at which any detailed junction modelling is considered necessary as a result of the agreed development impact (operation and / or construction) at the SRN. Development Operation The PEIR confirms that workforce numbers during operation will be a maximum of 130 staff following the opening of both Phases 1 and 2 (with a maximum of 100 staff being employed as part of Phase 1 only). Operations staffing is proposed to be implemented on a shift basis over a 24 hour period. In addition, the PEIR notes that during 28 day maintenance periods, which are expected to occur every four years, there would be up to 400 staff on	A Final CTMP and CWTP will be produced by the EPC Contractor prior to construction, pursuant to a Requirement of the draft DCO (EN070009/APP/2.1). 7. The Transport Assessment (Appendix 15A (ES Volume III, EN070009/APP/6.4)), provides details of both the construction and operational traffic flows throughout the day, including peaks, which allows the impact during the weekday AM and PM peaks to be identified.	

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		site. JSJV acknowledge that the implementation of a 24 hour shift rotation would likely result in shifts being scheduled in such a way that staff avoid travelling to / from the site in network peak hours, thus mitigating any specific junction impact. However, these shift periods will need to be confirmed by the Applicant moving forward before JSJV can accept that the development operation will not incur a material impact at the SRN. In response to the identified 'maintenance periods', as these periods remain unavoidable, JSJV would strongly recommend that targeted and robust measures are identified with the forthcoming development Travel Plan [TP] in order to specifically address, cater for, and mitigate the influx of staff trips over these short-term periods. Moreover, the Applicant will need to confirm the staff shift scheduling associated with the operation of the proposed development to ensure that the AM / PM peak hour impact of the site at the SRN can be fully evaluated. This confirmation will need to be provided within any Transport Assessment submitted in support of the proposed development. A planning control would also be needed to ensure implementation of such an approach, this being achieved through the conditioning of an Operational Management Plan on other similar development proposals. Decommissioning JSJV acknowledge that the assessment of potential decommissioning related traffic cannot be estimated with any accuracy at this time. However, JSJV welcome the commitment detailed within the PEIR that a Decommissioning Traffic Management Plan [DTMP] will be prepared and submitted (when appropriate) in order to control and mitigate the impact of any decommissioning related traffic. Total Construction Traffic – Workers and HGVs Construction – Worker Numbers (1,300 workers analysis) The PEIR confirms that based upon information supplied by the development client, a maximum of 1,300 on-site construction workers during month 17 of construction will be considered moving forward as a worst case assessment. As part of this worst case assessment, a car sharing assumption of 2 workers per car has been applied to the data considered. As detailed within the PEIR, 71% of construction workers will be associated with the construction of the Main Site, while 29% of workers will be associated with the various Connection Corridor sites. In addition, based upon the percentage split between the Connection Corridors to the north and south of the River Tees (4 sites to north and 3 sites to south) – a		

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		57% to 43% split has been considered. Based upon the quoted worker proportions and the assumption of two staff per vehicle, the total construction worker one-way trips associated with the Main Site and Connection Corridors are detailed in Table 1 below. The associated one-way daily HGV trips are also detailed in Table 2. SEE PDF for tables Based on the content of Table 1 and Table 2, the daily worker and HGV profile for the peak month of construction is detailed in Table 3 and Table 4 below. SEE PDF for tables With reference to the peak period construction flows detailed in the PEIR, JSJV note the following: • JSJV acknowledge that a two-person per car assumption appears relatively appropriate, however, no validating data is provided to justify where this figure has been achieved at comparable construction sites. This should be provided moving forward. • With the overall construction staff numbers informed by the Applicant's own first principles methodology, JSJV cannot comment on the specifics by which the trip generation data has been calculated. • With daily on-site construction activities commencing prior to the conventional AM network peak of 08:00 – 09:00 and continuing until well after the conventional PM network peak of 17:00 – 18:00, overall construction traffic flows are relatively evenly spread throughout the day. Such a daily staggering of construction flows would be welcomed by National Highways with regards to the impact of the construction phase at the SRN. • With construction traffic expected to be distributed amongst the Main Site and the various Connection Corridor sites north and South of the River Tees, JSJV acknowledge that the construction traffic flows as indicated are unlikely to incur a material impact at the SRN over the typical AM network peak (0800 – 0900), irrespective of distribution proportions. However, in line with the anticipated vehicle distribution and assignment discussed subsequently, the volume of development trips over the typical PM network peak (1700 – 1800) is considered further with regards to any potential material impact at the SRN. Trip Distribution It has been assumed within the PEIR that the majority of the employment generated would be occupied by people living in the immediate Middlesbrough and Stockton Travel to Work [TTW] areas. The assessment		

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		has therefore been based upon 75% of workers being local (Middlesbrough and Stockton) and 25% being transient. The distribution of the permanent resident construction workforce has been based on a gravity model and the number of those employed in construction industries in towns and cities (ONS, 2011) within a 45 minute drive time of the site. Table 5 below details the methodology by which the worker population and their distance from the proposed development site can be used to calculate an attractiveness factor, whereby the distribution methodology favours locations closer to the development site. SEE PDF FOR TABLE In contrast, the distribution of the transitory workforce has been undertaken based on a gravity model and the estimated number of accommodation beds available in the surrounding districts within a 30-minute travelling distance of the proposed development site. This information has been based upon the methodology adopted for the Net Zero Teesside project, which was based on the Visit Britain Accommodation Stock audit (2016). Table 6 below details the proposed distribution for transient workers based on this methodology. SEE PDF FOR TABLE With reference to the proposed distribution methodology, JSJV note the following: • JSJV has undertaken a high level evaluation of the parameters underpinning the distribution methodology calculations undertaken and note that the methodology by which the distribution of permanent and transient workers has been calculated is considered to be appropriate. • JSJV acknowledge that the proposed distribution methodology suitably corresponds to that which was accepted for the Net Zero Teesside project. • Vehicle Assignment Five key routes have been identified in the PEIR that are considered most likely to be taken by construction workers travelling to and from the development site: • Route 1 – Via A66 onto A1085 Trunk Road, Site Access; • Route 2 – Via A1085 Broadway onto Trunk Road, Site Access; • Route 3 – Via B1380 High Street onto A1053 Greystone Road, A1085 Trunk Road, Site Access;		

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		• Route 4 – Via A174 onto A1053 Greystone Road, A1085 Trunk Road, Site Access; and • Route 5 – Via A1085 Trunk Road, Site Access. • With regard to the vehicle assignment routes considered, JSJV note that Route 4 accounts for the most direct use of the SRN for access to the site (A1053 and A174 corridors). In addition, JSJV note that Routes 1, 2, 3 and 5 pass through the A1053 / A66 / Trunk Road junction and therefore could influence the operation of the A1053 arm of that junction which forms part of the SRN. Considering the approximate location of the proposed construction site(s) and the local / regional catchments from where construction staff will be drawn from, JSJV acknowledge that once staff trips are fully distributed across the SRN, the principal impact of site construction will most likely be incurred at the A1053 and A174 corridors (and the associated junctions). • The assignment of both the permanent and transient workforce via Route 4 (A1053 and A174 corridors) is detailed in Table 7 and 8 below. The combined impacts of all routes (1 through to 5) at the A1053 / A66 / Trunk Road junction are of a much larger scale and will require appropriate consideration at that location. SEE PDF FOR TABLES With reference to the proposed vehicle assignment methodology, JSJV note the following: In line with PEIR Paragraph 15.6.40, the total number of construction workers considered is stated to be 960, which does not reflect the stated 'worst-case' volume of 1,300 staff, as also accounted for earlier within the PEIR. In line with the distribution figures presented within the PEIR to date and the proposed construction parameters (daily staggering of vehicle trips), JSJV accept in principle the initial findings that the principal impact of site construction will most likely be incurred at the A1053 and A174 corridors (and the associated junctions). However, such findings would need to be confirmed in detail within a final Transport Assessment / Construction Traffic Management Plan moving forward once a principal contractor is appointed and construction schedules / methodologies / staff volumes are 153inimize153. As noted within JSJV TM001, the impact of the proposed development at the SRN over both the operational and construction phase must be		

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		understood in terms of absolute two-way flows over both morning / evening network peak hours. This is opposed to either total daily flows or proportional flows (percentage increase) in relation to baseline flows at any specific junction. Similarly, the study area should extend to any SRN junction where a potential impact needs to be considered (to aid discussions we suggest 30 two-way trips being a starting point for consideration). Finally, it is evident that, while temporary, the profile of construction activities, as identified in Plate 15-2 of the PIER, has a longevity that will require appropriate consideration to be given to the impacts but also 154inimiz efforts on the mitigations to be adopted in the Construction Traffic Management Plan and Construction Worker Travel Plan that could be adopted during that period. Summary and Conclusions JSJV would note that this TM002 review of the Traffic and Transport Chapter of the PEIR should be read alongside the JSJV TM001 (28th April 2023) review of the initial DCO scoping submitted in support of the proposed development. While this JSJV TM002 primarily considers the traffic and transport content of the PEIR, TM001 outlines the detail the key assessment parameters that will need to be considered by any Transport Assessment(s), Construction Traffic Management Plan(s) and Travel Plan(s) that will need to be prepared and submitted moving forward. Both TM001 and TM002 should be referred to when the Transport documentation is being prepared. On the basis of this review, the recommendation to National Highways in relation to this development proposal is: Pre-application / Scoping Response – comments are made on the pre-application / scoping in order to assist defining an appropriate assessment of the Strategic Road Network. This review has highlighted the following: 1. The appropriateness of the baseline flows considered within the PEIR will only necessitate further discussion by JSJV at the point at which any detailed junction modelling is considered necessary as a result of the agreed development impact (operation and / or construction) at the SRN. 2. PIC data applicable to the SRN will only necessitate further discussion and review in instances where the proposed development is considered to have a material impact at a specific SRN junction, once construction / development flows are agreed. Until this point, PIC data will not be commented on in detail by JSJV.		

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		3. The Applicant will need to confirm the staff shift scheduling associated with the operation of the proposed development to ensure that the AM / PM peak hour impact of the site at the SRN can be fully evaluated. This confirmation will need to be provided within any Transport Assessment submitted in support of the proposed development. 4. JSJV acknowledge that a two-person per car assumption appears relatively appropriate, however, no validating data is provided to justify where this figure has been achieved at comparable construction sites. This should be provided moving forward. 5. In line with PEIR Paragraph 15.6.40, the total number of construction workers considered is stated to be 960, which does not reflect the stated 'worst-case' volume of 1,300 staff, as also accounted for earlier within the PEIR. The number of construction workers that will inform any assessments moving forward will need to be confirmed by the Applicant moving forward. 6. In line with the distribution figures presented within the PEIR to date and the proposed construction parameters (daily staggering of vehicle trips), JSJV accept in principle the initial findings that the principal impact of site construction will most likely be incurred at the A1053 and A174 corridors (and the associated junctions). However, such findings would need to be confirmed in detail within a final Transport Assessment / Construction Traffic Management Plan moving forward once a principal contractor is appointed and construction schedules / methodologies / staff volumes are 155inimize155. 7. As noted within JSJV TM001, the impact of the proposed development at the SRN over both the operational and construction phase must be understood in terms of absolute two-way flows over both morning / evening network peak hours. This is opposed to either total daily flows or proportional flows (percentage increase) in relation to baseline flows at any specific junction. Similarly, the study area should extend to any SRN junction where a potential impact needs to be considered (to aid discussions we suggest 30 two-way trips being a starting point for consideration).		
Royal Mail Group Limited	24/10/23	Proposed DCO Application by H2Teeside by H2Teeside Limited Royal Mail Group Limited's response to section 42 consultation Introduction	Comment is noted, and the ES (Chapter 15: Traffic and Transport (ES Volume I, EN070009/APP/6.2)) and Appendix 15A: Transport Assessment (ES Volume III, EN070009/APP/6.4) has reviewed and updated where required the numbers of additional vehicles on the local road network during the critical construction phase, as once	No

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		Royal Mail and its consultants BNP Paribas Real Estate have reviewed the consultation material for the above project and wish to submit this response as part of the section 42 consultation. Royal Mail – relevant information Under section 35 of the Postal Services Act 2011, Royal Mail has been designated by Ofcom as a provider of the Universal Postal Service. Royal Mail is the only such provider in the United Kingdom. The Act provides that Ofcom's primary regulatory duty is to secure the provision of the Universal Postal Service. Ofcom discharges this duty by imposing regulatory conditions on Royal Mail, requiring it to provide the Universal Postal Service. Royal Mail is under some of the highest specification performance obligations for quality of service in Europe. Its performance of the Universal Service Provider obligations is in the public interest and this should not be affected detrimentally by any statutorily 156ecognized project. Royal Mail's postal sorting and delivery operations rely heavily on road communications. Royal Mail's ability to provide efficient mail collection, sorting and delivery to the public is sensitive to changes in the capacity of the highway network. Royal Mail is a major road user nationally. Disruption to the highway network and traffic delays can have direct consequences on Royal Mail's operations, its ability to meet the Universal Service Obligation and comply with the regulatory regime for postal services thereby presenting a significant risk to Royal Mail's business. Royal Mail position as at October 2023 Royal Mail and its advisor BNP Paribas Real Estate have reviewed the relevant sections of the PEIR for H2Teeside dated September 2023. Reference the list and indicative plan below, Royal Mail has five operational properties within approximately 5km of the proposed DCO boundary: 1. BE 2692 Redcar Delivery Office (c 0.45km) 2. BE 731 Cleveland Parcelforce Depot (c 0.9km) 3. BE 2683 Middlesborough Delivery Office (c 1.75km) 4. BE 2687 Stockton on Tees Delivery Office (c 4.35km) 5. BE 2686 Hartlepool Delivery Office (c 5 km) Every day, in exercising its statutory duties Royal Mail vehicles use all of the main roads that may potentially be affected by the construction of	operational there is not predicted to be any significant levels of additional traffic. The Transport Assessment has set out the numbers of additional construction traffic and, where considered necessary, has provided a full assessment of the capacity of any road junctions. It concludes that no likely significant effects are predicted to arise, meaning that Royal Mail's interests will not be affected.	

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		H2Teeside. Any periods of road disruption / closure, night or day, on or to the roads immediately connected to the scheme or the surrounding highway network will have the potential to impact operations and may consequently disrupt Royal Mail's ability to meet its Universal Obligation service delivery targets. Royal Mail's performance of the Universal Service Provider obligations is in the public interest and should not be affected detrimentally by any statutorily 157ecognized project. Accordingly, Royal Mail seeks to take all reasonable steps to protect its assets and operational interests from any potentially adverse impacts of proposed development. Royal Mail does not wish to stop or delay H2Teeside from being consented and constructed. However, Royal Mail does wish to ensure the protection of its future ability to provide an efficient mail sorting and delivering service to the public from and to the above identified operational facilities in accordance with its statutory obligations. Due to insufficient information presently being available by which to assess the level of potential risk to its operations and any proposed mitigations for such risk, at this point in time Royal Mail is not able to provide a S42 consultation response on H2 Teeside. Therefore, Royal Mail wishes to reserve its position to submit a consultation response/s later in the DCO consenting process when sufficient information is available. Royal Mail also wishes to reserve its position to submit representations to the future Public Examination, if required.		
North East North Cumbria Integrated Care Board (NENC ICB)	24/10/23	North East North Cumbria Integrated Care Board (NENC ICB) would have no objections to the land being used, in fact, we see that the reuse of the industrial land could provide many employment opportunities into the Tees Valley area. However, there is a concern in relation to our limited expertise with the creation of a hydrogen facility in the Tees area and the risks associated with this from both a hazard and operability (explosion and/or terrorism risk) point of view. As a result, we would need to understand what the risks and mitigations are so that in the event of an incident we (the NHS) can prepare and respond. Furthermore, as part of this process our due diligence would also consider the proximity to any of our NHS locations and would this cause any disruption to the delivery of services, e.g. road closures, changes to public transport.	The site will likely be designated as an Upper Tier COMAH site. As such, the operator will work with the HSE, local authorities and other stakeholders (including the NHS, police, fire service etc.) in developing both on-site and off-site emergency plans. These will detail which organisations have a role to play in emergency responses and include information on topics including communication procedures, rendezvous location, site access, special equipment requirements, etc., and will also be used to inform updates to accident plans for Domino sites. Chapter 20: Major Accidents and Disasters [ES Volume I, EN070009/APP/6.2] assesses impacts of potential disasters from hydrogen related matters and concludes that no likely significant effects are expected to arise as the risks will be kept As Low As Reasonably Practicable.	No

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			Chapter 22: Human Health [ES Volume I, EN070009/APP/6.2] has assessed effects on access to healthcare services based on impacts such as road closures and potential increases in traffic levels.	
Network Rail	25/10/23	I refer to your letter of 14 September 2023 in respect of the consultation under Section 42 of the Planning Act 2008 on the H2Teesside hydrogen project on land either side of the River Tees within the Boroughs of Redcar and Cleveland and Stockton-On-Tees on Teesside and the Borough of Hartlepool in County Durham. Network Rail is a statutory undertaker responsible for maintaining and operating the railway infrastructure and associated estate. It owns, operates, maintains and develops the main rail network. Network Rail aims to protect and enhance the railway infrastructure therefore any proposed development which is in close proximity to the railway line or could potentially affect Network Rail's specific land interests, will need to be carefully considered. Impact on Network Rail Infrastructure Network Rail has been reviewing the information provided and note that proposals include development adjacent to the railway infrastructure including connections through railway property. The scheme will intersect the operational railway on two lines DSN2 @ 19m 1500yds 158ecogni.(Stockton Cut Junction to Redcar) and LEN3 @ 65m 1300yds 158ecogni. (East Low Junction to Newcastle East Junction). Key concerns will be how the scheme intersects with and impacts on the operational railway safety in terms of the management of construction works around the operational railway and details such as access to railway property and the delivery of pipelines through the railway property. In addition, the routing of construction traffic (including HGVs/abnormal loads) and subsequent operational site traffic will require further consideration and discussion with Network Rail if it such routes take in railway assets such as bridges (with low clearance/weigh restrictions) and railway level crossings. We also note that in the Non-Technical Summary, the reopening of British Steel Redcar railway station is mentioned for use associated with the site as well as the possibility of using rail freight traffic in connection with the site. It should be noted that these proposals would require further discussion and agreement with Network Rail.	The Applicant welcomes the response from Network Rail and the ongoing discussions on the technical and land negotiations regarding the potential crossing of Network Rail infrastructure by the Proposed Development. The Applicant has held a number of discussions with Network Rail asset protection and easement teams regarding proposed crossings and how to minimise the effects of construction on Network Rail operations. The construction phase impact is set out and managed through the Appendix 15B: Construction Workers Travel Plan and Appendix 15C: Construction Traffic Management Plan [ES Volume III, EN070009/APP/6.4], and a measure / action can be included that any contractor will liaise fully with Network Rail where appropriate, and fully comply with any requirements for working near a railway. The Applicant has met with NR and provided further details on the Proposed Development and interactions with NR Assets. The Applicant has submitted BAPA clearances and awaits feedback. NR have also confirmed points of contact for progressing land agreements and Protective Provisions if required and the Applicant is progressing engagement with NR in relation to these. The Applicant has no formal plans to reopen the former British Steel Redcar railway station and recognise that this remains the responsibility of Network Rail. We are however keen to work with Network Rail to seek opportunities for the use of sustainable transport measures to enable construction workers to access the Site.	No

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		With these points in mind, at this stage the information supplied is not sufficiently detailed to fully assess potential impacts of the scheme on the railway and further information will be required to properly respond on the likely impacts of the proposed scheme. In order to ensure that the scheme does not impact on operational railway safety, the developer must liaise closely with Network Rail Asset Protection to ensure that the haulage routes into the site are appropriate, and the design and construction of the new facility and associated infrastructure will not have an adverse impact on railway operations. It is therefore assumed that a condition of the Order would be that detailed specifications of the proposed scheme and traffic management plans are to be provided and agreed in writing before development can commence. Please note that if the intention is to install cabling/equipment in support of the project through railway land, the developer will be need an easement from Network Rail and we would recommend that they engage with us early in the planning of their scheme in order to discuss and agree this element of the proposals if they have not done so already. Our Easements and Wayleaves Team can be contacted at easements&wayleaves@networkrail.co.uk. Network Rail will be seeking protection from the exercise of compulsory purchase powers over operational land either for permanent or temporary purposes. In addition, Network Rail will wish to agree protection for the railway during the course of the construction works and otherwise to protect our undertaking and land interests. Network Rail reserves the right to produce additional and further grounds of concern when further details of the application and its effect on Network Rail's land are available. In addition, any rights for power or other lines under, over or alongside the railway line will require appropriate asset protection measures deemed necessary by Network Rail to protect the operational railway and stations. We have standard protective provisions which will need to be included in the DCO as a minimum therefore contact should be made to our Property Surveyors at DCO_CPO@networkrail.co.uk to obtain a copy of the relevant wording In addition a number of legal and commercial agreements will need to be entered into, for example, asset protection agreements, method statements, connection agreements, property agreements and all other relevant legal and commercial		

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		agreements. This list is not exhaustive and will need to be reviewed once more details of the scheme are discussed between the parties. Consideration should be given to ensure that the construction and subsequent maintenance can be carried out without adversely affecting the safety of, or encroaching upon Network Rail's adjacent land. In addition, security of the railway boundary will require to be maintained at all times. In any event you must contact Network Rail's Asset Protection Engineers as soon as possible in relation to this scheme on the following e-mail address AssetProtectionEastern@networkrail.co.uk. Network Rail is prepared to discuss the inclusion of Network Rail land or rights over land subject to there being no impact on the operational railway, all regulatory and other required consents being in place and appropriate commercial and other terms having been agreed between the parties and approved by Network Rail's board. Network Rail also reserves the right to make additional comments once we have evaluated the proposals in more detail. Summary Network Rail would be grateful if the comments and points detailed within this consultation response are considered by H2Teesside Limited. Network Rail would welcome further discussion and negotiation with the H2Teesside Project in relation to the proposed development as required going forward. If you have any questions or require more information in relation to the above please let me know		
UK Health Security Agency	25/10/23	Thank you for your consultation regarding the above development. The UK Health Security Agency (UKHSA) welcomes the opportunity to comment on your proposals and Preliminary Environmental Information Report (PEIR) at this stage of the Nationally Significant Infrastructure Project (NSIP). Please note that we request views from the Office for Health Improvement and Disparities (OHID) and the response provided is sent on behalf of both UKHSA and OHID. Please note that we have replied to earlier consultations as listed below and this response should be read in conjunction with that earlier correspondence: Request for Scoping Opinion 5 May 2023 **Environmental Public Health** We have assessed the submitted documentation and note that the potential impacts on human health from both the operational and constructional phase of the development have been identified and	**Environmental Public Health** At this stage of the design the final quantities of amines and other chemicals required for the carbon capture process have estimated only. They will be fully quantified during the detailed design of the Proposed Development. bp will continue to engage with the UK Health Security Agency in relation to amines. It should be noted, however that the absorber column is a closed loop system and amines constitute less than 1% of total emissions to the overall emission footprint.	No

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		suitable mitigation proposed. However, the applicant notes that the final design of the Hydrogen Production Facility continues to be refined and subsequently there is little detail within the application in relation to the carbon dioxide (CO_2) removal process. The application states that there will be no emissions to air of amines or amine by-products during normal operation but provides no justification or technical information to verify this. Whilst we acknowledge that commercial confidentiality is crucial in these projects, we would request that the applicant should ensure that the emissions – particularly solvent by-products – of the CO_2 removal process are adequately recognized and a risk assessment carried out. We further acknowledge and reference the ongoing work by the Environment Agency in the risk assessment of several potential amine compounds proposed for use in CO_2 processes. **Human Health and Wellbeing** This section of OHID's response, identifies the wider determinants of health and wellbeing we expect the Environmental Statement (ES) to address, to demonstrate whether they are likely to give rise to significant effects. OHID has focused its approach on scoping determinants of health and wellbeing under four themes, which have been derived from an analysis of the wider determinants of health mentioned in the National Policy Statements. The four themes are: • Access • Traffic and Transport • Socioeconomic • Land Use Having considered the submitted Preliminary Environmental Information Report (PEIR), OHID wish to make the following specific comments and recommendations. **Hydrogen gas manufacture, storage, and distribution network – Community risk perception / understanding of risk.** The PEIR acknowledges the broad definition of health used by the World Health Organization (WHO), including reference to mental health. Mental well-being is fundamental to achieving a healthy, resilient, and thriving population. It underpins healthy lifestyles, physical health, educational attainment, employment and productivity, relationships, community safety and cohesion and quality of life. A scheme of this nature has impacts on the over-arching protective factors, which are:	This comment is noted, the four identified themes have been addressed within the Environmental Statement. **Human Health and Wellbeing** This comment is noted, the four identified themes have been addressed within the Environmental Statement. **Hydrogen gas manufacture, storage, and distribution network – Community risk perception / understanding of risk.** As noted in the Human Health PEIR chapter, an assessment of effects on mental health through perception of risk posed by the Proposed Development has been undertaken in the ES (Chapter 22: Human Health [ES Volume I, EN070009/APP/6.2.]]. This will be under the 'radiation' determinant as suggested by IEMA guidance. Noted that the Mental Well-being Impact Assessment Toolkit (MWIA) is recommended. Upon review of the Toolkit, the recommended factors for assessing mental well-being are grouped under three areas: enhancing control; increasing resilience and community assets; and facilitating participation and promoting inclusion. Therefore, the assessment of 'Community Identity, Culture, Resilience and Influence', and 'Social Participation, Interaction, and Support' within the Human Health chapter inherently assess mental health. To further this, an assessment of mental health effects of risk perception and understanding of risk has been included under the 'Community Safety' determinant. It finds that there are no significant effects likely. Consultation with the relevant LPA public health teams is ongoing, information that was provided to the Applicant prior to submission of the DCO Application has been included within Chapter 22: Human Health (ES Volume I, EN070009/APP/6.2). Chapter 20: Major Accidents and Disasters [ES Volume I, EN070009/APP/6.2] also assesses impacts of potential risks from hydrogen related matters and concludes that no likely significant effects are expected to arise as the risks will be kept As Low As Reasonably Practicable.	

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		• Enhancing control • Increasing resilience and community assets • Facilitating participation and promoting inclusion. The PEIR (para 22.6.54) makes reference to the potential for local public concern through understanding of risk / risk perception, but in relation to electromagnetic radiation only. This does not address the issues raised by OHID at scoping which specifically noted the perception of risks from new or novel technologies which are potentially hazardous. In this case the production, storage and distribution of hydrogen. Previous hydrogen distribution schemes have scoped-in community concern over hydrogen safety, due to this being a relatively new industry and the potential for major incidents. Communities in the near vicinity of the scheme will receive targeted communications as part of the normal consultation process. Communication programmes should provide a source of clear and objective information to increase knowledge and awareness. Consultations should also use the opportunity to assess levels of local concern, which can then be used to assess significance of effects and inform community consultation and information. The final ES should report on the findings of community consultation or other approaches that may indicate levels of community anxiety. This should be in addition to EMF concerns. Recommendation The ES should consider potential effects on mental health through risk perception / understanding of risk posed by the manufacture, storage and transportation of hydrogen and other hazardous substances. When estimating community anxiety and stress in particular, a qualitative assessment may be most appropriate. Robust and meaningful consultation with the local community will be an important mitigation measure, in addition to informing the assessment and subsequent mitigation measures. This may involve conducting resident surveys but also information received through public consultations, including community engagement exercises. The Mental Well-being Impact Assessment Toolkit (MWIA) contains key principles that should be demonstrated in a project's community engagement and impact assessment. We would also encourage consultation with the local authority's public health team, who are likely to have Health Intelligence specialists who will have knowledge about the availability of local data. The Mental Well-being Impact Assessment Toolkit (MWIA), could be used as a methodology. The assessment should identify vulnerable populations and provide clear mitigation strategies that are adequately linked to any	**Socio-economics - Housing affordability and availability** The assessment of construction phase employment uses the Rochdale envelope to assess any socio-economic effects and is based on the latest available project information. This means that the worst case scenario is used, which in this case is for a positive benefit, so the minimum value is used. This is why there are two numbers stated in the report, a maximum of 1,300, and a minimum of 800, where the 800 is used for the employment assessment. The ES assesses the effect of employment on the local housing market availability and affordability, including identifying the peak non-home based workforce estimates, the availability of beds and the construction-led demand for housing. However, this uses the peak workforce as an estimate, as this is assessing an adverse socio-economic effect. The 3,000 figure was an early estimate and has been revised as the project design has matured. The peak of 1,300 workers has been used to assess the proportion of non-home based workers. No likely significant effects in relation to this matter arise from the Proposed Development, including cumulatively with other nearby projects (see Chapter 18: Socio-economics and land use [ES Volume I, EN070009/APP/6.2].	

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		local services or assets. Baseline indicators the assessment would benefit from including social cohesion/connectedness, satisfaction with local area and quality of life indicators owing to their established links to mental health and wellbeing. In terms of sources, we would draw your attention to the following: • PHE Fingertips – Mental Health and Wellbeing JSNA o Area profiles with various indicators on common mental disorders (including anxiety) and severe mental illness which can be benchmarked with other local areas as well as regional and national data • Office for National Statistics – Wellbeing Indicators o Range of datasets related to wellbeing available including young people's wellbeing measures, personal wellbeing estimates and loneliness rates by local authority **Socio-economics – Housing affordability and availability** The scoping report (Para 3.14.1) recognized the potential for significant numbers of construction workers, where workforce peak numbers were reported to be approximately 3,100 people per day. The numbers of non-home-based workers were not stated. The PEIR, however, has significantly reduced the estimated numbers of peak construction workforce for the project, but provides no explanation as to why peak worker numbers have been reduced so drastically. Additionally, the PEIR (22.6.26 and 22.6.27) does not clearly identify the peak non- home based workforce numbers being used as part of the assessment on housing. The socio economic chapter (para 18.6.5) identifies two potential peak workforce numbers of 900 and 1300. For the socio-economic assessment a worst-case scenario approach uses the figure of 900. For the assessment on the impact on local housing a worst-case scenario approach would require use of the 1,300 peak total workforce, with the proportion of non-home based workers being identified for the assessment. Significant numbers of non-home-based construction workers could foreseeably have an impact on the local availability of affordable housing. Those residents looking for low-cost affordable homes will have the least capacity to respond to change (for example, where there may be an overlap between construction workers seeking accommodation in the private rented sector, and people in receipt of housing benefit seeking the same lower-cost accommodation). This impact could also be compounded by the cumulative accommodation demands from several large developments.		

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		Recommendation The peak numbers of construction workers and non-home-based workers should be established, and a proportionate assessment undertaken on the impacts for housing availability or affordability and impacts on any local services. The ES should report on the available bed space within the agreed travel to work area. The ES should address why the estimated peak construction workforce numbers have changed so significantly from the original scoping estimate of 3,100. Any cumulative effect assessment should consider the impact on demand for housing by construction workers and the likely numbers of non-home-based workers required across all schemes. If you require any clarification on the above points or wish to discuss any particular issues, please do not hesitate to contact us.		
Historic England	26/10/23	Having read the documentation provided at this stage, we consider that it is unlikely that the proposed development will have any significant impact on higher-grade heritage assets, which form the core of the work where Historic England can add value to discussions. As such, we do not propose to comment in detail on these proposals. However, particularly for historic environment issues outside the core of our work, others may wish to comment or provide advice on the wider historic environment. We consider that the people best placed to offer informed advice would be the specialist staff and consultants at the Local Authorities concerned. We would therefore advise, if this is not already in progress, that you request conservation and archaeological advice on this proposal as part of doubtless wider discussions with them. I hope that these comments at this early stage is helpful to you, should there be any amendments to the scheme which could result in different impacts to the historic environment then please let us know and we can provide further advice.	The Applicant welcomes and notes the comment noted. The archaeologists representing the relevant LPAs have been consulted in the preparation of Chapter 17: Cultural Heritage (ES Volume I, EN070009/APP/6.2).	No
Environment Agency	26/10/23	Please find enclosed our written representations for the above Development Consent Order (DCO) on behalf of the Environment Agency (EA). If you have any questions or require any clarification on the points below, please do not hesitate to contact me. **Flood Risk** Flood Zones	**Flood Risk** The Applicant confirms that a Flood Risk Assessment FRA) is included as part of the DCO Application at Appendix 9A: Flood Risk Assessment (ES Volume III, EN070009/APP/6.4). The Main Site is located in Flood Zone 1 (low risk of tidal/fluvial flooding) and following remediation of the site, the development platform will remain above the estimated H++ tidal flood level with a	No

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		The proposed Hydrogen Pipeline Corridor route is located within flood zones 3, 2 and 1 and is located across some EA assets. Flood Risk Assessment (FRA) An FRA should be submitted in support of your DCO application. The FRA must assess flood risk from all sources of flooding and recommend mitigation measures that will be implemented to ensure a safe development for the design flood event (1 in 200 year including climate change). It must also demonstrate that flood risk will not be increased elsewhere. The applicant within the preliminary FRA has classified the development as Essential Infrastructure and has applied the H++ sea level rise for climate change for 75 years (the lifetime of the development in accordance with the Planning Practice Guidance (PPG)). We consider this is an acceptable approach for a development of this scale and nature. Main Site Design Flood risk mitigation will need to be included within the development to ensure it can remain safe for its' lifetime. This includes having the finished floor levels above the design flood event plus a freeboard allowance of 600mm. Hydrogen Pipeline Corridor The proposed hydrogen pipeline corridor route could have impacts on our existing flood defences, our land and our future flood schemes. These are discussed below: Pipeline Routes The proposed Hydrogen Pipeline Corridor, heading north towards the Venator Plant, could affect our flood defence assets along Greatham Creek. The EA would require the existing flood standard of protection, provided by the defences, to be maintained both during the construction of the pipeline and after its completion. The EA's Greatham North East Flood Alleviation Scheme aims to improve the defences to the south of the Venator Plant. We expect to submit an application for planning permission in spring 2024 and have construction programmed to start in spring 2025.	freeboard allowance of 600 mm and therefore remains in Flood Zone 1. Delivery of the final platform elevation is secured through the DCO. Any mitigation beyond setting the level of the development platform has been outlined in Appendix 9A: Flood Risk Assessment (ES Volume III, EN070009/APP/6.4). **Hydrogen Pipeline Corridor** The siting of the Connection Corridors takes account of the location of existing and future Environment Agency (EA) flood defence assets. Any works required in close proximity to EA flood defences will be undertaken in line and with agreement from the EA, pursuant to protective provisions for their benefit in the draft DCO. Through these protections, the Proposed Scheme will not prevent the EA from being able to carry out the Greatham North East Flood Alleviation Scheme. **Pipeline design** The Applicant notes this comment. Chapter 5: Construction and Programme Management (ES Volume I, EN070009/APP/6.2) and Chapter 9: Surface Water, Flood Risk and Water Resources (ES Volume I, EN070009/APP/6.2) describes the details of pipeline crossing. Design detail will be further developed alongside the provision of additional details as part of the relevant permit applications, discussed in Chapter 9 (ES Volume I, EN070009/APP/6.2). These details are secured within protective provisions where appropriate. The proposed pipeline crosses existing watercourses at several locations in the existing Linkline corridor. In these cases the watercourses are currently routed in culverts below the existing Linkline corridor. Currently there are no plans to modify these structures. If however, condition surveys of these structures identify issues during detailed design then maintenance/repair works may be necessary as part of the works. The detailed design will demonstrate that excavations do not unduly compromise existing assets including but not limited to flood defences.	

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		We recognise that more information will be provided in the next stages of the DCO and most of our previous comments to the scoping consultation have been incorporated into the submitted preliminary FRA. We would like to repeat our comments on the pipeline design and construction with the inclusion of a few additional comments. Please note the following comments are needed for your DCO application and any future Flood Risk Activity Permit to ensure there is no loss in performance of our assets. Pipeline Design If the pipeline crosses a watercourse above ground, it must be appropriately designed and positioned to prevent accumulation of debris and localised increases in water levels. Where the pipeline is to utilise existing pipework that crosses watercourses, it is expected that modifications to the structure will be made where possible for improved conveyance and reduce debris accumulation. Where ground levels near a flood defence are to be disturbed, on either a permanent or temporary basis, the DCO designs must not allow additional water to pond at the toe of the flood defence. The applicant should seek to ensure that any works in the vicinity of our flood defences do not create any open drainage or seepage pathways. Pipeline Construction Open trench methodology is not permitted when crossing a flood defence. Excavations near the footprint of a flood defence must remain a safe distance away from the toe of the defence to ensure stability of the defence, this must be demonstrated in submitted designs. Any requirements placed upon “drilling operations” includes horizontal directional drilling, micro tunnelling or other equivalent trenchless installation. It also includes any of their associated enabling works including excavations or other temporary works as well as launch, reception and joining pits. Directional drilling would be permitted when crossing a flood defence provided: • The drilling operation does not affect the stability of the flood	Contractors method statements will set out appropriate controls to ensure the protection of existing assets during construction. Where required these can be shared with the relevant authority. **Pipeline construction** Flood defence crossings are currently planned to be carried out using trenchless techniques, and therefore the pipeline /crossing will be located at a suitable depth below any surface level flood defence structure. Details of the type of crossing proposed at each location is set out in Chapter 5: Construction and Programme Management (ES Volume I, EN070009/APP/6.2) The measures set out in the Framework CEMP (EN070009/APP/5.12), alongside method approvals in the Protective Provisions will ensure that excavations do not unduly compromise existing assets including but not limited to flood defences. The measures set out in the Framework CEMP (EN070009/APP/5.12), alongside method approvals in the Protective Provisions will ensure that trenchless crossings do not unduly compromise existing assets including but not limited to flood defences. **Pipeline maintenance** The need for such a permit is disapplied in the DCO. Approvals will be sought from the EA pursuant to their Protective Provisions instead. **Flood defence maintenance** The Applicant fully appreciates the need for the EA to be able to access its flood defence assets and has put provision into the Framework CEMP (EN070009/APP/5.12). requiring that this must be provided for by the Contractor at all times. This will also be discussed with the EA as part of discussions on Protective Provisions for their benefit. **Groundwater** Table 10-10 in Chapter 10: Geology, Hydrogeology and Contaminated Land (ES Volume I, EN070009/APP/6.2) has been updated to include the Sherwood Sandstone Principal Aquifer.	

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		defence structure by inducing a geotechnical failure, including when it is retaining flood water. • The drilling or permanent works do not provide a conduit for water seepage underneath the flood defence structure, including when it is retaining flood water. Pipeline maintenance Repairs or future improvement works on the pipeline will be subject to an Environmental Permit if taking place within 16m of a flood defence. Flood defence maintenance The EA requires continued access for routine maintenance of the existing and planned defences in order to continue the standard of protection. Any permissions or legal agreements to allow these works to go ahead must be agreed in advance of pipeline construction. Please be aware the EA have statutory powers to carry out works on our assets. Other associated infrastructure For completeness, the same requirements within Appendix 9A: Preliminary FRA Section 9A.9.36 (considerations to ensure no impacts to EA flood defence assets) shall also apply to any other construction over waterways, for example those detailed in sections 9A.9.19 to 29. **Groundwater** The information within the Preliminary Environmental Information Report (PEIR) appears robust, follows appropriate guidance and assessment methodologies and considers the mitigation requirements should any adverse effect be found. The Sherwood Sandstone principal aquifer should be included as a receptor within PEIR Chapter 10 Table 10-10. This receptor has been omitted from this table, but is referred to elsewhere, specifically within the proposed area of the hydrogen corridor. **Terrestrial Ecology**	**Terrestrial Ecology** Where possible, the Proposed Development Site boundary has been designed to avoid effects upon protected and notable species, for example by using existing access roads, HDD and use of existing infrastructure. The Framework CEMP (EN070009/APP/5.12) details measures to avoid potential effects on habitats and species during construction and outlines precautionary working methods to avoid harm to ecology receptors including nesting birds, otter, water vole and reptiles. A draft mitigation licence will be prepared for water vole where potential effects cannot be avoided. Ecology surveys to inform the ecological baseline have been completed in the 18 months prior to the application submission. Any requirements for update surveys or precautionary working methods have been outlined within the Framework CEMP (EN070009/APP/5.12). We welcome agreement on the approach outlined within the CEMP. All measures identified during the specialist assessments undertaken to inform the Environmental Statement have been incorporated into the Framework CEMP (EN070009/APP/5.12). **Biodiversity** An Indicative Landscape and Biodiversity Management plan is included as part of the DCO Application (EN070009/APP/5.10). Where possible, the Proposed Development has been designed to avoid adverse effects upon designated sites, habitats of principal importance and protected and notable species. The Main Site is located on an area of low ecological value. Within the connection corridors, existing infrastructure will be used to minimise effects on biodiversity wherever possible. In areas where there is no existing infrastructure, it is proposed to restore habitats post-construction. relation to Town and Country Planning Act 1990 application have now come into force. However, provisions relating to Planning Act 2008 projects have not yet come into force and are not expected to until at least November 2025. At a national level, this delay reflects the need for the complexities of infrastructure projects and its interaction with the BNG metric to be fully understood by Natural England and project promoters,	

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		We are generally satisfied with the PEIR approach and are in agreement with its conclusions of the receptors to be taken forward for assessment. The PEIR provides examples of mitigation for species and features for which the EA plays a lead role in protecting. Whilst we agree with the example mitigation measures provided for otter and water vole, these measures alone are not considered to be sufficient. Further species protection plans and/or precautionary method statements for otter and water vole should be provided within the Environmental Statement (ES) and Construction Environmental Management Plan (CEMP) and cover areas of the proposed development site that have potential to support these species. Additional mitigation measures could include mammal ramps in excavations, pre-construction surveys and the presence of an ECoW (Ecological Clerk of Works) on site during construction. Should the proposed additional survey work be completed and incorporated into the ES, we do not consider any further assessments are required at this stage. Given that ecological survey data generally has a shelf-life of 18 months (depending on species and circumstance), the applicant should ensure that updated surveys for each receptor that are taken forward for assessment are completed. This will ensure that any further assessment work to inform the ES is informed by up-to-date and relevant information. The approach outlined in the PEIR with regards to the CEMP is acceptable. The CEMP should also incorporate any mitigation measures identified in the ES. **Biodiversity Net Gain (BNG)** Whilst not mandatory for Nationally Significant Infrastructure Projects, we welcome that the PEIR states a key aim of the mitigation and enhancement strategy is to achieve an overall net gain in biodiversity across the proposed development site. It is noted that BNG is concerned with habitats only, and that simply providing a net gain in biodiversity units may not be sufficient to mitigate impacts to protected species such as otter and/or water vole. It is expected that any strategy to deliver net gain will be developed alongside a landscape and environment management plan, which should also take into account species-specific mitigation and/or enhancement measures for the wider site during operation.	acknowledging that they are not the same as blocks of land lost to housing developments. This is particularly true for a project such as the Proposed Development, with its numerous corridors involving a mix of above and underground land requirements for different types of pipelines, but which are also surrounded by a number of existing assets, necessitating differing limits of deviation. Infrastructure also have a range of 'temporary' land requirements that are shown in the application boundary but may not in face involve habitat loss. As such, the true 'loss' of habitats to the Proposed Scheme are much less than would actually be the case than simply assuming that the loss includes the entirety of the Order limits. Natural England is therefore working with the energy and infrastructure industry to consider how best the metric can apply to projects such as this. A specific additional complexity for the Proposed Development is the Main Site. At the moment the Main Site is the subject of extensive demolition works of the former Redcar steelworks and infrastructure; and it is anticipated it will also shortly be subject to extensive remediation activities. The former steelworks site are subject to restoration and habitat establishment requirements, and it is considered likely that this will apply to the remediation works. As such, the ecological baseline position of the site now would, for BNG purposes, be unrealistic in terms of establishing what the 'pre-development' habitat condition should be considered to be for the Main Site. For these reasons, the Applicant has not submitted a BNG Report/Assessment as part of its DCO Application for the Proposed Development. Notwithstanding this, and mindful of the policy imperatives of the NPS, the Applicant is committed to ensuring that the ecological impacts of the Proposed Development are fully mitigated, and where possible given the constraints of the Order limits and the Teesworks site more generally, deliver enhancements. The Applicant's proposals in this regard are set out in Chapter 12: Terrestrial Ecology (ES Volume I, EN070009/APP/6.2) and in the Outline Landscape and Biodiversity Management Plan (EN070009/APP/5.9). The measures in the latter will be developed into a Full BLMP to reflect the detailed design (and impacts) of the Proposed Scheme, in substantial accordance with that outline. This	

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		Paragraph 7.6.3 of the Non-Technical Summary (NTS) refers to direct or indirect habitat loss / modification. No habitat loss should be permitted as a result of this project. Mitigation or Compensation Opportunities PEIR Chapter 9 paragraph 9.9.2 discusses that further mitigation or compensation measures relating to a potential open-cut crossing of Belasis Beck for the installation of the pipeline corridor will be considered and re-assessed during the EIA. These compensation measures may be deliverable within the Holme Fleet area near the Belasis Beck catchment. The applicant may wish to make contact with the RSPB on this matter. **Marine Ecology and Fisheries** We are generally satisfied with the PEIR and its conclusions and have no further concerns to raise at this stage. We await further details on saltmarsh assessment and mitigation, which the PEIR states will be provided in the ES. **Water Framework Directive** We welcome that our previous comments regarding WFD have been acknowledged within this PEIR and that a WFD assessment will be presented in the ES. From a marine ecology and fisheries perspective, the forthcoming WFD Assessment should: • Consider the impact of the proposal on the WFD status of the Tees • Transitional water body (GB510302509900), Tees Coastal water body (GB650301500005) and any linked water bodies • Identify all potential risks to the following receptors: hydromorphology, biology – habitats, biology – fish, water quality, WFD protected areas and invasive non-native species (INNS) • Ensure that there is no deterioration resulting from the proposed activities • Demonstrate how the development/activity will avoid adverse impacts	is secured through the DCO. Through these measures, the Applicant will be able to deliver a commitment to no net loss, as a minimum. Furthermore, the Applicant is keen to secure enhancements in the wider Teesside area off-site from the Order limits and is working with stakeholders such as the EA, Natural England and RPSB to develop proposals in this regard. Whilst the Applicant does not propose to quantify these in BNG metric terms at this point in time, it is hoped that such measures, to be secured though a section 106 Agreement, will be able to demonstrate a wider qualitative net gain overall as a result of the Proposed Development. **Mitigation or Compensation Opportunities** Thank you for this suggestion. Liaison with RSPB is ongoing regarding effects and mitigation within and surrounding Saltholm RSPB Reserve. **Marine Ecology and Fisheries** Effects upon saltmarsh habitat will be avoided through the use of HDD. **Water Framework Directive** The WFD Assessment (EN070009/APP/5.16) has considered impacts to the Tees transitional water body and Tees Coastal water body, including all potential risks to the receptors listed. The WFD Assessment provides information on how adverse impacts will be avoided and/or mitigated, to achieve no deterioration to the two water bodies and receptors. River and groundwater WFD waterbodies have also been considered. The Proposed Development also ensures, in keeping with Natural England's nutrient neutrality requirements, that there would be no addition of nitrogen to the Tees Estuary. Full details are provided at Appendix 9C: Nutrient Neutrality Assessment (ES Volume III, EN070009/APP/6.4). **Geomorphology** The Applicant notes this response. Full details with regard to watercourse crossings have been included within Chapter 5: Construction Programme and Management (ES Volume I, EN070009/APP/6.2), Chapter 9: Surface Water, Flood Risk and Water Resources (ES Volume I, EN070009/APP/6.2) and WFD assessments (EN070009/APP/5.16). The WFD assessment follows PINS Advice	

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		• Describe how any identified impacts will be mitigated for or suggest compensation for loss. Guidance on how to assess the impact to WFD is available at: https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters The applicant should note that although the dissolved inorganic nitrogen (DIN) element for the estuary is reported as at Moderate status, monitoring has identified with 100% certainty that the DIN element falls into the Bad classification status. It is a rule of the WFD classification system that only biological elements can drive overall status below moderate. The WFD objective to prevent deterioration in the status of each body of water applies. Where an element is already at its lowest class, any further deterioration should be prevented, if necessary, through mitigation of all those effects and not limited to significant effects. **Geomorphology** The WFD assessment should follow industry guidance, consider all relevant information sources, and present option appraisals for watercourse crossings to help demonstrate favourable outcomes. **Water Quality Assessment and Hydrodynamic Modelling** The proposed further quantitative hydrodynamic dispersion modelling of the effluent discharge to the Tees Bay seems appropriate. The EA will be involved in reviewing the modelling calibration/validation report and the model outputs which are to be provided within the ES. **Foul drainage** There are inconsistencies within the PEIR regarding where foul drainage will be treated. PEIR Chapter 4: Section 4.3.42 states that foul water will be treated at either Bran Sands or Marske-by-the-Sea sewage treatment works (STW). Whereas PEIR Chapter 9: Sections 9.3.44 and 9.5.76 state that foul water will be treated at Marske-by-the-sea STW. Following the guidance provided in our response to the scoping opinion, we require confirmation of which STW the foul water from this development will be going to for treatment. This should include details to show that the sewage network and STW have capacity to carry and treat the increase in flows.	Note 18 (WFD Assessment) and Environment Agency guidance with regard to undertaking WFD assessment. Mitigation for watercourse crossings is outlined within both Chapter 9: Surface Water, Flood Risk and Water Resources (ES Volume I, EN070009/APP/6.2) and the WFD assessment (EN070009/APP/5.16). **Water Quality Assessment and Hydrodynamic Modelling** The Applicant notes this response. The scope of the hydrodynamic modelling was outlined to the Environment Agency at a meeting on 13 November 2023. This is presented at Appendix 9D: Water Quality Modelling Report (ES Volume III, EN070009/APP/6.4). **Foul drainage** Foul water will connect to the STDC sewage network for appropriate treatment and discharge. This is likely to be via Bran Sands WwTW but may also be via Marske-by-the-Sea WwTW. Further details are provided in Chapter 9: Surface Water, Flood Risk and Water Resources (ES Volume I, EN070009/APP/6.2). **Water Availability** The Applicant notes this response. An assessment of water availability is included in Chapter 9: Surface Water, Flood Risk and Water Resources (ES Volume I, EN070009/APP/6.2). This includes consideration of the impact of climate change over the lifetime of the development. Predicted quantities of water used by different aspects of the Proposed Development are also outlined in Chapter 9 and taken into account in the assessment of water availability. **Proximity to landfill sites** The assessment in Chapter 21: Materials and Waste (ES Volume I, EN070009/APP/6.2) has considered the potential impacts associated with disturbance to the ground in and around existing historic and operational landfill sites, including discussion on the potential for landfill gas and leachate migration to affect potential receptors. No likely significant effects are predicted. **Air Quality** An updated air quality assessment is included in Chapter 8: Air Quality (ES Volume I, EN070009/APP/6.2). The Applicant has also begun engagement with the Environment Agency under the	

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		Water Availability An assessment of water availability should be provided, including but not limited to, a consideration of prolonged droughts as a result of climate change and an overall assessment of the impact of climate change on the lifetime of the project. Predicted quantities of potable water, raw water, demineralised water, cooling water use etc during construction phases and operational phases would be useful information for the water providers and abstraction teams. The EA's Environmental Constraints Report issued March 2023, describes the current and future water availability and wastewater quality in the Tees Industrial Cluster area. The information within this report, describing the possible shortages of raw process water, will be useful to review for this application. A copy of the report can be requested from the following email: enablingnetzero@environment-agency.gov.uk **Proximity to landfill sites** The proposed development will interact with several areas of historic landfill and is also in close proximity to operational landfill sites. The effects of these landfill sites on your DCO application should be considered. Further work should assess the risks posed by any disturbance to ground in or around the existing historic and operational landfill sites. Landfill sites can generate leachate and landfill gas which pose a risk of harm to the environment. Historic landfill sites are generally not well engineered and, as such, may pose a greater risk of pollution if disturbed. **Air Quality** Air quality effects during construction should include those during the commissioning of the plant and include emissions during the tuning and optimisation of the process. These effects during the commissioning process should be considered separate to the effects during normal operations, where the process has been optimised and emissions are at a steady state and are understood. Appendix 8 (Air Quality) Table 8B-14 gives Nitrogen oxides (NOx) concentrations from the Air Pollution Information System (APIS) website. APIS NOx data currently uses 2019-2021 3-year averages. This information is therefore slightly out of date and may impact results. The ES should use 2020-2022 data, if it has been released.	enhanced pre-application scheme and is finalising an application for an Environmental Permit anticipated to be submitted in 2024. The permit will deal with the commissioning phase through a requirement for a Commissioning Plan. The Environmental Statement used the latest Air Pollution Information System information available at the time of the assessment. The Applicant is engaged with the Environmental Capacity in Industrial Clusters project and participated in the recent workshops run by the Environment Agency in collaboration with the Carbon Capture and Storage Association, Hydrogen UK and Hydrogen Energy Association. Phase 3 of the project is currently at the evidence gathering stage and has not reported on findings to date. **Stack design** The Applicant notes that the stack diameter and air emissions sampling location and monitoring platform design are to be considered along with stack heights. These aspects will be considered as part of the design and engineering process for the Proposed Development. Relevant Parameters are controlled through the DCO. **CO_2 storage** Any requirements for venting of CO_2 during Operations due to availability of the NEP CO_2 pipeline network, will be managed through conditions of the Environmental Permit granted for the operation of the Hydrogen Production Facility. **Carbon Capture Readiness (CCR)** This comment is noted. The carbon capture process is inherent to the Proposed Development as a Blue Hydrogen project. **95% Carbon Capture Rate** The plant is designed for a capture rate of at least 95% of the produced CO_2 under normal operations. It is the Applicants understanding that the decarbonisation readiness requirements apply to other technologies that may be required to switch over to hydrogen fuel in future and therefore do not apply here.	

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		It is a possibility that the proposed influx of decarbonising processes to the Tees Cluster area, as a result of the Northern Endurance Partnership (NEP) carbon capture gathering pipeline with offshore storage and the H2 distribution pipeline, may result in an increase in polluting emissions to air rather than a decrease, as proposed in PEIR Chapter 8 paragraph 8.4.15. Phase 3 of the EA/Department for Energy Security and Net Zero Environmental Constraints Project will look at air quality impacts of carbon capture, hydrogen production and hydrogen use within the Tees Industrial Cluster, with the conclusions due in early 2024. The applicant may find the results of this report useful. **Stack design** PEIR Chapter 8 Paragraph 8.5.10 discusses optimising stack heights. In order to ensure the stack height of the DCO is appropriate, consideration should be given at an early stage to the stack diameter, air emissions sample point location and monitoring platform design. CO_2 **Storage** Paragraph 4.2.4 of the Chapter 4 – Proposed Development states "no temporary CO_2 storage required on site". Consideration should be given to possible options should the construction and commissioning of the NEP CO_2 gathering pipeline be delayed or not constructed. The CO_2 capture, storage and use plans that the applicant would implement in these circumstances should be considered. In these circumstances, if the operator selects to vent captured CO_2 to atmosphere for a period of time, the impacts of this should be modelled and assessed within the permit. **Carbon Capture Readiness (CCR)** CCR assessments are done in accordance with the Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013 which relate to combustion plants generating 300 MW electricity or more. In this case, the activity is not combustion and does not generate 300 MW of electricity, so a CCR assessment is not needed for this project. **95% Carbon Capture Rate** A capture rate of 95% is the minimum required as set out in the EA's guidance on emerging techniques for hydrogen production with carbon capture. The guidance states that operators should consider how they would comply with future requirements for increased capture efficiency by making the plant decarbonisation ready. Operators should plan to	**Accidental CO_2 Losses** The Environment Agency comment relates to slow leakage of CO_2 from the CO_2 Export Corridor affecting terrestrial habitats in the Teesside and Cleveland Coast SPA/Ramsar. The CO_2 Export Pipeline site will be designed to industry standards. These standards ensure that the failure modes of the pipeline (such as erosion, corrosion, mechanical and materials) are adequately taken into account for the pipeline and the service it is performing (CO_2 transportation). The pipeline will be fully welded and welds will be subjected to non-destructive testing (NDT) as they are constructed. The pipeline will be tested for mechanical completion, once construction is completed and then, in line with the requirements of the pipeline design standard, strength tested. These tests are the demonstration that the pipeline has been constructed and tested in line with design standards. During the operating phase of the pipeline, the pipeline will be subject to ongoing preventative maintenance such as pigging and In-line inspection (ILI) to demonstrate ongoing integrity. **Environmental Permitting Regulations** The Environmental Permit application will include the relevant information on combustion processes including auxiliary boilers and emergency diesel generators. Pre-application discussions with the National Permitting Service (NPS) section of the EA has commenced and relevant EPR Schedule references are being confirmed as part of that process. The Applicant can confirm that radioactive sources are not required on the Proposed Development Site. Pre-application engagement for the permit application commenced in October 2023, with an initial meeting held in November 2023. The Environmental Permit will be updated in advance of submission. It is the Applicants intention to submit the Environmental Permit application in advance of commencement of the DCO Examination. **Control of Major Accident Hazards (COMAH) Regulations 2015** The Applicant is aware of the requirement to seek consent under both COMAH and Hazardous Substances Regulations and will be engaging with the regulatory bodies (HSE and LPA) for each regime to progress both applications.	

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		allow for space and technical retrofit within the design for additional carbon capture. **Accidental CO_2 Losses** Paragraph 7.7.5 of the NTS does not consider the impacts of accidental leaks or venting and then ponding of captured CO_2. CO_2 is a heavy gas, allowing ponding from pipe fractures or during a slow cumulative leak event. Accidental CO_2 losses should be considered further as this may impact on the design of the DCO. **EA Consents and requirements** **Environmental Permitting Regulations** A permit under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) will be required from the EA for the hydrogen production and carbon capture activities and their directly associated activities. This permit would also regulate the discharge of process waters and surface water run-off from these activities. This development will fall under EPR Part A (1) section 1.1 (>50MWth) large combustion plant EPR application. The EA are starting to permit all combustion plants great than 1MWth, information on auxiliary boilers and the emergency diesel generator will need to be included in the application. Radioactive sources have not been mentioned in the application. If they are to be used, they may require an EPR permit and must be included in the ES. When appropriate, we would encourage enhanced pre-app advice is sought in a timely manner, ahead of any submission for a EPR permit application. The timeline for processing of the permit is changeable and it is advisable that the operator consults with the EA on a regular basis during the project. **Control of Major Accident Hazards (COMAH) Regulations 2015** This site falls under the COMAH regulations 2015 and will be an Upper Tier COMAH site. The applicant must apply to the local authority for hazardous substance consent.	A provisional chemical list is provided in Chapter 21: Major Accidents and Disasters (ES Volume I, EN070009/APP/6.2). For details on the Other Consents and Licences being pursued for the Proposed Development, please refer to Other Consents and Licenses Statement (EN070009/APP/5.7). **Flood Risk Consents and Permits** The Applicant notes this response. Any work that would otherwise require a FRAP will be undertaken in line with EA requirements. Works will be approved pursuant to agreed protective provisions (if included in the draft DCO (EN070009/APP/2.1)). For details on the Other Consents and Licences being pursued for the Proposed Development, please refer to Other Consents and Licenses Statement (EN070009/APP/5.7). **Marine Licence** No marine licence applications are anticipated to be required. The Applicant engaged with the MMO regarding marine licensing during February-March 2024. For details on the Other Consents and Licences being pursued for the Proposed Development, please refer to Other Consents and Licences Statement (EN070009/APP/5.7). The Applicant will engage with the EA on construction phase consents at the relevant time. **Reuse of made ground** It is currently understood that STDC will obtain a DfR Permit for the remediation of the Main Site. The Applicant would then vary this for any additional remediation activities required; and to account for its construction activities. In the instance where STDC do not carry out initial remediation, then the Applicant will obtain the DfR permit.	

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		The PEIR is missing a list of proposed dangerous chemicals and proposed inventory. If the development is within a vulnerable flood risk area, then any secondary and tertiary containment must be designed to meet Ciria guidance including any arrangements for maintenance and testing. Pollution control measures (drains and sumps) must be similarly designed, maintained, and tested with penstock arrangements to stop any loss of spillage or firewater runoff. It is recommended the activation of the penstock is linked to the fire alarm. The EA has a climate change adaptation questionnaire for all COMAH operators. Upper Tier COMAH Safety Reports are required to address the issues within the questionnaire covering all aspects of operations including, but not limited to, pre-construction, site layout, position of tanks on site, control room location away from danger zones and overlapping public information zones. The Health and Safety Executive (HSE) will advise. It is recommended the Applicant submits their safety report and climate change questionnaire response well in advance of construction commencing, to allow a full review. **Flood Risk Consents and Permits** The River Tees is a designated 'main river' and under the Environmental Permitting Regulations certain works within 16m of a tidal main river, or within 16m of any flood defence structure on a tidal main river, require a Flood Risk Activity Permit from the EA. Assessments are required for both the temporary and permanent works. This includes works such as but not limited to; directional drilling under the River Tees, construction of outfalls, ground raising and works to construct and maintain the pipeline. You can find more information on permit requirements using the following link: Flood risk activities: environmental permits - GOV.UK (www.gov.uk). If a permit is required, it must be obtained prior to beginning the works. **Marine Management Organisation licence** You may also need a Marine Management Organisation license depending on if any works will be undertaken below the mean high water springs (MHWS).		

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		Water Quality Permit You do not require a permit if you are only discharging uncontaminated surface runoff. If you intend to discharge to surface water for dewatering purposes, this may be covered by a Regulatory Position Statement (RPS) for water discharge activities. If you can comply with all the conditions within the RPS, then a permit is not required for this activity. Further information is available at Temporary dewatering from excavations to surface water: RPS 261 - GOV.UK (www.gov.uk) Discharges that do not fully comply with the RPS, will require a bespoke discharge permit will be required. Guidance on applying for a bespoke water discharge permit is available at Discharges to surface water and groundwater: environmental permits - GOV.UK (www.gov.uk) **Water Resources Consent** If you intend to abstract more than 20 cubic metres of water per day from a surface water source e.g. a stream or from underground strata (via borehole or well) for any particular purpose then you will need an abstraction licence from the EA. There is no guarantee that a licence will be granted as this is dependent on available water resources and existing protected rights. Dewatering is the removal/abstraction of water (predominantly, but not confined to, groundwater) to locally lower water levels near the excavation. This can allow operations to take place, such as mining, quarrying, building, engineering works or other operations, whether underground or on the surface. The dewatering activities on-site could have an impact upon local wells, water supplies and/or nearby watercourses and environmental interests. This activity was previously exempt from requiring an abstraction licence. Since 1 January 2018, most cases of new planned dewatering operations above 20 cubic metres a day will require a water abstraction licence from us prior to the commencement of dewatering activities at the site. Further information is available at Apply for a water abstraction or impounding licence - GOV.UK (www.gov.uk) Please be advised that the following timescales apply for processing the permit application types listed below. Application Type Estimated Days to Allocation Simple Bespoke 32		

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		Complex Bespoke 108 Variation Normal 142 Variation Minor Technical 64 Variation Substantial 84 Admin Variation 113 **Reuse of made ground** Use of made ground in development projects is often undertaken using the CL:AIRE Definition of Waste Code of Practice (DoWCoP). This allows waste materials to be used outside of waste legislation, providing four key factors are met relating to certainty of use, quantity used, suitability for use and the environment and human health is protected. Reuse of the made ground on this development site is unlikely to be suitable for use under the DoWCoP. This is because the material is likely to consist of blast furnace slag and other historic contaminants. As such, reuse of the material would not be considered low risk for use under the DoWCoP as it presents a risk of causing pollution to the environment. We would therefore recommend that an Environmental Permit is sought to authorise and condition any proposed reuse of the made ground. We would encourage the developer to request pre-application advice to discuss permitting options further: Get advice before you apply for an environmental permit - GOV.UK (www.gov.uk).		
Wales and West Utilities Limited	22/09/23	This area is covered by Northern Gas Networks, not Wales & West Utilities. Please do contact Northen Gas Networks for correspondence on your proposed works.	Comment noted. The Applicant can confirm that Northern Gas Networks Limited were consulted as part of this consultation.	No
CA Telecom UK Limited	03/10/23	We can confirm that Colt Technology Services do not have apparatus near the above location as presented on your submitted plan, if any development or scheme amendments fall outside the 50 metre perimeter new plans must be submitted for review. Search is based on Overseeing Organisation Agent data supplied; we do not accept responsibility for O.O. Agent inaccurate data.	Comment noted.	No
North York Moors National Park Authority	10/10/23	The North York Moors National Park Authority consider that there is a credible risk of harm to the North York Moors SAC/SPA from either aerial pollutants arising from the development, or impacts on golden plover	The Applicant has assessed the potential air quality effects upon the North Yorks Moors SAC and SPA within Chapter 12: Ecology and Nature Conservation of the Environmental Statement [ES Volume I, EN070009/APP/6.2] and the Habitats Regulations Assessment –	No

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		species at wintering grounds in the Teesmouth area impacting on summer breeding populations returning to the North York Moors SPA.	Likely Significant Effects Report [EN070009/APP/5.12] and no likely significant effects are predicted.	
	10/10/23	Thank you for consulting the Authority on the H2 Teesside Project. Our Officers have no comments from a planning perspective, however the Authority's conservation department have sent comments separately.	Comment noted.	No
Hartlepool Borough Council	23/10/23	I can confirm that Hartlepool Borough Council have no objections to the application. Please note the following comments from internal consultees regarding the application: **HBC Ecology:** The Ecology work done to date is thorough, and I currently have no concerns regarding due process. I have looked at the Ecology sections and the non-technical summary of the PEIR. I support the non-technical summary findings in section 7.6 (Ecology and Nature Conservation including Aquatic Ecology) I support the non-technical summary findings in section 7.7 (Marine Ecology) I support the non-technical summary findings in section 7.8 (Ornithology) The development must consider the overlapping Phillips Tank Farm Grassland LWS, Greatham Creek North Bank Saltmarsh LWS and Greenabella Marsh LWS, as well as the adjacent Saltern Saltmarsh LWS; as well as the Teesmouth and Cleveland Coast SPA, Ramsar and SSSI. **HBC Traffic and Transport:** No highway or traffic concerns. During construction of the pipe lines in the Hartlepool area close consultation with the Highway Authority will be required. **Tees Archaeology:** We note that a DBA (Appendix 17a) and chapter on Cultural Heritage (Chapter 17) are included within the Preliminary Environmental Information Report. The DBA states: The following actions will be carried out to finalise the baseline conditions for heritage assets and inform the assessment to be presented within the ES: - additional walkover surveys of the Proposed Development Site; - geophysical survey of suitable areas where archaeological potential has been identified, specifically the fields adjacent to the Romano-British settlement at the energy plant, Saltholme Statera, to the west of the A1185, and the fields to the north and south of Cowpen Bewley (as outlined in Chapter 17: Cultural Heritage, PEI Report, Volume I);	Comment noted. The Applicant has engaged with Hartlepool Borough Council throughout the pre-application stage in respect of the Proposed Development and will continue to do so.	No

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		- stakeholder engagement will continue with archaeological advisors and conservation officers as the Proposed Development progresses to discuss the assessment findings and agree a proportionate scope of mitigation. We agree that these actions should be undertaken and used to inform the assessment within the Environmental Statement. Chapter 17 sets out the proposed mitigation measures for the development site. This includes avoiding heritage assets through design, establishing a programme of archaeological evaluation and mitigation prior to construction, as well a protocol establishing the procedures for the reporting, protection and management of unexpected archaeological discoveries; all archaeological investigations are to be carried out in accordance with a Written Scheme of Investigation that has been agreed be the relevant archaeology officer/s and approved in writing by the relevant LPAs. We also note that as the Proposed Development design progresses the assessment regarding mitigation during operational and decommissioning stages will be updated for the ES and the need for additional mitigation reconsidered. We consider that the proposed mitigation measures set out in Chapter 17 are reasonable, though they may need to be reviewed once the assessment within the Environmental Statement has been completed. **HBC Planning Policy:** No objections. **HBC Flood Risk Officer**: No comments. **HBC Economic Growth**: No objections. **HBC Head of Services for Heritage and Open Spaces**: No comment received. **Cleveland Emergency Planning Officer**: No comment received. **HBC Public Protection**: No comment received. In respect of consultations where no response was received at the time of issuing this response, you should not take this as no objection from the respective department/consultee or that they do not have comments to make and so you may wish to contact them directly.		
Redcar and Cleveland Borough Council	05/12/23	We have monitored the consultation to date and reviewed relevant information and have no specific comments to make at this stage, it goes without saying the Council is supportive of the scheme as a matter of principle and will respond once the DCO process is engaged.	Comment noted. The Applicant will continue to engage with Redcar and Cleveland Borough Council as the Proposed Development progresses.	No

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Redcar Bulk Terminal Limited	09/10/23	H2Teesside - response to October 2023 statutory consultation We act on behalf of Redcar Bulk Terminal Limited (Co. Regn. No. 07402297) of Time Central, 32 Gallowgate, Newcastle Upon Tyne, Tyne and Wear, NE1 4BF (""RBT"") and respond to the Consultation being carried out between 14 September – 26 October 2023 in respect of proposed development consent order ("DCO") for H2Teesside – Blue hydrogen production facility on Teesside (the "Development Proposal"), promoted by BP. RBT is the operator of the deep-water marine terminal situated on the East Bank of the River Tees (the ""Terminal""). The Terminal is the deepest terminal on the east coast of the UK, capable of handling Cape Size Vessels with drafts up to 17 metres. The terminal operates a 320-metre-long quay equipped with 2 rail mounted gantry cranes used for loading and unloading bulk sized cargo. In addition to the Terminal, land owned by RBT also includes about 130-hectare area used for short and long-term storage and processing of bulk cargos. The Terminal has separate rail handling facilities for rapid loading and off-loading of rail freight traffic and direct access to the UK rail and road networks with links to local highways. While RBT is in-principle supportive of the Development Proposal and its goals to decarbonise Teesside's industry, contribute to the UK economy and ensure national energy security, it is nevertheless essential that RBT's interests are not prejudiced. RBT provides a valuable service to numerous industries and its ability to engage and enter contracts with customers through the use of and access to its land and Terminal must be adequately protected. The information supplied is not sufficiently detailed to fully assess the potential impacts of the Development Proposal. At present a significant area of RBT's land has been identified as 'indicative temporary construction laydown area' and all RBT's remaining land is within land identified as being within the Hydrogen pipeline corridor. Further information and continuing dialogue with BP will be required to properly respond to any impacts that may arise in respect of RBTs interests once the Development Proposal is further clarified. In the meantime, RBT must protect its interests by objecting to the development Proposal as it stands now and in the absence of any sureties given to protect its existing and emerging plans for its business.	The Applicant has engaged with Redcar Bulk Terminal Ltd ('RBT') to discuss the Proposed Development. The Applicant welcomes RBT's in principle support for it, and noted the objection at this stage of consultation. The Applicant has, following and taking account of the feedback from RBT, been able to significantly reduce the areas of RBT's land included within the Order Limits, and has made the proposals for use of the land more specific. The Applicant has also engaged with RBT in relation to voluntary agreements regarding the proposed land use and protective provisions and will keep engaging. The Applicant's most recent engagement with RBT was 19th March 2024 and the parties are arranging a subsequent meeting in April 2024 to continue discussions on the proposals for RBT land and voluntary agreements. The Applicant is looking forward to ongoing engagement with RBT.	Yes
Teesside Environmental Trust	14/10/23	In principle, TET supports efforts to decarbonise Teesside. We do not have the technical expertise to comment upon the application of the proposed	The Applicant has engaged with Teesside Environmental Trust through the pre-application stage in respect of the Proposed	Yes

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		technologies but requests further consultation/engagement should the plans be taken forward to implementation. This includes mitigation plans demonstrating how any construction works will minimise disturbance to the Teesmouth and Cleveland Coast SPA, Ramsar Site and SSSI. As a large landowner and conservation charity working primarily on Teesside, TET notes that some of these technologies are pioneering, therefore, hope that they will be able to retain a dialogue with the project team should things move towards implementation.	Development and associated voluntary agreements for the rights required over their land. The Applicant has undertaken work to refine the land required for the Proposed Development since statutory consultation, informed by discussions with key land interests such as Teesside Environmental Trust, RSPB. The Applicant has also undertaken, technical and design assessments and where possible, the Proposed Development has been designed to avoid adverse effects upon designated sites, habitats of principal importance and protected and notable species TET were consulted on revisions to the Proposed Development Site as part of the Applicant's December 2023 consultation.	
MGT Teesside Limited (MGT)	17/10/23	Thank you for sending to MGT Teesside Limited (MGT) details of the consultation under the aforementioned legislation. We have a number of concerns and comments: • Land Ownership & Access Rights: From the site plans we note that the proposed application site includes part of the MGT site and access routes to the MGT site. Please find attached the lease site plan for MGT. In addition there are existing accesses adjoining the MGT site over which MGT retains rights. We assume that the proposed application boundary will be amended to not encroach on the MGT site or its access rights. • Flooding and Water Quality: From the Non-Technical Summary we note that the construction may impact the water quality or flooding risk of the River Tees and Danholm Gut. The MGT site adjoins the River Tees and the Danholm Gut courses through the MGT site. We have been contacted on a number of occasions in the recent past about the quality of both water courses and about flooding caused by blockages to Danholm Gut. On investigation the issue that caused the quality issue/flooding originated offsite. Construction works are likely to result in such issues in the future and so we request close monitoring of the quality of water courses and that steps are taken to ensure that flooding is not caused. This is particularly of importance due to the SSI designations near the MGT site.	**Land Ownership & Access Rights** The Applicant has undertaken further work to refine the land required for the Proposed Development since statutory consultation and as a result have removed MGT Teesside Limited's interest from the Proposed Development Order Limits. **Flooding and Water Quality** The FRA [ES Volume III, EN070009/APP/6.4] has assessed the risk of flooding from fluvial and tidal sources and recommends mitigation measures should there be potential for the Main Site to increase the risk of flooding to the surrounding area. This will be secured through the DCO A Detailed Surface Water Drainage Strategy will be secured under a requirement of the draft DCO. This will outline measures to manage the risk of flooding from surface water post development. Surface water will either be discharged to Tees Bay using the NZT outfall or via the Teesworks outfall to the Tees Estuary. There will be no surface water discharge to the Dabholm Gut. **Impact of Increased Traffic** The Framework CEMP (EN070009/APP/5.12) outlines measures to mitigate potential water quality impacts to water features surrounding the Proposed Development during the construction phase. This includes measures to manage construction site runoff and to prevent spillages on site. It includes a Water Management Plan with further details on emergency response, and outlines water	Yes

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		• Impact of Increased Traffic: From the Non-Technical Summary we note access to the Main Site is expected to be via the existing Teesworks access road from the A1085 Trunk Road, via the former Redcar Steelworks entrance or alternatively via the Lackenby Steelworks entrance. The A1085 Trunk Road provides a link to the A1053 Tees Dock Road, which in turn connects to the A174 to the south and the A66 to the north. Any increased use of the A66 will adversely affect MGT as access to the MGT site is via the Tees Dock Road which links to the A66. This route is used by employees and provision of goods and services to the MGT site. • Impact on Availability and Cost of Local landfill Facilities: From the Non-Technical Summary we note that the construction works will increase pressure on local landfill sites. This will adversely affect the availability/or cost of landfill facilities that are currently used by MGT. • Impact due to Adverse Effects of Extensive Construction Period: We note the duration of the construction activities will extend into 2030 with attendant impacts on adjoining land from construction traffic and dust and noise of a project with a long construction programme. • 3rd party Access to pipeline across the Estuary: We note the proposed development includes a pipeline crossing the Tees Estuary. We would suggest that the pipeline allows third party access. As a significant piece of infrastructure it makes sense for regulators to ensure that the infrastructure is able to be used by 3rd parties - we would suggest the ability for pipes carrying low-level steam and electricity. We would be grateful if you consider our comments/concerns which are not Exclusive and we may amend or add to them once a formal application is submitted. If you require any further information or discussion on the points made please contact the writer via the contact details set out below	quality monitoring that would be required for watercourses that could be impacted by the works. The Appendix 15A: Transport Assessment [ES Volume III, EN070009/APP/6.4] sets out the predicted increases in traffic during the construction and operational phases and has, where considered appropriate, undertaken a capacity assessment to understand the impact. Tables 15-18 and 15-21 of the PEI Report, set out the daily profile of construction traffic across a typical day, and within the Chapter 15: Traffic and Transport of the ES [ES Volume I, EN070009/APP/6.2] and Appendix 15A: Transport Assessment [ES Volume III, EN070009/APP/6.4], have been expanded so that the impact can be identified on individual junctions and roads. No significant effects are predicted to arise from traffic impacts. **Impact on Availability and Cost of Local landfill Facilities:** As part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that enough land is available to accommodate facilities (including landfills) for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas. If there is still a need for landfill, then the WPA will need to consent new landfill capacity to replace that which has been used up. **Impact due to Adverse Effects of Extensive Construction Period:** The impact from the additional traffic is set out in Chapter 15: Traffic and Transport of the ES [ES Volume I, EN070009/APP/6.2] and Appendix 15A: Transport Assessment [ES Volume III, EN070009/APP/6.4] and no significant impacts are predicted. The construction noise assessment has been updated for the ES based on updated plant, information and programme. **3rd party Access to pipeline across the Estuary:** The Applicant has been in dialogue with a number of parties regarding the new river Tees crossing and will continue these dialogues to explore opportunities for accommodating additional infrastructure as far as reasonably practicable, but has not assumed this for assessment purposes.	

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Norsea Pipeline Ltd	19/10/23	In response to the H2Teesside Project – Land either side of the River Tees within the Boroughs of Redcar and Cleveland and Stockton on Tees on Teesside and the Borough of Hartlepool in County Durham dated 14 September 2023, Norsea Pipeline Ltd, Norpipe Petroleum UK Ltd and Norpipe Oil AS provide the following comments relating to its land interests within the Proposed Development Site Boundary. We understand that comments are invited by 26 October 2023; we provide these comments in advance of that date. Norsea Pipeline Ltd (Norsea) The following lists Norsea's land interests within the Proposed Development Site Boundary • Norsea is leaseholder of the area with the green boundary within the image directly below: • Lease relating to land at Seal Sands dated 01 March 1974 • Landlord: PD Teesport Ltd • Tenant: Norsea Pipeline Ltd • Norsea sublets a part of the area within the green boundary to Norpipe Petroleum UK Ltd • Underlease relating to land at Seal Sands Teesside dated 20 December 1983 • Superior Landlord: PD Teesport Ltd • Landlord: Norsea Pipeline Ltd • Norsea has an easement shown by the darker green line in the image below (note this easement extends along the length of Seal Sands Road) • Norsea sublets a parcel of the green boundary land located in the bottom left of the image below to Northern Powergrid: • Underlease of land at Seal Sands dated 22 May 1974 • Landlord: Norsea Pipeline Ltd • Tenant: Northern PowerGrid • Norsea has the following interests in the land area marked red in the image directly below (Easements):	The Applicant has taken into account and reviewed the locations of the assets provided by - Norsea Pipeline Ltd, Norpipe Petroleum UK Ltd and Norpipe Oil AS / Norpipe Petroleum UK Ltd (Norpipe UK) / Norpipe Oil AS (Norpipe Oil) – and confirm that following further design refinement a number of interests and assets have now been removed from the Proposed Development Order Limits. The Applicant has initiated discussions with Norsea Pipeline Ltd, Norpipe Petroleum UK Ltd and Norpipe Oil AS / Norpipe Petroleum UK Ltd (Norpipe UK) / Norpipe Oil AS (Norpipe Oil) in relation to appropriate agreements for land interests, and draft protective provisions for assets which remain within the Order Limits.	Yes

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		• Deed of Easement relating to a 14"" diameter pipeline, two core fibre optic cables and a copper cable dated 15 September 2006 • Landlord: PD Teesport Ltd • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd • Deed of Easement relating to a 14"" diameter pipeline, two core fibre optic cables and a copper cable dated 21 December 2006 • Landlord: SABIC • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd • Deed of Easement relating to a 14"" diameter pipeline, two core fibre optic cables and a copper cable dated 5 October 2006 • Landlord: The Crown Estate Commissioners • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd • Lease as to pipes at Greatham in the County of Cleveland dated 16 August 1989 o Landlord: Inovyn • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd • Deed of Easement dated 24 September 1996 o Landlord: PD Teesport Ltd • Tenant: Norsea Pipeline Ltd • Norsea is leaseholder of the land marked pink in the image directly below: • Lease relating to land at Seal Sands, strip adjacent to jetties 1 & 2 dated 10 June 1976 • Landlord: PD Teesport Ltd • Tenant: Norsea Pipeline Ltd • Lease of foreshore / bed of the River Tees, Jetties 1, 2, dolphins dated 23 April 1976 o Landlord: The Crown Estate Commissioners		

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		• Tenant: Norsea Pipeline Ltd Norsea has a licence for pipeworks etc which connects the two green land areas via a pipe culvert and pipe bridge marked blue in the image below: • Licence dated 02 June 1976 • Landlord: PD Teesport Ltd • Tenant: Norsea Pipeline Ltd Norsea has a licence for electricity cables from PD Teesport Ltd marked orange in the image below: • Licence for electricity cables dated 10 October 1979 • Landlord: PD Teesport Ltd (originally Tees and Hartlepool Port Authority). • Tenant: Norsea Pipeline Ltd • Location: This licence runs parallel to the Norsea easement (darker green line above) some 32 metres away in the direction of Seal Sands Road." "Norpipe Petroleum UK Ltd (Norpipe UK) The following lists Norpipe UK's land interests within the Proposed Development Site Boundary Norpipe UK is freeholder of the land with the white boundary in the image directly below –site is known as Greatham Tank Farm: • Norpipe UK grants rights to several others through this land: • British Gas - Grant of Easement for gas pipeline dated 22 July 1983, • Northern Electric - permission to lay electricity lines across/intersecting the Southern edge/corner of the tank farm dated 30 October 1990, • Hartlepool Water – permission to lay water main dated 21 September 1984, • National Grid Wayleave - overhead electric cables across Greatham land, dated 20 June 2015, • Annual grazing licence to local farmer 1 May – 31 Oct Norpipe UK is leaseholder of the land marked orange in the image directly below: • Lease relating to land at Seal Sands dated 01 January 1977		

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		• Landlord: PD Teesport Ltd • Tenant: Norpipe Oil AS and Norpipe Petroleum UK Ltd Norpipe UK has the following interest in the land area marked red in the image directly below (Easements): • Lease as to pipes at Greatham in the County of Cleveland dated 16 August 1989 o Landlord: Inovyn (Formerly Ineos Chlor Ltd) • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd Norpipe UK has the following interests in the land area marked red in the image directly below (Easements): • Deed of Easement relating to a 14"" diameter pipeline, two core fibre optic cables and a copper cable dated 15 September 2006 • Landlord: PD Teesport Ltd • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd • Deed of Easement relating to a 14"" diameter pipeline, two core fibre optic cables and a copper cable dated 21 December 2006 • Landlord: SABIC (with consent of PD Teesport Ltd) • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd • o Deed of Easement relating to a 14"" diameter pipeline, two core fibre optic cables and a copper cable dated 5 October 2006 • Landlord: The Crown Estate Commissioners • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd Norpipe UK is leaseholder of the land marked yellow and has an easement under the creek marked pink in the image directly below: • Lease and Easement relating to land at Seal Sands dated 04 March 1977 • Landlord: The Crown Estate • Tenant: Norpipe Oil AS and Norpipe Petroleum UK Ltd		

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		END OF LIST FOR NORPIPE (UK)" "Norpipe Oil AS (Norpipe Oil) The following lists Norpipe Oil's land interests within the Proposed Development Site Boundary Norpipe Oil has the following interests in the land area marked red in the image directly below (Easements): • Deed of Easement relating to a 14"" diameter pipeline, two core fibre optic cables and a copper cable dated 15 September 2006 • Landlord: PD Teesport Ltd • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd • Deed of Easement relating to a 14"" diameter pipeline, two core fibre optic cables and a copper cable dated 21 December 2006 • Landlord: SABIC • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd • Deed of Easement relating to a 14"" diameter pipeline, two core fibre optic cables and a copper cable dated 5 October 2006 • Landlord: The Crown Estate Commissioners • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd • Lease as to pipes at Greatham in the County of Cleveland dated 16 August 1989 o Landlord: Inovyn • Tenant: Norpipe Oil AS / Norpipe Petroleum UK Ltd / Norsea Pipeline Ltd Norpipe Oil is leaseholder of the land marked orange in the image directly below: • Lease relating to land at Seal Sands dated 01 January 1977 • Landlord: PD Teesport • Tenant: Norpipe Oil AS and Norpipe Petroleum UK Ltd		

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		Norpipe Oil is leaseholder of the land marked yellow and has an easement under the creek marked pink in the image directly below: • Lease and Easement relating to land at Seal Sands dated 04 March 1977 • Landlord: The Crown Estate • Tenant: Norpipe Oil AS and Norpipe Petroleum UK Ltd Norpipe Oil is leaseholder of the land marked purple in the image directly below: • Agreement dated 01 April 1981 • Landlord: Hartlepool Borough Council • Tenant: Norpipe Oil AS END OF LIST FOR NORPIPE OIL		
Anglo American Woodsmith (Teesside) Limited; Anglo American Woodsmith Limited and; Anglo American Crop Nutrients Limited	20/10/23	Response to Public Consultation on behalf of Anglo American Woodsmith (Teesside) Limited; Anglo American Woodsmith Limited and; Anglo American Crop Nutrients Limited On behalf of our client, collectively known as “Anglo American”, we write in response to your letter dated 14 September 2023 and to comment on the consultation material provided in respect of the proposed H2 Teesside project. These comments are made following a review of the documents on your website (www.h2teesside.co.uk) and discussions that were held with BP on 12 September 2023 on this project along with Net Zero Teesside and HyGreen Teesside. These discussions follow on from those had with Dalcour Maclaren (acting on behalf of BP) in relation to the HyGreen Project where it was made clear that Anglo American welcomes the principle of the development for the generation of hydrogen on the proposed site and wishes to work co-operatively with BP and their advisers. As with the HyGreen project, it is important that this project (H2 Teesside) and the Anglo American Woodsmith Project, which is under construction on land common to these schemes, work together to ensure neither prejudices the delivery and successful operation of the other. As required under Section 47(1) of the Planning Act 2008, the consultation is accompanied by a Statement of Community Consultation setting out how H2 Teesside proposes to consult on the proposed	The Applicant has engaged with Anglo American (AA) during the pre-application stage in respect of the interfaces between the Proposed Development and the Woodsmith Project. Detailed discussions have been held with AA and information has been provided by the Applicant regarding the use of land within the Proposed Development Site for the construction of H2Teesside. Specifically, the Applicant has engaged with AA in respect of all proposed development projects within the Order limits and initiated discussions regarding solutions for working around the ‘pinch points’ and areas of overlap between the Proposed Development and AA’s interest highlighted by AA. The Applicant has undertaken work to significantly refine the land required for the Proposed Development following the feedback by AA. **Overlap areas:** • The Applicant has been able to significantly reduce the Order Limits at east of Wilton International following the feedback from AA. The Applicant remains in continuous dialogue with AA regarding pipeline and conveyor routing through Bran Sands while taking account of the Applicant’s and AA’s ongoing design development in this corridor.	Yes

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		application, including people living within the vicinity of the land to which is relates. In addition to this, the following documents have been made available for review: • Statutory consultation brochure • Statutory consultation leaflet • Site boundary and development areas plans • Preliminary Environmental Information Report ('PEIR') and Non-Tech summary (including figures & appendices) This consultation response has been prepared following a review of all these documents. The Woodsmith Project The Woodsmith Project is a new polyhalite fertiliser mine being developed in the North East of England. It comprises a new mine site south of Whitby in North Yorkshire and a 37 kilometre tunnel that will transport the naturally occurring mineral, polyhalite, to new processing and shipping facilities on Teesside. The Woodsmith Project is setting new standards for sustainable mining while helping to boost food production and sustainable farming practices. The Project consists of 5 key elements, many of which, are located at the Wilton International Complex and Bran Sands: • The underground mine including a surface access point at Woodsmith Mine, Sneatonthorpe. • A Mineral Transport System (MTS) consisting of a 37 km long tunnel that will transport the • Polyhalite from Woodsmith Mine to Wilton, Teesside. • A Material Handling Facility (MHF) at Wilton International Complex which will process the Polyhalite. • A Port Handling Facility and associated conveyor to transport the Polyhalite from Wilton International Complex to Bran Sands. • Harbour facilities and associated development at Teesside. The mine construction is now well advanced with good progress on shaft sinking. The tunnel between the mine and Teesside is now constructed along approximately 25 km of its route and planning permission has been granted and construction commenced for the Material Handling Facility (R/2018/0139/VC; dated 29 May 2018) and planning permission granted for the Overland Conveyor Footings (ref. ref. R/2022/0002/FFM; dated 25	• The Applicant can confirm that through design development and by taking AA's feedback onboard, it has removed the entirety of the water connection corridor routed to Wilton International, removing a significant overlap area with AA's Material Handling Facility and Material Transport System Portal. • The Applicant, as a result of taking feedback from AA and others into account and design development, has also removed the indicative temporary construction laydown area closest to the River Tees, the proposed hydrogen pipeline corridor and the electrical corridor, all of which previously overlapped with AA's Port Handling Facility. • The Applicant has also further refined the electrical connection corridor that was shown on land being used for road and rail infrastructure which is to be developed for Anglo American's overland conveyor route. The Applicant has also been sharing the information requested by AA in various engagement session between the two parties and is now also publishing this information as part of the DCO application. **Statement of Community Involvement** The Applicant welcomes Anglo American's in principle acceptance of the Statement of Community Involvement (assumed to be referring to the Applicant's Statement of Community Consultation) and consultation zones. The Applicant agrees that Anglo American is a landowner with a number of overlapping land interests, and that therefore regular communication and engagement is appropriate (in relation to which see above). The SoCC is principally about consultation with the local community (pursuant to Section 47, under which a SoCC is required), and therefore does not specifically address project overlaps or landownership matters. This document (the Consultation Report) sets out how the Applicant has had regard to comments from Anglo American and others and how they have influenced the Proposed Development. The Applicant has taken traffic generated by other developments into account, where deemed appropriate as detailed in the ES	

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		April 2023). The Woodsmith Project also delivers significant benefits to the local area. In 2022 alone, it delivered: • £222 million contribution to the regional economy of Yorkshire and the North East. The project has generated an additional £1.2 billion to the regional economy since construction started in 2017. • 1,000 local people working on the Woodsmith Project. The Project currently employs 1,650 people, of which 61% are from the local area. • £4.5 million contribution to Anglo American's Thriving Communities Programme, the Woodsmith Foundation and funding that meets their planning commitments. • £2.8 million towards projects supporting tourism, transport, training and the environment. • 50 projects to enhance the community environment and facilities. • 8,685 local students engaged. • 7 apprentices recruited in 2022. • 284 people supported to build their skills. • £1.7 million funding awarded by the Woodsmith Foundation to build their skills • 38 public meetings attended. • 27 new businesses created from Anglo American's enterprise start-up programme The importance of the Woodsmith Project to the North East and the wider area cannot, therefore, be overstated and it is essential that the H2 Teesside project does not prevent, or unreasonably constrain or prejudice, the ability to continue to construct and then successfully operate this project which comprises another nationally significant infrastructure project – the harbour facility DCO, which is an integral part of the Woodsmith Project. Interfaces with the Woodsmith Project It is noted from the figure included in page 5 of the consultation leaflet, that there are significant areas of overlap with Anglo American's land interests; some of which are in the freehold ownership of Anglo American. There are a number of overlaps between the two projects:	(Appendix 15A Transport Assessment, ES Volume III, EN070009/APP/6.4) AA were consulted on revisions to the Proposed Development Site as part of the Applicant's December 2023 consultation. The Applicant remains in dialogue with AA regarding the interfaces between the Proposed Development and the Woodsmith Project and how these will be managed, including through voluntary agreement, and if necessary Protective Provisions. The Applicant has also engaged in discussion with AA regarding the construction details and timelines for the Proposed Development with a view to discussing simultaneous operations and synergies. The Applicant awaits details of AA's Land Agent in order to commence discussions in relation to voluntary agreements.	

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		• From east of Wilton through to Bran Sands, the two projects share a 'corridor' along which a conveyor associated with the Woodsmith Project is consented under the York Potash Harbour Facilities Order 2016 (DCO). • proposed water connection corridor overlaps with the Materials Handling Facility and Minerals Transport System Portal (permitted under permissions ref. R/2018/0139/VC and R/2014/0626/FFM respectively) that are in the process of being constructed as part of the Woodsmith Project. • A proposed hydrogen pipeline corridor and electrical corridor is shown on the land proposed for the Port Handling Facility. The indicative temporary construction laydown area closest to the River Tees also overlaps with the Port Handling Facility. • An electrical connection corridor is shown on land currently used for road and rail infrastructure and which is to be developed for Anglo American's overland conveyor route. To allow our client to be able to understand what the nature of these interfaces are likely to be, we would request that the following information is provided for each of the areas of overlap, prior to any formal planning application submission being made: 1. Detail of the physical development proposed within each area of overlap, including any preliminary design details or parameters; 2. Construction details, including timescales, construction methodologies and the identification of any temporary structures likely to be required and; 3. Details of any operational requirements, including in relation to access and any ongoing maintenance. Redline Boundary The extensive red line boundary of the project is also a concern on the basis that it risks sterilising other legitimate development projects from coming forward as a result of an artificial inflation of the magnitude and extent of potential cumulative and in combination effects. Given the significant socio-economic implications this could present for the wider South Tees area, we consider that, prior to submission, the project boundary should be amended to reflect more definitive pipeline routes and utility corridors that are agreed in consultation with key stakeholders. This, in turn, will ensure that the red line boundary		

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		incorporates only land that is agreed to be required for the construction and operation of the H2 Teesside facility. Statement of Community Involvement In principle, Anglo American has no concerns with the strategy proposed in the Statement of Community Involvement or the inner or outer consultation zones suggested. As a landowner with a number of overlapping land interests, Anglo American expects regular communication and engagement with the applicant and associated project consultants, however, provision for this is not detailed in the current strategy. We would request that regular dialogue between the two projects is actioned moving forward. The Statement also notes that the applicant undertook early targeted engagement with potentially affected landowners and key technical consultees and other stakeholders on the Project and that this has informed initial decisions with regard to the extent of the Project Site and the scope of the ongoing EIA work. Whilst this is the case, the Statement does not include any of the comments or feedback received from Anglo American and due to the overlapping land interest, our client is concerned as to how these comments have been considered and whether they have influenced the current proposals. Clarification of this would be welcomed. Environmental Impact Assessment It is noted that the submitted PEIR Volume 1 Chapter 23 Cumulative and Combined Effects includes a Tier 1 long list of 221 projects (Table 23-4), for consideration in a later study of potential cumulative environmental effects. Anglo American is satisfied that its consented development projects are included in this Tier 1 list, as ID references 1, 33, 34, 35 and 174, and, as all are consented projects with suitable information available, would expect these to be taken forward into the Stage 2 'shortlist' for inclusion in Stages 3 and 4 and thereby within a cumulative assessment to be included in the ES. Anglo American is also satisfied that the stated Indicative Zones of Influence for each environmental topic (Table 23-2) are suitable for an adequate consideration of potential cumulative effects. It is noted that the traffic and transportation assessment (Volume 1 Chapter 15) does not include any traffic that would be generated by committed		

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		'other developments', and that this consideration will be completed during the EIA and reported in the ES. Concluding Remarks Our client welcomes the opportunity to engage on the H2 Teesside project and would request regular direct dialogue with BP to ensure the both the H2 Teesside Project and Woodsmith Project are aligned. As part of these discussions, we request further clarity is provided on the points raised in this letter.		
Alfanar Energy Limited	25/10/23	Alfanar Energy Limited (Alfanar) supports the aim to help Teesside decarbonise its industry. Alfanar is itself in the process of seeking to promote sustainable energy through its Lighthouse Green Fuels project. Alfanar notes that there it is anticipated that pipelines connected to both the H2Teesside project and Lighthouse Green Fuels project will be located along existing pipeline routes in and around the existing TV1 and TV2 sites occupied by Alfanar, on land at Port Clarence, near Stockton-on-Tees. Alfanar expect to work collaboratively with the promoter of the H2Teesside project to ensure the two schemes can construct and operate harmoniously. Alfanar would seek to collaborate on assumptions and parameters for our respective cumulative effects assessments and any potential opportunities for natural and social capital or net gain. Alfanar requests the promoter to engage with the Lighthouse Green Fuels project in relation to the production of the H2Teesside's Outline Construction Traffic Management Plan and Framework Construction Environmental Management Plan to ensure the two projects manage construction and traffic of the two schemes collaboratively in the relevant geographical areas. Alfanar is committed to working collaboratively with the promoter of the H2Teesside project in relation to the two projects to ensure the benefits of both projects are maximised and any adverse effects minimised.	The Applicant agrees on the importance of working collaboratively, noting the potential overlaps of project boundaries, including pipeline routing. The Applicant looks forward to seeing further information on the Lighthouse Green Fuels project during its statutory consultation. The Applicant has identified the Lighthouse Green Fuels project in the shortlist of planned developments for which cumulative effects will be assessed. Further details of the H2Teesside development will shortly be available to Lighthouse Green Fuels to inform Lighthouse Green Fuels' cumulative impact assessment once the H2T DCO submission is made. The Applicant looks forward to further engagement with Alfanar regarding the Lighthouse Green Fuels project, including in the areas of any potential opportunities for natural and social capital or net gain, the Outline Construction Traffic Management Plan and Framework Construction Environmental Management Plan, as proposed. The Applicant looks forward to collaborative working relationship. The Applicant has held a number of engagement sessions with Alfanar to work collaboratively in the shared areas of interest and will continue these dialogues. The Applicant has discussed and agreed the AGI locations and pipeline routing with Alfanar.	
Kellas Midstream Limited ("Kellas"), CATS North Sea Limited ("CNSL"), H2NorthEast Limited	26/10/23	4.1 Kellas is at an advanced stage of developing its own low carbon hydrogen production facility, H2NorthEast, at its CATS terminal in Teesside. When complete, it will deliver over 1GW of low carbon hydrogen to industries on Teesside.	The Applicant welcomes the feedback from Kellas Midstream Limited, CATS North Sea Limited, H2NorthEast Limited and its efforts in promoting the UK Hydrogen Economy.	

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		4.2 H2NorthEast will make a substantial contribution to the target set out in the British Energy Security Strategy of delivering 10GW of low carbon hydrogen production capacity by 2030. H2NorthEast has been offered funding from the Net Zero Hydrogen Fund which demonstrates strong government support for the project. Discussions with the Department for Energy Security and Net Zero are in progress regarding H2NorthEast's participation in the Cluster Sequencing Track 1 expansion process. 4.3 The UK government envisages a cluster of low carbon hydrogen projects operating in the Teesside and Humber area which will be necessary to meet its ambitious targets for low carbon hydrogen. Kellas agrees that there is potential for multiple low carbon hydrogen projects, including the Project, to operate on Teesside. 4.4 The Project should not therefore compromise the deliverability of the H2NorthEast scheme. 4.5 Based on the review of the consultation documents, Kellas have a number of concerns about the Project: (a) Excessive Land Requirements - PEIR document Figure 4-2 shows significant areas of land within the site boundary identified by H2 Teesside for the Hydrogen Pipeline Corridor that have also been identified by H2NorthEast for the development of its hydrogen production facility and associated primary utilities corridor (hydrogen distribution, CO_2 export pipeline, HV power supply, raw water pipeline, waste water pipeline). In addition, Figure 4-2 shows an area of land identified by H2 Teesside for Temporary Construction Laydown that is located adjacent to, and overlaps, the southern boundary of the CATS facility and land identified for use by the H2NorthEast facility. Utilisation of this area for Temporary Construction Laydown directly conflicts with the proposed location/routing of the H2NorthEast hydrogen pipeline and therefore negatively impacts the development and construction of the H2NorthEast facility. Figure 4-2 also shows a 2nd, larger, Temporary Construction Laydown area to the South East of CATS on INEOS land. H2NorthEast queries the requirement for the smaller area to the South of CATS in addition to the 2nd much larger area. Overall, the land identified by H2 Teesside in Figure 4-2 is considered to be in excess of that required for the proposed	The Applicant has, taking the consultation feedback into account, substantially reduced the order limits following the statutory consultation and will engage with CATS and Kellas in relation to their assets and their proposed H2NorthEast Development and will progress draft Protective Provisions shared by Kellas for discussion. It is the Applicant's understanding that the land identified for H2NorthEast project is now outside of the Applicant's reduced order limits. The Applicant notes that its Order limits (in relation to the Natural Gas Connection) are now comparable to those of the recently granted NZT DCO and as such it is the Applicant's understanding that the burden on Kellas's land would not be incremented by the Applicant. The Applicant, taking feedback onboard from Kellas, CNSL and other consultees, have removed the construction compound that was to be located adjacent to the southern boundary of the CATS facility and land understood to be identified for use by the H2NorthEast facility. The Applicant has published further details on its construction programme, sequence, and details (see for instance Chapter 5 of the Environmental Statement, Vol II, Document Ref. 6.2). The Applicant is currently seeking engagement with Kellas and CNSL to discuss this. The Applicant has also published further design details on the Main Site and connecting infrastructure as part of the DCO application. The Applicant has been able to significantly reduce the Order Limits by removing optionality and narrowing down Order Limits and it is the Applicant's understanding that the land identified for H2NorthEast Main Site has now been removed from the Applicant's Order Limits. The Applicant will engage with Kellas and the H2NorthEast Project with a view to discussing the interaction with the CATS infrastructure and H2NorthEast and working towards a mutually agreeable solution. At the time of writing, the Applicant is in communications with Kellas in order to agree a date for a meeting to discuss interaction between the projects.	

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		development described within the Statutory Consultation Brochure and PEIR documents, and directly impacts land identified for use by H2NorthEast. As such, the DCO proposals in their current form have the potential to prejudice the deliverability of H2NorthEast and this must be addressed before it is submitted for DCO via further engagement with H2NorthEast. (b) Construction schedule overlap - PEIR Volume 1 Chapter 5 – Construction Programme and Management states that Phase 1 construction is expected to commence in Q2 2025 for a period of 32-36 months with completion in early 2028. Phase 2 is expected to commence Q2 2028 and complete by end 2030. These dates overlap with the current H2NorthEast construction schedule of 2025 to 2028 for Phase 1 and 2028 to 2030 for Phase 2. Without a detailed construction plan, sequencing and schedule and clearly identified pipeline routes it cannot be established whether H2 Teesside construction activities will conflict with those of H2NorthEast. H2NorthEast considers it likely, based upon the information provided, that H2 Teesside construction activities will significantly impede those of H2NorthEast without further detailed engagement and consultation. There is insufficient detail and visibility of the proposed development provided within the consultation documents to determine whether this will impact the development of the H2NorthEast pipeline routing. As such, the DCO proposals in their current form have the potential to prejudice the deliverability of H2NorthEast and this must be addressed before it is submitted for DCO via further engagement with H2NorthEast. (c) Insufficient design detail - PEIR Volume 4 Non-Technical Summary and PEIR Chapter 4 state that various options are being considered for the pipeline routing, including above ground routing using new or existing pipe rack structures. There is insufficient detail and visibility of the proposed design provided within the consultation documents to determine whether this will impact the development of the H2NorthEast pipeline routing. As such, the DCO proposals in their current form have the potential to seriously prejudice the deliverability of H2NorthEast and this must be addressed before it is submitted for DCO via further detailed engagement with H2NorthEast. (d) Insufficient proposal definition and maturity - PEIR Volume 4 Non-Technical Summary and PEIR Chapter 4 state that alternative options for the Hydrogen Pipeline routing are still being evaluated. H2 Teesside is considered to be requesting an inappropriate and disproportionate degree		

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		of flexibility in the DCO proposal due to insufficient design definition and maturity. A request for flexibility using the "Rochdale Envelope" approach to define a maximum built envelope for the Environmental Impact Assessment (EIA) should not be confused with a request for flexibility that permits excessive development land to be made available under the DCO due to a lack of maturity. Under the key propositions of the "Rochdale Envelope" the need for flexibility should not be abused and "does not give developers an excuse to provide inadequate descriptions of their projects" (see Planning Inspectorate Advice Note Nine: Rochdale Envelope July 2018). Based on the PEIR documentation, it is considered that H2 Teesside is conducting DCO Pre-Application consultation too early in the project development, as it is difficult to make meaningful comment using the level of detail provided. In order for H2 Teesside to demonstrate that the statutory consultation requirements under the Planning Act 2008 (sections 42 and 47) have been complied with, H2NorthEast suggests that a clear iterative consultation process is followed, and further detailed documentation provided prior to submission of the DCO application. 4.6 Kellas would welcome direct engagement from H2 Teesside with H2NorthEast on an ongoing basis throughout planning, design and construction to identify areas of conflict and work toward a mutually agreeable solution. 4.7 The comments above are not considered final and Kellas reserves the right to comment further on the proposed development. 5 CONCLUSION 5.1 In conclusion Kellas, CNSL and H2NorthEast have the following concerns in relation to the Project: (a) The information currently available does not clearly set out the protections that H2 Teesside intend to put in place to manage the risk of works in close proximity to the CATS assets. CNSL would welcome early dialogue on this with a view to reaching an agreed position prior to submission of any DCO application. (b) Based on the information provided for the consultation, there is a real risk that the H2 Teesside Project prejudices the deliverability of the H2NorthEast project. UK Government policy supports the delivery of both		

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		projects. Kellas would welcome further discussions with H2 Teesside to work towards a mutually agreeable solution. 5.2 Kellas will be happy to provide additional detail in respect of the matters contained in this representation. Kellas will continue to engage with the H2 Teesside in respect of the Project.		
CLdN RoRo SA (CLdN)	26/10/23	CLdN RoRo SA (CLdN) is a European integrated ports, shipping and freight forwarding provider. We operate three sailings a week between our terminal in Zeebrugge and Teesport. The berths we currently use at Teesport are within the order limits of the project, inside the corridor of the hydrogen pipeline. This raises significant concerns that construction and operation of the project will impact on our services and operations. However, the port of Teesside, shipping operators and other marine transport elements are not identified as potential receptors or addressed in any way in the scope of the PEIR. This is a significant omission and gives rise to significant concerns about the way the impacts of the projects are being assessed, and the design of the project is being developed to avoid and minimise impacts on port users. This will include impacts from construction and operation on freight being transported to/from the port by road. The pipeline corridor is very widely drawn. There is a lack of any detail within the PEIR on the route of the pipelines, the location of construction compounds (including for HDD facilities), and methods or duration of construction. to enable us to understand the potential impacts on our operations. As a result, we are not able to understand from the PEIR the potential impacts on our operations and due to this lack of detail we cannot provide comments other than we are extremely concerned by the oversight in the scope of the PEIR in relation to the port and shipping, including inbound/outbound road freight connections. We urge you to address this additional detail urgently and consult before you make a DCO application. The port of Teesside is a nationally significant facility, as is the provision of freight services into the UK through the port. Impacts on port users must be properly scoped and assessed; and sufficient detail of the project	The Applicant has engaged with CLdN RoRo SA (CLdN) to explain how their feedback has been taken onboard and also to provide more details about the proposed river crossing. Following the meeting CLdN have confirmed to the Applicant that the reduced order limits have now allayed CLdN's concerns. CLdN have also expressed their desire to stay engaged with the Proposed Development going forward and the Applicant will take note of this.	

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		needs to be supplied in order for us to identify and understand potential impacts, and how to avoid and mitigate these.		
STDC Teesworks	26/10/23	STDC Teesworks H2Teesside Project S42 Consultation Thank you for inviting our client, the South Tees Development Corporation (STDC), hereafter referred to as 'Teesworks', to comment on the documents issues as part of the statutory consultation in respect of the Development Consent Order (DCO) being prepared for the H2Teesside Project ('the Project') Teesworks has engaged both Lichfields and legal advisors to review the published material on our behalf. Both are experienced with the DCO process and understand the objectives of Teesworks to deliver this nationally significant regeneration opportunity. First and foremost, Teesworks wishes to reiterate its in-principle support for the Project, which will be a significant generator of jobs, directly and indirectly into the Tees Valley and also a contributor to the regeneration of the Teesworks area, with investment in line with the industrial typologies that Teesworks seeks to attract. Teesworks wishes to work positively and proactively with bp to deliver the Project. We also issued a response to the EIA Scoping Report on 9 May 2023 for the Project. There are on-going discussions with bp in respect of the arrangements under which Teesworks will make available land in its ownership which is required for the Project. At this time, the commercial terms on which Teesworks will enable the delivery of the Project on its land are yet to be finalised but negotiations are proceeding on the basis of a leasehold arrangement over an initial period of 30 years (subject to options to renew for up to a maximum of a further 30 years). Whilst we are committed to working collaboratively with bp, we are concerned at the lack of detail currently available in the consultation documentation. In particular, we are concerned about the extent of land required for the Project and principally, its hydrogen pipeline corridor and how this land is to be secured through the DCO process. It was Teesworks expectation that this detail and clarity as to land requirements would have been available at this stage.	**H2Teesside Project S42 Consultation** The Applicant considers that its approach to statutory consultation was robust. This is explained further in the main Consultation Report. Additional details of the Proposed Development and associated assessments that have been undertaken have been reported within the Environmental Statement (EN070009/APP/6.2). **The DCO application boundary ("the Order limits")** At the time of submission of the PEIR, design development of the Proposed Development was underway and as such a worst case scenario was assessed. We can confirm the principles of the Rochdale Envelope (Chapter 2: Assessment Methodology, ES Volume I, EN070009/APP/6.2) have been applied in the undertaking of this Environmental Impact Assessment and every assessment broadly follows this, with any deviations clearly stated in each technical chapter as relevant. Further refinement and assessment has been undertaken since submission of the PEIR, this is presented in full in the Environmental Statement. The Order Limits have also reduced in a number of ways since statutory consultation as reflected on the Works Plans and Land Plans (total reduction of 840 ha). **Infrastructure and pipeline corridors** The Applicant has shared proposed pipeline routes with STDC/Teesworks and it is understood that all parties are now aligned on the approach. **Land powers** The Applicant is working with STDC/Teesworks to reach a voluntary agreement for the land required for the Proposed Scheme and good progress has been made. However, to ensure that the Proposed Development is able to be brought forward without impediment, compulsory acquisition powers over that land have been sought. As set out in the Statement of Reasons, there is a compelling case for	Yes

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		Unless such detail is prepared with Teesworks input and forms part of the DCO application submitted to the Planning Inspectorate (PINS), including sufficient protections for Teesworks' interests (eg protective provisions) we anticipate submitting an objection to the DCO examination in respect of bp's proposals. Clearly, Teesworks wish to avoid the need to make such an objection and hope to work with bp over the coming months to find a solution which facilitates the Project while being compatible with the aspirations for the Teesworks area. 'Section 42' Consultation We note that this statutory consultation has been undertaken under Section 42 of the Planning Act 2008. The material made available at this stage of consultation primarily comprises the Preliminary Environmental Information Report (PEIR). Government Guidance1 (para 93) explains that, for the pre-application consultation process, applicants are advised to include sufficient preliminary environmental information to enable consultees to develop ""an informed view"" of the project. We appreciate that, at this stage, the information made available for consultation will not be a draft of the DCO application. As explained in the guidance, however, the information ""must provide clarity"" to consultees as to the project. At this stage we expected that there would be fixed detail in respect of the proposed route corridors, locations, design and layout of the main elements, as well as the expected construction and operation procedures, set out in the PEIR. Crucially, at this stage, we expected to have been able to understand the developable area of the main facility, the associated infrastructure and pipeline corridors and, therefore, the proposed DCO application ""red line"" boundary (i.e. the Order Limits). We also need to understand the extent of land required to deliver the Project through its construction phase, including any temporary construction sites required within the overall Teesworks area and any material impact upon highway access points within the Teesworks area. Finally, we need to understand the nature, scope and location of any powers of compulsory acquisition and temporary possession proposed to be included in the DCO application. At this stage, the lack of information, particularly in respect of the final land requirements and red line boundary of the DCO application, raises serious concerns about the interface between the Project, existing and	these powers, and the Applicant is clear as to what each plot of land is required for, thus meeting the relevant statutory tests. **Sterilisation of necessary development land within the Teesworks site** It is understood that all parties agree that the land take proposals within the Order limits are appropriate to ensure that the mutual aim of decarbonisation facilities being able to be installed on this land are met and that there is no sterilisation of future development land. **Comments on the PEIR** Responses are provided on a topic-by-topic basis. **1.0 PEIR Chapter 3 - Existing Environment** Industrial use receptors are covered by Health and Safety regulations and would not normally be included in an EIA for air quality. Following this feedback the Northumbrian Water Bran Sands offices have been included as a receptor within the noise assessment, presented in Chapter 11: Noise and Vibration (ES Volume I, EN070009/APP/6.2). **2.0 PEIR Chapter 5 - Construction** A Framework Construction Environment Management Plan (CEMP) (EN070009/APP/5.12) has been submitted as part of the DCO Application, a Final CEMP will be produced in accordance with the framework prior to the construction of the Proposed Development, this will be secured via a Requirement in the Draft DCO (EN070009/APP/2.1). The Final CEMP will be developed in consultation with the relevant stakeholders at the time of production. The ES considers the scenario whether either STDC/Teesworks or the Applicant carry out the necessary remediation works. The location and uses of construction compounds can be found in Chapter 5: Construction Programme and Management (ES Volume I, EN070009/APP/6.2).	

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		planned development schemes within the Teesworks area and the overall delivery of Teesworks regeneration objectives, including the various planning permissions obtained by Teesworks for over 10 million square feet of business and industrial floorspace across its landholdings. Ultimately, should a DCO proceed with this uncertainty and generality in respect of the proposals, and particularly the land requirements, the proposals are at risk of being contrary to Local Plan policy and its Master Plan. The importance of the Master Plan and adherence to Local Plan policy was recognised by the Inspector who confirmed the Compulsory Purchase Order for STDC to acquire land including the Project site, in his report of April 2020, where he explained: ""The Master Plan aims to facilitate the comprehensive regeneration of the Order Lands and beyond. The Master Plan provides an overall development framework, both built and flexibility, which would enable the development of high quality regeneration across the Order Lands in the wider STDC area. The strategy is to provide a world class industrial park with a number of individual zones… The regeneration of the Order Lands will contribute to sustainable development and accord with national objective of building a strong, responsive and competitive economy."" Notwithstanding our overall support for the project, the statutory framework requires that we continue to object to any compulsory acquisition of Teesworks interests without its prior approval. We note that the Statement of Community Consultation makes reference to how the applicant has also taken into account bp's experience of pre-application consultation on the NZT application. Based on our experience on both schemes to date, further detail is required early in the DCO process. Our more detailed comments on this and other matters are set out below. Project Description Chapter 4.0 of the PEIR provides a description of the Project. It explains that the Project will be constructed in two phases, with a single hydrogen production unit, on-site hydrogen storage and supporting utilities would be constructed and commissioned first (Phase 1), with the second separate Phase 2 hydrogen production unit, on-site hydrogen storage and supporting utilities constructed thereafter. The H2 pipeline network will	The location of parking for site staff is covered provisionally in Table 5-2 (Chapter 5: Construction Programme and Management (ES Volume I, EN070009/APP/6.2)) and will be confirmed in detailed design pursuant to the Final CTMP. The location of spoil storage will be within the Order limits and outside of Flood Zone 3, as confirmed in Chapter 5: Construction and Programme Management (ES Volume I, EN070009/APP/6.2). All land required to facilitate the construction of the Proposed Development is included within the finalised Order limits as presented on Figure 4-1 (ES Volume II, EN070009/APP/6.3). Figure 4-4: Hydrogen Pipeline Corridor (ES Volume II, EN070009/APP/6.2) and the Indicative Hydrogen Distribution Network Plans (EN070009/APP/2.10) show the areas of the Hydrogen Pipeline Corridor that will be constructed using trenchless technologies. **3.0 PEIR Chapter 6 - Alternatives and Design Evolution** This response is noted. Consideration of alternatives in regards to the Connection Corridors is included within Chapter 6: Need, Alternatives and Design Evolution (ES Volume I, EN070009/APP/6.2). **4.0 PEIR Chapter 7 Planning Policy** The Applicant has considered national and local planning policy in detail within the Planning Statement (Document Ref. 5.2) and the Planning Statement – Policy Assessment Tables (Document Ref. 5.2.1). Applications for development consent must be determined in accordance with the relevant National Policy Statements. Local development plan documents can be relevant to decision on such applications and such policy has been considered. **5.0 PEIR Chapter 8 - Air Quality** Regarding air quality, locations of exposure are selected to capture places of public exposure and locations of designated habitats. Places of work are not included within the air quality assessment as	

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		be constructed and completed to facilitate transportation of hydrogen to offtakers. The PEIR assesses the construction, commissioning, operation and decommissioning phases. It is noted that Phase 1 will include the construction of the majority of the hydrogen pipeline, except for short additional spurs of hydrogen pipeline which will be constructed as part of Phase 2. Paragraph 5.2.9 of Chapter 5 of the PEIR explains that the construction programme set out in Table 5-1 is adopted on the basis that the construction activities would take place ""following site preparation and remediation works to be undertaken by Teesworks in advance of site handover"". Notwithstanding this, Table 5-1 then includes a row setting out the timing of the enabling works which will take place as part of the construction programme for the Project. Paragraph 5.2.10 and 5.3.4 state that demolition, site preparation and remediation works on the Main Site will be undertaken by Teesworks before the commencement of construction of the Project on the Main Site, with the landowner obtaining all necessary consents and permits. Paragraph 5.3.4 sets out the scope of works which the applicant has concluded will be undertaken by Teesworks during the site clearance and remediation phase. Paragraph 5.2.12 states that the ES (as defined in Appendix 1.0 of this letter) for the Project will include an assessment of the likely significant effects of undertaking the required 'enabling works' on the Main Site, including targeted remedial works. There is therefore considerable inconsistency within Chapter 5 of the PEIR and it is not clear whether enabling works fall within the construction phase of the Project or whether it falls outside the scope of the proposed application for development consent. Para 5.3.3 states that site construction power may be provided by Teesworks. In respect of the electrical connection corridor, paragraph 5.3.53 of the PEIR states that the Project would connect to the grid at an existing substation, at Teesworks or the NZT electrical connection and that there is also potential to connect at other substations locally such as at Lackenby and Grangetown. We note that the Scoping Opinion dated 17 May 2023 in respect of the Project states The ES should make clear the scope and status of the consent for site remediation, as well as the timescales for the works, and a	air quality in these locations is managed separately via occupational exposure legislation. Noted, consistent terminology has been utilised throughout the Environmental Statement (ES Volume I, EN070009/APP/6.2) when describing the different components of the Project. The air quality assessment presented in Chapter 8: Air Quality of the Environmental Statement (ES Volume I, EN070009/APP/6.2) including Appendix 8B which explains the operational assessment methodology identifies the acceptability of the final stack height and provides information on how this has been determined. All PEIR documents have been reviewed and updated following further design refinement of the Proposed Development. As part of this the inconsistencies highlighted in this response have been taken into account during the production of Chapter 8 (ES Volume I, EN070009/APP/6.2), Chapter 12 (ES Volume I, EN070009/APP/6.2) and the Non-Technical Summary of the Environmental Statement (EN070009/APP/6.1). **6.0 PEIR Chapter 9 - Surface Water, Flood Risk and Water Resources** The assessment undertaken at the PEIR stage has been updated within Chapter 9 (Surface Water, Flood Risk and Water Resources of the Environmental Statement (ES Volume I, EN070009/APP/6.2) based on the latest Proposed Development design. This assessment indicates a single temporary significant adverse effect to watercourse morphology with regard to the open-cut crossing of Holme Fleet to facilitate the installation of the Hydrogen Pipeline. This would be temporary with complete recovery expected of the watercourse morphology within 5 years. Changes in water quality relating to operational discharges have been modelled both for the Proposed Development alone and in combination with the NZT project (see Appendix 9B: Water Quality Modelling Report, ES Volume III, EN070009/APP/6.4) and indicates that there would be no significant adverse effect to Tees Bay. Potential impacts on water quality relating to surface water runoff has been assessed in Chapter 9 (Surface Water, Flood Risk and Water Resources (ES Volume I, EN070009/APP/6.2), including assessment	

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		clear description of how and at what point the baseline has been defined for the purpose of assessment.... The ES should include an assessment of any likely significant effects arising from site clearance and remediation works, for which powers are sought within the dDCO and confirm how this is to be secured. The ES should include information about works required to facilitate development that is proposed outside of the DCO application, including their scope and extent, status of any relevant consents required, timescales and degree of certainty bp has, however, reached no agreement yet with Teesworks as to how the first phase of Project is to be delivered and who will carry out the site preparation works in readiness for the construction phase. Similarly, no agreement is in place in respect of electrical connections or power. None of the detail referenced as being required within the Scoping Opinion has been made available to Teesworks, nor has it been discussed. Teesworks is committed to working with bp to agreeing the approach to site preparation - responsibilities, timescales and consenting processes. At this time, however, bp's expectation that the land will have been subject to preliminary preparatory works before it takes possession is only an assumption. It is not, therefore, appropriate for the DCO application to proceed without clarity on this matter and particularly to proceed on a basis that the site preliminary works should not form part of the DCO application. If those works are indeed to be excluded from the DCO, there should be greater clarity as to what consents for those preliminary works (ie planning permissions and / or prior approvals) are to be sought / implemented and who will be responsible for such. To that end, Teesworks hope to reach an agreed position with bp before submission of the DCO application. "The DCO application boundary (""the Order limits"") The PEIR explains that the ""Rochdale Envelope"" principals are being applied when undertaking the Environmental Impact Assessment, in order to assess the maximum parameters for those elements of the Project where flexibility needs to be retained in the DCO, so as to account for design evolution and finalisation. This is a reasonable, and widely adopted approach that Teesworks supports. However, the consultation material is vague in terms of a proposed Order limits (the DCO application ""red line"" boundary) and land take expectations and we comment as follows." Infrastructure and pipeline corridors	of the proposed SuDS treatment trains in line with CIRIA C753 The SuDS Manual (i.e. the Simple Index Approach), to ensure no adverse impact to receiving water features. A Flood Risk Assessment has been included with the DCO Application (Appendix 9A: Flood Risk Assessment (FRA) (ES Volume III, EN070009/APP/6.4) and takes into account the latest drainage arrangements for the Proposed Development. The drainage arrangements will be finalised at the detailed design stage and STDC Teesworks will be consulted with regard to the design development. The presence of historic drains will be determined at the detailed design stage and appropriate drainage arrangements made to ensure no increase in flood risk. STDC Teesworks will be consulted with regard to the further design development of the drainage design, particularly as it is anticipated that STDC Teesworks infrastructure may be utilised as part of it. Noted. Further details are given in Appendix 9A: Flood Risk Assessment (ES Volume III, EN070009/APP/6.4). **7.0 PEIR Chapters 10 - Geology, Hydrogeology and Contaminated Land** A Framework Construction Environment Management Plan (CEMP) (EN070009/APP/5.12) has been submitted as part of the DCO Application, a Final CEMP will be produced in accordance with the framework prior to the construction of the Proposed Development, this will be secured via a Requirement in the Draft DCO (EN070009/APP/2.1). The Final CEMP will be developed in consultation with the relevant stakeholders at the time of production. **8.0 PEIR Chapter 11- Noise and Vibration** The construction noise and vibration assessment has been updated for the Environmental Statement (ES Volume I, EN070009/APP/6.2) based on updated construction plant and information. Best practice measures to control construction noise are detailed in Appendix 5A: Framework Construction Environment Management Plan (CEMP) (ES Volume III, EN070009/APP/6.4) and secured via a Requirement in the draft DCO (EN070009/APP/2.1).	

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		The figures accompanying Chapter 4 (Figure 4-2--4-8) of the PEIR indicate that while there has been some refinement of the red line boundary from the EIA Scoping Report stage, an extensive area is still under investigation. Chapter 6 of the PEIR explains that the optionality in the routing of the hydrogen pipeline corridor still includes several options for crossing the River Tees, with the choice of routing in this location dependent on the construction methodology selected. Chapter 6 goes on to explain that the proposed construction methodologies is subject to ongoing design work, discussions with landowners and statutory consultation and is being informed by sensitive receptors, constraints and surveys. It is noted that where possible, existing established pipeline routes will be utilised and or the least intrusive construction method utilised, with the final design outlined in the ES. Teesworks was expecting to see greater refinement of the pipeline corridors within the statutory consultation material given the impact that this element of the Project has on: -land requirements; -the ownership and control of the land required; and -the subsequent accessibility and developability of adjacent land. It is pertinent to note that at the time of writing, no discussions have yet taken place between bp and Teesworks over the pipeline corridors. The consultation material indicates that bp intends to submit its DCO application in spring 2024. Teesworks therefore looks forward to progressing swift, detailed and progressive discussions with bp over the coming months so that adequate design iteration and refinement of the land take required for the Project can be concluded. Such agreement would result in the application adequately identifying the effects of the Project on Teesworks land and its regeneration objectives. Further iterations of the design will enable a reduced red line boundary which Teesworks is keen to ensure so as to give certainty as to the Projects impacts on landtake requirements. Conversely if this does not take place the application would maintain too much flexibility and un-certainty such that the impacts cannot be properly tested. Land interests could also be adversely affected to the detriment of delivering the wider regeneration plans for Teesworks. Chapter 4 notes that where the construction methodology is unknown, the worst case will be assessed. However, such an approach will lead to	Following your feedback the Northumbrian Water Bran Sands offices have been included as a receptor within the noise and vibration assessment, presented in Chapter 11: Noise and Vibration (ES Volume I, EN070009/APP/6.2). A Communication Strategy relating to piling and vibration will be included in the Final CEMP. **9.0 PEIR Chapters 12 to 14 - Ecology and Nature Conservation** The Applicant is working to avoid or minimise potential effects on designated sites, to be removed from the RLB where possible. Effects on designated sites will be assessed within Chapter 12: Ecology and Nature Conservation (ES Volume I, EN070009/APP/6.2) and the report to inform the HRA (EN070009/APP/5.12 & EN070009/APP/5.13). The precise location, design and methodology required to construct the pipelines associated with the Proposed Development are provided in Chapter 4: Proposed Development and Chapter 5: Construction and Programme Management (ES Volume I, EN070009/APP/6.2). The Applicant welcomes the opportunity to work with Teesworks and other stakeholders and to potentially contribute to the delivery of their biodiversity strategy. **10.0 PEIR Chapter 15 - Traffic and Transport** The PEIR only included a cumulative assessment of Teesside Net Zero within Section 15.10. However, as part of Chapter 24: Cumulative and Combined Effects (ES Volume I, EN070009/APP/6.2) this has been updated and an assessment against the short list of developments has been included. This information from STDC/Teesworks has been helpful in developing this. This is covered within Appendix 15B: Construction Traffic Management Plan (ES Volume III, EN070009/APP/6.4) and Appendix 15C: Construction Worker Travel Plan (ES Volume III, EN070009/APP/6.4) as a potential measure for any final Contractor, with Chapter 15: Traffic and Transportation (ES Volume I, EN070009/APP/6.2) and Appendix 15A: Transport Assessment (ES	

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		uncertainty at the DCO application stage and Teesworks will not have the clarity it needs in respect of how its landholdings will be affected during the construction and operational stages. It is explained in the consultation material that third-party connections to offtakers will be the subject of separate consent applications. Whilst this creates some uncertainty as to the design and practical solutions for end-users' connections to the pipelines, it is nevertheless vital from our perspective that the DCO application proceeds with certainty as to the pipeline routes and the associated land requirements (both during construction and operation), stand-off distances required for health and safety reasons, and any ongoing easements required for maintenance access. Land needed for the Project We understand that bp will be seeking a DCO that confers powers for the compulsory purchase of land required to deliver the Project. In respect of the land now owned by Teesworks that could be required for the Project, however, we wish to emphasise Teesworks desire to work positively with bp to reach an agreement to enter into an initial 30 year lease arrangement and subsequent renewal options of up to a further 30 years. We expect such agreement to be explained in the DCO application, when it is submitted to PINS, and that bp will commit (in respect of Teesworks' land) not to exercise any compulsory acquisition powers against any of Teesworks, Teesworks Limited (TWL) and South Tees Developments Limited (STDL) and any future interests Teesworks may have so long as relevant commitments agreed within the lease option are adhered to. Notwithstanding Teesworks position, we make the following comments in respect of any case for compulsory purchase of land. As it stands, if the DCO application was to be submitted on the basis of the current extensive red line, there is no apparent sound basis on which any compulsory acquisition powers can be conferred on bp, through the making of the DCO, over land that may or may not be required for the routes of pipelines and utility infrastructure corridors. A DCO may include provisions authorising the compulsory acquisition of land only if the decisionmaker is satisfied that the land: - is required for the development to which the consent relates;	Volume III, EN070009/APP/6.4) assessing a worst case assuming no reduction on HGVS due to some material arriving by rail. **11.0 PEIR Chapter 23 - Population and Human Health** An assessment of electromagnetic fields is included in the Chapter 22: Human Health (ES Volume I, EN070009/APP/6.2), including an assessment of effects on existing workers within the area. Effects on human health during construction and operation have been assessed to be not significant. **12.0 PEIR Chapter 24 - Cumulative and Combined Effects** A full cumulative assessment has been undertaken and can be found in Chapter 23: Cumulative and Combined Effects (ES Volume I, EN070009/APP/6.2). This information from STDC/Teesworks has been helpful in developing this. We welcome any comments you have on the approach taken and the developments that have been shortlisted for full assessment.	

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		- is required to facilitate or is incidental to that development; or - is replacement land which is given in exchange for the Order land (under certain provisions). The land must, therefore, be demonstrated to be ""required"" with an obvious need for the stated purpose. Compulsory purchase cannot be justified merely on the basis that it would be convenient to acquire it in order to give flexibility to decide following the making of the DCO where to route the pipelines and corridors to best suit end-user connections. Crucially, without final, confirmed, pipeline routes and utilities connection corridors, and without reducing the red line boundary to incorporate only the land required for such (including their construction), Teesworks questions how a DCO could be made that includes provisions for the compulsory purchase of land necessary to construct and, thereafter, maintain, the pipelines and other utility infrastructure. It is, therefore, vital to the DCO process for the final routes of the pipelines and utility infrastructure corridors to be defined and for the boundary of the DCO to be amended and drawn back to those defined routes (accounting for the land required both in their construction and subsequent operation). This process must take place prior to the submission of the DCO application. Any corridors required by the Project must be suitable in respect of both: - compatibility with the delivery of the Teesworks Master Plan and the comprehensive regeneration of the wider Teesworks area: ensuring that under-utilisation and potential sterilisation of land from redevelopment for other employment-generating uses is avoided or reduced to an absolute minimum; and - health and safety and the appropriate locating of infrastructure, including high pressure pipelines in proximity to employment population. It is noted that permission will be sought from the Hazardous Substances Authority, Health and Safety Executive (HSE) and Local Planning Authority (LPA) for storage of hydrogen, under the Control of Major Accident Hazards (COMAH) and Hazardous Substance Consent regimes respectively. In all instances of confirming compulsory purchase powers, there must be a compelling case in the public interest for the land to be acquired compulsorily through a DCO. This test must be applied to each and every parcel of land to be acquired, not merely in respect of acquisition overall.		

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		To achieve that, bp will need to demonstrate that reasonable steps to acquire the land by negotiation / agreement have been taken, and that there are no reasonable alternatives to the land proposed to be acquired or used. It is critical that meaningful attempts are first made to acquire the proposed land by agreement but Teesworks is yet to see any evidence that such genuine efforts have been made. We take this opportunity to emphasise Teesworks' intention to facilitate the Project on land in our ownership (or that of TWL or STDL) through a long lease arrangement, the commercial terms of which are currently yet to be drawn up. It is not our intention to relinquish the freehold ownership of the site and we expect to conclude a necessary lease arrangement through negotiation. Sterilisation of necessary development land within the Teesworks site Unless and until the red line boundary of the DCO is tightened to incorporate only land that is agreed to be required for the construction and operation of the Project, including the pipeline and infrastructure corridors, we raise significant concerns that the Project has the potential to lead to the under-utilisation or sterilisation of large tracts of land within the Teesworks area that are planned to deliver high quality industrial developments in a comprehensive manner, which in turn ensures efficient use of the land for maximum economic and social benefits. The routing of pipelines and infrastructure associated with the Project must be done in a manner that does not stymie the delivery of these objectives. In addition to incorporating proposed development plots for industrial end-uses (for which outline planning permissions have been granted to Teesworks), the red line boundary takes in the following assets essential to the regeneration of the area, as well as highly sensitive, constrained land: -Railway lines (the Darlington to Saltburn line); -Overhead power lines; -Below ground utilities corridors and substations; -The internal and arterial road network; -Sections of the River Tees; and -Environmentally sensitive areas (Special Protection Areas (SPA) and Sites of Special Scientific Interest (SSSI) and National Nature Reserved (NNR) immediately adjacent to the project. Comments on the PEIR		

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		In Appendix 1.0 to this letter, we comment in detail on certain aspects of the PEIR on a chapter by chapter basis. In summary, and in addition to the comments set out above, these relate to: -Inclusion of all sensitive receptors within the Teesworks area in assessments where necessary, including in respect of air quality and human health; -Teesworks' requests to be involved in the preparation of any Construction and Environmental Management Plan (CEMP) and that the CEMP contains a communications strategy and an agreement to notify surrounding businesses in advance of certain construction activities; -Confirmation of the temporary location(s) of any construction compounds, parking provision, and materials storage during the construction phase; -The robustness of the consideration of alternatives, particularly in the absence of determining the routes and corridors of pipelines and utility infrastructure; and -The risk of non-compliance with Planning Policy, in respect of the comprehensive regeneration of the Teesworks area and the need to avoid development that has the potential to stymie or prevent further phases of development. -The opportunity to review draft strategies for both the temporary and final drainage schemes for the construction and operational phases to ensure no adverse effects in relation to drainage, flooding or water quality across the wider Teesworks area; -The need to assess the impact of noise or piling during the construction or operational phase on occupiers of the Teesworks area; -The opportunities to mitigate and compensate for loss of biodiversity value through the use of the Environment and Biodiversity Strategy that Teesworks is currently updating and its desire to work with bp to account for the Project in this Strategy to its benefit; and -The omission of projects (subject to planning permissions or current planning applications) in or close to the Teesworks area, that should be accounted for in any cumulative assessment carried out as part of the ES. Summary and Way Forward There are clearly aspects of the Project requiring greater detail, clarity and amendment prior to the submission of a DCO application, none more so than the red line boundary and extent of land required for constructing and operating the Project, particularly its pipeline routes and infrastructure corridors.		

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		We therefore consider it is imperative for bp to hold targeted, consultation with Teesworks (and other landowners whose land is within the finalised Order limits) with urgency and to allow an appropriate period for responding prior to the submission of draft DCO documentation to PINS. It is hoped that the finalisation of the pipeline routes / infrastructure corridors and corresponding reduction in the red line boundary will give sufficient clarity to enable Teesworks to fully understand and assess the impacts of the Project and to be satisfied that there would be no unacceptable implications on the overall comprehensive regeneration of the Teesworks area. Should this be the case, and commercial and land agreement is reached on a 30 year lease arrangement as described earlier, then Teesworks would expect to be a position to fully support the DCO application. Many thanks again for consulting Teesworks at this stage. Teesworks look forward to working with you to resolve its concerns and to support you in delivering this important project. Thank you for inviting our client, the South Tees Development Corporation (STDC), hereafter referred to as ""Teesworks"", to comment on the documents issued as part of the statutory consultation in respect of the Development Consent Order (DCO) being prepared for the H2Teesside Project ('the Project'). **Annex 1: Detailed comments on Preliminary Environmental Information Report** **1.0 PEIR Chapter 3 - Existing Environment** 1.1 It is noted that this chapter lists the sensitive receptors relevant to the forthcoming Environmental Statement (ES), which have been identified within and outside of the site boundary. The sensitive receptors relate to residential properties and ecological designations. However, the existing industrial uses within the Teesworks Masterplan area have not been included, such as the Northumbrian Water Bran Sands Regional Effluent Treatment Works, whereby workers could be sensitive to air-borne pollutants or the buildings / equipment / plant could be sensitive to vibration. 1.2 We request that all sensitive receptors within the masterplan area be considered in the scoping of the ES. 2.0 PEIR Chapter 5 - Construction		

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		2.1 It is explained that a six year construction phase is anticipated commencing shortly after any DCO is granted in Q2 2025, with operation of Phase 1 in Q1 2028 and Phase 2 commencing in Q4 2030. 2.2 It is estimated that there will be a peak construction workforce of up to 1,300 people per day for both Phase 1 and Phase 2. Construction staff are anticipated to travel via the existing trunk road and local networks. The PEIR sets out that at this stage it is assumed that all construction HGVs associated with the Main Site would arrive/depart the site from Tees Dock Road via the A1053/A66/Tees Dock Road roundabout; 2.3 During the peak month, the volume of construction HGVs on the network is predicted to be 1,330 (730 and 600 of these are associated with the Main Site and Connection Corridors respectively). This equates to 67 per day (rounded from 66.5) based on 20 working days per month (37 and 30 of which are associated with the Main Site and Connection Corridors respectively). 2.4 Abnormal loads are to be delivered via the highway network or by boat via the existing Redcar Bulk Terminal or using the roll-on / roll-off facilities at Teesport. 2.5 We note that a Construction Environmental Management Plan (CEMP) will be prepared prior to construction and a framework CEMP will be prepared as part of the Environmental Statement. Teesworks supports this approach and considers it important that we are centrally involved in the preparation of any CEMP and have the opportunity to input into it prior to its finalisation. 2.6 Other matters of detail, relating to the practical delivery of the Project, on which we request clarification and further details of are as follows: -The location and extent of any construction compound(s); -The location and extent of any parking for site staff, HGVs and any abnormal vehicles; -The location of any spoil / soils to be stored during (and following) construction 2.7 It is assumed that the final DCO red line boundary will include all the land that will be required on a temporary basis during the construction process. We welcome confirmation that this is the case. 2.8 Paragraph 5.3.32 of the PEIR advises that Trenchless methods (such as HDD and micro-tunnelling) are being considered for the crossing of the River Tees and Greatham Creek due to their environmental sensitivity. Trenchless crossings are also being considered for railways, roads and utilities infrastructure (by HDD). 2.9 A specific area will need to be developed for the trenchless technologies as additional land will also be temporarily required either		

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		side of the trenchless crossings to allow for movement of additional plant. We request that the location of this land be confirmed. 2.10 As set out in the main body of our response, Chapter 5 of the PEIR advises that before the applicant takes possession of the site, preliminary works will be required which will not form part of the DCO application. 2.11 Until discussions have progressed further with Teesworks, in order to agree the terms on which the Project is to be delivered on its land, the applicant should not assume (for the purposes of assessing the impacts of the development proposal) that preliminary site preparation works will be consented separately to the DCO. Teesworks look forward to reaching agreement on this matter with bp. **3.0 PEIR Chapter 6 - Alternatives and Design Evolution** 3.1 The Project includes an appropriate degree of flexibility in the dimensions of buildings and structures to allow for the selection of the preferred technology and contractor. As such, a maximum built 'envelope' has been defined to accommodate the necessary flexibility and to enable the effects of the Project to be assessed on a 'worst case' basis within the ES. Teesworks supports this approach in respect of the Main Site of the project. 3.2 Teesworks also supports the conclusion to progress with Main Site A as the preferred site and recognises the benefits locating the Project directly adjacent to the Northern Endurance Partnership onshore facilities and simplifying the connection corridor. 3.3 However, consideration of alternatives in respect of other elements of the Project, namely the pipelines and connection / utilities corridors have not, we feel, been subject to a satisfactory level of consideration. 3.4 We request that bp give full and proper consideration to the existing and proposed new connection corridors, as part of the exercise to refine and finalise a reduced DCO red line boundary. **4.0 PEIR Chapter 7 Planning Policy** 4.1 The statutory development plan policy is summarised in this chapter, together with nonstatutory supplementary development principles and priorities for the South Tees area, set out in the South Tees Area Supplementary Planning Document (SPD), May 2018. The SPD is a material consideration in the determination of applications for development proposals and expand upon policies in the Redcar & Cleveland Local Plan, particularly Policies LS4 (South Tees Spatial Strategy) and ED6 (Promoting Economic Growth).		

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		4.2 Development Principle STDC1 provides a series of priorities for the South Tees area in line with the SPD's Vision and Objectives. It also sets out the aim of resisting piecemeal development of the South Tees Area where it would conflict with the comprehensive redevelopment of the area. At paragraph 3.2 of the SPD it is explained that: ""The overarching principle of this SPD is to deliver the comprehensive redevelopment of the South Tees Area that will create an exemplar world class industrial business park, realising the vision for the South Tees Area"" 4.3 It is important that the Project is sufficiently defined so as to avoid the stymying of redevelopment opportunities. The need to identify the required pipelines and infrastructure corridors and to tighten the DCO red line boundary accordingly, should ensure compliance with the development principles set for the area in the SPD, including at Development Principle STDC2, where it is set out that: ""The Council will, in partnership with the STDC, promote a comprehensive approach to development within the South Tees Are. Development that has the potential to stymie or prevent further phases of development, or to reduce the market demand for land to be taken up, and/or to adversely affect the ability to provide infrastructure essential to the delivery of later phases of development / occupation, will be resisted."" 4.4 We reiterate Teesworks desire to work with bp to identify suitable corridors for all pipelines and utility infrastructure required to serve as part of the Project, so that they are located where they are compatible with the delivery of the Master Plan and the comprehensive regeneration of the wider Teesworks area, avoiding under-utilisation and potential sterilisation of land. **5.0 PEIR Chapter 8 - Air Quality** 5.1 We note that the assessment identifies no significant effects from air pollutants 5.2 A preliminary operational assessment for the Production Facility has predicted that air quality effects on human health receptors are not significant. As the design progresses and when additional information becomes available, further air quality modelling would be undertaken during the EIA. Subject to further air quality modelling, it is predicted that air quality effects on nearby ecological receptors during the operation of the Project are likely to be significant. 5.3 The Air Quality chapter has not assessed any human health receptors within the immediate surrounding area, including adjacent Teesworks		

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		lands. Instead it has only considered human health receptors within the wider area that lies outside the Teesworks surrounding area. We request that the potential effects from air pollutants on employees within the surrounding area are assessed, including workers therein; 5.4 Chapter 4 of the PEIR sets out at paragraph 4.8.4 that the flare will be the tallest element of the Project, with a maximum height of 100m for the flare being considered. Chapter 8 of the PEIR refers to 'stack height', stating dispersion modelling has been undertaken to determine the optimum stack heights at the current stage of design. We request that consistent terminology is used throughout the ES for each of the components of the Project to aid the readers understanding of the Project and how it will affect sensitive receptors. 5.5 Notwithstanding our comments above in respect of the need to identify human health receptors within the immediate surrounding area (including the wider Teesworks lands), the PEIR advises that a stack height of 100m would result in non-significant impacts on human health receptors. Chapter 8 advises that final stack height for the operational proposed development is still to be determined; however, the results reported in this assessment are considered to be associated with the lowest stack height that could be used, if the maximum building heights used in the assessment are representative of the final design, and therefore represent a worst case. We trust it will be a requirement of the DCO that a further assessment will be undertaken once the stack height is determined to ensure that there would be no adverse effects on human health. 5.6 In respect of ecological receptors, para 8.9.5 of Chapter 8 states that the air quality effects during operation on nearby ecological receptors requires further evaluation in the ES and that the significance of the effects for daily NOx, nutrient nitrogen and acid deposition will be discussed in Chapter 12: Ecology and Nature Conservation of the ES. However the Non Technical Summary of the PEIR states that it is predicted that air quality effects on ecological receptors during the operation stage are likely to be significant and that further evaluation will be undertaken in Chapter 12 of the ES and the Habitat Regulations Assessment. There is some discrepancy in presentation between the two documents and the likely significance of the effects. It is imperative that this is addressed within the ES and that the ES and Non Technical Summary remain consistent in terms of the detail provided and the significance of the effects of the Project on the environment.		

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		6.0 PEIR Chapter 9 - Surface Water, Flood Risk and Water Resources 6.1 The chapter identifies the potential for a localised and potential temporary Moderate Adverse (significant) effect on the hydromorphical status of Belasis Beck as a result of open cut installation (which is considered as a worst case). With the implementation of mitigation measures through the CEMP and associated Water Management Plan (WMP), no other significant effects during construction have been identified. 6.2 Changes in water quality within the Tees Coastal waterbodies from operational discharges have been predicted to have a potential moderate adverse (significant) effect due to the very high importance of these receptors for water quality. This will be re-evaluated during the EIA when more details regarding effluent quality and water treatments are available. If required, mitigation measures would then be identified. 6.3 With the implementation of a Surface Water Drainage Strategy, a Pollution Prevention Plan, Emergency Response Plan, a Surface Water Maintenance and Management Plan and measures outlined in the Preliminary Flood Risk Assessment, no other significant effects are predicted for surface water, flood risk or water resources during Proposed Development operation. 6.4 We note that Chapter 9 explains that the surface water drainage strategy remains under development but that it is expected that surface water drainage will discharge to Tees Estuary via Dabholm Gut or Tees Bay. There are three options for this route: 1) direct feed to Dabholm Gut (with any new pipework and outfall to be consented under a subsequent planning application); 2) discharge via the existing Bran Sands discharge pipeline (but not requiring treatment at Brans Sands WwTW as this is surface water runoff); or 3) discharge via the NZT outfall. 6.5 We request the opportunity to review draft strategies for the drainage scheme. This is to ensure that there would be no adverse effects in relation to drainage, flooding or water quality across the Teesworks area and to ensure that the drainage strategy does not impact on the delivery and implementation of Teesworks Environment and Biodiversity Strategy 6.6 We trust that full due diligence will take place to make sure that there are no historic drains within the Teesworks area which could be affected		

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		by the Project and which could result in flooding elsewhere across the Teesworks area. 6.7 We are pleased to note that a Flood Emergency Response Plan is to be prepared. We request to be consulted further on this Plan so that we can input into and fully understand how the site would be evacuated should there be a flood warning. **7.0 PEIR Chapter 10 - Geology, Hydrogeology and Contaminated Land** 7.1 During construction, there is the potential for the mobilisation of contamination, changes to hydrogeological regimes and changes to surface water quality and quantity. This chapter identifies that the impacts will be managed by appropriate construction mitigation measures (which will be outlined in the CEMP)) and as such no significant adverse effects are anticipated. 7.2 Again, we would reiterate Teesworks desire to be involved in the preparation of a draft CEMP. **8.0 PEIR Chapter 11- Noise and Vibration** 8.1We note that during construction, vibration would likely occur for short periods, as piling would likely be required for some of the main structures. During construction, no significant noise effects are predicated, provided that best practice measures to control construction noise are implemented, and we welcome the confirmation that this will be a requirement of the DCO. 8.2During operation, the assessment has concluded that with the specification of additional mitigation measures associated with the construction, operation and decommissioning of the Project, noise and vibration effects can be reduced to non-significant levels. 8.3We note that the sound emission data will be used to inform the noise control measures to be applied in the Project and it is important that these measures are set out in the draft requirements in the DCO when prepared in draft ahead of its submission to PINS. 8.4 However, this chapter does not assess the impact of noise or piling during the construction or operational phase on occupiers of the Teesworks area. None of the noise sensitive receptors identified on Figure 1 of Chapter 11 are located within Teesworks. We request that this		

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		chapter includes such an assessment, particularly given that vibration is known to damage buildings. It is important to ensure that there would be no adverse effects from vibration on the operations of existing and committed new business premises in the Teesworks area. 8.5 We request that the CEMP contains a communications strategy and an agreement to notify to the surrounding businesses in advance of any piling or vibration creating activities. This will ensure that users within the immediate area are aware of the nature and duration of the activity. **9.0 PEIR Chapters 12 to 14 - Ecology and Nature Conservation** 9.1 The predicted effects of the development on ecology is considered in three chapters in the PEIR: Ecology and Nature Conservation, Marine Ecology and Ornithology. 9.2 The preliminary assessment indicates that the Project construction activities have the potential to generate a range of potentially significant adverse effects on a range of ecological habitats, including designated and non-designated sites, as well as protected species. 9.3 We note that engagement is ongoing with Natural England and further work is taking place to seek to reduce the impacts and to restore habitats. It will be important to refine and reduce down the extent of the red line boundary of the DCO, including the extent of land located within designated sites (including the Teesmouth and Cleveland Coast Ramsar, SSSI and SPA), and national and local wildlife sites. 9.4 A precise location, specification and construction method of the required pipelines through these areas will be important to accurately complete the necessary Habitat Regulations Assessment. 9.5 Teesworks wishes to continue to engage with bp as the DCO application is progressed in readiness for its submission to PINS. In respect of ecology and biodiversity matters, Teesworks is developing an Environment and Biodiversity Strategy in partnership with key agencies including Natural England, the Environment Agency and RCBC. 9.6 The Environment and Biodiversity Strategy is, therefore, likely to bring benefit to the Project. We look forward to finalising the Strategy and sharing it with bp so that the opportunities for mitigation and		

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		compensation can be fully considered and hopefully incorporated into the requirements of the DCO. **10.0 PEIR Chapter 15 - Traffic and Transport** 10.1 We note the conclusion that no significant effects are identified during construction and operation on the highway network. During the peak month (month 17), the volume of construction HGVs on the network is predicted to be 1,330 (730 of which are associated with the Main Site, and 600 of which are associated with the Connection Corridors). 10.2 Only the Net Zero Teesside (NZT) development has been included in the committed development traffic however there are a number of development projects in the Teesworks area and immediately beyond that are not referred to in the PEIR and should be incorporated into cumulative assessments where necessary, including transport assessment, [projects then listed]. ...10.3 We would be pleased to assist bp in providing information in respect of those projects set out above which are led by Teesworks and to provide a programme as to their implementation for bp's consideration in any cumulative assessments completed within the ES. 10.4 We support the statement within paragraph 15.7.1 of the PEIR which states that: ""The contractors will also review the use of rail travel for construction staff accessing the Proposed Development Site potentially using the existing Redcar British Steel railway station (currently mothballed).”" We will support bp and seek to work with the rail operator to fully explore the feasibility of reintroducing services on the line. 10.5 We support the preparation of a Construction Workers Travel Plan and an operational Travel Plan. **11.0 PEIR Chapter 23 - Population and Human Health** 11.1 This chapter advises that the Project will incorporate embedded mitigation measures to avoid any significant human health effects. It is likely that all electrical and control system cables will be installed below ground or at ground level with no new overhead transmission lines proposed. Therefore, it is considered that with appropriate Proposed		

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		Development design, significant effects associated with Electromagnetic Fields will be avoided. We request that the effects on existing workers within the Teesworks area are included in the assessment. **12.0 PEIR Chapter 24 - Cumulative and Combined Effects** We note that Teesworks is included in the long list of sites to be considered cumulatively and that this list is to be reviewed to determine its status at the time of undertaking the ES. Teesworks would be pleased to assist bp to ensure that the assessment is comprehensive and accounts for all relevant projects including those planned in the Teesworks area that are the subject of planning applications or planning permissions.		
SABIC UK Petrochemicals Limited (SABIC)	26/10/23	SABIC UK Petrochemicals Limited Response to Section 42 Consultation H2 Teesside Development Consent Order (DCO) Application We are instructed by SABIC UK Petrochemicals Limited (SABIC) in relation to the above development. Introduction SABIC operates from two primary pieces of land at Wilton International (Wilton) and the North Tees site (North Tees). Its two main manufacturing sites are at Wilton: one, known as the Cracker (Cracker), manufactures ethylene; the second known as the LDPE Plant (LDPE Plant) uses some of that ethylene to make low density polyethylene. These facilities at Wilton are linked to the North Tees site via a Link Line Corridor and a tunnel under the River Tees. There are substantial logistical facilities at both sites, including major storage capacity, a cross-country Link lines network and substantial distribution and shipping services, as well as (at the North Tees site) three terminals and other storage facilities. Both the Wilton and North Tees sites are COMAH sites and as such SABIC is under a duty to take all necessary measures to prevent major accidents involving dangerous substances, and to limit the consequences to people and the environment of any major accidents which do occur. The COMAH designation is as a direct result of the large quantities of chemicals or substances of a hazardous nature, that are either manufactured or stored at these locations. In addition to the above SABIC is a major employer in the region, employing approximately 400 full time employees (with an additional 400 contractors) locally, and 31,000 persons globally. SABIC contributes £400	The Applicant has engaged with SABIC and will continue to do so in respect of the construction of H2Teesside, including any necessary further technical and design assessments. SABIC's concerns regarding navigation and detailed plans were discussed along with refined project information at a meeting on 21 November 2023. SABIC were also consulted on a revision to the Order Limits as part of the Applicant's December 2023 consultation where the Applicant had substantially reduced the SABIC land within the Order limits. The Applicant has also discussed pipeline routings and AGI locations in these meetings with SABIC and the parties have arrived at mutually agreeable positions. AGI locations within Wilton International and in North Tees were moved following feedback from SABIC to a mutually agreeable position. The Applicant has also significantly reduced the order limits involving SABIC's land interests following the consultation feedback and ongoing engagements with SABIC. The Applicant is also in discussions with SABIC regarding Protective Provisions. The Applicant has also noted SABIC's feedback regarding the below geographic areas: **Wilton** The Applicant's Proposed Development includes installation of the hydrogen pipeline only within the established corridors or routes in Wilton International. The Applicant has also discussed the pipeline	Yes

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		million to the local economy. As such it is very strongly in the public interest to protect SABICs interests and assets in the areas of the proposed DCO Application. Given the above, and the nature of the materials that SABIC manufactures and has control of, SABIC considers that in any DCO application it should essentially be treated as a statutory undertaker. It will therefore require protective provisions in its preferred form in order to be satisfied that the Application will not cause detriment to the carrying on of its undertaking. Protective provisions in favour of SABIC have been included in two recently made DCOs and are also being sought in relation to the Net Zero Teesside Project. SABIC would welcome discussions with the Applicant in relation to protective provisions to be included within the draft Order. General comments on the proposed Application SABIC has reviewed the relevant documents prepared for statutory consultation and notes the following: Insufficient detail has been provided to-date to enable SABIC to properly consider the full impacts of the Application on its assets and land due to the scale of the plans and the width of corridors which have been included on them. Where possible SABIC has included specific comments in this response, however SABIC requests further details and notes that the Applicant has offered a call to discuss these during the first two weeks of November. This is welcomed. The plans that have been provided for statutory consultation are not at a scale such that they are easily readable or possible to properly consider the impacts on the ground. SABIC notes that there are a number of parcels to be included in the Order Limits for which no explanation has been provided as to the rationale. A number of these are discussed below and SABIC would welcome a further discussion as to the extent of the SABIC land required for the Application. Specific issues with the proposed Application SABIC sets out below the specific issues with proposed Application, which are broken down into the relevant parcels in which SABIC has an interest, and which appear to be affected by the proposed Application, being: • Wilton; • North Tees; • Access to North Tees; and	routing within Wilton with SABIC before and it is the Applicant's understanding that SABIC has no objection to this pipeline routing. **North Tees** The Applicant takes note of SABIC's interests in North Tees and has discussed pipeline routing and AGI placement in North Tees with SABIC in an in-person meeting. **Access to North Tees** The Applicant has taken feedback from SABIC and others onboard and has been able to adopt trenchless crossing construction for Seal Sands Road, to avoid impacting traffic flows. The Applicant has also significantly refined the red line boundary near SABIC's cavity heads. **Tees and Pipeline Corridors** The Applicant has, following feedback and design development, been able to remove the Tunnel No 1 crossing location from the Order limits. The Applicant is seeking consent for building a new crossing either with Mirco-bored Tunnel or Horizontal Directional Drilling technique. As both of these techniques are trenchless in nature, there will be no impact navigability of the River Tees. The Applicant is looking forward continuing engagement with SABIC as the application progresses.	

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		• Tees and Pipeline Corridors. Taking each area in turn: Wilton Notwithstanding the need for further information, we understand that at the Wilton Site, hydrogen pipes will be placed in the Wilton site roads running to the north of, and down the access road to the west of SABIC's cracker. In addition we understand that hydrogen pipes will be installed within the pipeline corridor that runs along the eastern edge of the Wilton site. SABIC has interests in the pipeline corridor, including its own apparatus installed within that area. SABIC will require full protection for its assets. In addition, SABIC requires that access is maintained at all times to SABICs land interests within the area. This is an operational site for SABIC and it needs to ensure that it will have uninterrupted access at all times for ongoing operational and maintenance requirements. It should be clearly understood that any interruption to SABIC's supply or export pipelines would have a profound effect. The Cracker in particular cannot be turned on and off at the flick of a switch. It would require draining and resetting, which would be likely to take between two and three weeks. This would interrupt operations at the LDPE Plant which relies on the Cracker for supplies and cause loss of revenue, delays to the fulfilment of orders and reputational damage to SABIC. It is imperative, therefore, that adequate safeguards are put in place to prevent this from happening. Due to Wilton being a COMAH site, uninterrupted access at all times will be required for emergency services to ensure that there are no safety implications of the proposed scheme being carried out, and so that SABIC can continue to comply with its COMAH plan. Currently the Application plans appear to show that land used for SABIC's control centre is to be compulsorily acquired. We are not clear on why this land is needed or if further refinements can be carried out to the red line boundary in this area to reduce the land take, however this would be a serious concern to SABIC. SABIC would welcome further discussions with the Applicant in relation to the extent of land in SABIC's ownership required by the proposed Application. SABIC reserves its position in relation to the extent of land required in which it has an interest until further details and better quality plans have been provided. In any event SABIC will require protective provisions as discussed earlier in this letter placing restrictions on the compulsory acquisition of its land and rights.		

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		North Tees We note that the plans appear to show that part of the access to SABIC's plant at the North Tees Site is included in the red line boundary. This appears to encroach on the fence line along SABICs boundary. This site is a COMAH site, as well as being a bonded warehouse. SABIC has responsibilities under its COMAH plan to ensure the safety and security of the site. In addition SABIC has responsibilities to HM Treasury to ensure the safety of the goods held in the bonded warehouse which have not yet been subject to excise duties. The goods held in this warehouse consist of fuels and the removal of any fence in this location would create a risk of unauthorised third parties entering a restricted site, and give rise to risks including to health and safety. If the fence line is included in the proposed Application, and is ultimately removed by the Applicant, SABIC may have to take steps to re-install fencing in this area on the grounds of health and safety, and security. SABIC also needs to ensure that uninterrupted access at all times to its site is maintained for ongoing operational needs, but, as discussed above, so it can continue to comply with its COMAH plan. Continued access would be required at all times for emergency services. Due to these risks SABIC considers that the Order limits should be drawn back beyond its fence line and would therefore welcome further discussions on this point. Access to North Tees We understand that it is proposed that the hydrogen pipeline will be installed within the highway that forms the access to the North Tees site (or its verge). SABIC needs to ensure that uninterrupted access at all times to its site is maintained for ongoing operational needs, and for emergency services, and so that it can continue to comply with its COMAH plan. SABIC would therefore be concerned about any powers in the DCO which provided for the stopping up or temporary closure of these roads. SABIC owns the reservoirs west of Seaton Carew Road and would need to maintain access to these at all time, as well as uninterrupted flow of water to and from this site. In addition, the land that is to be acquired south west of Greatham Creek includes substantial SABIC assets including through the cavity heads and the Brine reserves, and is a COMAH site. We are concerned that the Applicant will be looking to carry out works in an area of high industrial use and where live operations are ongoing. As a general comment the Order limits are drawn very widely at this location,		

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		and it would be important that any order limited the land take in this location to the minimum necessary and also avoided interrupting these operations. Further discussion with the Applicant on this point would be welcomed and SABIC will require protective provisions in order to protect its apparatus in this location. Tees and Pipeline Corridors We understand that the Applicant is proposing to install a hydrogen pipeline within the pipeline corridor that leads to Tunnel No.2 and then alongside Tunnel No. 1. The plans appear to include both tunnels within the Order limits, but it is not clear whether the Applicant is considering using these Tunnels for the scheme. Because Tunnel No. 1 requires significant upgrades to get this up to an appropriate condition, Tunnel No. 2 does not have much capacity for any further installations. SABIC notes the reference in the consultation documentation to the use of a micro-bored tunnel for crossing the river and the statement that that it appears that no dredging of closures to navigation would be required. However further clarity is required in relation to the use of horizonal directional drilling and the potential impacts of such operations on the existing Tunnels and pipelines. SABIC would be concerned about any proposals contained in the DCO to interfere with navigation. SABIC relies on navigation on the Tees being available, reliable and predictable in order to bring in the supplies it needs for its operations, and to export its products to purchasers. SABIC would welcome further discussions around this area and the Applicant's proposed plans for this location. We look forward to further discussions on the proposed Application in the coming weeks, including receipt of further clarity on the Applicant's proposals as set out above.		
BOC Limited	27/11/23	Fieldfisher LLP on behalf of BOC Limited ("BOC") Proposed application by H2 Teesside Limited (the "Applicant") for an Order Granting Development Consent for the H2 Teesside Hydrogen Project (the "Application") We have been instructed by BOC to advise them in relation to the Application.	The Applicant has engaged with BOC in relation to H2Teesside and has discussed various matters including that of Protective Provisions. The Applicant's solicitors are engaging with BOC's legal representatives in order to discuss the Protective Provisions.	No

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		We understand the deadline for responding to the Consultation was 26 October 2023 and we apologise for the late correspondence. BOC is the largest provider of industrial, medical and special gases in the United Kingdom and Ireland. As well as atmospheric gases, BOC supply thousands of different types of gas, and gas mixtures to more than 400,000 customers in an enormous range of industries. With a network of major production facilities, distribution centres and retail stores across the UK and Ireland, BOC supplies compressed, bulk and pipeline gases, chemicals, engineering solutions and associated equipment. We understand that BOC have already provided you with information in relation to its land interests in the area affected by the Application. It is apparent that the Application has the potential to impact on BOC apparatus (including pipelines). While BOC do not object in principle to the current Application outlined in your letter dated 14 September 2023, this is on the basis that acceptable protective provisions will be agreed between BOC and the Applicant. BOC therefore request that the Applicant instruct its Solicitors to negotiate these with us on behalf of BOC, as soon as possible. The agreement of protective provisions is of critical importance to ensure that BOC retains all necessary protections and rights to enable it to repair maintain and operate its apparatus and pipeline network.		
PD Teesport Limited.	8/12/23	1. INTRODUCTION 1.1 We are instructed by PD Teesport Limited (“PDT”) in relation to the development consent application made by H2 Teesside (the “Applicant”) for the H2Teesside Project (the “Project”). This representation is made on behalf of PDT. 1.2 PDT is the statutory harbour authority for Teesport (the “Port”) under the Teesport Acts and Orders 1966 to 2008, the local legislation relating to the Port. Under section 12 of the Tees and Hartlepool Port Authority Act 1966 it is PDT’s duty “to take such steps from time to time as they may consider necessary for the conservancy, maintenance and improvement of the harbour and the facilities afforded therein”. Powers and duties relating to the Port are conferred and imposed on them under the Teesport Acts and Orders 1966 to 2008 and under public general legislation. PDT is therefore responsible for safe use and maintenance of the river and	The Applicant welcomes PD Teesport’s support in principle for the Proposed Development, and has taken into account PD Teesport’s comments regarding the locations of concern highlighted within the Order limits and whilst the land is required for operation and construction of the scheme itself, efforts have been made to reduce permanent land use requirements and temporary construction areas as shown in the Land and Works Plans that form part of the Application. The Applicant has submitted Land Plans including plot numbers with the DCO Application. The Applicant has also been able to reduce the Order limits near the Ro-Ro facility at the east bank of the River Tees and is aware of the existing crossings in the area.	Yes

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		wholly committed to ensuring that the river plays its full part in supporting the future growth of our region and the UK as a whole. 1.3 PDT's status as a harbour authority means that it is a Statutory Undertaker for the purposes of section 127 of the Planning Act 2008 ("2008 Act")." 1.4 Teesport is a key piece of national infrastructure and one of the largest private employers in the Tees Valley. It plays a critical role facilitating the nation's trade. Its main operation at Teesport is the sixth largest port in the UK and only major port in England to handle more exports than imports. It supports 22,000 jobs and contributes £1.4 billion to the UK economy each year. 1.5 Handling 25 million tonnes per year, the Port supports the movement of international imports and exports throughout the North of the UK; affirming its position as a key driver in the nation's supply chain operations. 1.6 With circa 22 'Unitised' vessel calls a week (excluding bulks calls), Teesport is the UK's northern gateway for global shippers; serving worldwide markets including Scandinavia, the Baltics, the Netherlands, Belgium, France, Poland and Iceland. Our important bulks business handles circa 3.5m tonnes of cargo per annum and services a variety of bulk, steel, timber and breakbulk customers In addition, Teesport services 6 short sea Roro callsa week, and fortnightly services to major African ports. The frequency of services, scope of operations and direct international and continental European connections expand Teesport's reach beyond the major hub ports of Europe, providing shippers with maximum choice. 1.7 Lying close to Hartlepool and the Tees Valley's other industries, Teesport is part of the region's energy hub, bringing together a business cluster that unlocks powerful collaborative potential between energy providers, world-class manufacturers and industry leading suppliers. 1.8 With a proven reputation of delivering new, private investment, PDT has attracted over £1 billion's worth of projects to Teesside in the last decade as part of an ambitious vision to make the River Tees the UK's most successful port region by 2050. 1.9 The works proposed to be authorised by the Project for which application has been made would be constructed partly within PDT's limits of jurisdiction and the Project's construction and operation could potentially adversely affect PDT's harbour undertaking and other harbour users. 1.10 As part of the Project, the Applicant may seek compulsory powers for the purchase and/or creation of new rights over various plots which PDT	The Applicant has removed the South Gare Road from the red line boundary. The Applicant has, as part of this DCO application, published the reduced red line boundary on RBT and intended land use for RBT land. The Applicant has also removed the area known as West Lackenby from its red line boundary. Seal Sands Road and Tees Dock Road are intended to be used for access purposes only and no pipeline laying is planned within the road, except for a trenchless crossing of the road which will not impact traffic movements. The Applicant can confirm that the former tank farm site near Tunnel No 1 head has been removed from the red line boundary. In line with PDT's suggestions, the Applicant is eager to further engage and is in further discussions regarding voluntary agreements for land rights for the Proposed Development. The Applicant is also at an early stage of engagement regarding Protective Provisions.	

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		either owns, occupies or in which it has interests. The Applicant may also take powers to extinguish, suspend or interfere with PDT's rights and impose new restrictions on such land. 1.11 PDT supports the Applicant's project in principle but is concerned to ensure that the construction and operation of the proposed works do not adversely affect its harbour undertaking or other harbour users/surrounding occupiers and businesses. Those concerns can be addressed by the removal of certain plots from the Order and the inclusion of appropriate protective provisions. PDT is seeking to work positively with the Applicant and believes that its knowledge and experience of the harbour area can assist the Applicant in successfully advancing its proposals whilst minimising its impacts on surrounding businesses. 2. LAND ISSUES 2.1 The areas of land identified below are shown on the following plans contained within the PEI Report: 2.1.1 Figure 4-1: Proposed Development Site Boundary 2.2 The proposed site boundary was amended on 27 October 2023, and illustrated on the following plan: 2.2.1 07_ARDG_TEESIDE_LIQ: Land Interest Questionnaire Plan. 2.3 Both of these plans will be referred to within this letter to describe the areas of land discussed, given the current lack of plot nos to refer to. 2.4 A plan has also been prepared by PDT which shows the areas of concern discussed below for ease of reference. General concerns regarding powers sought 2.5 The powers sought by the Applicant may include the ability to acquire the freehold of and rights in land belonging to statutory undertakers (such as PDT). Furthermore, in relation to such acquisition and the acquisition of new rights by the Applicant, the powers in the proposed order may well provide for any private rights and restrictions in such land to be suspended, unenforceable or where notified extinguished where they would be inconsistent with the exercise of the new rights. Whilst concerns in respect of proposed acquisition powers relating to particular areas of PDT's harbour area are addressed below, more generally it must be noted that the harbour area is particularly complicated from a land interest perspective with a vast number of businesses relying upon the Port's activities, historic rights and infrastructure. Not all of these businesses will have the resources and/or wherewithal to engage in the NSIP regime and PDT must seek to protect these broader interests in the continuing operations of the Port.		

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		2.6 Such complexities are managed by the Port on a day to day basis, with the benefit of its vast experience and knowledge of the area, the businesses which it hosts and their interrelationships. For this reason, PDT considers that exercise of order powers within its arbour area and on land in which it has any interest must be subject to careful scrutiny once detailed scheme designs have crystallised with a view to fully understanding and minimising its impacts. It is proposed that this can be achieved in part through appropriate protective provisions. Riverside ro-ro and Northern Gateway Container Terminal (NGCT) 2.7 The scheme boundary encompasses the area occupied by the Riverside ro-ro berth, located on the eastern bank of the River Tees next to the Riverside Ro Ro Terminal. 2.8 This facility was built in 1999/2000 to accommodate stern ramp roll on roll off (ro-ro ferries). The facility is a key component of the PDT Unitised business and will become CLOUD_UK\219999282\4 4 increasingly important following a planned enhancement to the facility to enable it to handle 200m long car carriers to support the current buoyant African business in addition to the existing ferry business. The development of infrastructure to support these stern ramp vessels at a capital cost of circa £7-8m has received Board approval at the September 2021 Board meeting. 2.9 The Northern gateway is a fully consented (Teesport Harbour Revision Order 2008) deep sea terminal which will ultimately consist of over a kilometre of quay, channel deepening and associated landside infrastructure. The project also includes a new rail terminal which is to be constructed in the area between the Asda and Tesco import centres and Dabholm gut (again shown on the drawing). This is a key project for PDT's growth plans with in excess of £5m invested to date in the development stages, including the current marine and landside site investigation works. The quay construction will require piles to be driven to significant depth which could impact on any pipeline infrastructure. 2.10 Consequently, the acquisition of rights in this area (and potential interference with existing rights) to enable construction of new pipe infrastructure is likely to be very disruptive and potentially significantly determinantal to the operation of the Port and its future expansion. This is not to mention the knock-on impacts that may be experienced by the surrounding occupiers and beneficiaries of this facility. 2.11 If the relevant land is not removed then PDT considers that material determinant may be caused to its undertaking, within the meaning set out in section 127 of the 2008 Act.		

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		Existing Pipeline Infrastructure 2.12 The area behind the Riverside ro-ro is already fairly congested with existing pipelines which pass under the River Tees to the South Bank. This includes pipelines belonging to, inter alia, Sembcorp, Breagh, Trafigura and BOC. There is little information available on the Project proposals which allow PDT to assess the potential clashes. 2.13 It would also be necessary to consider the nature of the pipeline and any associated Health and Safety Executive ("HSE") consultation distances which could impact on the activities of PDT and its tenants including Tesco and Asda. Access to South Gare Breakwater 2.14 South Gare Breakwater is an area of land located on the mouth of the River Tees which is owned and controlled by PDT. This breakwater effectively protects the river and land along the river edge from damage that would otherwise naturally occur from the North Sea. In addition to being important as a breakwater and for navigation purposes (requiring maintenance, often on an unplanned basis), access is also required for pilotage, a lighthouse and radar systems and a variety of private uses such as fishermen huts, sub aqua clubs, RNLI buildings etc. 2.15 Access to the South Gare Breakwater is taken, as of right, via the South Gare access road which runs along the edge of the former Site of Special Scientific Interest ("SSSI") before turning north to run along the peninsula. 2.16 Part of this access track is within the proposed development site boundary, located to the north of the Steel Works 'Main Site' as shown on Figure 4-1. The extent and type of works to be undertaken in this area is unclear but PDT must be permitted to retain access to South Gare Breakwater for operational port purposes (as well as for its tenants/licensees) at all times during the Applicant's works and on completion of the Project. access to Redcar Bulk Terminal 2.17 The land known as Redcar Bulk Terminal ("RBT") is included within the proposed development site boundary. It is unclear whether this is simply an area through which pipelines may be located or whether other uses of the land are proposed. 2.18 PDT has rights of access along the accessway that leads to the RBT as well as holding the freehold title in RBT itself. Whilst the site is subject to a lease, PDT has retained the rights to use RBT where there is capacity. Access to RBT is required to be maintained at all times for the purposes of PDT exercising its rights to use the berth, for example being able to		

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		import construction materials, during and after the Applicant's proposed works." "West Lackenby 2.19 The area known as West Lackenby, being the triangular shaped area located between Tees Dock Road MHW and the railway, has been included in the proposed development boundary. This area is used by PDT for bulk storage, and includes some areas of car parking and security buildings. 2.20 The amended site boundary shown on plan 07_ARDG_TEESIDE_LIQ also includes Tees Dock Road to the north of this area. It is unclear why this area has been included and clarity on its intended purpose in required. It is unclear from the plans, but it would also appear that the Teesport North Substation is included within the order limits. This substation provides the connection to the national electricity grid for the whole of Teesport and is critical infrastructure. Any works in this area will need to carefully protect this asset. Access roads 2.21 There are a number of access roads included within the order limits, notably both public and private parts of Tees Dock Road and a private road running from the Tees Dock roundabout to the BOC Middlesborough site alongside the railway line. Tees Dock Road is very busy at peak periods and is critical for PDT's operations. Any use or works to this road ill need to be carefully considered and any impacts on PDT's operations avoided/mitigated. As private roads, there are also potential cost implications associated with damage/wear and tear, which will need to be addressed by the applicant. Seal Sands Pipeline Corridors and Access Roads 2.22 PDT holds the freehold ownership in much of the pipeline corridors and access roads in the Seal Sands area. Use of these corridors for its proposed pipelines, must be done in a way which is safe, avoids interruption to other critical infrastructure in the area and causes minimal disturbance to local businesses. Former tank farm site - East bank of the river2.23 PDT owns both the freehold and sublease of the former tank farm site located on the east bank of the river immediately adjacent to the tunnel head. PDT intends to bring this site back into beneficial use and it is unclear why the area has been included within the proposed order limits. PDT requires further information on any proposed use of this site. Emergency Access Road 2.24 An emergency access road for the petrochemical industrial cluster at Seal Sands is located off the A178 Tees Road to the north of Greatham		

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		Creek. A plan showing the route of the emergency access is attached. The northernmost point of Figure 4-1 includes part of this access road. This emergency access (which forms part of the wider Seal Sands emergency plan) is required to remain unobstructed at all times. PDT requires further details of any proposed works or access proposals that may interfere with this access." 3. PROTECTION AND FURTHER CONSULATION 3.1 On the basis of the information currently available, PDT does not consider that it is necessary for the Applicant to acquire land or interest in land from PDT, and that alternatives are certainly available. 3.2 As a result, PDT requires further information/justification for the inclusion of a number of plots in which it has interests within the order limits. Once this is provided, PDT may be able to provide additional useful consultation responses to help guide the Applicant's proposals. 3.3 PDT would encourage the Applicant to engage with it as early as possible in relation to any private treat acquisitions that it may decide to pursue. 3.4 PDT propose that the DCO include protective provisions to offer protection in relation to PDT's interests. Aside from PDT's interests, there must also be protection from the various businesses around the Port, who rely on the Port's uninterrupted operation. 3.5 PDT proposes to work with the Applicant to agree suitable protective provisions		

Table 15.2: Second Consultation – Section 42 (and non-prescribed) Consultation Responses

CONSULTEE	DATE OF RESPONSE	CONSULTEE RESPONSE	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION
Verizon	2/1/24	Verizon is a licensed Statutory Undertaker. We have reviewed your plans and have determined that Verizon (Formally known as MCI WorldCom, MFS) has no apparatus in the areas concerned.	Comment noted	No
Redcar Bulk Terminal Limited	10/1/24	H2Teesside - response to January 2024 second statutory consultation As you are aware, we act on behalf of Redcar Bulk Terminal Limited (Co. Regn. No.07402297) of Time Central, 32 Gallowgate, Newcastle Upon Tyne, Tyne And Wear, NE1 4BF (""RBT"") and responded on 9 October 2023 to the Consultation being carried out between 14 September – 26 October 2023 (the ""First Consultation"") in respect of proposed development consent order ("DCO") for H2Teesside – Blue	The Applicant has engaged with Redcar Bulk Terminal Ltd ('RBT') to discuss the Proposed Development. The Applicant welcomes RBT's in principle support for it, and noted the objection at this stage of consultation. The Applicant has engaged with RBT in relation to voluntary agreements regarding the proposed land use and protective provisions and will keep engaging. The Applicant's most recent engagement with RBT was 19th March 2024 and the parties are	Yes

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		hydrogen production facility on Teesside (the “Development Proposal”), promoted by BP. We attach RBT's First Consultation response at Appendix 1. This response is to the second consultation running between 3 December 2023 – 23January 2024 (the ""Second Consultation"") in respect of the DCO for the Development Proposal. This Second Consultation response is supplemental and additional to RBT's First Consultation response. RBT remains in-principle supportive of the Development Proposal and its goals. However, at this stage the information supplied continues to be insufficiently detailed to fully assess the potential impacts of the Development Proposal on RBT's land and operations. While a significant area of RBT's land has been removed from the 'Revised Draft Order Limits’ when compared to the First Consultation documents, the potential effects of the Development Proposal on RBT remain numerous. These include: • Potentially physically severing RBT's land with the creation of a series of landlocked ""parcels"". See Appendix 2, which identifies the landlocked parcels in yellow hatching. • Acquiring land which would prevent RBT operations, including the potential acquisition of land which would sever the ability to transfer bulk goods via road and rail and, although the plan is not clear, possibly from using RBT’s materials handling systems (conveyors), as well as potentially severing certain utility connections. See Appendix 3, with RBT land shown in red and the DCO land in blue. • Eliminating or restricting direct access between RBT, the internal road network for the area and the public highway. See Appendix 4, it is unclear the extent to which the land shown in blue is to be compulsorily acquired, whether the intention is to see access rights only and, if so, whether the acquisition of such rights will prejudice RBT. The lack of detail regarding the Development Proposal raises several concerns to RBT which necessitates a further and robust objection to the Development Proposal as it is currently presented. Further information and continuing dialogue with BP will be required to properly respond to any impacts that may arise in respect of RBTs interests once the Development Proposal is further clarified. It would be of particular use if further detail could be provided as to the proposed nature of the acquisition of RBT's land and crucially whether the Development Proposal envisages a permanent land take, temporary occupation or the creation of	arranging a subsequent meeting in April 2024 to continue discussions on the proposals for RBT land and voluntary agreements. The Applicant is looking forward to ongoing engagement with RBT.	

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		new rights. In the meantime, RBT must continue to protect its interests by objecting to the Proposed Development as it stands now and in the absence of any sureties given to protect its existing and emerging plans for its business.		
NATS	13/12/23	NATS anticipates no impact from the proposed changes to the scheme. As such, it's position of NO OBJECTION remains unaffected.	Comment noted	No
City Fibre	13/12/23	Please use our online enquiry service found at https://plant.cityfibre.com Terms and conditions and a user guide can be found on that page.	Comment noted	No
Cadent	14/12/23	Thank you for your email. This application falls outside of Cadent's distribution network. Please contact National Grid and/or your local Gas distributor for comments on this application.	Comment noted	No
GTC	14/12/23	Using the site boundary of the H2 Teesside Project, found on the planning inspectorate webpage, I can confirm GTC has no assets within the order limits. See the attached screenshot of our asset map for proof of this. If you require any further information, please do not hesitate to contact us.	Comment noted	No
Joint Nature Conservation Committee	14/12/23	Thank you for consulting JNCC on the H2 Teesside Project, which we received on 13/12/2023. Natural England is now authorised to exercise the JNCC's functions as a statutory consultee in respect of certain applications for offshore and offshore waters (0-200nm) adjacent to England. As this phase of operations are inshore / onshore, Natural England should provide a response where relevant. As such JNCC have not reviewed this application and will not be providing further comment.	Comment noted	No
Ministry of Defence	15/12/23	Thank you for consulting the Ministry of Defence (MOD) on 'Further Consultation on the H2 Teesside Project' The Defence Infrastructure Organisation (DIO) Safeguarding Team represents the MOD as a consultee in UK planning and energy consenting systems to ensure that development does not compromise or degrade the operation of defence sites such as aerodromes, explosives storage sites, air weapon ranges,	Comment noted	No

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		and technical sites or training resources such as the Military Low Flying System. I can confirm that, following review of the application documents, the proposed development falls outside of MOD safeguarded areas and does not affect other defence interests. The MOD, therefore, has no objection to the development proposed.		
National Highways	15/12/23	Thank you for contacting National Highways. Can I suggest you contact me directly as I deal with this proposal for us. This appears to be some small amendments to the site boundary – none of which appear to have any relationship with presenting any new issues affecting the Strategic Road Network (SRN) that we have not already been considered. Can I confirm that our previous comments remain relevant to the development proposals as their consideration moves forward.	Comment noted	No
South Tees Development Corporation	18/12/23	On behalf of the South Tees Development Corporation and South Tees Developments Ltd, I would like to express our support for bp's H2 Teesside Limited's planning application for the construction and development of the H2Teesside hydrogen project. The South Tees Development Corporation, South Tees Developments Ltd and South Tees Site Company are part of the Tees Valley Combined Authority Group. They are also are part of a Joint Venture Partnership to develop the 4,500-acre area known as Teesworks, the UK's largest industrial zone and heart of the country's first operational Freeport. This has already seen billions of pounds of investment in transformational projects by companies including bp, as well as SeAH Wind Ltd and Circular Fuels Ltd. This is a scheme of national importance, helping to meet Government's hydrogen production target and leading the drive to Net Zero. It will build on the region's growing reputation in the innovative industries of tomorrow and capitalise on our workforce's skillsets. It is directly linked to other world-leading schemes taking place on Teesworks right now, such as bp's Net Zero Teesside carbon capture, utilisation and storage development which, as part of the Northern Endurance Partnership's East Coast Cluster, will create the UK's first decarbonised industrial cluster by 2040. Not only will this hydrogen facility create a considerable number of jobs for local people, but it will also generate business rates. As a major Teesworks tenant with Net Zero Teesside, bp has already shown its dedication to the	The Applicant welcomes South Tees Development Corporation's support for the Proposed Development	No

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		region and this facility will further mark out its intentions to work alongside us as a supportive region for its plans. As the need for alternative, renewable energy sources becomes ever more important, we anticipate having bp's project our doorstep will help attract other clean energy firms to the area. This will position us as a key location for the sector, complementing the work being done in other innovative clean industries such as offshore wind, Sustainable Aviation Fuel and carbon capture and helping to form a circular economy that is more than the sum of its parts. We look forward to continuing to work with bp on this project and others to drive the economic development of the entire Tees Valley.		
Tees Valley Combined Authority Group	19/12/23	On behalf of the Tees Valley Combined Authority Group, I would like to make clear the Group's wholehearted support in respect of bp's H2 Teesside Limited's planning application for the construction and development of the H2Teesside hydrogen project. TVCA's responsibilities, devolved from Government, are focused around a ten-year Investment Plan in business and inward investment, transport, employment, education and skills, culture and tourism, research and innovation and place, creating jobs, boosting the economy and transforming Tees Valley. This is a scheme of national importance which supports our overarching aims and will help to meet Government's hydrogen production target and leading the drive to cleaner, healthier and more sustainable fuels. It will build on the region's growing reputation in leading the way in the innovative industries of tomorrow and capitalise on our workforce's skillsets. It is directly linked to other world-leading schemes taking place in Tees Valley and at Teesworks. In particular bp's Net Zero Teesside carbon capture, utilisation and storage development which, as part of the Northern Endurance Partnership's East Coast Cluster, will create the UK's first decarbonised industrial cluster by 2040. Not only will this hydrogen facility create a considerable number of jobs for local people, but it will also generate business rates. As a major Teesworks tenant with Net Zero Teesside, bp has already shown its dedication to the region and this facility will further mark out its intentions to work alongside us as a supportive region for its plans. As the need for alternative, renewable energy sources becomes ever more important, we anticipate having bp's project our doorstep will help attract other clean energy firms to the area. This will position us as a key location for the sector, complementing the work being done in other innovative clean industries such as offshore wind, Sustainable Aviation Fuel and carbon capture and helping to form a circular economy that is more than the sum of its parts.	The Applicant welcomes Tees Valley Combined Authority's support for the Proposed Development	No

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		We look forward to continuing to work with bp on this project and others to drive the economic development of the entire Tees Valley.		
Hartlepool Development Corporation	19/12/23	On behalf of the Hartlepool Development Corporation Board, I would like to express our support for bp's H2 Teesside Limited's planning application for the construction and development of the H2Teesside hydrogen project, part of which involves Hartlepool. The Hartlepool Development Corporation has been established by the Tees Valley Mayor to transform the town centre by driving investment, capitalising on its assets and cutting red tape. Bp's proposals, while not directly falling within the footprint of the HDC zone, will nevertheless support its efforts by complementing its aims, creating jobs and becoming an attractor for other similar projects. This is a scheme of national importance, helping to meet Government's hydrogen production target and leading the drive to Net Zero. It will build on the region's growing reputation in the innovative industries of tomorrow and capitalise on our workforce's skillsets. It is directly linked to other world-leading schemes taking place in the region right now, such as bp's Net Zero Teesside carbon capture, utilisation and storage development at Teesworks which, as part of the Northern Endurance Partnership's East Coast Cluster, will create the UK's first decarbonised industrial cluster by 2040. Not only will this hydrogen facility create a considerable number of jobs for local people, but it will also generate business rates. As a major Teesworks tenant with Net Zero Teesside, bp has already shown its dedication to the region and this facility will further mark out its intentions to work alongside us as a supportive region for its plans. As the need for alternative, renewable energy sources becomes ever more important, we anticipate having bp's project our doorstep will help attract other clean energy firms to the area. This will position us as a key location for the sector, complementing the work being done in other innovative clean industries such as offshore wind, Sustainable Aviation Fuel and carbon capture and helping to form a circular economy that is more than the sum of its parts. We look forward to continuing to work with bp on this project and others to drive the economic development of the entire Tees Valley.	The Applicant welcomes Hartlepool Development Board's support for the Proposed Development	No
Vodafone	20/12/23	Please accept this email as confirmation that Vodafone: Fixed does have apparatus within the vicinity of your proposed works.	Comment noted	No
Marine Management Organisation	3/1/24	Please be aware that any works within the Marine area require a licence from the Marine Management Organisation. It is down to the applicant themselves to take the necessary steps to ascertain whether their works will fall below the Mean High Water Springs mark.	**Marine Licensing** No licence applications are anticipated to be required for European protected marine species.	

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		Response to your consultation The Marine Management Organisation (MMO) is a non-departmental public body responsible for the management of England's marine area on behalf of the UK government. The MMO's delivery functions are; marine planning, marine licensing, wildlife licensing and enforcement, marine protected area management, marine emergencies, fisheries management and issuing European grants. Marine Licensing Works activities taking place below the mean high water mark may require a marine licence in accordance with the Marine and Coastal Access Act (MCAA) 2009. Such activities include the construction, alteration or improvement of any works, dredging, or a deposit or removal of a substance or object below the mean high water springs mark or in any tidal river to the extent of the tidal influence. Applicants should be directed to the MMO's online portal to register for an application for marine licence https://www.gov.uk/guidance/make-a-marine-licence-application You can also apply to the MMO for consent under the Electricity Act 1989 (as amended) for offshore generating stations between 1 and 100 megawatts in English waters. The MMO is also the authority responsible for processing and determining Harbour Orders in England, together with granting consent under various local Acts and orders regarding harbours. A wildlife licence is also required for activities that that would affect a UK or European protected marine species. The MMO is a signatory to the coastal concordat and operates in accordance with its principles. Should the activities subject to planning permission meet the above criteria then the applicant should be directed to the follow pages:	**Environmental Impact Assessment** This comment is noted, the legislation and guidance highlighted here has been taken into account in the preparation of the Environmental Statement [ES Volume I, EN070009/APP/6.2], where applicable. **Marine Planning** The Applicant has undertaken a marine plan policy assessment and this is included in ES Volume III, EN070009/APP/6.4. **Minerals and waste plans and local aggregate assessments** This comment is noted and has been considered as part of any relevant consultation for the Proposed Development.	

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		check if you need a marine licence and asked to quote the following information on any resultant marine licence application: • local planning authority name, • planning officer name and contact details, • planning application reference. Following submission of a marine licence application a case team will be in touch with the relevant planning officer to discuss next steps. Environmental Impact Assessment With respect to projects that require a marine licence the EIA Directive (codified in Directive 2011/92/EU) is transposed into UK law by the Marine Works (Environmental Impact Assessment) Regulations 2007 (the MWR), as amended. Before a marine licence can be granted for projects that require EIA, MMO must ensure that applications for a marine licence are compliant with the MWR. In cases where a project requires both a marine licence and terrestrial planning permission, both the MWR and The Town and Country Planning (Environmental Impact Assessment) Regulations http://www.legislation.gov.uk/uksi/2017/571/contents/made may be applicable. If this consultation request relates to a project capable of falling within either set of EIA regulations, then it is advised that the applicant submit a request directly to the MMO to ensure any requirements under the MWR are considered adequately at the following link https://www.gov.uk/guidance/make-a-marine-licence-application Marine Planning Under the Marine and Coastal Access Act 2009 ch.4, 58, public authorities must make decisions in accordance with marine policy documents and if it takes a decision that is against these policies it must state its reasons. MMO as such are responsible for implementing the relevant Marine Plans for their area, through existing regulatory and decision-making processes.		

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		Marine plans will inform and guide decision makers on development in marine and coastal areas. Proposals should conform with all relevant policies, taking account of economic, environmental and social considerations. Marine plans are a statutory consideration for public authorities with decision making functions. At its landward extent, a marine plan will apply up to the mean high water springs mark, which includes the tidal extent of any rivers. As marine plan boundaries extend up to the level of the mean high water spring tides mark, there will be an overlap with terrestrial plans which generally extend to the mean low water springs mark. A map showing how England's waters have been split into 6 marine plan areas is available on our website. For further information on how to apply the marine plans please visit our Explore Marine Plans service. Planning documents for areas with a coastal influence may wish to make reference to the MMO's licensing requirements and any relevant marine plans to ensure that necessary regulations are adhered to. All public authorities taking authorisation or enforcement decisions that affect or might affect the UK marine area must do so in accordance with the Marine and Coastal Access Act and the UK Marine Policy Statement unless relevant considerations indicate otherwise. Local authorities may also wish to refer to our online guidance and the Planning Advisory Service soundness self-assessment checklist. If you wish to contact your local marine planning officer you can find their details on our gov.uk page. Minerals and waste plans and local aggregate assessments If you are consulting on a mineral/waste plan or local aggregate assessment, the MMO recommend reference to marine aggregates is included and reference to be made to the documents below; • The Marine Policy Statement (MPS), section 3.5 which highlights the importance of marine aggregates and its supply to England's (and the UK) construction industry. • The National Planning Policy Framework (NPPF) which sets out policies for national (England) construction minerals supply. • The Managed Aggregate Supply System (MASS) which includes specific references to the role of marine aggregates in the wider portfolio of supply.		

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		• The National and regional guidelines for aggregates provision in England 2005-2020 predict likely aggregate demand over this period including marine supply. The NPPF informed MASS guidance requires local mineral planning authorities to prepare Local Aggregate Assessments, these assessments have to consider the opportunities and constraints of all mineral supplies into their planning regions - including marine. This means that even land-locked counties, may have to consider the role that marine sourced supplies (delivered by rail or river) play - particularly where land based resources are becoming increasingly constrained. If you require further guidance on the Marine Licencing process, please follow the link https://www.gov.uk/topic/planning-development/marine-licences		
The Coal Authority	4/1/24	Thank you for your notification of 13 December 2023 seeking the views of the Coal Authority on the above. I have checked the site location plan against the information held by the Coal Authority and can confirm that the proposed development site is located outside of the defined coalfield. On this basis, the Planning team at the Coal Authority have no comments to make.	Comment noted.	No
Historic England	4/1/24	Thank you for your letter of 13 December 2023 consulting Historic England regarding a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation. Historic England is the Government's statutory adviser on all matters relating to the historic environment in England. We are a non-departmental public body established under the National Heritage Act 1983 and sponsored by the Department for Culture, Media and Sport (DCMS). We champion and protect England's historic places, providing expert advice to local planning authorities, developers, owners and communities to help ensure our historic environment is properly understood, enjoyed and cared for. Having read the documentation provided at this stage, we consider that it is unlikely that the proposed development will have any significant impact on higher-grade heritage assets, which form the core of the work where Historic England can add value to discussions. Position	Comment is noted.	No

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		As indicated in our letter dated 26 October 2023, Historic England are taking a limited involvement in this NSIP as there is no proposed harm to the higher value designated historic environment. It is our opinion that the Local Authority conservation and archaeological advisors are best placed to provide advice and comment on the potential impacts to the historic environment this change may bring. They have the local knowledge and expertise to provide the best advice in this circumstance and should be providing the necessary advice on these proposed changes.		
Alfanar Energy Limited	23/1/24	Alfanar notes the changes to the proposed order limits for the H2Teeside project. It is still anticipated that pipelines connected to both the H2Teesside project and Lighthouse Green Fuels project will be located along existing pipeline routes in and around the existing TV1 and TV2 sites occupied by Alfanar, on land at Port Clarence, near Stockton-on-Tees. We note the H2Teeside order limits have been extended to include the access roads at Riverside Road and Huntsman Drive connecting to the A178 (Seaton Care Road), which are also included in the draft order limits for Lighthouse Green Fuels. There will be a need for further discussions between Lighthouse Green Fuels and H2Teeside to agree interface requirements and AGI location. Alfanar expect to work collaboratively with the promoter of the H2Teesside project to ensure the two schemes can construct and operate harmoniously.	The Applicant agrees on the importance of working collaboratively. The Applicant has identified the Lighthouse Green Fuels project in the shortlist of planned developments for which cumulative effects will be assessed. Further details of the H2Teesside development will shortly be available to Lighthouse Green Fuels to inform Lighthouse Green Fuels cumulative impact assessment once the H2Teesside DCO submission is made. H2Teesside look forward to further engagement with Alfanar regarding the Lighthouse Green Fuels project, including in the areas of any potential opportunities for natural and social capital or net gain, the Outline Construction Traffic Management Plan and Framework Construction Environmental Management Plan, as proposed. H2Teesside looks forward to collaborative working relationship to ensure the success of both initiatives. The Applicant has held a number of engagement sessions with Alfanar to work collaboratively in the shared areas of interest and will continue these dialogues. The Applicant has also held an engagement session with Alfanar to explore interface requirements and discuss the AGI location. The AGI location has been agreed in-principle with Alfanar. The Applicant will work with Alfanar to collaboratively manage the interface between the projects in the future.	
Sembcorp Industries Ltd	1/3/24	1. INTRODUCTION 1.1 We are instructed by Sembcorp Utilities (UK) Limited (“Sembcorp”) in relation to the proposed development consent order application made by H2	The Applicant acknowledges the critical role that Sembcorp Utilities (UK) Limited plays through its operations and management at the Wilton International site and Pipeline Corridors across Teesside.	Yes

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		Teesside (the "Applicant") for the H2Teesside Project (the "Project"). This consultation response is made on behalf of Sembcorp. 1.2 Sembcorp Energy UK (SEUK), a wholly-owned subsidiary of Sembcorp Industries, is a leading provider of sustainable solutions supporting the UK's transition to Net Zero. With an energy generation and battery storage portfolio of over 1.3GW in operation or under development, Sembcorp's expertise helps major energy users and suppliers improve their efficiency, profitability, and sustainability, while supporting the growth of renewables and strengthening the UK's electricity system. Sembcorp's Wilton International site, within the Teesside Freeport, sits amongst a hub of decarbonisation innovation. At the site, Sembcorp provide energy-intensive industrial businesses with combined heat and power (CHP) via its private wire network that supplies electricity generated by gas and biomass. These services are complemented by a fleet of fast-acting, ecentralised power stations and battery energy storage sites situated throughout England and Wales. Monitored and controlled from Sembcorp's central operations facility in Solihull, these flexible assets deliver electricity to the national grid, helping to balance the UK energy system and ensure reliable power for homes and businesses. Sembcorp Industries is a leading energy and urban solutions provider, driven by its purpose to do good and play its part in building a sustainable future. Headquartered in Singapore, Sembcorp leverages its sector expertise and global track record to deliver innovative solutions that support the energy transition and sustainable development. By focusing on growing its Renewables business, Sembcorp aims to transform its portfolio towards a greener future. Sembcorp has a balanced energy portfolio of 20.5GW, with 13GW of gross renewable energy capacity comprising solar, wind and energy storage globally*. The company also has a proven track record of transforming raw land into sustainable urban developments, with a project portfolio spanning over 14,000 hectares across Asia. Sembcorp is listed on the main board of the Singapore Exchange. It is a constituent stock of FTSE Russell Index, MSCI Singapore Index, Straits Times Index as well as sustainability indices including FTSE4Good Index, iEdge SG ESG indices and several MSCI ESG indices. 1.3 At its Wilton International site ("Wilton") Sembcorp supplies customers with the development land, energy and utilities they need. Based in Teesside and part of the East Coast Cluster the site is in a prime location for the future of decarbonised power, offering direct access to a skilled workforce alongside potential Freeport tax incentives. For investing, energy-intensive industrial businesses, Wilton International is ready-to-go with established supply chains and multimodal freight logistics. This includes the operation of a private electricity grid as well as the management and control of a significant network	Discussions concerning Protective Provisions, land agreements and other commercial agreements as may be required are at an early stage. The intention of the Applicant is to voluntarily acquire the required land and rights from Sembcorp through ongoing negotiation and put in place arrangements for them to have oversight of works which affect their apparatus. The Applicant wishes to progress discussions with Sembcorp to understand and address the specific concerns raised relating to interactions between the H2Teesside Project Sembcorp's operations and the proposals being brought forward by other parties. The safety concerns of Sembcorp have been considered as part of the EIA process – see Chapter 20: Major Accidents and Disasters and will be continued through the COMAH process with HSE. The Applicant notes that it is the only CCS-enabled hydrogen project in the North East of England to have been selected by DESNZ as part of Tracker 1 Cluster Sequencing under the Hydrogen Production Business Model (HPBM). The HPBM does not promote sharing of hydrogen pipelines and transfer of molecules to intermediaries. The Applicant has, as part of this DCO application, published the intended use for each plot identified within the red line boundary. The Applicant has met with Sembcorp in numerous instances and will be meeting with Sembcorp to discuss the Proposed Development in detail and the extent of powers sought throughout the development boundary. These meetings will provide an opportunity for both parties to articulate their positions, express any concerns and agree a way forward.	

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		of pipeline corridors connecting Wilton and other industrial businesses located within the other clusters at Billingham and North Tees. The pipeline corridors enable the transportation of industrial gases, raw materials and feedstock seamlessly between manufacturers, storage and process plants. The role of Wilton in the UK and local economy 1.4 Wilton, where Sembcorp's industrial power and other utility assets are located, is one of the UK's leading multi-occupancy industrial and manufacturing sites, with the products made there being both of national importance and generating millions of pounds in export revenues annually for the UK economy. 1.5 Wilton is a large industrial / manufacturing site located between Redcar and Middlesbrough, to the south of the former steel-making enclave now being redeveloped by Teesworks and Teesport (the fifth largest port in the UK and only major net exporting port in England) and to the north of the A174 Redcar - A19 dual carriageway. Initially developed by the former Imperial Chemical Industries conglomerate (""ICI""), Wilton was officially opened in the early 1950s as a major integrated petrochemical facility, supported by internal electricity generation facilities. Following divestment by ICI in the late 1990s, Wilton continues to contain major petrochemical process plant and it now hosts diversified businesses in a variety of fields including energy generation, plastic recycling and process research together with office accommodation and production research facilities. Raw materials are imported to and exported from Wilton via marine terminals at Teesport and North Tees, by pipeline, by road and by rail. 1.6 Wilton's operation is split between Sembcorp (as a freeholder and integrated infrastructure provider to the entire complex) and a series of individual processes and related industrial undertakings. A number of multinational chemical companies now operate on the site and more than £1 billion has been spent by companies at Wilton in recent years. This includes in excess of £200 million by Sembcorp to date in new and improved assets. Sembcorp is constructing its first Battery Energy Storage System (BESS) at Wilton International which will be the largest BESS site in its UK fleet at 300MWh. This builds on Sembcorp's commitment to delivering a low carbon and energy secure future for the UK, including pioneering new technologies such as the UK's first ever wood-fired power station, Wilton 10 – built by Sembcorp at Wilton and part fuelled by locally processed waste wood material. Sembcorp pioneered biomass-fuelled power in 2007, which led to		

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		the company shutting down the last of its coal-fired boilers at Wilton Power Station in 2014, ahead of the Government's 2015 commitment to phase out coal; over the next 10 years. In 2016, Sembcorp's waste-to-resource facility came online, diverting 440,000 tonnes of landfill waste per year. In 2018 Sembcorp's UK operations expanded outside of Wilton International with 40+ rapid-response energy generation and battery energy storage system (BESS) sites across England and Wales. In 2019 Sembcorp's first 60MWh BESS came online across three sites, doubling in 2022, and now stands at 120MWh. 1.7 Other significant investment at Wilton includes £250 million by SABIC on its Low Density Polyethylene plant (the world's largest such facility), £350 million on Crop Energies' bioethanol plant and a new £250 million energy from waste facility in which Sembcorp is a major stakeholder. Furthermore, SABIC is currently underway with a major overhaul and fuel conversion project for its Olefins 6 'cracker' plant with an estimated cost of around £850 million. 1.8 Around 4,400 people are currently employed at Wilton, with a further 1,300 contractors visiting the site each weekday. Thousands more jobs are supported through the supply chains of businesses based at the site, which include SABIC, Ensus, Alpek Polyester UK, Huntsman, Biffa Polymers, Nippon Gases and Anglo American. The significance of these businesses cannot be overestimated. For instance, Biffa's polymer recycling plant has recycled over 3 billion plastic milk bottles in the last decade, Alpek produces enough PET for eight billion bottles a year and Anglo American's £3bn project at Wilton – processing polyhalite which is mined 37km south of Whitby – is one of the largest construction projects in the UK that you can't see (as its all underground). 1.9 Sembcorp actively markets Wilton with a view to securing inward investment and further growth. The Northeast of England is recognised and promoted by the Department for International Trade as a leading location in the UK for foreign direct investment into the chemistry using industries. Wilton's status as a multi-occupancy business and research centre is a key attraction. The complex is one of the largest R&D facilities in Europe and is home to the Centre for Process Innovation (""CPI""), part of the Technology Strategy Board's (also branded as Innovate UK) High Value Manufacturing Catapult network. CPI is a British technology and innovation centre which was established in 2004 by the UK Government agency ONE NorthEast as one of five centres of excellence in a long-term strategy to ""reposition the North-East [of England] on the world stage for research and development"". CPI helps companies to develop, prove, prototype and scale-up new products and processes by providing access to facilities, expertise and networks of public		

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		and private funders. Accordingly, Wilton's continued success forms a key part of the Government’s long-standing economic and trade strategy for the UK. 1.10 Wilton is also one of the main sites used by the economic cluster body the Northeast of England Process Industry Cluster (""NEPIC""). An economic or business cluster is a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. Clusters have the potential to affect competition in three ways: by increasing the productivity of the companies in the cluster; by driving innovation in the field; and by stimulating new businesses in the field. Clusters increase the productivity with which companies can compete, nationally and globally. 1.11 NEPIC was created by the chemistry using industries based in Northeast England – including many Wilton-based businesses – where more than 1,400 companies are locally based in the supply chain for this vital sector. The sector has over 35,000 direct employees and some 190,000 indirect employees in the northeast of England and together they represent over one third of the industrial economy of the region. With more than 1,400 companies directly involved in the supply chain of these industries generating £26 billion of annual sales. Companies in the NEPIC area manufacture 50% of the UK's petrochemicals and 35% of the UK's pharmaceuticals and they significantly contribute towards making the region the only net exporting region of the UK. Since 2004, the total GVA contribution of NEPIC to the local and UK economy was valued at £4.3 billion. Sembcorp is a long-standing member of NEPIC and supports their annual awards and events including their Clean Growth Conference. In 2023 Sembcorp were winners of NEPIC’s Apprenticeship Employer of the Year and Communities and Reputation awards. 1.12 To sustain cluster performance in the long term, strong inter-organisational relationships within the cluster are vital, including important aspects of strategic management of the essential supporting infrastructure. In the case of Sembcorp, this includes the strategic management of multiple functional utility pipelines comprising the Sembcorp Pipeline Corridor (see detail below) across the Wilton International site. 1.13 Wilton thus forms part of an important cluster of petrochemical, specialty and other process manufacturing businesses of local, regional and national economic significance. Sembcorp plays a central role as part of that cluster.		

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		1.14 Wilton itself is an industrial and manufacturing hub of national importance and whilst overall Sembcorp supports the Project, Sembcorp is concerned of the impact the Project may have on it, Wilton and a number of the existing industrial emitters on Teesside, which the H2 pipeline network is intended to support. Sembcorp's role 1.15 Sembcorp supplies the major industrial businesses at Wilton with secure and reliable supplies of electrical power, steam, water (raw, potable and demineralised), and other services, using greener, more sustainable power generating facilities. It also owns much of the land available for development on the site. Wilton's 'ready-to-go' site solution integrates energy, development land, infrastructure, utilities and security, supported by the site's extensive network of internal infrastructure, providing gas, electricity, water, steam, drainage, Compressed air, Brine, Nitrogen Cavities, reservoirs, pipe and road connectivity, moving inputs, products, by-products and wastes between different production facilities – both within and out with the Wilton complex itself. This includes: 1.15.1 on-site energy generation utilising multiple assets with National Grid backup to ensure energy security, resilience and cost savings; 1.15.2 established industrial infrastructure ready to deliver the utilities, feedstocks, industrial gases and products needed by investing businesses; 1.15.3 a range of large-scale, fully serviceable development plots are available, with flexible tenancies and pre-consented planning – enabling quick and convenient 'plug-and-play' property solutions and enabling businesses to reduce investment project costs, risk and timeframes; and 1.15.4 specialist site safety and security teams compliant with all applicable standards demanded by major process industry companies, including COMAH regulations. 1.16 For investing, energy-intensive industrial businesses, this delivers competitive advantage through reduced costs, risk and project timeframes. 1.17 Sembcorp also provides an essential pipeline route and associated infrastructure between Wilton and Billingham via North Tees (""Sembcorp		

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		Pipeline Corridor""). The Sembcorp Pipeline Corridor carries a variety of industrial gases, raw materials and feedstock including natural gas, fuel oils, nitrogen and hazardous chemicals such as hydrogen cyanide. These are produced or used by major multinationals and household names including BOC, Ineos, Huntsman and Mitsubishi. The Sembcorp Pipeline Corridor connects directly into Wilton's substantial network of service corridors (also known as vein lines), which themselves incorporate established pipelines, cables, cable routes & supports, culverts, bridges, pipe supports and anchor blocks. 1.18 Importantly, the Sembcorp Pipeline Corridor provides pipeline connection capability to: 1.18.1 A significant number of top tier COMAH sites both on Wilton, Seal Sands and Billingham Industrial Clusters. 1.18.2 The UK's ethylene distribution network, with Teesside being the central node and the only chemical cluster to provide combined production, consumption, storage and export facilities on the system. 1.19 Sembcorp takes on a key role in respect of the Sembcorp Pipeline Corridor: managing, maintaining, patrolling and facilitating both the use of the corridor and the shared apparatus infrastructure and any works within it (see further below). Sembcorp acts as a central body for the management of the Sembcorp Pipeline Corridor (as distinct from its parallel capacity as a landowner) and this co- ordinating function provides significant economic and strategic value. 1.20 In addition, Sembcorp coordinates all users use of the Sembcorp Pipeline Corridor, in terms of both routine communication and in the management of all works, from routine assurance to future proposals and enhancements. As such, the value of Sembcorp's involvement to the cluster, the region and the UK is conceptually different to and wider than a mere land interest and should be recognised accordingly. 1.21 If compulsory acquisition rights are included in the DCO in relation to the Sembcorp Pipeline Corridor then Sembcorp's ability to service its other customers and to continue to provide this vital collaborative function may be adversely impacted and thus compromise Sembcorp's purpose and vision in building a sustainable future within the UK.		

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		The legal framework governing the Sembcorp Pipeline Corridor 1.22 Sembcorp is a freeholder, leaseholder and rights holder pursuant to several deeds in and around the Teesside area. As the owner and controller of the complete Sembcorp Pipeline Corridor, Sembcorp has granted several packages of rights to its customers to use the Corridor, including use of the surrounding land, apparatus and infrastructure. 1.23 There are broadly two main categories of apparatus and infrastructure: 1.23.1 Shared Apparatus and Infrastructure is the equipment and civil structures that Sembcorp or its predecessors have built and provided for its customers to provide a readily useable route for new pipelines and other apparatus. All customers are able to make shared use of this equipment (where provided for in their package of rights) and Sembcorp maintains it in exchange for an annual pipeline infrastructure charge. 1.23.2 Exclusive Apparatus Infrastructure is the equipment that customers build within the Sembcorp Pipeline Corridor for their sole purpose and use, where other customers are not entitled to use it. It should be noted that Exclusive Apparatus Infrastructure is still subject to Sembcorp's direction and consent to design. 1.24 Sembcorp grants rights to its customers by way of deed to use the Sembcorp Pipeline Corridor for the transmission of waste, water, natural gas, nitrogen for the customers' specific businesses. 1.25 In this regard, the various packages of rights granted by Sembcorp over the Sembcorp Pipeline Corridor generally provide for the following functions to be exercised by Sembcorp in the wider interest: 1.25.1 management is the organisation and coordination of activities within the Sembcorp Pipeline Corridor, such as communication to customers via the distribution list of any works or proposals (new customers, new works, and maintenance) that will be taking place, liaison with other landowners where relevant and the operation of a diary and plan for upcoming maintenance activities, so as to ensure customers' apparatus is not damaged, works are co-ordinated and managed safely, and that in so far as is possible business is not interrupted. This also includes overseeing the protective provisions as between asset owners provided for in the relevant packages of rights i.e.		

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		Sembcorp will not consent to any one asset owner's works in the Corridor unless that asset owner has gone through the applicable process of notifying the other asset owners of the details/method statement etc and affording those other asset owners an opportunity to specify what protective measures need to be put in place to protect their respective assets during any those works; 1.25.2 maintenance of the Shared Apparatus and Infrastructure within the Sembcorp Pipeline Corridor more generally and provision of access and accessways, including effecting repairs (planned and reactive) and patrolling the Corridors and alerting customers to any major defects or issues identified by those patrols; 1.25.3 facilitation including: – access onto the Sembcorp Pipeline Corridor and adjoining property for – the purpose of carrying out inspection and/or works to a customer's own – apparatus or Exclusive Apparatus Infrastructure; – liaising with other customers in respect of any proposed works; – scheduling the works and issuing inductions and issue of access permits in accordance with the relevant works provisions; – reviewing method statements, monitoring design and safety reviews; – producing and issuing a 'mod' form in respect of any proposed works – and reviewing specified qualifying activities; – attending customers' project meetings and/or process reviews; and – monitoring and auditing any works conducted. 2. H2 Teesside land footprint and compulsory acquisition		

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		2.1 The H2 Teesside revised draft Order Limits are shown Figure 4-1: Proposed Development Site Boundary and Sembcorp notes that there is significant overlap with its estate. In particular there is extensive areas within the proposed limits in the Wilton area and across the wider Sembcorp pipeline corridor. 2.2 It is noted in the Statutory Consultation Brochure that the Applicant seeks to use Sembcorp's existing above ground pipeline corridor through Seal Sands to Billingham as the hydrogen pipeline corridor. 2.3 Sembcorp is therefore concerned regarding the extent of powers sought by the Applicant, including the ability to acquire the freehold of and rights in land belonging to Sembcorp and, whether any powers in the proposed order may provide for any private rights and restrictions in its land to be suspended, unenforceable or where notified extinguished where they would be inconsistent with the exercise of the new rights. For the reasons explained in this response, it is important that Sembcorp's coordination and safety role described above is not subverted through the exercise of compulsory acquisition. There are further concerns that exercising DCO powers may restrict future development within the Sembcorp estate and the growth of the Tees Valley economy. Other concerns relate to any powers of the Applicant that may restrict accessways that serve Sembcorp and other businesses in the area. 2.4 As such, Sembcorp considers that the Applicant should seek to protect Sembcorp's assets, interests and the key role that it performs in managing critical infrastructure in the area. This is best achieved by private treaty negotiation rather than by compulsion. Notwithstanding this, and to the extent that compulsory acquisition is proposed, it is imperative that appropriate protective provisions are incorporated into any DCO proposed for the project. Due to the similarities between the projects, the starting point for these provisions should be those agreed in relation to the latest draft of the Net Zero Teesside Order. Existing Pipeline Infrastructure 2.5 Sembcorp seeks to protect and maintain its pipeline corridor. As outlined above, the pipeline corridor is fundamental in serving an array of businesses and customers both on Teesside and nationally. 2.6 Sembcorp is concerned that any acquisition rights (and potential interference with existing rights) over the Sembcorp Pipeline Corridor will cause significant disruption to the pipelines.		

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		2.7 Sembcorp has exercised control over the pipeline corridor for its own benefit and the collective benefit of all users since 2003 in a way to maintain and promote the safe, effective and integrated operation. In exercising such controlled operations, Sembcorp has been successful in regulating the interplay with plant operators and the exchange of materials through its pipeline corridor and has consequently maximized financial benefit. Any disruption would most likely compromise the financial benefit. 2.8 In addition, such disruption may have significant health and safety implications since some facilities within the Wilton complex are on the register maintained by the Health and Safety Executive (HSE) under the COMAH Regulations; 2.9 If the Applicant seeks compulsory acquisition or extinguishment of rights within the operational area of the integrated Sembcorp Pipeline Corridor, the potential for the timing of acquisition and development and for the interference with access, operations and other upgrade proposals could be significantly detrimental to the continuing safe and economic operation of plant, both that of individual operators at Wilton and within the wider cluster served by the Corridor. Furthermore, the acquisition of new rights (and potential interference with existing rights) may be of significant detriment to the any future development proposals. Coordination and capacity 2.10 Sembcorp is now in contact with several parties seeking to promote nationally significant infrastructure as well as important Tees Valley Developments on both sides of the Tees, most notably: 2.10.1 Net Zero Teesside – a collection of industrial, power and hydrogen businesses which aim to decarbonize their operations through the deployment of carbon capture utilization and storage (CCUS). DCO project currently granted. 2.10.2 Lighthouse Green Fuels – a project that will make sustainable aviation fuel (SAF) from non-recyclable waste and waste biomass at Alfanar's Billingham site, Stockton-on-Tees, UK. DCO project, at pre application stage. 2.10.3 Wavecrest Energy LNG import facility – a project to construct a new LNG import facility.		

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		2.10.4 H2NorthEast is a major project to build a 1GW CCUS-enabled low carbon hydrogen production facility next to the CATS terminal on Teesside. 2.10.5 Whitetail Clean Energy power station - a 350 MW power plant with CCS at Sembcorp's site. 2.10.6 Teesside Green Lithium - large-scale lithium refinery. 2.11 To varying degrees, these projects wish to utilise the Sembcorp pipeline corridor. Whist Sembcorp seeks to work collaboratively with all developers, it is concerned that those promoting these projects should coordinate and collaborate with each other in relation to their infrastructure requirements. In particular, because of the complex and heavily developed areas through which the Sembcorp pipeline corridor navigates, it is constrained and has a finite capacity and, as currently designed, it is unlikely to accommodate all of the infrastructure required to enable the above mentioned projects. 2.12 In order to make the most efficient use of the available space, Sembcorp considers that all developers wishing to install new infrastructure in the pipeline corridor should; 2.12.1 explore the possibilities for sharing such infrastructure – for example hydrogen and gas pipelines; and 2.12.2 Consider design solutions which facilitate the most efficient use of space and maximise the current and provide for future capacity of the pipeline corridor. 2.13 If each developer operates in a silo then the ultimate capacity of the pipeline corridor may be unnecessarily constrained and other NSIP infrastructure obstructed. For example, the continued addition of pipelines to the corridor is likely to make it exceptionally difficult and uneconomic to add a pipe rack to the corridor, which could significantly increase its capacity, thereby unlocking other projects and achieving greater public benefits. Design solutions which allow one NSIP project to proceed to the detriment of others must surely be avoided. Access roads 2.14 Any proposed use or works to any access roads will need to be carefully considered and any impacts on Sembcorp's operations avoided/mitigated.		

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		Where any rights relate to private roads, there are also potential cost implications associated with damage/wear and tear, which will need to be addressed by the applicant. 3. PROTECTION AND FURTHER CONSULATION 3.1 On the basis of the information currently available, Sembcorp is concerned regarding the extent of the compulsory acquisition powers that may be exercised over its land and potential subversion of its important functions. 3.2 Sembcorp requires further information in relation to the plots to be included in the order in which it has interests. Once this is provided, Sembcorp may provide additional consultation responses to help guide the Applicant's proposals. 3.3 Sembcorp would encourage the Applicant to engage with it as early as possible in relation to any private treaty acquisitions that it may decide to pursue. 3.4 Sembcorp proposes that the DCO include protective provisions in relation to Sembcorp's interests, which should be based on those agreed for the proposed Net Zero Teesside Order. Sembcorp proposes to work with the Applicant to agree suitable protective provisions.		
North York Moors National Park Authority	10/1/24	Thank you for consulting the Authority on the H2 Teesside Project. We have no further comments to make at this stage. However, we have an interest in the North York Moors Special Protection Areas (SPA)/Special Areas of Conservation (SPC) and nearby Teesmouth SPA/SAC and would still like to be consulted as plans develop and the EIA is produced.	Comment is noted. See response in Table 15.1.	
Active Travel England	14/12/23	Thank you for your email. In relation to the above planning consultation, Active Travel England has no comment to make as it falls outside of its statutory remit.	Comment noted.	No
Canal and Rivers Trust	15/1/24	Thank you for your consultation on the amendments to the H2Teeside Project, notably with regards to the red line boundary of the works. The Canal & River Trust are Navigation Authority for the River Tees. However, our jurisdiction is upstream of the Tees barrier, and does not include the	Comment noted.	No

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		section of the Tees to be crossed by the proposals. The revised boundary does not include land in close proximity to our assets. As a result, we do not have any comment to make on the proposals. Should the scheme be amended to include parts of the Tees where we are Navigation Authority, we would request to be re-consulted so we can assess the impact of the proposals on our network.		
Cleveland Fire Brigade	16/1/24	I have been asked to look into the consultation you released with reference to the H2 Teesside Project. I have viewed the second consultation documents and can confirm that there are no issues highlighted from CFB in relation to the proposed changes. CFB work closely with the LRF where we share information reference upcoming developments, the H2 project is involved in these discussions.	Comment noted.	No
Anglo American Woodsmith (Teesside) Limited; Anglo American Woodsmith Limited and; Anglo American Crop Nutrients Limited	17/1/24	On behalf of our client, collectively known as “Anglo American”, we write in response to your letter dated 13 December 2023 and to comment on the updated consultation material provided in respect of the proposed H2 Teesside project. This follows Anglo American having responded to the previous consultation in October 2023, where various queries relating to the project were raised (see Appendix 1). Anglo American welcomes the opportunity to review the revised draft H2 Teesside proposals and supports the principle of the red line boundary being reduced to only include areas that will be utilized in the construction and operation of the H2 Teesside Project. Notwithstanding this, the latest plans continue to show areas of land which overlap with Anglo American’s land interests (which include freehold, leasehold, optioned and easement areas), including a corridor of land to the south of the approved Materials Handling Facility (see Figure 1 below) which, through email dialogue in November 2023, our client had expressly advised BP not to include. As advised in our previous consultation response, both the Materials Handling Facility and Minerals Transport System Portal (as approved under permissions ref. R/2018/0139/VC and R/2014/0626/FFM respectively) are in the process of being constructed as part of the Woodsmith Project. Furthermore, Anglo American has recently consulted on its proposals to submit a full planning application for a Port Handling Facility and associated overland conveyor along the route of the previous outline planning permission ref. R/2017/0906/OOM. Understanding	The Applicant has engaged with Anglo American (AA) during the pre-application stage in respect of the interfaces between the Proposed Development and the Woodsmith Project. Detailed discussions have been held with AA and information has been provided by The Applicant regarding the use of land within the Proposed Development Site for the construction of H2Teesside. Specifically, the Applicant has engaged with AA in respect of all proposed development projects within the Order limits and initiated discussions regarding solutions for working around the ‘pinch points’ and areas of overlap between the Proposed Development and AA’s interest highlighted by AA. The Applicant has undertaken work to significantly refine the land required for the Proposed Development following the feedback by AA. The Applicant remains in dialogue with AA regarding the interfaces between the Proposed Development and the Woodsmith Project and how these will be managed, including through voluntary agreement, and Protective Provisions. The Applicant has also engaged in discussion with AA regarding the construction details and timelines for the Proposed Development with a view to discussing simultaneous operations and synergies.	Yes

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		the interfaces between the two projects is therefore critical to ensure that neither scheme hinders the delivery of the other. For the reasons given above, our previous response letter (see Appendix 1) requested a number of clarifications in respect of the H2 Teesside project: • Detail of the physical development proposed within each area of overlap, including any preliminary design details or parameters; • Construction details, including timescales, construction methodologies and the identification of any temporary structures likely to be required and; • Details of any operational requirements, including in relation to access and any ongoing maintenance. It is disappointing that no further information, including as part of this latest consultation, which allows our client to be able to fully understand and assess BP's proposals has been provided. Accordingly, we would ask BP to consider this letter as an objection to the currently draft Development Consent Order, pending this detail being made available and the concerns around the red line boundary being addressed to the satisfaction of Anglo American. We would like to avoid the situation which arose in respect of the Net Zero DCO application whereby sufficient detail at a sufficiently early stage was not provided resulting in too much being left to sort out during the course of the Examination. Our clients would also wish to have early sight of any proposed draft protective provisions and side agreement. We reiterate, however, that out client wishes to work positively and proactively with BP in addressing the points raised in this letter and would request regular communication between both parties to ensure that the H2 Teesside and Woodsmith Projects are aligned. In the spirit of this, we advise you that Anglo American will be appointing land agents in respect of its interests and, moving forward, would ask that they are engaged on any land matters. We will provide relevant contact details in due course.	The Applicant awaits details of AA's Land Agent in order to commence discussions in relation to voluntary agreements.	
CF Fertilisers	18/1/24	Thank you for letter dated 13th December 2023 on the H2Teesside project. CF Fertilisers UK Limited ("CF Fertilisers" or "CF") make the following initial comments. CF Fertilisers is the UK's sole ammonium nitrate fertiliser manufacturer. The site also manufactures and sells other nitrogen-based chemicals, such as nitric acid and ammonia solution. We also sell utilities to	The Applicant has engaged with CF Fertilisers with regards to the Proposed Development and has also made contact with CF Fertilisers following their statutory consultation feedback in order to arrange a meeting to discuss the Project including queries raised through the consultation process on the practical engineering details relating to pipeline and cabling	

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		neighbouring Teesside businesses. The Billingham complex is a 'top tier' Control of Major Accident Hazards ("COMAH") registered site. At this point the proposed pipeline and associated works may unduly disrupt CF Fertilisers' current and future operations, specifically having the potential to: • adversely affect existing pipeline and cabling infrastructure; • inhibit possible simplification and demolition of the sites legacy pipe bridges and pipe corridors; • prevent access (by CF and other third parties with rights of access) to critical infrastructure (owned by either CF or other third parties); • inhibit future development options for the site; • extinguish, suspend, or interfere with CF's rights and impose new restrictions on land CF either owns, occupies, or has rights over; and • compromise COMAH safety planning and give rise to new unacceptable hazards. As such, CF Fertilisers would welcome the opportunity to meet with your project team to discuss the details of the proposed pipeline, its construction, and any additional Above Ground Installation metering and services required, with a goal to understanding how it may impact our site and operation. Please advise some suitable dates/times that you and your team will be able to attend Billingham site to discuss further.	infrastructure, pipe bridges and corridors, access, proposed developments, Health & Safety and land requirements. In relation to the Billingham complex being COMAH-designated, the Applicant will comply with the required permitting processes and liaise with the CF Fertilisers team where works occur within their boundary. The Applicant understands that once this meeting is held, CF Fertilisers will commence discussions on negotiating Heads of Terms for a voluntary land agreement and protective provisions.	
ConocoPhillips (U.K.) Teesside Operator Limited ("COPUK), Norsea Pipeline Limited, Norpipe Oil AS, and Norpipe Petroleum UK Ltd.	22/1/24	Further to your letter dated 13 December 2023 with regard to: THE H2TEESSIDE PROJECT - LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 ConocoPhillips (U.K.) Teesside Operator Limited ("COPUK") is responding to your consultation on behalf of itself, Norsea Pipeline Limited, Norpipe Oil AS, and Norpipe Petroleum UK Ltd.	The Applicants have taken into account and reviewed the locations of the assets provided by - Norsea Pipeline Ltd, Norpipe Petroleum UK Ltd and Norpipe Oil AS / Norpipe Petroleum UK Ltd (Norpipe UK) / Norpipe Oil AS (Norpipe Oil) – and confirm that following further design refinement a number of interests and assets have now been removed from the Order limits post consultation. The Applicants have initiated discussions with Norsea Pipeline Ltd, Norpipe Petroleum UK Ltd and Norpipe Oil AS / Norpipe Petroleum UK Ltd (Norpipe UK) / Norpipe Oil AS (Norpipe Oil) in relation to appropriate agreements for land interests, and draft protective provisions for assets which remain within the Red Line Boundary.	Yes

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		On the basis that the H2 Proposed Development Site Boundary appended to the planning notice dated 13 December 2023 covers land at Seal Sands and the stretch of land between the ConocoPhillips operated oil terminal and Greatham Tank farm, we have included details of our relevant land interests within the attached document. We received planning notices addressed to Norsea Pipeline Limited, Norpipe Petroleum UK Ltd and COPUK; the proposed response includes land interests relating to all three companies plus Norpipe Oil AS. Please note that the information contained in the attached document is confidential. Please also note that neither ConocoPhillips (U.K.) Teesside Operator Limited, nor Norsea Pipeline Limited, nor Norpipe Oil AS, nor Norpipe Petroleum UK Limited accept any liability or make any warranty regarding the content or the accuracy of the information provided.		
INEOS UK SNS Limited, ONE-Dyas UK Limited	22/1/24	This representation is submitted by INEOS UK SNS Limited, on behalf of itself and for and on behalf of its joint land interest holder, ONE-Dyas UK Limited. We note the identification of our land interests in the plans provided as part of the second consultation in respect of the Project. These land interests are in place to bring gas from the Breagh offshore natural gas field, and potentially from other fields in the area yet to be developed, through offshore and onshore pipeline apparatus for processing at the Teesside Gas Processing Plant and then for onward sale. The expectation is that extraction of natural gas from the Breagh field will continue for at least another 15 years, with the potential for the facilities to be used by other fields in the area beyond that time period. The onshore pipeline is a Major Accident Hazard Pipeline, with Teesside Gas & Liquids Processing acting as operator of the onshore pipeline and Duty Holder (via Px Limited) on behalf of the Breagh joint venture. The onshore pipeline is a nationally significant asset that is integral to the UK's current and future energy security strategy, and we urge the Project to ensure that the rights it proposes to acquire under the proposed development consent order does not put at risk safe and efficient operations. We look forward to engaging with the Project to agree appropriate protective provisions.	The Applicant is aware of the Breagh Pipeline and have initiated discussions with INEOS UK SNS Limited and ONE-Dyas UK Limited in relation to protective provisions for those assets within the Development Boundary.	No
National Grid Energy Transmission	22/1/24	NGET wishes to confirm that the contents of its previous consultation response (as attached) still remain valid in relation to the most recent further consultation for the H2 Teesside DCO.	See Table 15.1.	No
Flavour Specialty Ingredients Ltd	22/1/24	Subject: Flavour Speciality Ingredients Ltd (Va Natara Global) response to Second Consultation for H2 Teesside Project (the ""Project"") We note your	The Applicant will continue communications with Flavour Speciality Ingredients Ltd (Natara Global) following receipt of	No

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		letter of 13 December 2023 to Frutarom (UK) Limited (""Frutarom, requesting input into the second consultation on the Project. For clarity. Flavour Speciality Ingredients Ltd are the registered Comers Of the property known as land on the south side of Belasis Avenue. Billingham, Stockton-on-Tees which is registered at HM Land Registry With title number CE154562 (the ""Property"") Frutarom sold the Property to Flavour Specialty Ingredients Ltd on 1 August 2023 the letter dated 13 December 2023 was therefore incorrectly sent to Frutarom and we ask that you immediately your records Prior to receiving the letter dated 13 December 2023 forwarded to us from Frutarom. we had not received any formal communication from yourselves. With regard to the Project and the associated proposed Development Consent Order (the ""DCO') for the project. until now, we have therefore been unable to review and respond comprehensively to you, including to the first-round consultation process. Please ensure that future communications are sent to the above address marked for the attention of Steven Jackson — Vice President, Operations and Supply Chain, or by e-mail to steven.jackson@natara- global.com. Our lack of input, or response to date, on this matter does not constitute approval of your proposals in respect of the project and the proposed DCO With regard to your request for input to the second consultation on the Project, as presented in your letter of 13 December 2023. we cannot accept this proposal, and must therefore register our objection. The exact nature of your requirements for access to. exclusive use of, or other use of part of the property is unclear, but the Project appears to require access to/control of our only site entrance from Belasis Avenue onto the property, along with access to/control of the yard areas between our site buildings on the Property. The Property is a key chemical manufacturing facility engaged in the manufacture, storage and distribution of natural extracts and resins. blended oils and synthetic aromachemicals. The site currently operates five days per Week/16hrs per day as standard and flexes to 24-hour operation dependant on product through-put. We may look to extend operations in the future and require the flexibility to do so. Site activities at the property include road deliveries of raw materials for Production/finished goods for distribution, road movements of finished goods from the site on HGVs, as well as constant on-site movement between production areas and warehousing using heavy machinery that requires adequate space to maneuver. In addition, some materials/production waste are stored in the yard area Your proposal to use the road entrance and yard areas of the property would therefore restrict our ability to use these areas for	consultation response. As requested, the Applicant has made contact with the Vice President, Operations & Supply and has met with Flavour Speciality Ingredients Ltd on site to discuss their concerns further. The Applicant understands that this meeting provided further clarity on the use of the operational site for temporary construction works and permanent rights for access during the operation of the pipeline and how these requirements will work alongside their operations. Flavour Speciality Ingredients Ltd (Natara Global) and the Applicant will continue discussions on negotiating Heads of Terms for a voluntary land agreement. The Applicant understands that Flavour Specialty Ingredients Ltd did not have any registered interests until the acquisition of the assets from Frutarom Ltd in August 2023, as such any formal communications in relation to the first round of consultation will have been delivered to Frutarom's registered address.	

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		our day-to-day production and distribution and severely limit (or stop altogether) our ability to continue production on site. In addition. many of the chemicals used or stored on Site are hazardous and/or flammable. so unchecked third-party Movements on site could be extremely dangerous. As noted above, the business is now under new ownership. As part of this new ownership. we will be reviewing the strategy for the business, including production options, Any restrictions on our ability to operate at the Property. therefore have a knock-on impact on our strategic options for the business, In addition. we note that there are limited short-term alternative production options. Our other UK site manufactures completely different chemicals. and a move to an alternative •new site would be onerous and expensive duo to the permitting and licencing required with submission required with various governmental bodies and agencies (if could even be obtained for an alternative site). We also note that are viable alternative options that the Project should consider, which would remove the need for access and use of our Property, most notably using or replacing the existing pipe bridge to the East of the property in the main corridor of the Project. We understand that this would be less disruptive to us and other neighbouring Landowners and should be diligently explored. We would welcome the opportunity to discuss the Project with you. to better understand your requirements, and to discuss potential alternative options. We fully protect and reserve our position and rights to make any further comments on the outcome of this second consultation round, or future OCO application or planning proposals.		
SABIC UK Petrochemicals Limited, SABIC Tees Holdings Limited	22/1/224	SABIC UK Petrochemicals Limited, SABIC Tees Holdings Limited Response to Second Section 42 Consultation H2 Teesside Development Consent Order (DCO) Application We are instructed by SABIC UK Petrochemicals Limited and SABIC Tees Holdings Limited (SABIC) in relation to the above development. Introduction SABIC operates from two primary pieces of land at Wilton International and the North Tees Site. Its two main manufacturing sites are at Wilton International: one, known as the Cracker, manufactures ethylene; the second known as the LDPE Plant uses some of that ethylene to make low density polyethylene.	The Applicant has had positive early engagement with SABIC and notes the detail provided on each of the parcels that fall within the Order limits that have been provided. The Applicant has made significant reductions to the Order Limits following comments made by SABIC in the first round of consultation in relation to the various parcels highlighted. This includes, areas in Wilton, North Tees, River Tees, Linkline Corridors and Brinefields.	Yes

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		SABIC's facilities at Wilton are linked to the North Tees Site via a Link Line Corridor which runs north (along the western boundary of the Northumbrian Water Bran Sands Effluent Treatment Works) and a tunnel under the River Tees (known as Tunnel No 2). There are substantial logistical facilities at both sites, including major storage capacity, a cross-country link lines network and substantial distribution and shipping services, as well as (at the North Tees site) three terminals and other storage facilities. SABIC also operates Brine Fields east of Seaton Carew Road, which provide underground brine-winning and storage cavities. They were originally mined by ICI to extract brine which was used to manufacture chlorine. Today the cavities are used to store chemicals. When not in use the cavities are filled with brine from the above-ground Brine Reservoirs situated to the west of Seaton Carew Road and north of the A1185. Some (more limited) quantities of brine are still also mined in the Brine Fields to maintain the salinity of the brine in the brine reservoirs. These constituent parts of SABIC's operations must be understood as a single, interconnected, holistic system rather than a fragmented mosaic of separate operations. The Wilton and North Tees sites and the Brinefields are all COMAH sites and as such SABIC is under a duty to take all necessary measures to prevent major accidents involving dangerous substances, and to limit the consequences to people and the environment of any major accidents which do occur. The AC_205953836_2 2 COMAH designation is as a direct result of the large quantities of chemicals or substances of a hazardous nature, that are either manufactured or stored at these locations. In addition to the above SABIC is a major employer in the region, employing approximately 400 full time employees (with an additional 400 contractors) locally, and 31,000 persons globally. SABIC contributes £400 million to the local economy. As such it is very strongly in the public interest to protect SABICs interests and assets in the areas of the proposed DCO Application. Given the above, and the nature of the materials that SABIC manufactures and has control of, SABIC considers that in any DCO application it should essentially be treated as a statutory undertaker. It will therefore require protective provisions in its preferred form in order to be satisfied that the Application will not cause detriment to the carrying on of its undertaking. Protective provisions	The Applicant confirms that it will seek further engagement, in order to confirm the extent of the rights that are required for the Proposed Development, how they might interact with SABIC's interests and better understand their concerns. The Applicant can confirm that the land included within the Order limits is required for the operation and construction of the scheme and efforts have been made to reduce permanent land use requirements, refine compound and temporary construction areas, as shown in the Land and Works Plans that form part of the Application post both phases of consultation. In relation to its interest in land, the Applicant is looking to progress discussions in relation to voluntary land agreements. Protective provisions are also being progressed as requested. It is hoped that these arrangements will also deal with the concerns raised with regards to competing uses in the Sembcorp corridor. The Proposed Development will be designed in accordance with applicable industry practice and standards and further information will be shared as the design matures. In relation to the COMAH-designated sites, the Applicants will comply with the required permitting processes and liaise with the SABIC team where works occur within their boundary.	

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		in favour of SABIC have been included in two recently made DCOs and are also being sought in relation to the Net Zero Teesside Project. General comments Since the first Section 42 Consultation SABIC has met with the Applicant and has been provided with further information about the scheme. SABIC welcomes the provision of these additional details. SABIC also welcomes the work which has been undertaken to minimise the amount of land contained in the Order limits. The precise nature of the powers to be taken over the Order land cannot be ascertained until a copy of the draft DCO is made available. In particular this extends to the nature of the proposed powers of compulsory acquisition to be taken in each plot and the extent of powers to exclude SABIC from highways and access roads. SABIC sets out below the specific issues with proposed Application, which are broken down into the relevant parcels in which SABIC has an interest, and which appear to be affected by the proposed Application, being: 1. Wilton International; 2. North Tees Site 3. River Tees 4. Linkline Corridors. 5. Brine Fields and Brine Reservoirs 6. WGEP Taking each area in turn: 1. Wilton International It is understood that the Applicant intends to install its hydrogen pipes in the link line corridors through the Wilton International. It is understood that the Applicant is seeking to maintain optionality in relation to running its apparatus along the eastern or western side of the Wilton Complex and that this explains the two access routes into the site shown on Figure 1A: AC_205953836_2 3 Figure 1A The red line boundary includes a number of the Wilton site roads used by SABIC to access its apparatus, including the road running north to south at the		

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		north east corner of SABIC's cracker. When ICI was broken up standard rules were established for the closure of roads within the Wilton site. This system is not managed by Sembcorp. This is a carefully balanced system whereby Sembcorp as landowner has control of the roads and operators such as SABIC notify them of their access and maintenance needs and essentially ""book"" time to work on their assets. This system works well to balance the competing requirements of different operators, but is dependent on the land ownership and system of mutual rights and obligations which exist over the land. SABIC considers that the Applicant should use the established system to take access and would be very concerned about a development consent order which allowed the Applicant to unilaterally close the access roads. SABIC has pipes in the Link Line Corridors within the Wilton Site and will require maintenance and operation access at all times through any construction and subsequent operation phase. See the Section of this letter on Link Line Corridors below. In addition, SABIC requires that access is maintained at all times to SABICs land interests within the area. This is an operational site for SABIC and it needs to ensure that it will have uninterrupted access at all times for ongoing operational and maintenance requirements. It should be clearly understood that any interruption to SABIC's supply or export pipelines would have a profound effect. The Cracker in particular cannot be turned on and off at the flick of a switch. It would require draining and resetting, which would be likely to take between two and three weeks. This would interrupt operations at the LDPE Plant which relies on the Cracker for supplies and cause loss of revenue, delays to the fulfilment of orders and reputational damage to SABIC. It is imperative, therefore, that adequate safeguards are put in place to prevent this from happening. Due to Wilton being a COMAH site, uninterrupted access at all times will be required for emergency services to ensure that there are no safety implications of the proposed scheme being carried out, and so that SABIC can continue to comply with its COMAH plan. Currently the Application plans includes the land outlined in yellow in Figure 1B below. Some of this land is leased to Anglo American to facilitate the construction of the York Potash Development. The remainder of the land is used by SABIC for storage and general use. It is understand that there is vacant land to the west of this site (not owned by SABIC – see the green cross below) which could be used for AC_205953836_2 4		

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		this purpose. SABIC would therefore ask that the Applicant considers using that vacant land, or other vacant land at Wilton instead of land which is currently in use by SABIC. Figure 1B The land shown in Figure 1C below covers part of the SABIC cavity area. This has underground storage cavities, above and below ground pipework. This is also the location where SABIC's (above-ground) system 32 goes underground and becomes the Trans-Pennine Ethylene Pipeline (TPEP) which is a major accident hazard pipeline. Underground pipework to essential water supplies from the reservoirs situated to the south of the A174 are also located in this area. Any new assets and construction activity in this area would need to take account of these existing high hazard items. Figure 1C The area hatched in yellow in Figure 1D below covers approximately half of SABIC's B7 tank area. This land is required by SABIC for its operations. A more suitable location for the Applicant's apparatus would be likely to be in the Sembcorp owned land to the NW of the bund adjacent the pipe corridor. This would be within the currently proposed Order limits. AC_205953836_2 5 Figure 1D SABIC will require protective provisions as discussed earlier in this letter placing restrictions on the compulsory acquisition of its land and rights. 2. North Tees Site The revised plans show more land at the North Tees Facility within the red line. It is understood that most of this additional land is for access, should an H2 connection be constructed to link in with SABIC's boilers as shown on Figure 2A. Figure 2A AC_205953836_2 6 The North Tees Facility is an important and part of SABIC's operations. As has been previously explained, the North Tees Facility is a COMAH site, as well as being a bonded warehouse. SABIC has responsibilities under it's COMAH plan to ensure the safety and security of the site. In addition SABIC		

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		has responsibilities to HM Treasury to ensure the safety of the goods held in the bonded warehouse which have not yet been subject to excise duties. The goods held in this warehouse consist of fuels and the removal of any fence in this location would create a risk of unauthorised third parties entering a restricted site, and give rise to risks including to health and safety. SABIC will only agree to its land at North Tees being included within the Order limits to the extent that it is required to link its site to the authorised development and, importantly, only subject to the inclusion of its standard protective provisions within the Development Consent order. SABIC also needs to ensure that uninterrupted access at all times to its site is maintained for ongoing operational needs and for emergency services, as discussed above, so it can continue to comply with its COMAH plan. SABIC would therefore be concerned about any powers in the DCO which provided for the stopping up or temporary closure of the highways and access roads to the North Tees site or the access roads within the North Tees Site. SABIC is concerned about the inclusion of the additional land in highlighted in Figure 2A. This area contains SABIC's air compressors and water purification plant, and must not be considered a normal access route or an equipment laydown area. Figure 2B appears to show proposed two new construction access points to the North Tees site by the Applicant. These routes would not provide a suitable access for construction traffic, nor are access controls in place at this locations. Any construction traffic should be routed via the main North Tees gate or other temporary suitable means, however Figure 2B does not show an acceptable solution. Figure 2B On addition SABIC is concerned about the inclusion of the land identified below in Figure 3C. This area contains live SABIC equipment, as well as essential access to pipeline corridors and CF Fertilisers Ammonia Storage facility (via an access route which SABIC are responsible for). AC_205953836_2 7 Figure 3C Further discussion with the Applicant on this point would be welcomed and SABIC will require protective provisions in order to protect its apparatus in this location.		

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		3. River Tees SABIC welcomes the certainty provided by the consultation documents that Tunnel No.1 will not be included in the scheme. Tunnel No. 2 does not have much capacity for any further installations and SABIC understands that the Applicant intends to use a micro-bored tunnel to cross the river and that no dredging of closures to navigation would be required. However further clarity is required in relation to the use of horizonal directional drilling and the potential impacts of such operations on the existing Tunnels and pipelines. SABIC would be concerned should the DCO include powers to interfere with navigation. SABIC relies on navigation on the Tees being available, reliable and predictable in order to bring in the supplies it needs for its operations, and to export its products to purchasers. SABIC would welcome further discussions around this area and the Applicant's proposed plans for this location. AC_205953836_2 8 4. Link Line Corridors The Applicant is intending to install its pipes within the Link Line Corridors. The various industrial sites on Teesside between Billingham in the west and Seal Sands and Wilton International in the east which were once owned and operated by ICI. Many of ICI's factories and facilities were interdependent and symbiotic, and they were linked together by pipes. The connecting corridors through which these pipes ran the Link Line Corridors. When ICI was broken up many of the different plans passed into new ownership and a new model had to be found to manage these essential connections. Today the Link Line Corridors are owned by Sembcorp, but contain pipes which are owned and operated by the various businesses within the Teesside cluster. For example SABIC owns and operates pipes running through the Link Line Corridors between the North Tees Site and Wilton International and between North Tees and the Saltholme Brine Reserves. As the landowner Sembcorp has control of the corridor and manages a carefully balanced access system whereby operators such as SABIC notify them of their access and maintenance needs and essentially ""book"" time to work on their assets. This system works well to balance the competing requirements of different operators, but is dependent on the land ownership and system of mutual rights and obligations which exist over the land. SABIC would be very concerns about a development consent order which allowed the Applicant to take rights in the Link Line Corridor which did not include these balances. It would be even more concerned about any powers being exercised which		

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		extinguished or modified the existing rights of operators within the corridor. In addition, SABIC will require maintenance and operation access through any construction and subsequent operation phases. 5. Brine Fields and Brine Reservoirs The Brine Fields provide underground brine winning and storage cavities. The ground is not as stable as some other ground in the area and are will need to be taken to avoid subsidence. In addition to the underground cavities there are well-heads and boreholes across the site and any developer would need to fully understand their location and nature. The Brine Fields are also a top-tier COMAH site to which SABIC and emergency services require access at all times. As a general comment, the Brine Fields are an integral part of SABIC's operations and require protection so that they can remain operational at all times. It is understood that the land identified in Figure 5A below would be used temporarily for the directional drilled pipe. The land shown in Figure 5B and 5C, and the land immediately to the south would be used for the new hydrogen pipeline and associated access to it. There are several underground brine winning cavities and pipework in the land shown on Figures 5A and 5B, and it would therefore be important that any works were carried out in close consultation with SABIC. The area shown on Figure 5C crosses several access roadways and pipe corridors which SABIC will require continuous access to at all times. AC_205953836_2 9 Figure 5A Figure 5B Figure 5C AC_205953836_2 10 The additional land in Figure 5D is understood to be required by the Applicant for a construction depot/laydown area. However this crosses existing pipework and it would therefore be important that any works were carried out in close consultation with SABIC. The Applicant should also consult with the farmer, who is understood to use land in this area for livestock management, pens etc. Figure 5D		

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		It is understood that the land shown on Figure 5E is required for construction traffic (and subsequent maintenance/operation) of the Applicant's hydrogen pipe. Access for SABIC is required at all times along this road. Figure 5E AC_205953836_2 11 Land has been taken into the Order limits which show on Figure 5F below which is currently used by SABIC as a lay-down and construction area. This facility is important to SABIC's operations on site and SABIC would not want to lose us of this facility. Figure 5F 6. The Wilton to Grangemouth Ethylene Pipeline (WGEP) Figure 6A below shows SABIC's Compound 38. At this point an above ground ethylene pipeline (system 32, which is shown with a purple line on Figure 6A) goes underground and becomes the WGEP. The WGEP is shown with a magenta line on Figure 6A. Figure 6A WGEP – (underground) System 32 (above ground) AC_205953836_2 12 The WGEP is a high pressure buried ethylene pipeline running between Wilton and Grangemouth. It is major accident hazard pipeline which is likely to present engineering challenges to the development. Any development in the vicinity of the WGEP could present serious operational difficulties to SABIC. SABIC welcomes the exclusion of Compound 38 from the Order limits, but it will require access to this compound at all times. SABIC notes that the Order limits continue to extended out south of the east-west Link Line Corridor in this location. It is unclear why this is the case and why the land shown with a blue cross in Figure 6B is included in the Order limits. SABIC considers that any development by the Applicant should be located so as not to interfere with the WGEP. Figure 6B		

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		A copy of SABIC's Protective Provisions are attached. We look forward to further discussions on the proposed Application in the coming weeks.		
Kellas Midstream/CNSL/H2NE	22/1/24	Response to further consultation (H2Teesside) 1 INTRODUCTION 1.1 This document is submitted by Kellas Midstream Limited ("Kellas"), CATS North Sea Limited ("CNSL") and H2NorthEast Limited ("H2NE") in response to the second consultation by H2Teesside Limited ("H2 Teesside") in relation to its proposals for a blue hydrogen production facility on Teesside (the "Project"). 1.2 Kellas, CNSL and H2NE submitted a consultation response on 25 October 2023 to the first consultation undertaken by H2 Teesside in accordance with section 42 of the Planning Act 2008. That response set out the general concerns of Kellas, CNSL and H2NE, all of which remain, and on which we would welcome further engagement with H2 Teesside. Those comments are not repeated in this response. 1.3 Specific comments on the refined red line boundary that is the subject of the second consultation are below. 2 REFINED RED LINE BOUNDARY 2.1 Kellas, CNSL and H2NE welcome the general refinement of the red line boundary that has been undertaken by H2 Teesside following the first section 42 consultation. The reductions go some way to addressing one of the concerns raised in our previous letter (at paragraph 4.5(a)) around excessive land take. 2.2 Land at the CATS Terminal – The plan titled "Stage 2 Consultation Overview" shows two relatively small additional land areas hatched yellow in proximity to the CATS Terminal. The consultation brochure does not set out why this additional land take is required, or exactly what area it covers. Please can this information be provided? 2.3 H2NorthEast - The reduced red line boundary for H2 Teesside reduces the potential for conflict with the H2NorthEast project, however, it does not remove it entirely. It remains the case that there is likely to be a significant spatial overlap between the projects and a temporal overlap in their construction schedules. H2NE would welcome continued and more detailed engagement with the H2 Teesside team to ensure that the H2 Teesside project does not prejudice delivery of H2NorthEast, and vice versa – there is real potential for clashes during the design and construction phases that could result in delay to both projects, thereby risking the required commercial operations date and increasing costs. DocuSign Envelope ID: FF051C8A-1730-4C3F-90A0-A177109CE267	See Table 15.1 response. The two relatively small additional land areas hatched yellow in proximity to the CATS Terminal are required by the Applicant for enabling a connection to the natural gas network. The Applicant notes that the extent of the red line boundary in this area matches that of the recently granted NZT DCO, and is for the same purpose, and as such no additional burden on Kellas and CNSL is envisaged. The Applicant has also published further design details as part of the DCO application submission. The Applicant is also in discussions with Kellas for organising a meeting to discuss these points further and progressing voluntary agreement and protective provision.	No

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		22 January 2024 3 CONCERNS REMAINING CATS Pipelines and Terminal 3.1 As detailed in section 3 of the letter dated 25 October 2023, CNSL will require H2 Teesside to include protective provisions within any draft DCO submitted as part of the application for the Project. A copy of our template protective provisions for the CATS Pipeline is enclosed. We look forward to further engagement with you on this matter. 3.2 We would re-iterate our request in section 3 of our letter dated 25 October 2023 that a monthly meeting be arranged that would keep CNSL informed of progress of H2 Teesside and ensure that its development is done in an open and collaborative manner with established uses in the area. 3.3 As noted above, we would welcome further information as soon as possible on the additional land take proposed at the CATS Terminal site. H2NorthEast 3.4 In our letter dated 25 October 2023, we raised concerns that the deliverability of H2NorthEast could be prejudiced by H2 Teesside. We raised concerns relating to (a) excessive land requirements, (b) construction schedule overlap, (c) insufficient design detail being provided and (d) that the H2Teesside proposals were insufficiently defined and matured. 3.5 Whilst the refinement of the red line boundary is welcome, we remain concerned at the lack of detail that is available about the H2Teesside proposals as a whole. Very little additional information has been provided beyond the red line boundary drawing. As such, we remain concerned about the potential interaction between the projects and would request that a regular meeting is arranged to work towards a mutually agreeable solution. {PROTECTIVE PROVISIONS ATTACHED]		
Maritime and Coastguard Agency	23/1/24	THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 ‘DUTY TO CONSULT’ OF THE PLANNING ACT 2008 & REGULATION 13 ‘PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)’ OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 Thank you for your letter dated 13 December 2023 inviting comments on the further consultation on the project. The documents have been considered by representatives of UK Technical Services Navigation, and the Maritime and Coastguard Agency (MCA) would like to respond as follows:	In light of the methodologies proposed for how the Proposed Development will cross the River Tees and Greatham Creek set out in Chapter 5 of the ES, no activities for the Proposed Development will require a Marine Licence nor will there be any impact on marine users as a result of the Proposed Development.	No

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		The MCA has an interest in the works associated with the marine environment, and the potential impact on the safety of navigation, access to ports, harbours and marinas and any impact on our search and rescue obligations. The MCA would expect any works in the marine environment to be subject to the appropriate consents under the Marine and Coastal Access Act 2009 before carrying out any marine licensable works. Unfortunately, we have no record of receiving the first consultation dated 14th September 2023 within UK Technical Services Navigation. All correspondence on this application should be sent to navigationsafety@mcga.gov.uk. We note the proposals are for the construction, operation (including maintenance) and decommissioning of the H2Teesside project, which comprises: • an approximately 1.2 Gigawatt thermal (GWth) blue hydrogen production facility (including on-site hydrogen storage); • carbon export, natural gas, water and wastewater, electricity, oxygen and nitrogen connections; and • hydrogen pipeline connection to export hydrogen to a wider network of future users. A hydrogen pipeline network is required to connect various potential industrial offtakers across the Tees Valley to the Production Facility at the Main Site. Various route options and construction methodologies are being considered throughout the proposed hydrogen pipeline network, including trenchless crossings (such as Horizontal Directional Drilling (HDD) for the crossing of the River Tees and Greatham Creek. The proposed trenchless technologies would be below the river/estuary bed at a depth to prevent impacts on river channel integrity, habitats and infrastructure (including other bores and tunnels). The final methods to be used are yet to be confirmed. It would be useful to confirm whether there will be any works undertaken below the Mean High-water Springs (MHWS) as part of the project which may impact other marine users of the River Tees and Greatham Creek. We note the documentation states that 'some aspects of the Proposed Development could require a marine licence namely the construction and operation of the crossing of the River Tees for the proposed hydrogen pipeline, and the potential for crossings of Greatham Creek below MHWS'. The MCA would be interested in any licensable activities and those which impact the river users. It is our understanding that the site for the crossing of the River Tees falls within the jurisdiction of a Statutory Harbour Authority (SHA) – PD Ports. The SHA is responsible for maintaining the safety of navigation within their waters		

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		during the construction and the operational phase of the project. It is unclear at this stage what activities as part of the project may impact users of the River Tees and Greatham Creek, if any. Should any works be undertaken which impact other marine users, the MCA would expect the impacts to be fully assessed in discussion with the Port Authority in accordance with the Port Marine Safety Code (PMSC) and its associated Guide to Good Practice. To ensure local stakeholder input, the MCA would recommend a hazard identification workshop be held, to bring together relevant navigational stakeholders for the area to discuss the potential impacts on navigational safety. Decisions relating to further controls should be agreed in consultation with other interested parties to determine whether the ALARP status has been met for each risk. In this case, a robust Safety Management System (SMS) for the project should be in place under this code. From the Guide to Good Practice, section 7 Conservancy, a Harbour Authority has a duty to conserve the harbour so that it is fit for use as a port. The harbour authority also has a duty of reasonable care to see that the harbour is in a fit condition for a vessel to be able to use it safely. Section 7.8 Regulating harbour works covers this in more detail. We look forward to receiving further details on the proposals as the project progresses, and we will respond within our remit.		
STDC/Teesworks	23/1/24	Response to H2Teesside – Second Consultation Thank you for inviting our client, the South Tees Development Corporation (STDC), hereafter referred to as “Teesworks”, to comment on the documents issued as part of the second consultation in respect of the Development Consent Order (DCO) being prepared for the H2Teesside Project (‘the Project’). First and foremost, Teesworks wishes to again reiterate its in-principle support for the Project, which will be a significant generator of jobs, directly and indirectly into the Tees Valley and also a contributor to the regeneration of the Teesworks area, with investment in line with the industrial typologies that Teesworks seeks to attract. Teesworks wishes to work positively and proactively with bp to deliver the Project. While the reduction in the red line boundary included within the second consultation is welcomed, in principle, by Teesworks, limited detail is available in the consultation material on the specifics of why additional land is needed in the vicinity of British Steel Train Station and there is no explanation given for why the large swathe of land is retained below the area marked ‘7’. Teesworks seeks further clarity and detail to be provided on the rights and requirements which bp seeks over its land, both in respect of the land maintained within the	The Applicant has been in weekly engagement with Teesworks to discuss the Proposed Development including and voluntary agreements regarding the Main Site and easements. The land in the vicinity of the former British Steel Train Station is needed to enable hydrogen and electrical connections. The Applicant is working the routing of these connection collaboratively with the Teesworks technical and commercial teams. The Applicant and Teesworks have made significant progress in progressing the voluntary agreement discussions and the Applicant will keep working with Teesworks to finalise these, including final easements, and service corridors.	

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		Order Limits and also the additional land which is now included within this second consultation. Lichfields, on behalf Teesworks, met with bp's team in early December and requested a programme of future meetings to enable further discussion relating to refining the Order Limits, design fix and EIA assumptions and methodology. We then followed up (via email on 12 December) for a copy of that programme. A further request for the programme and a meeting was made to bp on 11 January 2024. Whilst we are committed to working collaboratively with bp, at the current time, Teesworks retains the position it set out in its previous response of 26 October 2023, a copy of which is enclosed. Pg 2/3 29190034v1 We look forward to an early meeting with bp and its representatives to discuss the matters raised in this and our previous response.		
Environment Agency	23/1/24	THE H2TEESSIDE PROJECT - FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 (CHANGE IN SITE BOUNDARY) LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM Thank you for re-consulting us on the H2Teesside Project following changes to the Project Site Boundary, which we received on 13 December 2023. Our previous comments on the Preliminary Environmental Information Report consultation, in our response dated 26 October 2023, still stand as the changes to the Project Site Boundary do not impact our previous advice. In addition to our previous advice, we wish to provide the below comments in relation to the proposed changes to the Project Site Boundary. Flood Defences The changes to the Project Site Boundary in the area at the Venator Site, outlined by Change 1 within the December Update Brochure, may have an impact on our flood defence improvement works. The Environment Agency's Greatham North East Flood Alleviation Scheme aims to improve the defences to the south of the Venator Plant. As part of our improvement works, we will be creating a site compound to support construction on Venator's land for the duration of the works. Our site compound location has been agreed with Venator and is located in the hashed yellow area shown here in the increased red line boundary for H2 Teesside. We	**Flood Defences** The Greatham North East Flood Alleviation Scheme was recognised to be a development with the potential to cumulatively interact with the construction and / or operation of the Proposed Development. As such, this development was shortlisted for a full Stage 4 cumulative effects assessment and has been considered by each technical chapter where there is known to be an overlap in sensitive receptors / impact pathways. All topics except geology, hydrogeology and contaminated land and marine ecology considered effects to be the same as has already been reported in the Environmental Statement for the Proposed Development in isolation. Marine ecology conservatively identified a potential cumulative effect in relation to an increase in airborne sound levels above baseline and the subsequent potential for behavioural effects exhibited by seals hauled-out at Seal Sands which could include the disturbance of resting, moulting and breeding. However, this cumulative effect was deemed to be Minor Adverse and Not Significant. As such, we consider the potential overlap with the Greatham North East Flood Alleviation Scheme to have been fully considered within the EIA, for the full cumulative effects assessment please refer to Chapter 23: Cumulative and Combined Effects (ES Volume I, EN070009/APP/6.2).	No

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		expect to submit an application for planning permission in summer 2024 and have construction programmed to start in spring 2025. The additional area added to the H2 Teesside Project Site Boundary may have an impact on our Scheme if works at this location are to begin before our Flood Alleviation Scheme has been completed. To ensure the two projects do not coincide and impact each other, we ask for confirmation of the dates when construction for your project is expected to commence in this area. We also request clarity on what works are proposed in this area to ensure there will be no impacts on our flood defence improvement works. Ecology The updated redline boundary introduces new ditches and a minor watercourse in the north-western area (change number 6 within the December Update Brochure). These ditches should be subject to a water vole survey due to the presence of records in the area around Cowpen Bewley Woodland Park. All newly added areas to the Project Boundary should be subject to a habitat survey, if they have not already been surveyed.	The yellow shaded area for Change 1 will be for the construction of a connection from Venator to the Greatham branch of the Hydrogen Pipeline Network which may overlap with the EA's proposed construction compound. The routeing of the hydrogen pipeline in the Greatham area is designed to avoid impacts on the SPA/Ramsar. When selecting the routeing early engagement with the Environment agency identified the need to avoid impacts on flood alleviation schemes. Consequently, HDD techniques will be used to cross the creek to avoid the flood alleviation scheme The exact timing of works in the venator area is yet to be defined but the Applicant and Venator will work with the EA to avoid conflicts in this area and will provide further information in due course to allow Protective Provisions to be agreed. **Ecology** The new yellow hashed area brought into the redline boundary for Change 6 was subject to a Phase One Habitat Survey in November 2023. During this survey it was identified the minor watercourse was suitable for water voles and so their presence has been assumed for the purposes of this assessment. The survey season for water vole had passed by the time this new area was brought into the redline boundary, and as such a water vole survey is yet to be conducted to cover this new area. The water vole survey window opens again in April, at which point a survey of this area will be conducted and discussed with the Environment Agency.	
National Gas Transmission	23/1/24	THE H2TEESSIDE PROJECT — LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 I refer to your further statutory consultation for the above proposed DCO. NGT previously responded to a Statutory Consultation on 9th October 2023 and has no further comments to make in relation to operational apparatus located within or in proximity to the Order limits. Potential impacts to NGT apparatus remain the same as previously detailed.	The Applicant has noted and will adhere to the comments on standards and guidelines provided by National Gas for works in proximity to their infrastructure. The Applicant has engaged with National Gas in relation to Protective Provisions and the seeking of voluntary land agreements where required.	No

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		NGT wishes to reiterate that where the promoter intends to acquire land, extinguish rights, or interfere with any of NGT apparatus, protective provisions will be required in a form acceptable to it to be included within the DCO. NGT requests to be consulted at the earliest stages to ensure that the most appropriate protective provisions are included within the DCO application to safeguard the integrity of our apparatus and to remove the requirement for objection. Adequate access to NGT pipelines must be maintained at all times during construction and post construction to ensure the safe operation of our network. NGT has also been separately engaging with and will continue to work with BP on the H2 Teesside project to identify how it can integrate with Project Union. Project Union is an NGT project whereby it's looking at creating a national hydrogen network that will connect hydrogen supply, demand and storage.		
Navigator Terminals	23/1/24	1. INTRODUCTION 1.1 We are instructed by Navigator Terminals Limited ("Navigator") in relation to the development consent application made by H2 Teesside (the "Applicant") for the H2Teesside Project (the "Project"). This representation is made on behalf of Navigator. 1.2 Navigator is the UK's leading independent bulk liquid storage provider with over 1.28 million cubic metres (cbm) of storage capacity. Formed in 2016, Navigator operates four terminals, each strategically located in major UK ports and serving key demand centres within the UK. Across these locations we are able to offer our customers unique storage solutions for crude, petroleum, chemical, bitumen, liquefied gas and biofuel products. 1.3 In the North East, Navigator operates two sites. The first, North Tees, includes the region's only independent deep water jetty and modern rail distribution facilities. The site is a fuel and crude storage hub for the North East. The terminal has pipeline connections to neighbouring Navigator Terminals Seal Sands, and is connected by pipeline to the Ekofisk crude pipeline. 1.4 Situated on the north bank of the River Tees, Navigator Terminals Seal Sands facility is fully integrated into the pipeline system of the UK's largest chemical cluster and is also connected by pipeline to the neighbouring Navigator Terminals North Tees. Both terminals have excellent motorway and truck road connections bringing Scotland, the Midlands and the North of England within a 3 hour drive. 1.5 Both sites operated by Navigator are designated as upper tier for the purposes of the Control of Major Accident Hazards Regulations 2015. There are also various pipelines that carry hazardous substances and are classified as Major Accident Hazard Pipelines. The COMAH regulations require all operators of upper-tier establishments to prepare a safety report. Its purpose is to show	The Applicant has engaged with the Navigator Terminals team to discuss the Proposed Development and are discussing the progression of land agreements and protective provisions in relation to the specific operational requirements and development proposals at Navigator Terminals' sites at North Tees and Seal Sands. Should any proposed works fall within the boundaries of the COMAH-designated sites, the Applicants will comply with the required permitting processes and liaise with Navigator Terminals' team. The Applicant has taken into account Navigator Terminals' comments regarding the extent of the order limits and whilst the land included within the Order Limits is required for operation and construction of the scheme itself, efforts have been made to reduce permanent land use requirements, refine compound and temporary construction areas as shown in the Land and Works Plans that form part of the Application and are required for the development since consultation.	No

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		that it has put in place arrangements for the control of major accident hazards and to limit the consequences to people and the environment of any that do occur. 1.6 Navigator does not object to the principle of the Project but is concerned to ensure that the construction and operation of the proposed works do not adversely affect its existing business operations, its future proposals, and the continued safety of people and the environment. 1.7 Aside from Navigator's own business and proposals, the location of Navigator's sites makes them very attractive to a number of nationally significant infrastructure projects, notably: 1.7.1 Net Zero Teesside – a collection of industrial, power and hydrogen businesses which aim to decarbonize their operations through the deployment of carbon capture utilization and storage (CCUS). DCO project currently awaiting a SoS decision. 1.7.2 Lighthouse Green Fuels – a project that will make sustainable aviation fuel (SAF) from non-recyclable waste and waste biomass at Alfanar's Billingham site, Stockton-on-Tees, UK. DCO project, at pre application stage. Navigator has partnered with LGF to support this project by providing importation and storage of feedstock and product. 1.7.3 H2 Northeast - a project to build a 1GW CCUS-enabled low carbon hydrogen production facility adjacent to the CATS terminal on Teesside. 1.7.4 Wavecrest Energy LNG import facility – a project to construct a new LNG import facility, including new jetty to be developed on Navigator's foreshore. 1.8 Navigator is seeking to work positively with the Applicant and other developers who wish CLOUD_UK\223132859\1 3 to locate infrastructure within or adjacent to its estate. Its knowledge of the land and complex infrastructure in the area can assist the Applicant in successfully advancing its proposals whilst ensuring that projects are suitably coordinated thereby minimising impacts on existing businesses. 1.9 Navigator's Estate and Existing Operations 1.10 Satellite maps of Navigator's sites are appended to this representation. At the northern end of the North Tees site is a partially undeveloped site fronting onto the River Tees, the majority of which has been included within the draft order limits. This site, whilst partially undeveloped, is strategically important to Navigator. It is immediately adjacent to Navigator's existing bulk storage site and also contains a research facility operated by Intertek in its north west corner. To the north of the site is a tunnel and pipeline corridor (both operated by Sembcorp) through which pass various pipelines that cross under the river Tees. These include several pipelines from Navigator's site and others across the wider North Tees and Billingham chemical sites. In addition to the		

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		pipelines that run along the outer boundary of the Northern edge of the Navigator site until they reach a pipe tunnel, there are several large diameter directionally drilled natural gas pipelines that cross the river outside of the tunnel. The pipelines outside of the tunnel occupy approximately a quarter of the land that appears undeveloped, due to restrictions on development of land within the proximity of pipelines. Navigator also has a visible, but -1m pipeline culvert/corridor running East/West in the middle of the field, connecting the operating site (storage tanks) to the pipeline corridor and tunnel, and onwards to customers. 1.11 Any works proposed on this site must firstly be located and planned very carefully so as to avoid disturbance to the busy Intertek building and any impacts on existing pipeline infrastructure. As already mentioned, there is a safety dimension to this because of the upper tier COMAH status of the Navigator site and the presence of MAH pipelines. 1.12 Navigator's proposals 1.13 Navigator has already earmarked a significant proportion of the site for its own CO_2 hub development (shown on drawing 26605-000-P1-0000-00004 appended). Last year Navigator announced that it would partner with enfinium to develop the UK's first 'Rail to Zero' carbon capture rail corridor, that would enable dispersed industrial sites to permanently store their emissions. The proposal will involve transportation of carbon dioxide (CO_2) captured at enfinium's Ferrybridge waste facilities in West Yorkshire to Navigator's storage facilities in Teesside using rail freight. The CO_2 would then be transported safely offshore from Navigator's facilities for permanent storage. The pioneering project would enable enfinium to decarbonise the UK's largest, and one of the most efficient, (R1) energy from waste sites in the UK. By permanently storing the biogenic emissions captured from its waste stream, the Ferrybridge site would also generate around 700,000 tonnes of 'negative emissions' or 'carbon removals' every year – making a significant contribution towards the UK Government's target to produce 23 million tonnes of negative emissions per year by 2035 to remain on track to achieve a 'Net Zero' economy by 2050. 1.14 Navigator is also working with Wavecrest Energy which proposes to locate a new LNG import facility, including new jetty, on Navigator's site and foreshore area. 1.15 The site also has planning permission for propane storage within the site. CLOUD_UK\223132859\1 4 1.17 Finally, Navigator proposes to accommodate a construction laydown area for BP's other NSIP project Net Zero Teesside on the western half of its site, along with additional pipelines. The area proposed to be used is shown edged red on drawing 204482_PLN_HOT_70.1_B appended.		

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		1.18 Other proposals in the vicinity 1.19 Aside from Navigator's own project, several other developers of nationally significant infrastructure require rights across its estate, notably for pipelines crossing the River Tees and accessing the pipeline corridor to the west as well as for construction and laydown areas. Access roads 1.20 There are a number of access roads included within the order limits across the Seal Sands area. Any use or works to these roads will need to be carefully considered together with any impacts on Navigator's operations. As private access roads are involved, there are also potential cost implications associated with damage/wear and tear, which will need to be addressed by the Applicant. Pipeline Corridors 1.21 Navigator has various interests in the pipeline corridors at Seal Sands which are located around its COMAH site[s]. Use of these corridors for the proposed pipelines must be done in a way which is safe, avoids interruption to other critical infrastructure in the area and causes minimal disturbance to local businesses. Emergency Access Road 1.22 An emergency access road for the petrochemical industrial cluster at Seal Sands is located off the A178 Tees Road to the north of Greatham Creek. It is understood that parts of this access are included within the draft order limits. This emergency access (which forms part of the wider Seal Sands emergency plan) is required to remain unobstructed at all times. Navigator requires further details of any proposed works or access proposals that may interfere with this emergency access. Efficient use of land 1.23 Whilst Navigator wishes to assist the various NSIP projects, including H2 Teesside and Net Zero Teesside, to proceed, it is currently concerned that they may not be adequately coordinated to make efficient use of the land available. Notably, between BP's two projects, the majority of Navigators undeveloped site has now been included within draft or proposed order limits. Navigator must be satisfied that any proposal will: 1.23.1 Not prevent its land being used for its own important net zero related projects; 1.23.2 Be planned collaboratively with all stakeholders and other project developers, to avoid the inefficient use of land; as opposed to a "first come first served" approach. For example, discussions were held last year in relation to the development of a new tunnel under the River Tees that might accommodate pipelines for a number of projects; as opposed to a piecemeal approach which may not be efficient from a land use perspective;		

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		1.23.3 Consider project programmes and the possible implications for Navigator as landowner, including cumulative/successive development and access use; and 1.23.4 Clearly identify possible conflicts and interactions between projects, so that they can be understood and managed. CLOUD_UK\223132859\1 5 1.24 Until such time as these matters are expressly considered and assurances provided that they are being sensitively managed, Navigator objects to the current iteration of the Project 2. PROTECTION AND FURTHER CONSULATION 2.1 On the basis of the information currently available, Navigator does not consider that it is necessary for the Applicant to acquire all of the land or interests in its land and lesser options have not been adequately explored; for instance combining construction laydown areas with the Net Zero Teesside project and the potential for shared infrastructure. 2.2 As a result, Navigator requires further information/justification for the inclusion of a number of plots in which it has interests within the order limits. Once this is provided, Navigator may be able to provide additional useful consultation responses to help guide the Applicant's proposals. 2.3 Navigator would encourage the Applicant to engage with it as early as possible in relation to any private treaty acquisitions that it may decide to pursue. 2.4 Navigator proposes that the DCO include protective provisions to offer protection in relation to its interests. Aside from Navigator's own interests, there must also be protection for others such as Intertek, who operate from the site. 2.5 Navigator proposes to work with the Applicant to agree suitable protective provisions.		
Dow Chemical Company	23/1/24	The Dow Chemical Company Limited fully reserves its position as landowner in respect of its land ownerships at Seal Sands falling within the ambit of the DCO. Dow is the Lessee of 2 parcels of land from INEOS.	The Applicant will continue to engage with DOW Chemicals in relation to their interests within the Development Boundary.	No
PD Teesport	23/1/24	1. INTRODUCTION 1.1 This representation responds to H2 Teesside Limited's further consultation on 13 December 2023 and supplements PD Teesport Limited's ("PDT") 1st written representation of 8 December 2023 ("the 1st representation"). 1.2 It is noted that since the 1st representation was submitted, the draft order limits for the H2 Teesside project has been reduced, and in some areas new land included. This representation will therefore consider the extent to which such reduction in area may affect the matters previously raised by PDT.	See Consultation Round 1 response The Applicant has taken into account PD Teesport's comments regarding the locations of concern highlighted within the Order limits and whilst the land is required for operation and construction of the scheme, efforts have been made to reduce permanent land use requirements and temporary construction	No

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		General concerns regarding powers sought 1.3 The concerns raised in paragraphs 2.5 and 2.6 of the 1st representation remain unchanged. Riverside ro-ro and Northern Gateway Container Terminal (NGCT) 1.4 The concerns raised in paragraphs 2.7 to 2.11 of the 1st representation remain unchanged. Existing Pipeline Infrastructure 1.5 The concerns raised in paragraphs 2.12 and 2.13 of the 1st representation remain unchanged. Access to South Gare Breakwater 1.6 The concerns raised in paragraphs 2.14 to 2.16 of the 1st representation remain unchanged. Access to Redcar Bulk Terminal 1.7 The concerns raised in paragraphs 2.17 and 2.18 of the 1st representation remain unchanged. West Lackenby 1.8 It is noted and welcomed by PDT that the area known as West Lackenby, being the triangular shaped area located between Tees Dock Road MHW and the railway, as well as part of Tees Dock Road has been removed from the draft order limits. This addresses the matters raised in paragraphs 2.19 and 2.20 of the 1st representation. Access roads 1.9 The concerns raised in paragraph 2.21 of the 1st representation remain unchanged. Seal Sands Pipeline Corridors and Access Roads 1.10 Whilst some of the pipeline corridors and access roads at Seal Sands have been removed from the draft order limits, many still remain and so the concerns raised in paragraph 2.22 of the 1st representation remain unchanged. Former tank farm site - East bank of the river 1.11 It is noted and welcomed by PDT that the area known as the former tank farm site located on the east bank of the river immediately adjacent to the tunnel head has been removed from the draft order limits. This addresses the matters raised in paragraph 2.23 of the 1st representation. Cloud_UK\222641303\2 3 Emergency Access Road 1.12 The reduction of the order limits in the vicinity of the emergency access located off the A178 Tees Road to the north of Greatham Creek does not	areas as shown in the Land and Works Plans that form part of the Application. In line with PDT's suggestions, The Applicant is eager to further engage in discussions regarding voluntary agreements for land rights for the Proposed Development and it is the intention of The Applicant to voluntarily acquire the required land and rights required for Proposed Development through ongoing negotiation. The Applicant is also at an early stage of engagement regarding Protective Provisions.	

CONSULTEE	DATE OF RESPONSE	CONSULTEE RESPONSE	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION
		adequately address the issues raised by PDT in paragraph 2.24 of the 1st representation. 2. PROTECTION AND FURTHER CONSULATION 2.1 On the basis of the information currently available, PDT remains of the view that it does not consider that it is necessary for the Applicant to acquire land or interest in land from PDT, and that alternatives are certainly available. 2.2 PDT also still requires further information/justification for the inclusion of a number of plots in which it has interests within the order limits. Once this is provided, PDT may be able to provide additional useful consultation responses to help guide the Applicant's proposals. 2.3 PDT would encourage the Applicant to continue engagement with it in relation to any private treaty acquisitions that it may decide to pursue. 2.4 PDT propose that the DCO include protective provisions to offer protection in relation to PDT's interests. Aside from PDT's interests, there must also be protection from the various businesses around the Port, who rely on the Port's uninterrupted operation. 2.5 PDT proposes to work with the Applicant to agree suitable protective provisions.		
Network Rail	24/1/24	Proposed scheme: The H2Teesside Project I refer to your 13th December 2023 letter in respect to the pre-application consultation under Section 48 of the Planning Act 2008 for the Outer Dowsing Offshore Wind Farm. Network Rail is a statutory undertaker responsible for maintaining and operating the railway infrastructure and associated estate. It owns, operates, maintains and develops the main rail network. Network Rail aims to protect and enhance the railway infrastructure therefore any proposed development which is in close proximity to the railway line or could potentially affect Network Rail's specific land interests, will need to be carefully considered. Impact on Network Rail Infrastructure Network Rail has been reviewing the information provided and note that proposals include development adjacent to the railway infrastructure including connections through railway property. The scheme will intersect the operational railway on three lines DSN2 @ 19m 1500yds approx. (Stockton Cut Junction to Redcar), LEN3 @ 65m 1300yds approx. (East Low Junction to Newcastle East Junction) and HAH1 @ 0m 396yds approx. (Belasis Lane Junction to Haverton Hill South Junction).	The Applicant welcomes the response from Network Rail and the ongoing discussions on the technical and land negotiations regarding the potential crossing of Network Rail infrastructure by the Proposed Development. The Applicant has held a number of discussions with Network Rail asset protection and easement teams regarding proposed crossings and how to minimise the effects of construction on Network Rail operations. The construction phase impact is set out and managed through the Appendix 15B: Construction Workers Travel Plan and Appendix 15C: Construction Traffic Management Plan [ES Volume III, EN070009/APP/6.4], and a measure / action can be included that any contractor will liaise fully with Network Rail where appropriate, and fully comply with any requirements for working near a railway. The Applicant has met with NR and provided further details on the Proposed Development and interactions with NR Assets. The Applicant has submitted BAPA clearances and awaits feedback. NR have also confirmed points of contact for progressing land agreements and Protective Provisions if	No

CONSULTEE	DATE OF RESPONSE	CONSULTEE RESPONSE	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION
		At this time we have no further comments to make on the additional information supplied, other than those returned in response to the Autumn consultation (25 October 2023) as detailed in the attachment which still apply.	required and the Applicant is progressing engagement with NR in relation to these.	
Enovert	24/1/24	Please see the email thread below as a record of our discussions to date with Dalcour Maclaren, who we understand to be working on behalf of the applicant. Through discussions with Dalcour Maclaren we intend to engage with the Project and the Applicant to ensure that Highfield Environmental's land and Enovert's interests are protected as part of the proposed development. In the first instance, it would be helpful to have more detail on the proposed interactions between the Project and the land within our land interests, as highlighted in the email tread below.	The Applicant will continue to engage with Enovert and Highfield Environmental in relation to their interests within the Development Boundary.	No

Table 15.3: Additional/Targeted Consultation – Section 42 (and non-prescribed) Consultation Responses

CONSULTEE	DATE OF RESPONSE	CONSULTEE RESPONSE	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION
PD Teesport	5/3/24	Written Representation (no.3) of PD Teesport Limited in Response to Targeted Consultation INTRODUCTION 1.1 This representation responds to H2 Teesside Limited's targeted consultation on 5 February 2024 and supplements PD Teesport Limited's ("PDT") 1st written representation of 8 December 2023 ("the 1st representation") and 2nd written representation of 23 January 2024 ("the 2nd representation"). 1.2 It is noted that since the 1st representation and 2nd representation were submitted, the draft order limits for the H2 Teesside project has been amended with some areas of new land included. This representation will therefore consider the extent to which such reduction in area may affect the matters previously raised by PDT. 2. NEW ORDER LIMITS	See response in Table 15.1. The Applicant has taken into account PD Teesport' s comments regarding the locations of concern highlighted within the order limits and whilst the land is required for operation and construction of the scheme itself, efforts have been made to reduce permanent land use requirements and temporary construction areas as shown in the Land and Works Plans that form part of the Application and are required for the development. In line with PDT's suggestions, The Applicant is eager to further engage and is in further discussions regarding voluntary agreements for land rights for the Proposed Development. The Applicant is also at an early stage of engagement regarding Protective Provisions.	No

CONSULTEE	DATE OF RESPONSE	CONSULTEE RESPONSE	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION
		2.1 PDT confirm that the concerns raised in the 1st representation and 2nd representation remain unchanged following the further amendment of the order limits and that those comments remain extant. 2.2 PDT have no further comments to raise in light of the amended order limits. 3. PROTECTION AND FURTHER CONSULATION 3.1 On the basis of the information currently available, PDT remains of the view that it does not consider that it is necessary for the Applicant to acquire land or interest in land from PDT, and that alternatives are certainly available. 3.2 PDT also still requires further information/justification for the inclusion of a number of plots in which it has interests within the order limits. Once this is provided, PDT may be able to provide additional useful consultation responses to help guide the Applicant's proposals. 3.3 PDT would encourage the Applicant to continue engagement with it in relation to any private treaty acquisitions that it may decide to pursue. 3.4 PDT propose that the DCO include protective provisions to offer protection in relation to PDT's interests. Aside from PDT's interests, there must also be protection from the various businesses around the Port, who rely on the Port's uninterrupted operation. 3.5 PDT proposes to work with the Applicant to agree suitable protective provisions.		
Ineos Nitriles Targeted	7/3/24	We refer to the form of consultation sent to our client INEOS Nitriles (UK) Limited (copy attached). We confirm that we act for INEOS Nitriles (UK) Limited. We have the following comments in relation to the consultation: H2 Teesside should be aware that the majority of the land which is shown on the plan for the construction/laydown area is leased to Dow Chemicals – any discussions in relation to the use of that land needs to be had with them in the context of their lease. We note that you have confirmed that you are already in touch with them. To the extent that you are going to require additional land outside of the Dow demise for the laydown/access then that will need to be the subject of further discussion with INEOS. Any rights of way across the INEOS site will need to be with our agreement and subject to our determination on the route. In relation to the route of the pipelines along the route of the "Sembcorp" easement, you will already be aware of the rights that exist in relation to this	The Applicant is engaged with INEOS Nitriles in relation to their land and assets within the Development Boundary and is discussing the progression of voluntary agreements. The Applicant is aware of how the land in question is held and the respective areas which are under a lease with DOW Chemicals and operated as part of the Linkline Corridor. The Applicant is in contact with DOW Chemicals and understands that INEOS Nitriles and DOW Chemicals are also meeting to discuss the extend of the development boundary over their land interests. In this regard, The Applicant would also encourage an all-parties meeting with INEOS Nitriles and DOW Chemicals in order to progress discussions. The Applicant is also in discussions with Sembcorp in relation to utilising the pipeline corridor for the new hydrogen pipeline and confirms that the intention is to construct the pipeline within the existing Linkline Corridor.	No

CONSULTEE	DATE OF RESPONSE	CONSULTEE RESPONSE	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION
		area as a result of the work that you are involved with on NZT. You will also be aware that other projects for this area involving DCO's are also requiring rights along this route. INEOS will require that the route is used efficiently and retained within the current pipeline corridor so as to ensure that multiple new pipelines along the route of the Sembcorp Easement does not sterilise larger and larger parts of the INEOS site (which would of course cost the applicant(s) more in relation to compensation for the site payable to INEOS). Hence the pipeline should remain within the already used corridor. We fully reserve our position with regard to the detail of any rights which are require as part of your project and the term on which the easement is granted to permit the pipeline to cross the land which belongs to our client.		

Table 15.4: First Consultation – Section 47 Community Consultation Responses

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
1.	Principle of development	Stated support for the development.	The Applicant would like to thank the individuals and organisations who wrote stating their support for the Proposed Development, with the majority citing their acknowledgement of the positive effect from a socio-economic perspective.	No change required.	ES Chapter 4: Proposed Development (Document Ref. 6.2.4). ES Chapter 7: Legislation and Policy (Document Ref. 6.2.7). Planning Statement (Document Ref. 5.2). Need Statement (Document Ref. 5.3).
		Stated that the proposed development is not supported locally.	Of those who completed a Feedback Form, 77% of respondents either *'strongly supported*' or *'supported'* the aims to help Teesside decarbonise its industry; and 70% either '*strongly supported*' or *'supported'* the Applicant's proposals for H2Teesside. Similar levels of support are also recorded in the letters and emails that were received in response to the consultation.	No change required.	
		Concern over the use of natural gas and associated need to store the CO_2, stating that the monies should be focussed on other technologies.	Government energy and climate change policy confirms that as the UK transitions to a decarbonised energy system, natural gas will continue to have an important role to play in ensuring the reliability of electricity supplies by providing back-up to intermittent renewable generation. Carbon capture and storage is stated by the Committee on Climate Change to be a necessity, and not an option; and the Government has recognised new CCS infrastructure as a Critical National Priority.	No change required.	
		Stated that it should not be used for domestic heating purposes.	The low carbon hydrogen produced by the Proposed Development would be supplied via a new hydrogen pipeline network to existing and new industries and businesses on Teesside.	No change required.	

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			Replacing the natural gas currently used by those industries and businesses will help industries on Teesside to reduce their CO_2 emissions and decarbonise. Therefore, the Proposed Development would not impact domestic energy prices. Whether hydrogen is to be used for domestic heating purposes is a decision Government will separately need to make.		
		Query whether the site is the right one, as companies seek to reduce their reliance on fossil fuels this could result in a stranded asset and/or attract industries emitting greenhouse gases.	The low carbon hydrogen produced by the Proposed Development would be supplied via a new hydrogen pipeline network to existing industries and businesses on Teesside. Replacing the natural gas currently used by those industries and businesses will help them reduce their CO_2 emissions. The Proposed Development would be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Hydrogen Production Facility and its ancillary development (also referred to as the 'Main Site'), including its carbon capture and compression facilities, would be located on part of the Foundry, which forms part of Teesworks, within the borough of Redcar and Cleveland. It is adjacent to the Northern Endurance Partnership (NEP) infrastructure (the consented Net Zero Teesside Project). Teesworks is a major brownfield industrial site and Freeport, part of which was formerly occupied by the Redcar Steel Works. The land at the Foundry is also identified as a suitable location in the local development plan for industrial development including energy-related industries.	No change required.	
		Seeking clarification of the long-term offshore storage.	Carbon dioxide captured by the Proposed Development would be transported by pipeline to the separately consented NEP infrastructure on the adjacent Net Zero Teesside site for high-pressure compression and then on through NEP pipelines to offshore transport and underground storage in the Endurance offshore storage site.	No change required.	

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
2.	Safety	Seeking confirmation that regard would be had to safety matters.	The Environmental Statement includes an assessment of potential impacts and effects on Major Accidents and Disasters, including in relation to risks such as fire and explosion. The assessments have identified all risks designed to be as low as reasonably practicable, within the tolerable range and, therefore, not significant. The safety management of the Proposed Development will primarily be managed through the HSE and the COMAH process. Further information can be found in Appendix 20-C of the Environmental Statement.	No change required.	ES Chapter 20: Major Accidents and Disasters (Document Ref. 6.2.20).
3.	Socio-economics	Seeking employment opportunities, particularly for local people, to be maximised.	The Proposed Development would lead to employment generation both through direct employment and wider benefits for the economy. It is estimated that up to 2,440 net construction jobs (direct and indirect) would be generated per annum of which 1,220 are expected to be from the local area (the Middlesbrough and Stockton TTWA). Jobs during operation are estimated at up to 130 FTE with the majority filled by people from the local area. The employment effects will be enhanced by the Applicant providing support to local businesses and stakeholders and supporting skills development at the Proposed Development. The draft DCO includes a requirement (Requirement 28) that will secure an Employment, Skills and Training Plan, to be agreed with the local authorities, to maximise the local employment and training opportunities provided by the Proposed Development. This will build on the programmes that bp has committed to in the Environmental Statement.	No change required.	ES Chapter 18: Socio-economics and Land Use (Document Ref. 6.2.18). Draft DCO (Document 4.1) – Schedule 2, Requirement 26 'Employment, Skills and Training Plan'.
		Investment/business opportunities in Teesside, including industrial development.	In addition to the direct construction and operational employment generated by the Proposed Development itself, there would be an increase in local employment arising from indirect and induced effects of the construction activity. Employment growth will arise locally through manufacturing services and suppliers to the construction and operational processes (indirect or supply linkage multipliers). Additionally, part of the income of the workers and suppliers would be spent in the Middlesbrough and Stockton Travel To Work Area (TTWA), generating further employment.	No change required.	
		Query where construction workers will stay.	Demand for temporary accommodation from the construction workers would typically be met by bed and breakfast accommodation for shorter stays. Using the occupancy rates as an approximation for the worst case scenario for temporary accommodation in the Wider Impact Area, it is assumed that 17% of all hotels and accommodation would be available for short-term accommodation for construction workers, which is deemed sufficient to meet the labour supply in the	No change required.	

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			construction phase. The overall effect on the temporary accommodation sector is considered to have a minor adverse (i.e. not significant) effect, given the number of workers predicted and the capacity within the sector to meet the worst-case potential demand for accommodation.		
4.	Cultural heritage	Concern over the impacts on cultural heritage, particularly Cowpen Bewley Village.	Impacts to cultural heritage have been considered in the Environmental Statement. All necessary mitigation measures are secured by DCO Requirement. In respect of Cowpen Bewley, no likely significant effects are expected to arise to the setting of the Conservation Area as a result of the Proposed Development.	No change required.	ES Chapter 17: Cultural Heritage (Document Ref. 6.2.17). Draft DCO (Document 4.1) – Schedule 2, Requirement 13 'Archaeology'.
5.	Noise	Concern over the noise impacts on the community during the construction and operational phases, particularly given noise concerns expressed by residents in relation to other operators.	The noise and vibration assessment has concluded that there would be no significant effects associated with either the construction and/or operational phase. The Applicant has sought to avoid effects through siting of the development, and the inclusion of standard good practice measures (including those identified by recognised bodies such as the World Health Organisation). The Application includes a Framework Construction Environmental Management Plan (CEMP), which sets out the key measures to be employed during the construction of the Proposed Development, to control and minimise the impacts on the environment. The Framework CEMP sets out how impacts will be managed during construction. A Final CEMP will be prepared by the contractor undertaking the construction works on behalf of bp. The submission, approval, and implementation of the Final CEMP is legally secured by the Development Consent Order. Measures will include, but not be limited to: controls over the timing of the works, which will typically be undertaken during weekday daytimes (07:00 to 19:00) and Saturdays (07:00 to 16:00) plus up to one hour before and/or after for mobilisation (start-up and close down), with the exception of certain activities as set out in the Framework CEMP; abiding by agreed construction noise limits at nearby noise sensitive receptors; ensuring that processes are in place to minimise noise before works begin; and	No change required.	ES Chapter 11: Noise and Vibration (Document Ref. 6.2.11). Framework CEMP (Document Ref. 5.12) Draft DCO (Document Ref. 4.1) – Schedule 2, Requirement 15 'CEMP'.

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			ensuring that modern plant is used. No significant noise effects have been predicted during operation, having regard to existing noise levels.		
6.	Vibration - construction	Concern over vibration impacts on properties, particularly historic properties, during the construction phase.	Potential construction and operational vibration effects have been assessed. The assessments conclude that there would be no significant effects from construction traffic or construction vibration.	No change required.	ES Chapter 11: Noise and Vibration (Document Ref. 6.2.11). Framework CEMP (Document Ref. 5.12) Draft DCO (Document Ref. 4.1) – Schedule 2, Requirement 20 'Control of noise – construction' .
7.	Proposed development – pipeline routing	Seeks the relocation of the pipeline in the vicinity of Cowpen Bewley to the northeast side of the A1185 Seal Sands Road.	As a result of responses to the first round of consultation, the Applicant reviewed pipeline routeing options in the Cowpen Bewley area, including whether the pipeline could be moved to the north-east of the A1185 Seal Sands Road. The review identified several constraints that mean routeing the pipeline to the north-east of the A1185 is not viable. These constraints include: requiring working close to the European designated Teesmouth and Cleveland Coast Special Protection Area (SPA) and internationally designated Ramsar site; steep embankments of the A1185; designated areas for historical landfill; ecologically sensitive areas, specifically ponds; existing infrastructure, including pipeline routes and pylons; a route to the north-east of the A1185 and then south of the railway line would require increased land take within Cowpen Bewley Woodland Park. As part of the pipeline routeing review, the Applicant was able to reduce the Order Limits to the east of Cowpen Bewley. The Applicant undertook a targeted consultation in February 2024 on this change.	Change proposed in the Cowpen Bewley Targeted Consultation (February 2024)	ES Chapter 4: Proposed Development (Document Ref. 6.2.4). ES Chapter 6: Alternatives and Design Evolution (Document Ref. 6.2.6). Consultation Report, Section 14.0 (Document Ref. 5.1).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
8.	Air quality	Query the emissions to air that would arise from the proposed development.	During the construction phase, a Construction Environmental Management Plan will require dust suppression measures to be used to ensure no significant effects occur. Furthermore, there would be no adverse effects on residential receptors from construction traffic. During operation, potential impacts could arise from emissions associated with the Hydrogen Production Facility. Modelling shows that there may be small increases in air quality pollutants, but they will not exceed current environmental standards for the protection of human health. Therefore, emissions from the development are not expected to have significant effects. The carbon capture aspect of the Proposed Development would not have any emissions as it is a closed loop system.	No change required.	ES Chapter 8: Air Quality (Document Ref. 6.2.8). ES Chapter 22: Human Health (Document Ref. 6.2.22). Framework CEMP (Document Ref. 5.12) Draft DCO (Document Ref. 4.1) – Schedule 2, Requirement 15 'CEMP'.
		Query the monitoring arrangements during the operational phase.	The Hydrogen Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. In addition, the Proposed Development will be operated in line with appropriate standards which have been reviewed with the Environment Agency during pre-application discussions. The operator will implement and maintain an Environment Management System (EMS) which will be attested to relevant International Standards Organisation standards. The EMS will outline requirements and procedures required to ensure that the Proposed Development is operating to the appropriate standard; and compliance will be monitored.	No change required.	
9.	Water	Query which pollutants would be in the wastewater before and after treatment.	The Applicant has considered operational impacts to the water environment including: pollution from surface water runoff; changes in water quality from the discharge of wastewater; nutrient nitrogen enrichment (increase of nutrients) of ponds located close to the Main Site from nitrogen released to air; increased surface water runoff from new areas of hardstanding (that do not allow water through); and increased demand on water supplies. The assessment has identified no significant effects. It is anticipated that water quality should improve through the implementation of sustainable drainage systems, which will improve the quality of runoff water that enters the Tees Estuary.	No change required.	ES Chapter 9: Surface Water, Flood Risk and Water Resources (Document Ref. 6.2.9).
		Query whether the facility needs both a freshwater connection and a discharge for treated water.	The Proposed Development would comprise both water supply connection works to provide cooling and make-up water to the	No change required.	ES Chapter 4: Proposed Development (Document Ref. 6.2.4).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			Hydrogen Production Facility; and wastewater disposal works in connection with the hydrogen production facility.		
		Query whether the treated water could be reused in the facility, or to drinking water standards and where the water would ultimately be discharged to.	Treated water may be re-used as process water within the Proposed Development. Otherwise treated water would be discharged to Tees Bay using the either consented NZT outfall to Tees Bay under the site's Environmental Permit or the consented Teesworks outfall.	No change required.	-
		Query whether industry or householders would have to reduce their water consumption first in the event of a water shortage.	It is the responsibility of the water company to ensure that all of its customers – residential and businesses – have the water they need. This is managed by their business plans that identify how they will manage water demands, as well as through licences which specify how much industries can use.	No change required.	-
10.	Public access	Query whether the existing access to the southern point where the Tees meets the North Sea would remain in place as a result of the construction and/or operation of the Proposed Development. Seeks for any diversions to be published to avoid inconvenience. Query over the interaction of the Proposed Development with the 'Black Path' trail.	There will be no change in access to South Gare via South Gare Road, Coatham Dunes, Coatham Sands or the Teesdale way as a result of the construction and/or operation of the Proposed Development. The Proposed Development Site does not overlap with the cultural heritage Black Path trail. Therefore, no closures of this footpath is envisaged as part of the Proposed Development.	No change required.	ES Chapter 15: Traffic and Transport (Document Ref. 6.2.15).
11.	Technology	Query over the operations, including what happens to the HS2 [Disulfanide] once the CO_2 is to be captured.	Sulphur components are removed from the natural gas, before the reforming process, by converting them to H2S. The resulting H2S is subsequently removed in adsorption beds. Spent adsorption beds would be disposed by a contractor, who would be certified for this work and who would consign them to an appropriate treatment facility.	No change required.	-
12.	Local community	Need to minimise effects on local communities.	The Applicant has worked hard to ensure it has minimised the effects of its proposals before further embedding mitigation measures. The technical assessments within the ES provide full details of the measures that have been identified to minimise effects. The necessary controls (in particular the development of a CEMP) will be secured as part of the DCO, should it be granted.	No change required.	All topic specific chapters of the ES, as summarised in the ES Non-Technical Summary (Document Ref. 6.1) and ES Chapter 24: Summary of Significant Effects (Document Ref. 6.2.24). Schedule of Operational Mitigation and Monitoring (Document Ref. 5.11).
		Concern over the effects on the village and residents of Cowpen Bewley.	The ES identifies receptors within Cowpen Bewley, where appropriate, and has assessed effects on those receptors. Where appropriate, avoidance, minimisation and mitigation measures have been adopted to minimise the effects, including reducing the Order Limits as much as practicable for this stage of design. The ES	Change proposed in the Cowpen Bewley Targeted Consultation (February 2024) and in the DCO Application.	

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			concludes no likely significant effects are expected to arise to receptors in Cowpen Bewley.		Draft DCO (Document Ref. 4.1), Schedule 2 – Requirement 15 'CEMP'
		Impact on property values and compensation.	Property values are not a material planning consideration. Therefore, it has not been assessed as part of the socio-economic assessment within the ES. The Applicant has incorporated appropriate avoidance, minimisation and mitigation measures to ensure that there are no significant effects on residential properties or areas. With regard to land required for the Proposed Development, the Applicant will seek to reach commercial agreement with landowners. Where that is not possible and compulsory acquisition rights are granted through the DCO, the relevant compensation provisions will be applied.	No change required.	Draft DCO (Document Ref. 4.1).
13.	Consultation	Stated that the extent of consultation has been inadequate.	The Applicant agreed the approach to the community consultation with the host local authorities through a Statement of Community Consultation (SoCC). This included agreement on the area where the consultation would take place, the duration of consultation and the consultation methods to be employed. This approach accords with the requirements under the Planning Act 2008, as well as good practice. The Applicant carried our further community consultation (in addition to that set out in the SoCC) in response to changes made to the Proposed Development. This included the Second Consultation in December 2023/January 2024 and the Cowpen Bewley Targeted Consultation in February/March 2024. Full details of the approach taken to the consultation is detailed in the Consultation Report.	No change required.	Consultation Report (Document Reference 5.1), as well as the topic specific chapters of the ES detailing the relevant technical engagement with stakeholders (Document Ref. 6.2).
14.	Design	Seeking additional tree planting.	Tree planting will be undertaken on the replacement land at Cowpen Bewley as part of linking it to the Country Park. The planting scheme will be prepared in consultation with and agreed by Stockton-on-Tees Borough Council. This tree planting will aim to offset the permanent loss of trees near the NGN facility at Cowpen Bewley Woodland Park.	Replacement land with tree planting at Cowpen Bewley added to the Proposed Development.	ES Chapter 4: Proposed Development (Document Ref. 6.2.4). ES Chapter 5: Construction Programme and Management (Document Ref. 6.2.5).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
					Outline Landscape and Biodiversity Management Plan (Document Ref. 5.9).
15.	Public access to the Cowpen Bewley site	Query the access and egress arrangements for the public to the site near Cowpen Bewley.	The replacement open space land has been located such that it can be accessed from the rest of the Woodland Park which is adjacent to the south-east.	Replacement land with tree planting at Cowpen Bewley added to the Proposed Development.	ES Chapter 4: Proposed Development (Document Ref. 6.2.4) ES Chapter 5: Construction Programme and Management (Document Ref. 6.2.5) Outline Landscape and Biodiversity Management Plan (Document Ref. 5.9)
		Concern over the adequacy of the roads to accommodate construction heavy vehicles and query the siting and scale of welfare provision.	The transport assessment has considered the suitability of the roads from the perspective of severance, pedestrian amenity, fear and intimidation, safety, hazardous loads and driver delay. All effects are identified to be minor, which has regard to the provision of traffic management measures being adopted. Welfare provision will be required. Regard will be taken to their siting and scale. Welfare facilities located at construction compounds will be constructed from a mix of single and modular units. These will be stacked where practicable to minimise the surface area taken up at ground level. It is anticipated that units would be stacked up to an equivalent maximum height of five units (approximately 15 m) at compounds and two units (approximately 6 m) at satellite compounds. The Development Consent Order, once granted, will require the land used for construction purposes to be restored within one year of the date of final commissioning of each relevant Work No. (or such longer period as the relevant planning authority may approve). The restoration must be undertaken in accordance with the scheme approved by the local planning authority.	No change required.	ES Chapter 5: Construction Programme and Management (Document Ref. 6.2.5). ES Chapter 15: Traffic and Transport (Document Ref. 6.2.15).
16	Transport	Concern over the management and routing of construction traffic and seeking assurance that the controls will be implemented, communicated and monitored.	The Application includes a Framework Construction Traffic Management Plan, as well as a Framework Construction Workers Travel Plan. The Development Consent Order, once granted, will require that no construction works commence (other than permitted preliminary works) until final versions of these plans are submitted to	No change required.	Framework Construction Traffic Management Plan (Document Ref. 5.16).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			and approved by the local planning authority. The plans must then be implemented as approved unless otherwise agreed with the relevant planning authority.		Framework Construction Workers Travel Plan (Document Ref. 5.15). Draft Development Consent Order (Document Ref. 4.1), Schedule 2 – Requirement 18 'Construction traffic management plan'.

Table 15.5: Second Consultation – Community Consultation Responses

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
1.	Principle of development	Stated support for the development.	The Applicant would like to thank the individuals and organisations who wrote stating their support for the proposed development, with the majority citing their acknowledgement of the positive effect from a socio-economic perspective.	No change required.	ES Chapter 4: Proposed Development (Document Ref. 6.2.4). Planning Statement (Document Ref. 5.2). Need Statement (Document Ref. 5.3).
		Stated that Teesside are used as 'guinea pigs' and should not face high user charges.	Of those who expressed their support, those letters and emails cited similar reasons for their support to the reasons given in response to the Stage 1 consultation (i.e. decarbonisation of industries in Teesside and socio-economic benefits). The low carbon hydrogen produced by the Proposed Development would be supplied via a new hydrogen pipeline network to existing and new industries and businesses on Teesside. Replacing the natural gas currently used by those industries and businesses will help industries on Teesside to reduce their CO_2 emissions and decarbonise. Whether hydrogen is to be used for domestic heating purposes is a decision Government will separately need to make.	No change required.	
2.	Proven technology	Query whether the site is the right one, as companies seek to reduce their reliance on fossil fuels this could result in a stranded asset and/or attract industries emitting greenhouse gases.	The low carbon hydrogen produced by the Proposed Development would be supplied via a new hydrogen pipeline network to existing on Teesside. Replacing the natural gas currently used by those industries will help industries on Teesside to reduce their CO_2 emissions. The Proposed Development would be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's	No change required.	ES Chapter 6: Alternative and Design Evolution (Document Ref. 6.2.6). ES Chapter 16: Landscape and Visual Amenity (Document Ref. 6.2.16).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Hydrogen Production Facility and its ancillary development (also referred to as the 'Main Site'), including its carbon capture and compression facilities, would be located on part of the Foundry Site, which forms part of Teesworks, within the borough of Redcar and Cleveland and which is adjacent to the NEP infrastructure. Teesworks is a major brownfield industrial site and Freeport, part of which was formerly occupied by the Redcar Steel Works.		
		Stating it should not be used for domestic purposes.	Whether hydrogen is to be used for domestic heating purposes is a decision Government will separately need to make to the decision on the Proposed Development.	No change required.	
		Concern raised that the technology has not been proven at scale.	The Applicant considers that technology for blue hydrogen production is proven, widely used and readily available and can be deployed at a large scale to meet Government ambitions, such as those outlined in the UK Hydrogen Strategy (HM Government, 2021).	No change required.	
3.	Design	Query the impact of the '101 cabins' sited in the land close to the lighthouse.	The Environmental Statement includes an assessment of potential effects from a landscape and visual amenities perspective, including in relation to a selected viewpoint from the South Gare Breakwater. The view from the lighthouse is considered representative of the views from the Fishermen's Huts Association huts at South Gare. The assessment has identified no significant adverse effects upon landscape and visual amenities at this viewpoint (and by implication at the huts) associated with the construction and operational phase of the Proposed Development.	No change required.	
4.	Safety	Seeking confirmation that regard would be had to safety matters.	The Environmental Statement includes an assessment of potential impacts and effects on Major Accidents and Disasters, including in relation to risks such as fire and explosion. The assessments have identified all risks designed to be as low as reasonably practicable, within the tolerable range and, therefore, not significant. The safety management of the Proposed Development will primarily be managed through the HSE and the COMAH process. Further information can be found in Appendix 20-C of the Environmental Statement. The Project has an established order of precedence for applicable codes, standards, specifications and regulatory requirements	No change required.	ES Chapter 20: Major Accidents and Disasters (Document Ref. 6.2.20).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			including relevant legislations, regulations, and National and International Engineering Standards and Practices. The primary governmental requirements are set out in the Pipeline Safety Regulations (1996). The governing pipeline design code for the project is the Institution of Gas Engineers and Managers (IGEM) technical directive 1, edition 6, Supplement 2 (IGEM/TD/1 Ed.6 Supp.2): 'High Pressure Hydrogen Pipelines', 2021. This supplement gives additional requirements and qualifications for the transmission of Hydrogen above the requirements in IGEM/TD/1, and its recent date of issue (2021) means it represents latest industry best practice and knowledge. Guidance from other relevant documents will also be considered, but with an order of precedence below the governing design code. Specifically including BSI PD 8010-1 Pipeline Systems and ASME B31.12 Hydrogen Piping & Pipelines. Furthermore, all construction (and ultimately decommissioning) activities will be undertaken in accordance with the Construction (Design and Management) Regulations 2015. Other short-form documents are available online that may or may not apply. In particular, the Pipeline Safety Trust (PST) document titled "Hydrogen Pipeline Safety: Summary for Policymakers (2023)" that you have referenced focuses on hydrogen blending into existing pipelines, which is different from the proposed H2Teesside hydrogen pipeline, which are designed specifically for hydrogen and not repurposed.		
5.	Socio-economics	Support for the investment/business opportunities in Teesside, including industrial development.	The proposed development would lead to employment generation both through direct employment and wider benefits for the economy. It is estimated that up to 2,440 net construction jobs (direct and indirect) would be generated per annum of which 1,220 are expected to be from the local area (the Middlesbrough and Stockton TTWA). Jobs during operation are estimated at up to 130 FTE (direct and indirect) with the majority filled by people from the local area. The draft DCO includes a requirement (Requirement 30) that will secure an employment and skills plan, to be agreed with the local authorities, to maximise the local employment and training opportunities provided by the Proposed Development. In addition to the direct construction and operational employment generated by the proposed development itself, there would be an increase in local employment arising from indirect and induced effects of the construction activity. Employment growth would arise	No change required.	ES Chapter 18: Socio-economics and Land Use (Document Ref. 6.2.18). Draft Development Consent Order (Document 4.1), Schedule 2 – Requirement 26 'Employment, skills and training plan'.

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			locally through manufacturing services and suppliers to the construction and operational processes (indirect or supply linkage multipliers). Additionally, part of the income of the workers and suppliers would be spent in the Middlesbrough and Stockton TTWA, generating further employment.		
6.	Transport	Concern over the management and routing of construction traffic and seeking assurance that the controls will be implemented, communicated and monitored.	The Application includes a Framework Construction Traffic Management Plan, as well as a Framework Construction Workers Travel Plan. The Development Consent Order, once granted, will require that no construction works commence (other than permitted preliminary works) until final versions of these plans are submitted to and approved by the local planning authority. The plans must then be implemented as approved unless otherwise agreed with the relevant planning authority.	No change required.	Framework Construction Traffic Management Plan (Document Ref. 5.16). The Framework Construction Workers Travel Plan (Document Ref. 5.15). Draft Development Consent Order (Document Ref. 4.1), Schedule 2 – Requirement 18 'Construction traffic management plan'.
7.	Proposed development – siting of pipeline	Seeks the relocation of the pipeline in the vicinity of Cowpen Bewley to the north-east side of the A1185 Seal Sands Road.	As a result of responses to the first and second rounds of consultation, the Applicant reviewed pipeline routeing options in the Cowpen Bewley area, including whether the pipeline could be moved to the north-east of the A1185 Seal Sands Road. The review identified several constraints that mean routeing the pipeline to the north-east of the A1185 is not viable. These constraints include:	Change proposed in the February 2024 consultation.	ES Chapter 4: Proposed Development (Document Ref. 6.2.4). ES Chapter 6: Alternatives and Design Evolution (Document Ref. 6.2.6).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			• requiring working close to the European designated Teesmouth and Cleveland Coast Special Protection Area (SPA) and internationally designated Ramsar site; • steep embankments of the A1185; • designated areas for historical landfill; • ecologically sensitive areas, specifically ponds; • existing infrastructure, including pipeline routes and pylons; • a route to the north-east of the A1185 and then west of the railway line would require increased land take within Cowpen Bewley Woodland Park. As part of the pipeline routeing review, the Applicant was able to reduce the Order Limits to the east of Cowpen Bewley. The Applicant undertook a targeted consultation in February 2024 on this change.		
8.	Environmental effects	Concern that the proposed development would have significant environmental effects.	The Applicant has worked hard to avoid, minimise and mitigate the impacts of the Proposed Development, as detailed in the Environmental Statement that accompanies the application for development consent.	No change required.	All topic specific chapters of the ES, as summarised in the ES Non-Technical Summary (Document Ref. 6.1) and ES Chapter 24: Summary of Significant Effects (Document Ref. 6.2.24). Schedule of Operational Mitigation and Monitoring (Document Ref. 5.11). Draft Development Consent Order (Document 4.1).

Table 15.6: Targeted Consultation – Community Consultation Responses

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
1.	Proposed changes	Stated support for the proposed changes.	The Applicant would like to thank the individuals and organisations who wrote stating their support for the proposed changes and the Proposed Development as a whole.	No change required.	ES Chapter 4: Proposed Development (Document Ref. 6.2.4). Planning Statement (Document Ref. 5.2).
2.	Principle and broad siting	Stated that the proposed development is not supported locally.	Of those who expressed their support, those letters and emails cited similar reasons for their support to the reasons given in response to the Stage 1 consultation (i.e. decarbonisation of industries in Teesside and socio-economic benefits). The UK Government has identified that low carbon hydrogen has an important role to play in reaching net zero. This was reaffirmed in the *'Hydrogen Strategy Delivery Update'* (DESNZ, December 2023). The Department for Energy Security and Net Zero (DESNZ) has identified that demand for low carbon hydrogen will come several sectors, including industry, power, heat and transport. DESNZ notes that if demand for hydrogen in key sectors is at the top end of their forecasted ranges, the UK could need up to 40 TWh of hydrogen supply in 2030 to meet this demand domestically. By 2035, DESNZ expects demand for hydrogen to increase sharply and notes that '*we need production to be ready to meet this demand'*. The UK Government also recognises hydrogen's role in supporting greater energy security in the UK. Hydrogen can be used as a long-term store of low carbon energy and could provide critical flexibility for the power system. The Government's approach to developing low carbon hydrogen production encompasses multiple production routes, including both Carbon Capture Storage (CCS) enabled (blue) and electrolytic (green) hydrogen, provided they comply with the UK Low Carbon Hydrogen Standard (LCHS). The Government's '*Hydrogen Production Roadmap*' notes that analysis by both DESNZ and the Climate Change Committee has indicated that CCS-enabled (blue) hydrogen will be important in scaling up production into the 2030s and can be consistent with the UK's net zero commitments.	No change required.	Need Statement (Document Ref. 5.3).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			The Teesside area is responsible for a significant portion of UK carbon emissions. It is an area that has a proud industrial heritage but has suffered from the decline of heavy industries such as steel, coal and shipbuilding in recent years. H2Teesside can strengthen Teesside's development into the UK's leading hydrogen hub, creating new high-quality jobs, supporting local education and skills development and kick-starting a highly skilled UK-based hydrogen supply chain. Teesside is a prime location to focus efforts to decarbonise industry. The cluster is an existing UK energy hub and is tightly packed with existing pipeline corridors and other infrastructure that will make construction of the proposed development more efficient. H2Teesside will generate economic benefit to the local area, providing both direct and indirect jobs during the construction and operational phases, as well as safeguarding jobs and businesses in Teesside by helping local industries decarbonise.		
3.	Replacement woodland	Query whether the replacement woodland at Cowpen Bewley would result in a biodiversity net gain or loss, and query how it would be consented. Concern over the loss of the woodland and query whether the replacement will be sufficient mitigation. Concern relating to access to the replacement land from a highway safety perspective. Seeking a construction management plan to manage the undertaking of the works.	The replacement woodland would be secured via the Development Consent Order which relates to the H2Teesside project, rather than via a planning application to the local planning authority. The Application includes a Framework Construction Environmental Management Plan (CEMP), which sets out the key measures to be employed during the construction of the Proposed Development, to control and minimise the impacts on the environment. The Framework CEMP sets out how impacts will be managed during construction. A Final CEMP will be prepared by the contractor undertaking the construction works on behalf of bp. The submission, approval, and implementation of the Final CEMP will be legally secured by the Development Consent Order. Measures will include, but not be limited to: controls over the timing of the works, which will typically be undertaken during weekday daytimes (07:00 to 19:00) and Saturdays (07:00 to 16:00) plus up to one hour before and/or after for mobilisation (start-up and close down), with the exception of certain activities as set out in the Framework CEMP; abiding by agreed construction noise limits at nearby noise sensitive receptors;	No change required.	Framework CEMP (Document Ref. 5.12). Outline Landscape and Biodiversity Management Plan (Document Ref. 5.9). Draft Development Consent Order (Document 4.1), Schedule 2 – Requirement 15 'CEMP'.

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			ensuring that processes are in place to minimise noise before works begin; and ensuring that modern plant is used. The application also includes an Outline Landscape and Biodiversity Management Plan. Works will be required to comply with approved plan, which will be controlled via a requirement imposed by the DCO, if granted.		
4.	Highways	Concern that the road running from Billingham to Seal Sands will be '*incorporated into the development'*, which is popular with pedestrians, cyclists and local road users.	The road will remain in place for all road users and would not be '*incorporated into the Proposed Development'*. The Application includes a Framework Construction Traffic Management Plan, as well as a Framework Construction Workers Travel Plan. The Development Consent Order, once granted, will require that no construction works commence (other than permitted preliminary works) until final versions of these plans are submitted to and approved by the local planning authority. The plans must then be implemented as approved unless otherwise agreed with the relevant planning authority.	No change required.	Framework Construction Traffic Management Plan (Document Ref. 5.16). Framework Construction Workers Travel Plan (Document Ref. 5.15). Draft Development Consent Order (Document Ref. 4.1), Schedule 2 – Requirement 18 'Construction traffic management plan'.
5.	Environmental effects on local residents of Cowpen Bewley	Requesting details on the effects on local residents on Cowpen Bewley from a noise, access, general disturbance perspective	The Applicant has worked hard to avoid, minimise and mitigate the impacts of the Proposed Development, as detailed in the Environmental Statement that accompanies the application for development consent. Potential effects on Cowpen Bewley Residents are associated with loss of woodland and temporary restrictions on public rights of way at Cowpen Bewley Woodland Park. Temporary significant effects are identified in the socio-economic and land use and human health assessments. Temporary significant effects on habitats and wildlife within Cowpen Bewley Woodland Park are assessed in the Terrestrial Ecology and Ornithology assessments. The ES is accompanied by a Schedule of Operational Mitigation and Monitoring (Document Ref. 5.11) which details all of the mitigation measures secured within the scheme. Furthermore, the DCO once granted will require approval of the detailed management plans (e.g. transport, biodiversity and construction) which will specify the	No change required.	All topic specific chapters of the ES, as summarised in the ES Non-Technical Summary (Document Ref. 6.1). ES Chapter 12 Terrestrial Ecology (Document Ref. 6.2.12). ES Chapter 13 Ornithology (Document Ref. 6.2.13). ES Chapter 18 Socio-Economics and Land Use (Document Ref. 6.2.18). ES Chapter 22 Human Health (Document Ref. 6.2.22).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			detailed controls that need to be complied with during the construction phase.		ES Chapter 24: Summary of Significant Effects (Document Ref. 6.2.24). Schedule of Operational Mitigation and Monitoring (Document Ref. 5.11). Draft Development Consent Order (Document 4.1).
6.	Safety	Querying the safety of the Proposed Development.	The Environmental Statement includes an assessment of potential impacts and effects on Major Accidents and Disasters, including in relation to risks such as fire and explosion. The assessments have identified all risks designed to be as low as reasonably practicable, within the tolerable range and, therefore, not significant. The safety management of the Proposed Development will primarily be managed through the HSE and the COMAH process. Further information can be found in Appendix 20-C of the Environmental Statement.	No change required.	ES Chapter 20: Major Accidents and Disasters (Document Ref. 6.2.20) and associated appendices.
7.	Property values	Querying potential impacts on property values and compensation.	Property values are not a material planning consideration. Therefore, it has not been assessed as part of the socio-economic assessment within the ES. The Applicant has incorporated appropriate avoidance, minimisation and mitigation measures to ensure that there are no significant effects on residential properties or areas. With regard to land required for the Proposed Development, the Applicant will seek to reach commercial agreement with landowners. Where that is not possible and compulsory acquisition rights are granted through the DCO, the relevant compensation provisions will be applied.	No change required.	Draft DCO (Document Ref. 4.1).
8.	Health	Querying potential impacts on human health.	An assessment has been undertaken in relation to the construction and operational effects of the Proposed Development on health. The assessment concludes that there would be no greater than a minor adverse effect on some aspects relating to health, albeit for other matters the Proposed Development would have a beneficial effect,	No change required.	ES Chapter 22: Human Health (Document Ref. 6.2.22).

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			for example in terms of social participation, interaction and support, and employment and income.		
9.	Green Belt	Query effects on the Green Belt.	The Proposed Development comprises largely existing or former industrial land. The Main Site is located on part of the former Redcar Steelworks (the Foundry). Section 6.5 of Chapter 6 'Design Evolution and Alternatives' of ES Volume I sets out the selection approach that has been taken for the location of the Main Site. The hydrogen distribution corridors largely follow existing pipeline corridors that cross existing or former industrial land. The routing of the distribution corridors has sought to avoid sensitive receptors and minimise impacts on these. Section 6.7 of Chapter 6 'Design Evolution and Alternatives' of ES Volume I sets out the approach that has been taken to the routing of the connection corridors. The Proposed Development would lead to the permanent loss of 1.96 hectares (ha) of open space at Cowpen Bewley Woodland Country Park due to the installation of Above Ground Infrastructure (AGI) and associated pipeline, where the Proposed Development Site boundary encroaches onto the site. However, replacement land will be provided which is contiguous with Cowpen Bewley Woodland Park, being adjacent to its current northern edge. The replacement land will be joined with and become part of Cowpen Bewley Woodland Park, with those in whom the Lost Open Space is vested and the public able to enjoy the replacement land alongside and as part of using the existing parts of Cowpen Bewley Woodland Park.	No change required.	ES Chapter 6: Need, Alternatives and Design Evolution (Document Ref. 6.2.6). Planning Statement (Document Ref. 5.2).
10.	Community engagement	Seeking engagement with the residents of Cowpen Bewley in relation to the Proposed Development, particularly the replacement woodland.	bp committed to continuing engagement with residents as it progresses the design of the project, underpinned by further technical work, to seek to reduce the amount of land required within Cowpen Bewley Woodland Park. Bp also committed to residents that it would retain a bank of trees on the edge of the park to ensure that views of the AGI are screened as much as possible, taking into account there is already a gap in the treeline to accommodate existing infrastructure.	Replacement land with tree planting at Cowpen Bewley added to the application.	ES Chapter 4: Proposed Development (Document Ref. 6.2.4) ES Chapter 5: Construction Programme and Management (Document Ref. 6.2.5) Outline Landscape and Biodiversity Management Plan (Document Ref. 5.9)

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
11.	Noise	Concern over the noise impacts on the community during the construction and operational phases, particularly given noise concerns expressed by residents in relation to other operators.	The noise and vibration assessment has concluded that there would be no significant effects associated with either the construction and/or operational phase. The Applicant has sought to avoid effects through siting of the development, and the inclusion of standard good practice measures (including those identified by recognised bodies such as the World Health Organisation). The Application includes a Framework Construction Environmental Management Plan (CEMP), which sets out the key measures to be employed during the construction of the Proposed Development, to control and minimise the impacts on the environment. The Framework CEMP sets out how impacts will be managed during construction. A Final CEMP will be prepared by the contractor undertaking the construction works on behalf of bp. The submission, approval, and implementation of the Final CEMP is legally secured by the Development Consent Order. Measures will include, but not be limited to: • controls over the timing of the works, which will typically be undertaken during weekday daytimes (07:00 to 19:00) and Saturdays (07:00 to 16:00) plus up to one hour before and/or after for mobilisation (start-up and close down), with the exception of certain activities as set out in the Framework CEMP; • abiding by agreed construction noise limits at nearby noise sensitive receptors; • ensuring that processes are in place to minimise noise before works begin; and • ensuring that modern plant is used. No significant noise effects have been predicted during operation, having regard to existing noise levels.	No change required.	ES Chapter 11: Noise and Vibration (Document Ref. 6.2.11). Framework CEMP (Document Ref. 5.12) Draft DCO (Document Ref. 4.1) – Schedule 2, Requirement 15 ‘CEMP’.
12.	Cowpen Bewley Woodland Park	Concern relating to the inclusion of land at Cowpen Bewley Woodland Park within the Order Limits, including impact on wildlife and loss of trees.	Loss of trees at Cowpen Bewley Woodland Park would be compensated for by tree planting will be undertaken on the replacement land at Cowpen Bewley which will be linked to Woodland Park north of the A1185. The planting scheme on the replacement land will be prepared in consultation with and agreed by Stockton-on-Tees Borough Council. This tree planting will aim to	Replacement land with tree planting at Cowpen Bewley added to the application.	ES Chapter 4: Proposed Development (Document Ref. 6.2.4) ES Chapter 5: Construction Programme and

NO.	THEME	ISSUE/QUESTION	APPLICANT RESPONSE	CHANGE(S) MADE TO PROPOSED DEVELOPMENT/APPLICATION	RELEVANT DOCUMENT REFERENCE
			offset the permanent loss of trees near the NGN facility at Cowpen Bewley Woodland Park.		Management (Document Ref. 6.2.5) Outline Landscape and Biodiversity Management Plan (Document Ref. 5.9)
13.	Highways	Concern over the impact on the road network, from a user safety perspective.	The traffic and transport assessment in the Environmental Statement has assessed the key road network from the perspective of severance, pedestrian amenity, fear and intimidation and highway safety. The assessment concludes that there would be only minor adverse, or negligible effects across all of the receptors assessed. The Application includes a Framework Construction Traffic Management Plan, as well as a Framework Construction Workers Travel Plan. The Development Consent Order, once granted, will require that no construction works commence (other than permitted preliminary works) until final versions of these plans are submitted to and approved by the local planning authority. The plans must then be implemented as approved unless otherwise agreed with the relevant planning authority.	No change required.	ES Chapter 15: Traffic and Transport (Document Ref. 6.2.15). Framework Construction Traffic Management Plan (Document Ref. 5.16). Framework Construction Workers Travel Plan (Document Ref. 5.15). Draft Development Consent Order (Document Ref. 4.1), Schedule 2 – Requirement 18 ‘Construction traffic management plan’.

16.0 EIA RELATED CONSULTATION

16.1 Introduction

16.1.1 This section provides a brief summary of the Environmental Impact Assessment ('EIA') related consultation and publicity that took place during the pre-application process for the Proposed Development.

16.2 EIA Notification and Scoping

16.2.1 The Applicant submitted a letter to PINS on 30 March 2023, formally notifying the Secretary of State ('SoS') of the Applicant's intention to provide an ES pursuant to Regulation 8(1)(b) of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017' (the 'EIA Regulations') and also seeking an EIA scoping opinion under Regulation 10(1) of the same regulations in respect of the Proposed Development. The letter was accompanied by an EIA Scoping Report. A copy of the notification letter is provided at Appendix 16.1.

16.2.2 PINS acknowledged the EIA scoping opinion request on 6 April 2023 and issued consultation letters to the relevant consultees on 11 April. PINS issued the EIA Scoping Opinion (Document Ref. 6.4.2) to the Applicant on 17 May 2023. This was accompanied by the responses received from the relevant consultation bodies. The Scoping Opinion confirmed that the SoS was broadly satisfied with the suggested approach to and the topics to be covered by the EIA but drew the Applicant's attention to a number of general points as well as points made in respect of specific topic areas.

16.2.3 The EIA scoping opinion was accompanied by a list of consultation bodies notified of the EIA scoping opinion request pursuant to EIA Regulation 1(1)(a). The EIA scoping opinion was not accompanied by a list of any additional consultation bodies identified pursuant to Regulation 11(1)(c) of the EIA Regulations.

16.2.4 How the preparation of the ES for the Proposed Development has taken account of the EIA Scoping Opinion is set out at Chapter 2 'Assessment Methodology' and the individual topics chapters in the ES (Document Ref. 6.2).

16.3 Preliminary Environmental Information

16.3.1 Preliminary Environmental Information ('PEI') is defined in the EIA Regulations as *"information … which (a) has been compiled by the applicant; and (b) is reasonably required for consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)."*

16.3.2 The EIA Scoping Opinion was used to inform the Applicant's preparation of a PEI Report ('PEIR') for the Proposed Development. The preparation of the PEIR was also informed by dialogue between the Applicant's environmental consultants and the host local authorities (RCBC, STBC and HBC) and key technical consultees such as the Environment Agency and Natural England.

16.3.3 The PEIR was prepared for and made available for the First Consultation by the Applicant in September/October 2023 and took the form of a draft ES. The letters sent to the Section 42 consultees and non-prescribed consultees provided details of how the PEIR could be viewed in electronic and hard copy form and it was also made available to the local community pursuant to Section 47 and in accordance with the SoCC.

16.3.4 The PEIR was also made available for the Second Consultation that took place in December 2023 and January 2024 in respect of the proposed changes to the Order Limits for the Proposed Development, which included a reduction in the flexibility and optionality included at the time of the First Consultation as well as a small number of additions to accommodate works required for the Proposed Development.

16.4 EIA Regulation 13 Notification

16.4.1 EIA Regulation 13 'Pre-application publicity under Section 48 ('Duty to publicise')', places a requirement on applicants, where an application for development consent involves EIA development, as is the case for the Proposed Development, to, at the same time as publishing the Section 48 notice, send a copy of that notice to the relevant consultation bodies (the 'EIA consultation bodies') and any person notified to them by PINS in accordance with EIA Regulation 11(1)(c).

16.4.2 The EIA Scoping Opinion issued by the SoS for the Proposed Development included a list of consultation bodies that were notified of the Applicant's EIA scoping opinion request under EIA Regulation 11(1)(a). The Applicant had regard to this list in compiling the list of consultees to be notified pursuant to Section 42.

16.4.3 No consultation bodies were notified to the Applicant by PINS pursuant to EIA Regulation 11(1)(c).

16.4.4 All of the consultation bodies notified to the Applicant under EIA Regulation 11(1)(a) by the SoS were consulted pursuant to Section 42 and also notified in accordance with EIA Regulation 13 for the First and Second Consultations.

16.4.5 All of the Section 42 letters (Letter 1) sent to prescribed persons, the MMO, local authorities and landownership interests (Sections 42(a),(aa),(b),(c) and (d) for the First Consultation referenced EIA Regulation 13 and included a copy of the combined Section 42, 47 and 48 notice. The letters sent to non-prescribed consultees also included the notice. Copies of the letters (Letters 1 and 2) are provided at Appendix 10.1. The list of consultees is provided at Appendix 7.1 of the Consultation Report. The EIA consultation bodies were therefore notified pursuant to EIA Regulation 13 for the First Consultation.

16.4.6 For the Second Consultation, Letter 1 (Section 42(a), (aa) and (b)), Letter 3 (Section 42(d)) and Letter 4 (Section 42(d)) all referenced EIA Regulation 13 and were accompanied by a copy of the Section 48 notice. Letter 2 sent to the non-prescribed persons was also accompanied by a copy of the Section 48 notice. Copies of Letters 1 to 4 are provided at Appendix 13.3. The EIA consultation bodies were therefore notified pursuant to EIA Regulation 13 for the Second Consultation.

16.5 Preparation and finalisation of the ES

16.5.1 Following the issue of the PEIR at the First Consultation and receipt of responses which addressed environmental matters, the Applicant's environmental consultants have continued to engage with the host local authorities and key technical consultees in respect of the preparation and finalisation of the ES, which forms part of the application for development consent.

17.0 NEXT STEPS

17.1.1 The Applicant is committed to continued engagement with consultees and key stakeholders such as the local community, following the submission of the application for development consent, as well as throughout the construction and operation of the Proposed Development, should a DCO be made by the SoS.

17.1.2 The Applicant will issue updates on the Proposed Development and the development consent application process via the Project Website, press releases and social media as appropriate.

17.1.3 In addition to the above, there are statutory notification and publicity requirements pursuant to Section 56 of the PA 2008 that the Applicant will need to fulfil following acceptance of the Application for examination by the SoS. This will provide an opportunity for people to register as an interested party in the examination process and be involved in the examination of the Application.

APPENDIX 6.1: DRAFT SOCC FOR NON-STATUTORY CONSULTATION AND EMAILS DATED 24 & 25 APRIL 2023 TO RCBC, STBC, HBC, STDC AND TVCA

APPENDIX 6.2: STBC AND HBC RESPONSES TO NON-STATUTORY CONSULTATION ON DRAFT SOCC

APPENDIX 6.3: DRAFT SOCC FOR STATUTORY CONSULTATION AND EMAILS AND LETTERS DATED 17 MAY 2023 TO RCBC, STBC, HBC, STDC AND TVCA AND RESPONSE FROM STBC

APPENDIX 6.4: END OF CONSULTATION ON DRAFT SOCC EMAILS DATED 20 JUNE 2023 TO RCBC, STBC, HBC, STDC AND TVCA

APPENDIX 6.5: FINAL PUBLISHED SOCC

APPENDIX 6.6: COMBINED SECTION 42, 47 AND 48 NOTICE, COPIES OF PUBLISHED NOTICES AND SCREENSHOT OF SOCC AND NOTICE ON PROJECT WEBSITE

APPENDIX 7.1: CONSULTEE LISTS FOR THE FIRST AND SECOND CONSULTATIONS

APPENDIX 7.2: LOCAL AUTHORITY BOUNDARY PLAN

APPENDIX 7.3: LISTS OF POLITICAL STAKEHOLDERS FOR FIRST AND SECOND CONSULTATIONS

APPENDIX 8.1: PRE-APPLICATION CONSULTATION NOTICE JUNE 2023

APPENDIX 8.2: PRE-APPLICATION ADVERTISEMENT DETAILS

APPENDIX 9.1: FIRST CONSULTATION - SECTION 46 NOTIFICATION DATED 11 SEPTEMBER 2023 AND LETTER TO PINS DATED 28 NOVEMBER 2023

APPENDIX 9.2: FIRST CONSULTATION - PINS SECTION 46 ACKNOWLEDGEMENT DATED 29 NOVEMBER 2023

APPENDIX 10.1: FIRST CONSULTATION - SECTION 42 LETTERS 1 AND 2

APPENDIX 10.2: FIRST CONSULTATION – SECTION 42 SITE NOTICE AND SITE NOTICE LOCATIONS PLAN

APPENDIX 10.3: FIRST CONSULTATION – PLANS, CONSULTATION LEAFLET AND BROCHURE AND PRELIMINARY ENVIRONMENTAL INFORMATION REPORT AND NON-TECHNICAL SUMMARY

APPENDIX 11.1: FIRST CONSULTATION – EXAMPLE EMAILS TO LOCAL POLITICAL REPRESENTATIVES

APPENDIX 11.2: FIRST CONSULTATION – PRESS/MEDIA RELEASE

APPENDIX 11.3: FIRST CONSULTATION – SOCIAL MEDIA POSTS

APPENDIX 11.4: FIRST CONSULTATION – CONFIRMATION OF MAIL OUT OF CONSULTATION LEAFLET

APPENDIX 11.5: FIRST CONSULTATION – POSTER

APPENDIX 11.6: FIRST CONSULTATION – PUBLIC WEBINAR PRESENTATION

APPENDIX 11.7: FIRST CONSULTATION – VIRTUAL CONSULTATION ROOM LANDING PAGE

APPENDIX 11.8: FIRST CONSULTATION – INFORMATION BOARDS AND QUESTION AND ANSWER DOCUMENT.

APPENDIX 11.9: FIRST CONSULTATION – EVENTS PHOTOGRAPHS

APPENDIX 11.10: FIRST CONSULTATION – SCREENSHOTS OF PROJECT WEBSITE

APPENDIX 11.11: FIRST CONSULTATION – FEEDBACK FORM

APPENDIX 11.12: FIRST CONSULTATION – FEEDBACK FORM RESPONSES

APPENDIX 12.1: FIRST CONSULTATION – COMBINED SECTION 42, 47 AND 48 NOTICE AND PUBLISHED NOTICES

APPENDIX 12.2: EIA SCOPING OPINION LETTER FROM PINS DATED 17 MAY 2023

APPENDIX 13.1: SECOND CONSULTATION – EMAILS TO RCBC, STBC AND HBC DATED 28 NOVEMBER 2023

APPENDIX 13.2: SECOND CONSULTATION – SECTION 46 NOTIFICATION TO PINS 12 DECEMBER 2023 AND PINS SECTION 46 ACKNOWLEDGEMENT DATED 12 DECEMBER 2023

APPENDIX 13.3: SECOND CONSULTATION – SECTION 42 LETTERS 1 TO 4

APPENDIX 13.4: SECOND CONSULTATION – PLAN SHOWING THE CHANGES AND H2TEESSIDE PROJECT UPDATE BROCHURE

APPENDIX 13.5: SECOND CONSULTATION – SECTION 42 SITE NOTICE AND SITE NOTICE LOCATIONS PLAN

APPENDIX 13.6: SECOND CONSULTATION – SECTION 48 NOTICE AND COPIES OF PUBLISHED NOTICES

APPENDIX 13.7: SECOND CONSULTATION – COMMUNITY UPDATE LETTER TO THE LOCAL COMMUNITY

APPENDIX 14.1: ADDITIONAL SECTION 42 LETTERS 18 JANUARY 2024

APPENDIX 14.2: ADDITIONAL SECTION 42 LETTER 31 JANUARY 2024

APPENDIX 14.3: ADDITIONAL SECTION 42 LETTERS 5 FEBRUARY 2024

APPENDIX 14.4: ADDITIONAL SECTION 42 LETTERS 8 FEBRUARY 2024

APPENDIX 14.5: TARGETED COWPEN BEWLEY CONSULTATION – EMAILS DATED 20 DECEMBER 2023 AND 16 JANUARY 2024 (INCLUDING OPEN SPACE REPLACEMENT LAND ASSESSMENT) TO STBC

APPENDIX 14.6: TARGETED COWPEN BEWLEY CONSULTATION – EMAIL DATED 2 FEBRUARY 2024 TO STBC

APPENDIX 14.7: TARGETED COWPEN BEWLEY CONSULTATION – EMAIL DATED 7 FEBRUARY 2024 TO STBC

APPENDIX 14.8: TARGETED COWPEN BEWLEY CONSULTATION – EMAIL DATED 8 FEBRUARY 2024 TO STBC

APPENDIX 14.9: TARGETED COWPEN BEWLEY CONSULTATION – SECTION 42 LETTERS DATED 8 FEBRUARY 2024

APPENDIX 14.10: TARGETED COWPEN BEWLEY CONSULTATION – LETTER AND PLANS DATED 9 FEBRUARY 2024 TO LOCAL COMMUNITY

APPENDIX 16.1: EIA REGULATION 8(1)(B) NOTIFICATION LETTER TO PINS

APPENDIX 6.1: DRAFT SOCC FOR NON-STATUTORY CONSULTATION AND EMAILS DATED 24 & 25 APRIL 2023 TO RCBC, STBC, HBC, STDC AND TVCA

H2TEESSIDE HYDROGEN PROJECT

STATEMENT OF COMMUNITY CONSULTATION ('SOCC')

DRAFT FOR INFORMAL CONSULTATION

DRAFT

Date: April 2023

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1.0 INTRODUCTION

Overview

1.1 H2 Teesside Limited (the 'Applicant'), is proposing to apply to the Secretary of State for the Department for Energy Security & Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') for construction, operation and maintenance of the H2Teesside hydrogen project on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham.

1.2 H2 Teesside Limited is owned by bp Plc ('bp'). Bp will be the lead developer and operator of the H2Teesside Project.

1.3 H2 Teesside Limited's application will be submitted to the Planning Inspectorate ('PINS') who administer the application process on behalf of the SoS.

1.4 H2Teesside needs development consent as it is a 'Nationally Significant Infrastructure Project' by virtue of Section 14(g) and Sections 35 and 35ZA on the PA 2008.

1.5 Prior to submitting an application for development consent, applicants are required to carry out pre-application consultation in accordance with Sections 42, 47 and 48 of the PA 2008. This Statement of Community Consultation ('SoCC') sets out how the Applicant proposes to consult the local community about H2Teesside.

1.6 Information on the development consent process can be found on the PINS website at:

https://infrastructure.planninginspectorate.gov.uk/application-process/the-process/

H2Teesside

1.7 H2Teesside (the 'Project') will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

1.8 The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent. The Secretary of State for DESNZ is expected to make a decision on the NZT development consent application in early May 2023.

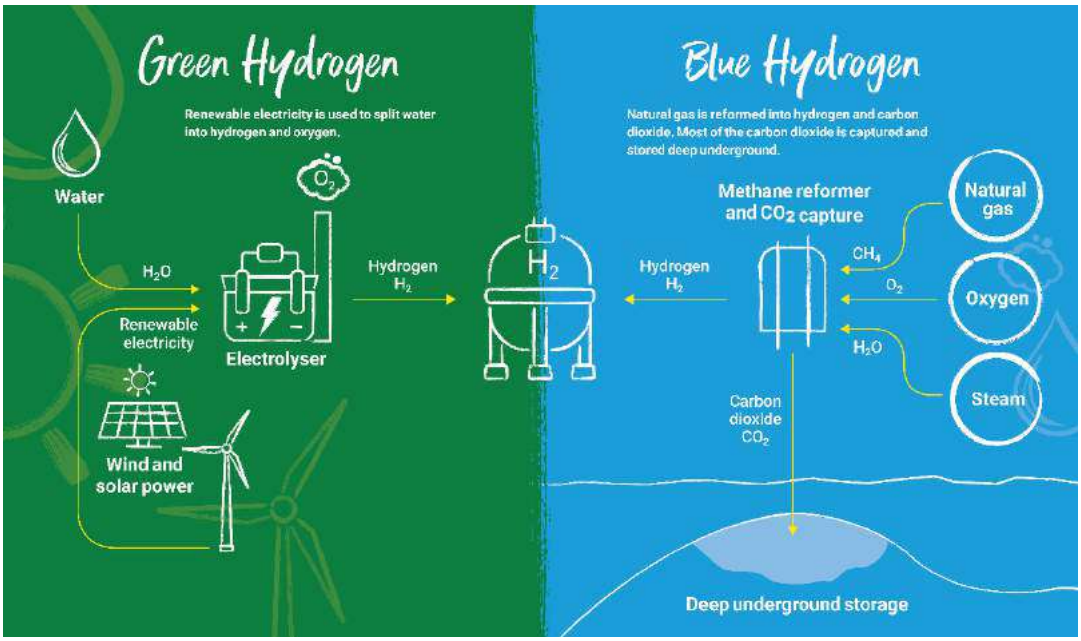
1.9 H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

1.10 The low-carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emission by 2050.

1.11 The Project will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

1.12 bp is advancing a separate 'green' hydrogen project, known as HyGreen on Teesside. HyGreen will have an initial production capacity of circa 80 megawatts ('MW') electrical with the potential to expand up to 500 MW of hydrogen production. HyGreen will split water in an electrolyser to produce hydrogen and oxygen using renewable electricity. Some sections of the hydrogen distribution pipelines for HyGreen will be located in the same pipeline corridors as those for H2Teesside and the NEP onshore infrastructure. It is currently envisaged that all the elements of HyGreen will be consented separately under the Town and Country Planning Act 1990 (the 'TCPA') and will be subject to separate pre-application consultation.

1.13 The infographic below provides and overview of the 'blue' and 'green' hydrogen processes.



1.14 H2Teesside comprises the following main elements:

- A hydrogen production plant of up to 1.2 GW thermal to be developed in two phases.
- A natural gas supply connection for the supply of gas to the hydrogen production plant.
- An air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process.
- An electricity grid connection to provide power to the Project.
- Water supply and treatment and wastewater infrastructure.
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2.
- Hydrogen distribution pipelines to supply the low carbon hydrogen across Teesside.

1.15 The Project involves land within the boroughs of RCBC south of the River Tees and STBC north of the Tees on Teesside and within HBC, also north of the Tees.

1.16 The hydrogen production plant and its associated and ancillary development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure and CO_2 capture and compression facilities and connection) will be located within the administrative area of RCBC. The hydrogen distribution pipelines corridors will extend either side of the River Tees to a

number of potential industrial offtakers and encompass land within the administrative areas of RCBC, STBC and also HBC.

1.17 Further information on the Project can be found at the project website:

www.h2teesside.co.uk

Environmental Information

1.18 H2Teesside is an Environmental Impact Assessment ('EIA') development for the purposes of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017'. This means that an EIA of the Project will be undertaken by the Applicant. This will assess the likely significant environmental effects arising from the Project. It will also identify any mitigation that is necessary to control or reduce those environmental effects. The findings of the EIA will be documented within an Environmental Statement ('ES') that will form part of the application for development consent.

1.19 Environmental information will be made available during the pre-application consultation on the Project. This will take the form of a Preliminary Environmental Information Report ('PEIR'). The PEIR will take the form of a draft ES and provide information on the likely significant environmental effects of the Project, so far as known to the Applicant at that stage. There will be an opportunity to comment upon the PEIR during the pre-application consultation. The comments received will be taken into account in the preparation of the ES.

Purpose of the SoCC

1.20 This Statement of Community Consultation ('SoCC') has been prepared by the Applicant in accordance with Section 47 'Duty to consult local community' of the PA 2008. Section 47 places a statutory duty on applicants to *"prepare a statement setting out how the applicant proposes to consult, about the proposed application, people living in the vicinity of the land."* The SoCC sets out how the Applicant will consult (in accordance with Section 47) the local community on H2Teesside prior to the submission of the application for development consent.

1.21 The SoCC has been prepared with reference to guidance on pre-application consultation published by the Government (Department for Communities and Local Government - 'Planning Act 2008: Guidance on the pre-application process', March 2015), the Planning Inspectorate ('PINS') and the relevant local authorities (Redcar and Cleveland Borough Council, Stockton-on-Tees Borough Council and Hartlepool Council) for the purposes of Section 47 of the PA 2008. The Applicant has had regard to the responses to its consultation on the SoCC from the relevant local authorities in preparing

and finalising the SoCC for publication. Although there was no statutory duty to do so, the Applicant also consulted the Tees Valley Combined Authority and the South Tees Development Consultation on the SoCC and has had regard to the comments received from those bodies.

1.22 In preparing the SoCC, the Applicant has also taken into account bp's experience of pre-application consultation on the NZT development consent application.

2.0 APPROACH TO PRE-APPLICATION CONSULTATION

Consultation Objectives

2.1 The Applicant's objectives for the pre-application consultation on H2Teesside are to:

- To ensure public understanding of the design and decision-making processes for the Project.
- To create a clear understanding of the Project, given the number of net zero projects in the area, and also provide engaging messaging to help avoid confusion with other projects.
- To reach silent and/or seldom heard audiences by using varied communications methods. With regard to this, the Applicant will seek to identify any groups or specific stakeholders with protected characteristics so that they can be included in the consultation.
- To explain the benefits of the Project, including in terms of job creation, protection of existing industry and decarbonisation.
- To provide stakeholders with the opportunity to submit comments and feedback while the proposals are still at a formative stage, and to provide them with a number of different ways in which to do so.
- To provide a mechanism to review the comments and feedback received and show how these have been taken into account in finalising the proposals and the application for development consent.

Consultation Stages & Timescale

2.2 During the first half of 2023 the Applicant has undertaken early targeted engagement with potentially affected landowners and key technical consultees and other stakeholders on the Project. This early engagement has informed initial decisions with regard to the extent of the Project Site and the scope of the ongoing EIA work.

2.3 Taking account of the level and type of public engagement on recent projects on Teesside, notably NZT, the decision has been taken for the pre-application public consultation for the Project will take place as one main stage of statutory consultation in accordance with the relevant requirements of the PA 2008, notably Sections 42, 47 and 48. The statutory consultation will run for a period of six weeks

Consultation Area

2.4 A 'Consultation Area' has been defined for the purposes of the Applicant's pre-application public consultation. The Consultation Area is divided into two zones; an Inner Consultation Zone ('ICZ') and an Outer Consultation Zone ('OCZ').

2.5 The ICZ is defined by the outer red line in **Figure 2.1** below. The Project Site is indicated by the inner red line. The ICZ represents the area within which the Applicant considers there is the greatest potential for local communities to be most affected by/interested in the Project. The ICZ extends approximately 1 kilometres ('km') from the boundary of the Project Site. The Applicant has sought to ensure that the defined ICZ does not cut across communities and where appropriate, main roads and natural features have been used to define the edge of the ICZ. The ICZ includes over 37,000 residential and businesses and includes Redcar, Warrenby, Dormanstown, Lazenby, Grangetown, Eston, Normanby, South Bank, Billingham and Greatham.

Figure 2.1 – Project Site and Inner Consultation Zone



2.6 The OCZ, has been defined with reference to the early EIA work on the Project and extends to approximately 15 to 20 km from the boundaries of the Project Site. This area is considered to represent the maximum extent within which environmental effects could occur. .

What will we consult on?

2.7 The pre-application consultation will provide information on the following:

- What H2Teesside is and what it will do.
- The practical uses of hydrogen and its benefits.
- The role of carbon capture, usage and storage ('CCUS') in enabling H2Teesside.
- Decisions made with regard to the design and layout of the Project and the options under consideration.
- The findings of the environmental assessment work undertaken at the time of the consultation, presented in the form of the PEIR.
- The proposals for avoiding, minimising and/or mitigating any likely environmental effects of the Project, to the extent defined and known at that stage.
- An update on the timeline for the Project and the key milestones, including the anticipated submission date for the development consent application.
- How comments and feedback can be provided and the deadline for the receipt of these.

3.0 CONSULTATION METHODS

3.1 The Applicant will employ a wide range of consultation methods to ensure that the local community and other key local stakeholder organisations and local political representatives are provided with the opportunity to engage with the Project and provide comments and feedback. The key consultation methods to be employed are outlined below.

Press/media releases

3.2 Press/media releases will be used to publicise the Project. A press release will be issued to the local and regional press at the start of the statutory consultation. Press releases will also provide information on how the local community can find out about the proposals and the ways in which people can provide comments and feedback.

Radio/social media

3.3 The Applicant will offer interviews to local radio stations broadcasting within the Consultation Area to publicise the Project, how the local community can find out about the proposals and the ways in which people can provide comments and feedback. The Applicant will also use local social media forums and pages to further publicise the consultation.

Information Leaflet/Newsletter

3.4 An Information Leaflet/Newsletter will be sent to all residents and businesses within the ICZ prior to the start of the statutory consultation. This will provide information on the Project, the ways in which information is being provided and presented, how further information and consultation materials can be requested, and how comments and feedback can be made as well as the deadline for the submission of these.

3.5 In addition to local residents and businesses, the Information Leaflet will be sent to local political representatives, including local MPs, district councillors and parish and town councils.

Newspaper notices/posters

3.6 The statutory consultation will be advertised by placing information notices in local newspapers circulating across both the Consultation Area for two consecutive weeks. The local newspapers that will be used are the Northern Echo, Teesside Gazette and Darlington and Stockton Times. Posters will also be circulated to identified community groups and stakeholders across the Consultation Area, along with a request for them to be shared via their channels, and displayed in public places. In accordance with Section 48 of the PA 2008, a notice will be published in a national newspaper and other relevant publications for one week and in local newspapers (those mentioned above) for two

consecutive weeks. Site notices will also be erected at appropriate intervals around the Project Site boundaries, including at intervals along the route corridors for the various connections.

Webinars/video conferences

3.7 The Applicant will offer webinars or video conferences to the local community, community groups and representatives, and local political representatives, in order to provide another means by which people can learn about the Project, ask questions and provide comments and feedback.

Virtual consultation room

3.8 The Applicant will run an online virtual consultation room that simulates the typical approach used in public consultation events/exhibitions. As part of the virtual consultation room, information boards/banners will be displayed online providing detailed information on the Project. Other consultation materials will also be made available, including the PEIR and FAQs Document.

3.9 A Feedback Form will be made available via the virtual consultation room so that people can provide comments and feedback when accessing it.

Public consultation events

3.10 The Applicant will hold six physical public consultation events within the Consultation Area. These will be held at suitable public venues at a variety of times, including during the day, evening and at least one event on a Saturday, in order to provides a range of opportunities for people to attend.

Inspection locations

3.11 Hard copies of the consultations materials, including the Preliminary Environmental Information Report ('PEIR') and Frequently Asked Questions ('FAQs') Document, will be deposited at a number of locations within the Consultation Area (e.g. local authority offices and public libraries) for inspection by the public.

Project Website

3.12 A Project Website has been established and will be used to host all of the consultation materials, including the PEIR, and to provide information on how people can provide comments and feedback and request hard copy documents/a USB. People will also be able to complete the Feedback Form on the Website. The Website address is: www.h2teesside.co.uk

Freephone number

3.13 The Applicant will operate a manned Freephone number so people, including those without internet access, can contact us to ask questions about the Project, provide comments and feedback and also request hard copy documents/a USB device. The Freephone service will operate between the hours of 10am and 4pm Monday to Friday.

3.14 When phoning, people will be able to arrange an appointment to speak to members of the Project Team where they have specific questions or queries. When a person phones the Freephone number, those manning the service will establish the areas of interest and then arrange for a relevant member of the Project Team to respond to the person, where appropriate by telephone at an agreed time. The relevant member of the Project Team will take a note of the questions/queries raised and also document the answer(s) given. The contact details of the person and the date and time of the call will also be recorded.

Feedback Form

3.15 A Feedback Form will be made available during the consultation for people to use to submit comments and feedback. The Feedback Form will be available to complete via the virtual consultation room and also on the Project Website. In addition, people will be able to request hard copies of the Feedback Form by email, post or telephone.

Freepost

3.16 The Applicant will provide a Freepost address to allow people to submit comments and completed Feedback Forms by post.

4.0 RECORDING AND TAKING ACCOUNT OF CONSULTATION

Recording and analysis

4.1 All comments and feedback received to the statutory consultation (including completed Feedback Forms) will be recorded and entered into a response tracker. The comments and feedback received will then be carefully reviewed, analysed and grouped under specific topic or theme headings. Under each topic/theme heading the issues/matters requiring consideration will then be identified.

4.2 The Applicant will consider the issues/matters raised during the pre-application consultation on the Project. In having regard to the issues/matters raised the Applicant will also identify where these have resulted in any changes to the Project.

Reporting

4.3 The pre-application consultation undertaken on the Project, including the comments/feedback received to the statutory consultation and how the Applicant have had regard to them, will be documented within a Consultation Report, which will form part of the application for development consent.

4.4 Comments/feedback received to the consultation may be made public, however, no personal information will be published unless necessary. The Applicant will take reasonable care to comply with the requirements of the General Data Protection Regulation and the PINS Privacy Policy. A copy of the H2Teesside Privacy Notice can be viewed on the Project Website: http://h2teesside.co.uk/privacy

5.0 CONTACT DETAILS

5.1 You can find out more about H2Teesside by viewing the Project Website: www.h2teesside.co.uk or contacting the Project Team as follows:

- By email: TBC
- By post: TBC
- By telephone: TBC

[redacted]

From: [redacted]
Sent: 24 April 2023 11:59
To: [redacted]
Cc: [redacted]
Subject: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)
Attachments: 220424 - H2Teesside SoCC - Draft of Informal Consultation.docx

Importance: High

Good morning.

We will be undertaking statutory consultation on the H2Teesside Project later this year in advance of the DCO application submission.

In advance of carrying out that consultation there is a requirement under s47 of the Planning Act 2008, for the Applicant, H2 Teesside Limited, to prepare a statement (a Statement of Community Consultation or 'SoCC') setting out how they propose to consult, about the proposed DCO application, people living in the vicinity of the land to which it relates and, before preparing that statement to consult each local authority that is within s43(1) about what is to be in that statement.

Redcar and Cleveland Borough Council, Stockton-on-Tees Borough Council and Hartlepool Borough Council are local authorities for the purposes of s43(1) and, as such, there is a requirement for the Applicant to consult each of your authorities on the SoCC.

The Applicant is intending to formally consult the authorities on the SoCC in mid-May. That consultation will last for a minimum period of 28 days.

In advance of the formal consultation on the SoCC, the Applicant would like to provide the authorities with an opportunity to comment on an early draft of the SoCC. A copy of the draft SoCC is attached to this email. This is provided as a Word document. I would be grateful if any additions or changes could be made as track changes.

We would ask that comments are provided by close of business on **5 May 2023**.

We will also be seeking comments from the Tees Valley Combined Authority and South Tees Development Corporation.

Kind regards

[redacted]

[redacted]

[redacted]

dwdllp.com

Chartered Surveyors & Town Planners
6 New Bridge Street, London, EC4V 6AB

DWD

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[redacted]

From: [redacted]
Sent: 24 April 2023 12:02
To: [redacted]
Cc:
Subject: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)
Attachments: 220424 - H2Teesside SoCC - Draft of Informal Consultation.docx

Importance: High

Good morning [redacted]

I am contacting you on behalf of bp/H2 Teesside Limited, in respect of the H2Teesside hydrogen project.

We will be undertaking statutory consultation on the H2Teesside Project later this year in advance of the submission of an application seeking development consent for the Project.

In advance of carrying out that consultation there is a requirement under s47 of the Planning Act 2008, for the Applicant, H2 Teesside Limited, to prepare a statement (a Statement of Community Consultation or 'SoCC') setting out how they propose to consult, about the proposed development consent application, people living in the vicinity of the land to which it relates and, before preparing that statement to consult each local authority that is within s43(1) about what is to be in that statement.

The Applicant is intending to formally consult the relevant local authorities (Redcar and Cleveland BC, Stockton-on-Tees BC and Hartlepool BC) and also the TVCA and STDC on the SoCC in mid-May. That consultation will last for a minimum period of 28 days.

In advance of the formal consultation on the SoCC, the Applicant would like to provide STDC with an opportunity to comment on an early draft of the SoCC. A copy of the draft SoCC is attached to this email. This is provided as a Word document. I would be grateful if any additions or changes could be made as track changes.

We would ask that comments are provided by close of business on **5 May 2023**.

Kind regards

[redacted]

[redacted]

[redacted]

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Chartered Surveyors & Town Planners
6 New Bridge Street, London, EC4V 6AB

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[redacted]

From: [redacted]
Sent: 25 April 2023 09:02
To: [redacted]
Subject: FW: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)
Attachments: 220424 - H2Teesside SoCC - Draft of Informal Consultation.docx

Importance: High

[redacted] please accept my apologies.

I entered your email address incorrectly and received an undelivered receipt last night.

Kind regards

[redacted]

[redacted]

[redacted]

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From: [redacted]
Sent: Monday, April 24, 2023 12:05 PM
To: [redacted]
Cc: [redacted]
Subject: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)
Importance: High

Dear [redacted]

I am contacting you on behalf of bp/H2 Teesside Limited, in respect of the H2Teesside hydrogen project.

We will be undertaking statutory consultation on the H2Teesside Project later this year in advance of the submission of an application seeking development consent for the Project.

In advance of carrying out that consultation there is a requirement under s47 of the Planning Act 2008, for the Applicant, H2 Teesside Limited, to prepare a statement (a Statement of Community Consultation or 'SoCC') setting out how they propose to consult, about the proposed development consent application, people living in the vicinity of the land to which it relates and, before preparing that statement to consult each local authority that is within s43(1) about what is to be in that statement.

The Applicant is intending to formally consult the relevant local authorities (Redcar and Cleveland BC, Stockton-on-Tees BC and Hartlepool BC) and also the TVCA and STDC on the SoCC in mid-May. That consultation will last for a minimum period of 28 days.

In advance of the formal consultation on the SoCC, the Applicant would like to provide the TCVA with an opportunity to comment on an early draft of the SoCC. A copy of the draft SoCC is attached to this email. This is provided as a Word document. I would be grateful if any additions or changes could be made as track changes.

We would ask that comments are provided by close of business on **5 May 2023**.

Kind regards

[redacted]

[redacted]

[redacted]

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[redacted]

From: [redacted]
Sent: 25 April 2023 12:41
To: [redacted]
Cc: [redacted]
Subject: RE: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)

This document was classified as: OFFICIAL

This document was classified as: OFFICIAL

Hi [redacted]

No comments from Stockton the approach is acceptable

Thank you

[redacted]
Stockton-on-Tees Borough Council
[redacted] | Web: www.stockton.gov.uk

From: [redacted]
Sent: 24 April 2023 11:59
To: [redacted]
Cc: [redacted]
Subject: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)
Importance: High

Good morning.

We will be undertaking statutory consultation on the H2Teesside Project later this year in advance of the DCO application submission.

In advance of carrying out that consultation there is a requirement under s47 of the Planning Act 2008, for the Applicant, H2 Teesside Limited, to prepare a statement (a Statement of Community Consultation or 'SoCC') setting out how they propose to consult, about the proposed DCO application, people living in the vicinity of the land to which it relates and, before preparing that statement to consult each local authority that is within s43(1) about what is to be in that statement.

Redcar and Cleveland Borough Council, Stockton-on-Tees Borough Council and Hartlepool Borough Council are local authorities for the purposes of s43(1) and, as such, there is a requirement for the Applicant to consult each of your authorities on the SoCC.

The Applicant is intending to formally consult the authorities on the SoCC in mid-May. That consultation will last for a minimum period of 28 days.

In advance of the formal consultation on the SoCC, the Applicant would like to provide the authorities with an opportunity to comment on an early draft of the SoCC. A copy of the draft SoCC is attached to this email. This is provided as a Word document. I would be grateful if any additions or changes could be made as track changes.

We would ask that comments are provided by close of business on **5 May 2023**.

We will also be seeking comments from the Tees Valley Combined Authority and South Tees Development Corporation.

Kind regards

[redacted]

[redacted]

[redacted]

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APPENDIX 6.2: STBC AND HBC RESPONSES TO NON-STATUTORY CONSULTATION ON DRAFT SOCC

Christy Ng

From: [redacted]
Sent: 09 May 2023 16:13
To: [redacted]
Cc: [redacted]
Subject: RE: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)

Hi [redacted]

Thanks for this sorry for the slightly late response.

Our consultation advice is set out on the document below (particularly for Developers 5.11 to 5.13) the only obvious omission appears to be site notices.

https://www.hartlepool.gov.uk/downloads/file/4844/statement_of_community_involvement_-_adopted_september_2019

We have a rural plan in Hartlepool and the consultation zone crosses part of this area. I would advise therefore you consult the **Hartlepool Rural Neighbourhood Plan Working Group** [redacted]. Finally parts of the consultation area fall within the remit of the newly established Hartlepool Mayoral Development Corporation, which is an Local Planning Authority in itself, I am awaiting a named contact there but would suggest in the meantime you consult them through the TVCA.

I would also advise you consult the RSPB, Teesmouth Bird Club, HSE, Cleveland Fire Brigade, EDF (Hartlepool Nuclear Power Station), Environment Agency and Natural England though I am sure you had those in hand.

Thanks

[redacted]
Hartlepool Borough Council
[redacted]

Web: www.hartlepool.gov.uk
Facebook: /hartlepoolcouncil
Twitter: @HpoolCouncil

From: [redacted]
Sent: 26 April 2023 16:10
To: [redacted]
Cc: [redacted]
Subject: RE: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)

Thank you [redacted]

[redacted]

[redacted]

[redacted]

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From: [redacted]
Sent: Tuesday, April 25, 2023 12:41 PM
To: [redacted]
Cc: [redacted]
Subject: RE: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)

This document was classified as: OFFICIAL

This document was classified as: OFFICIAL

Hi [redacted]

No comments from Stockton the approach is acceptable

Thank you

[redacted]

Stockton-on-Tees Borough Council

[redacted] Web: www.stockton.gov.uk

From: [redacted]
Sent: 24 April 2023 11:59
To: [redacted]
Cc: [redacted]
Subject: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)
Importance: High

Good morning.

We will be undertaking statutory consultation on the H2Teesside Project later this year in advance of the DCO application submission.

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In advance of the formal consultation on the SoCC, the Applicant would like to provide the authorities with an opportunity to comment on an early draft of the SoCC. A copy of the draft SoCC is attached to this email. This is provided as a Word document. I would be grateful if any additions or changes could be made as track changes.

We would ask that comments are provided by close of business on **5 May 2023**.

We will also be seeking comments from the Tees Valley Combined Authority and South Tees Development Corporation.

Kind regards

[redacted]

[redacted]

[redacted]

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please use the reply function to tell us and then permanently delete what you have received. This message has been scanned for malware by Websense. www.websense.com

[redacted]

From: [redacted]
Sent: 25 April 2023 12:41
To: [redacted]
Cc: [redacted]
Subject: RE: H2Teesside - Statement of Community Consultation (Draft for Informal Consultation)

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We will also be seeking comments from the Tees Valley Combined Authority and South Tees Development Corporation.

Kind regards

[redacted]

[redacted]

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APPENDIX 6.3: DRAFT SOCC FOR STATUTORY CONSULTATION AND EMAILS AND LETTERS DATED 17 MAY 2023 TO RCBC, STBC, HBC, STDC AND TVCA AND RESPONSE FROM STBC

H2TEESSIDE HYDROGEN PROJECT

STATEMENT OF COMMUNITY CONSULTATION ('SOCC')

DRAFT FOR STATUTORY CONSULTATION

Date: May 2023

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1.0 INTRODUCTION

Overview

1.1 H2 Teesside Limited (the 'Applicant'), is proposing to apply to the Secretary of State ('SoS') for the Department for Energy Security & Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') for construction, operation and maintenance of the H2Teesside hydrogen project on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham.

1.2 H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the H2Teesside Project.

1.3 H2 Teesside Limited's application will be submitted to the Planning Inspectorate ('PINS') who administer the application process on behalf of the SoS.

1.4 H2Teesside needs development consent as it is a 'Nationally Significant Infrastructure Project' by virtue of Section 14(g) and Sections 35 and 35ZA on the PA 2008.

1.5 Prior to submitting an application for development consent, applicants are required to carry out pre-application consultation in accordance with Sections 42, 47 and 48 of the PA 2008. This Statement of Community Consultation ('SoCC') sets out how the Applicant proposes to consult the local community about H2Teesside pursuant to Section 47.

1.6 Information on the development consent process can be found on the PINS website at:

https://infrastructure.planninginspectorate.gov.uk/application-process/the-process/

H2Teesside

1.7 H2Teesside (the 'Project') will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

1.8 The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent. The Secretary of State for DESNZ is expected to make a decision on the NZT development consent application in September 2023.

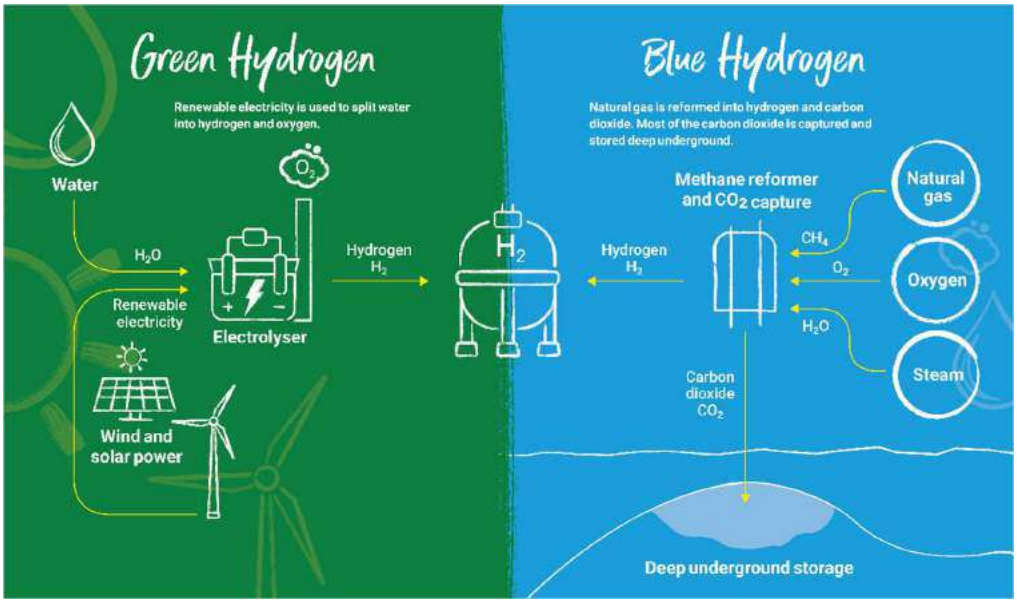
1.9 H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

1.10 The low-carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emission by 2050.

1.11 The Project will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

1.12 bp is advancing a separate 'green' hydrogen project, known as HyGreen on Teesside. HyGreen will have an initial production capacity of circa 80 megawatts ('MW') electrical with the potential to expand up to 500 MW of hydrogen production. HyGreen will split water in an electrolyser to produce hydrogen and oxygen using renewable electricity. Some sections of the hydrogen distribution pipelines for HyGreen will be located in the same pipeline corridors as those for H2Teesside and the NEP onshore infrastructure. It is currently envisaged that all the elements of HyGreen will be consented separately under the Town and Country Planning Act 1990 (the 'TCPA') and will be subject to separate pre-application consultation.

1.13 The infographic below provides an overview of the 'blue' and 'green' hydrogen processes.



1.14 H2Teesside comprises the following main elements:

- A hydrogen production plant of up to 1.2 GW thermal to be developed in two phases.
- A natural gas supply connection for the supply of gas to the hydrogen production plant.
- An air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process.
- An electricity grid connection to provide power to the Project.
- Water supply and treatment and wastewater infrastructure.
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2.
- Hydrogen distribution pipelines to supply the low carbon hydrogen across Teesside.
- Other ancillary development, including hydrogen storage and laydown facilities.

1.15 The Project involves land within the boroughs of RCBC south of the River Tees and STBC north of the Tees on Teesside and within HBC in County Durham, also north of the Tees.

1.16 The hydrogen production plant and its associated and ancillary development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and

compression facilities and connection) will be located within the administrative area of RCBC. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers and encompass land within the administrative areas of RCBC, STBC and also HBC.

1.17 Further information on the Project can be found at the Project Website: www.h2teesside.co.uk

Environmental Information

1.18 H2Teesside is an Environmental Impact Assessment ('EIA') development for the purposes of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017'. This means that an EIA of the Project will be undertaken by the Applicant. This will assess the likely significant environmental effects arising from the Project. It will also identify any mitigation that is necessary to control or reduce those environmental effects. The findings of the EIA will be documented within an Environmental Statement ('ES') that will form part of the application for development consent.

1.19 Environmental information will be made available during the pre-application consultation on the Project. This will take the form of a Preliminary Environmental Information Report ('PEIR'). The PEIR will take the form of a draft ES and provide information on the likely significant environmental effects of the Project, so far as known to the Applicant at that stage. There will be an opportunity to comment upon the PEIR during the pre-application consultation. The comments received will be considered in the preparation of the ES.

Purpose of the SoCC

1.20 This Statement of Community Consultation ('SoCC') has been prepared by the Applicant in accordance with Section 47 'Duty to consult local community' of the PA 2008. Section 47 places a statutory duty on applicants to '*prepare a statement setting out how the applicant proposes to consult, about the proposed application, people living in the vicinity of the land'.* The SoCC sets out how the Applicant will consult (in accordance with Section 47) the local community on H2Teesside prior to the submission of the application for development consent.

1.21 The SoCC has been prepared with reference to guidance on pre-application consultation published by the Government (Department for Communities and Local Government - 'Planning Act 2008: Guidance on the pre-application process', March 2015), the Planning Inspectorate ('PINS') and the relevant local authorities (Redcar and Cleveland Borough Council, Stockton-on-Tees Borough Council and Hartlepool

Borough Council) for the purposes of Section 47 of the PA 2008. The Applicant has had regard to the responses to its consultation on the SoCC from the relevant local authorities in preparing and finalising the SoCC for publication. Although there was no statutory duty to do so, the Applicant also consulted the Tees Valley Combined Authority and the South Tees Development Consultation on the SoCC and has had regard to the comments received from those bodies.

1.22 In preparing the SoCC, the Applicant has also taken into account bp's experience of pre-application consultation on the NZT development consent application.

2.0 APPROACH TO PRE-APPLICATION CONSULTATION

Consultation Objectives

2.1 The Applicant's objectives for the pre-application consultation on H2Teesside are to:

- To ensure public understanding of the design and decision-making processes for the Project.
- To create a clear understanding of the Project, given the number of net zero projects in the area, and also provide engaging messaging to help avoid confusion with other projects.
- To reach silent and/or seldom heard audiences by using varied communications methods. The Applicant will seek to identify any groups or specific stakeholders with protected characteristics so that they can be included in the consultation.
- To explain the benefits of the Project, including in terms of job creation, protection of existing industry and decarbonisation.
- To provide stakeholders with the opportunity to submit comments and feedback while the proposals are still at a formative stage, and to provide them with different ways in which to do so.
- To provide a mechanism to review the comments and feedback received and show how these have been taken into account in finalising the proposals and the application for development consent.

Consultation Stages & Timescale

2.2 During the first half of 2023 the Applicant has undertaken early targeted engagement with potentially affected landowners and key technical consultees and other stakeholders on the Project. This early engagement has informed initial decisions with regard to the extent of the Project Site and the scope of the ongoing EIA work.

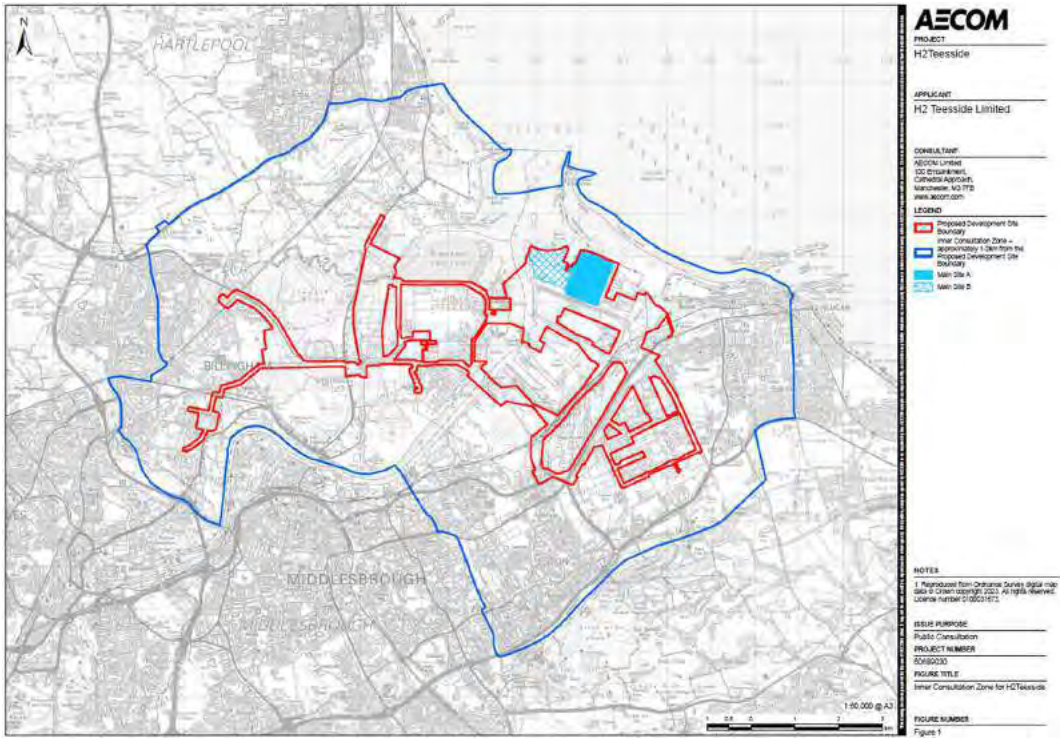
2.3 Taking account of the level and type of public engagement on recent projects on Teesside, notably NZT, the decision has been taken for the pre-application public consultation for the Project will take place as one main stage of statutory consultation in accordance with the relevant requirements of the PA 2008, notably Sections 42, 47 and 48. The statutory consultation will run for a period of six weeks.

Consultation Area

2.4 A 'Consultation Area' has been defined for the purposes of the Applicant's pre-application public consultation. The Consultation Area is divided into two zones; an Inner Consultation Zone ('ICZ') and an Outer Consultation Zone ('OCZ').

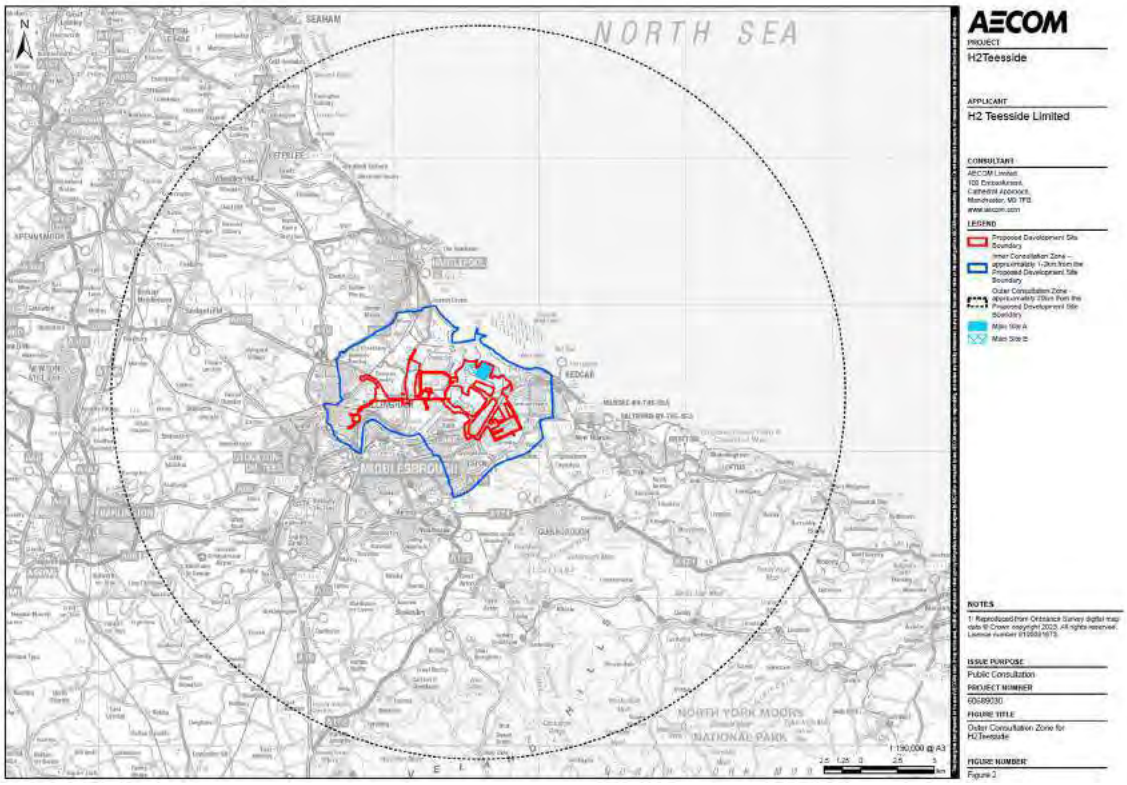
2.5 The ICZ is defined by the outer red line on **Figure 2.1**. The Project Site is indicated by the inner red line. The ICZ represents the area within which the Applicant considers there is the greatest potential for local communities to be most affected by/interested in the Project. The ICZ extends approximately 1 kilometre ('km') from the Project Site boundary. The Applicant has sought to ensure that the defined ICZ does not cut across communities and where appropriate, main roads and natural features have been used to define the edge of the ICZ. The ICZ includes over 37,000 residential and businesses and includes Redcar, Warrenby, Dormanstown, Lazenby, Grangetown, Eston, Normanby, South Bank, Billingham and Greatham.

Figure 2.1 – Project Site and Inner Consultation Zone



2.6 The OCZ, has been defined with reference to the early EIA work and extends as a worst case to approximately 20km from the Project Site boundary (as defined for the purposes of the EIA) and contains all the land within the proposed development consent application site boundary for H2Teesside. At this stage it is considered to represent the maximum extent within which environmental effects could occur. The largest Study Area for the H2Teesside EIA is currently 15km from the Project Site boundary, for the identification of and assessment of impacts to Statutory Designated Ecological Sites (including for purposes of Habitats Regulations Assessment (HRA) and also for the air quality assessment. The OCZ is shown on **Figure 2.2** below.

Figure 2.2 – Project Site and Outer Consultation Zone



What will we consult on?

2.7 The pre-application consultation will provide information on the following:

- What H2Teesside is and what it will do.
- The practical uses of hydrogen and its benefits.
- The role of carbon capture, usage and storage ('CCUS') in enabling H2Teesside.
- Decisions made on the design and layout of the Project and the options under consideration.
- The findings of the environmental assessment work undertaken at the time of the consultation, presented in the form of the PEIR.
- The proposals for avoiding, minimising and/or mitigating any likely environmental effects of the Project, to the extent defined and known at that stage.
- An update on the timeline for the Project and the key milestones, including the anticipated submission date for the development consent application.
- How comments and feedback can be provided and the deadline for the receipt of these.

3.0 CONSULTATION METHODS

3.1 The Applicant will employ a wide range of consultation methods to ensure that the local community and other key local stakeholder organisations and local political representatives are provided with the opportunity to engage with the Project and provide comments and feedback. The key consultation methods to be employed are outlined below.

Press/media releases

3.2 Press/media releases will be used to publicise the Project. A press release will be issued to the local and regional press at the start of the statutory consultation. Press releases will also provide information on how the local community can find out about the proposals and the ways in which people can provide comments and feedback.

3.3 The Applicant may also use other forms of media, such as social media, to further publicise the consultation, as considered appropriate.

Information Leaflet/Newsletter

3.4 An Information Leaflet/Newsletter will be sent to all residents and businesses within the ICZ prior to the start of the statutory consultation. This will provide information on the Project, the ways in which information is being provided and presented, how further information and consultation materials can be requested, and how comments and feedback can be made as well as the deadline for the submission of these.

3.5 In addition to local residents and businesses, the Information Leaflet will be sent to local political representatives, including local MPs, district councillors and parish and town councils.

Newspaper notices/posters

3.6 The statutory consultation will be advertised by placing information notices in local newspapers circulating across both the Consultation Area for two consecutive weeks. The local newspapers that will be used are the Northern Echo, Teesside Gazette and Darlington and Stockton Times. Posters will also be circulated to identified community groups and stakeholders across the Consultation Area, along with a request for them to be shared via their channels and displayed in public places. In accordance with Section 48 of the PA 2008, a notice will be published in a national newspaper and other relevant publications for one week and in local newspapers (those mentioned above) for two consecutive weeks.

Site Notices

3.7 The Applicant will erect site notices at appropriate intervals around the Project Site boundaries, including at intervals along the route corridors for the various connections.

The site notices will notify the local community of the consultation and provide information on how to participate.

Webinars/video conferences

3.8 The Applicant will offer webinars or video conferences to the local community, community groups and representatives, and local political representatives, in order to provide another means by which people can learn about the Project, ask questions and provide comments and feedback.

Virtual consultation room

3.9 The Applicant will run an online virtual consultation room that simulates the typical approach used in public consultation events/exhibitions. As part of the virtual consultation room, information boards/banners will be displayed online providing detailed information on the Project. Other consultation materials will also be made available, including the PEIR and FAQs Document.

3.10 A Feedback Form will be made available via the virtual consultation room so that people can provide comments and feedback when accessing it.

Public consultation events

3.11 The Applicant will hold six physical public consultation events within the Consultation Area. These will be held at suitable public venues at a variety of times, including during the day, evening and at least one event on a Saturday, to provide a range of opportunities for people to attend.

Inspection locations

3.12 Copies of the consultation materials, including the PEIR and FAQs Document, will be accessible at locations within the Consultation Area (e.g. local authority offices and public libraries) for inspection by the public.

Project Website

3.13 A Project Website has been established and will be used to host all the consultation materials, including the PEIR, and to provide information on how people can provide comments and feedback and request a copy. People will also be able to complete the Feedback Form on the Website. The Website address is: www.h2teesside.co.uk

Freephone number

3.14 The Applicant will operate a manned Freephone number so people, including those without internet access, can contact us to ask questions about the Project, provide comments and feedback and also request hard copy documents/a USB device. The Freephone service will operate between the hours of 10am and 4pm Monday to Friday.

3.15 When phoning, people will be able to arrange an appointment to speak to members of the Project Team where they have specific questions or queries. When a person phones the Freephone number, those manning the service will establish the areas of interest and then arrange for a relevant member of the Project Team to respond to the person, where appropriate by telephone at an agreed time. The relevant member of the Project Team will take a note of the questions/queries raised and also document the answer(s) given. The contact details of the person and the date and time of the call will also be recorded.

Feedback Form

3.16 A Feedback Form will be made available during the consultation for people to use to submit comments and feedback. The Feedback Form will be available to complete via the virtual consultation room and also on the Project Website. In addition, people will be able to request hard copies of the Feedback Form by email, post or telephone.

Freepost

3.17 The Applicant will provide a Freepost address to allow people to submit comments and completed Feedback Forms by post.

4.0 RECORDING AND TAKING ACCOUNT OF CONSULTATION

Recording and analysis

4.1 All comments and feedback received to the statutory consultation (including completed Feedback Forms) will be recorded and entered into a response tracker. The comments and feedback received will then be carefully reviewed, analysed and grouped under specific topic or theme headings. Under each topic/theme heading the issues/matters requiring consideration will then be identified.

4.2 The Applicant will consider the issues/matters raised during the pre-application consultation on the Project. In having regard to the issues/matters raised the Applicant will also identify where these have resulted in any changes to the Project.

Reporting

4.3 The pre-application consultation undertaken on the Project, including the comments/feedback received to the statutory consultation and how the Applicant have had regard to them, will be documented within a Consultation Report, which will form part of the application for development consent.

4.4 Comments/feedback received to the consultation may be made public, however, no personal information will be published unless necessary. The Applicant will take reasonable care to comply with the requirements of the General Data Protection Regulation and the PINS Privacy Policy. A copy of the H2Teesside Privacy Notice can be viewed on the Project Website: http://h2teesside.co.uk/privacy

5.0 CONTACT DETAILS

5.1 You can find out more about H2Teesside by viewing the Project Website: www.h2teesside.co.uk or contacting the Project Team as follows:

- By email: info@h2teesside.net
- By post: H2Teesside FREEPOST
- By telephone: 0800 080 3028

Date: 17th May 2023
Your Ref: -
Our Ref: 16373

6 New Bridge Street
London EC4V 6AB
T: 020 7489 0213
F: 020 7248 4743
E: info@dwdllp.com
W: dwdllp.com

[redacted]
Planning & Development Manager
Hartlepool Borough Council

By email: [redacted]

Dear [redacted]

H2TEESSIDE HYDROGEN PROJECT – LAND WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES, TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

THE PLANNING ACT 2008 – SECTION 47(2) CONSULTATION WITH SECTION 43(1) LOCAL AUTHORITIES ON DRAFT STATEMENT OF COMMUNITY CONSULTATION

I write on behalf of the Applicant, H2 Teesside Limited, to consult Hartlepool Borough Council ('HBC') in accordance with Section 47(2) of the Planning Act 2008 (the 'PA 2008') on the draft Statement of Community Consultation ('SoCC') for the H2Teesside Hydrogen Project.

The Applicant is proposing to apply to the Secretary of State for the Department for Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the PA 2008 for construction, operation and maintenance of the Project on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham.

HBC is a local authority for the purposes of Section 43(1) of the PA 2008 and must therefore be consulted on the draft SoCC that has been prepared, setting out how the Applicant proposes to consult, about the proposed application for development consent, people living within the vicinity of the land to which the Project relates. A copy of the draft SoCC accompanies this letter.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership ('NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres offshore from Teesside under the North Sea.

The low-carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emission by 2050.

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Registered Office: 6 New Bridge Street, London EC4V 6AB.fdsa

The Project will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

Section 47(3) of the PA 2008 states that the deadline for the receipt by an applicant of a local authority's comments on the draft SoCC is the end of the period of 28 days starting with the day after the day on which the authority received the consultation documents (the draft SoCC). The Applicant would therefore request that any comments are submitted by **15th June 2023**. Comments should be sent by email to [redacted] or by post, marked for the attention of [redacted] at DWD, 6 New Bridge Street, London, EC4V 6AB.

Further information on the Project can be found at www.h2teesside.co.uk

Yours sincerely

[redacted]

[redacted]
Partner – Head of Planning
DWD
[redacted]

Date: 17th May 2023
Your Ref: -
Our Ref: 16373

6 New Bridge Street
London EC4V 6AB
T: 020 7489 0213
F: 020 7248 4743
E: info@dwdllp.com
W: dwdllp.com

[redacted]
Head of Planning and Development
Redcar and Cleveland Borough Council
Directorate of Growth, Enterprise and Environment
Redcar and Cleveland House
Kirkleatham Street
Redcar, TS10 1RT

By email: [redacted]

Dear [redacted]

H2TEESSIDE HYDROGEN PROJECT – LAND WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES, TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

THE PLANNING ACT 2008 – SECTION 47(2) CONSULTATION WITH SECTION 43(1) LOCAL AUTHORITIES ON DRAFT STATEMENT OF COMMUNITY CONSULTATION

I write on behalf of the Applicant, H2 Teesside Limited, to consult Redcar and Cleveland Borough Council ('RCBC') in accordance with Section 47(2) of the Planning Act 2008 (the 'PA 2008') on the draft Statement of Community Consultation ('SoCC') for the H2Teesside Hydrogen Project.

The Applicant is proposing to apply to the Secretary of State for the Department for Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the PA 2008 for construction, operation and maintenance of the Project on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham.

RCBC is a local authority for the purposes of Section 43(1) of the PA 2008 and must therefore be consulted on the draft SoCC that has been prepared, setting out how the Applicant proposes to consult, about the proposed application for development consent, people living within the vicinity of the land to which the Project relates. A copy of the draft SoCC accompanies this letter.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership ('NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres offshore from Teesside under the North Sea.

The low-carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the

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Registered Office: 6 New Bridge Street, London EC4V 6AB.fdsa

Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emission by 2050.

The Project will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

Section 47(3) of the PA 2008 states that the deadline for the receipt by an applicant of a local authority's comments on the draft SoCC is the end of the period of 28 days starting with the day after the day on which the authority received the consultation documents (the draft SoCC). The Applicant would therefore request that any comments are submitted by **15th June 2023**. Comments should be sent by email to [redacted] or by post, marked for the attention of [redacted] at DWD, 6 New Bridge Street, London, EC4V 6AB.

Further information on the Project can be found at www.h2teesside.co.uk

Yours sincerely

[redacted]

[redacted]
Partner – Head of Planning
DWD
[redacted]

Date: 17th May 2023
Your Ref: -
Our Ref: 16373

6 New Bridge Street
London EC4V 6AB
T: 020 7489 0213
F: 020 7248 4743
E: info@dwdllp.com
W: dwdllp.com

[redacted]
Principal Planning Officer
Stockton-on-Tees Borough Council

By email: [redacted]

Dear [redacted]

H2TEESSIDE HYDROGEN PROJECT – LAND WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES, TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

THE PLANNING ACT 2008 – SECTION 47(2) CONSULTATION WITH SECTION 43(1) LOCAL AUTHORITIES ON DRAFT STATEMENT OF COMMUNITY CONSULTATION

I write on behalf of the Applicant, H2 Teesside Limited, to consult Stockton-on-Tees Borough Council ('STBC') in accordance with Section 47(2) of the Planning Act 2008 (the 'PA 2008') on the draft Statement of Community Consultation ('SoCC') for the H2Teesside Hydrogen Project.

The Applicant is proposing to apply to the Secretary of State for the Department for Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the PA 2008 for construction, operation and maintenance of the Project on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham.

STBC is a local authority for the purposes of Section 43(1) of the PA 2008 and must therefore be consulted on the draft SoCC that has been prepared, setting out how the Applicant proposes to consult, about the proposed application for development consent, people living within the vicinity of the land to which the Project relates. A copy of the draft SoCC accompanies this letter.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership ('NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres offshore from Teesside under the North Sea.

The low-carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emission by 2050.

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Registered Office: 6 New Bridge Street, London EC4V 6AB.fdsa

The Project will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

Section 47(3) of the PA 2008 states that the deadline for the receipt by an applicant of a local authority's comments on the draft SoCC is the end of the period of 28 days starting with the day after the day on which the authority received the consultation documents (the draft SoCC). The Applicant would therefore request that any comments are submitted by **15th June 2023**. Comments should be sent by email to [redacted] or by post, marked for the attention of [redacted] at DWD, 6 New Bridge Street, London, EC4V 6AB.

Further information on the Project can be found at www.h2teesside.co.uk

Yours sincerely

[redacted]

[redacted]
Partner – Head of Planning
DWD
[redacted]

Date: 17th May 2023
Your Ref: -
Our Ref: 16373

6 New Bridge Street
London EC4V 6AB
T: 020 7489 0213
F: 020 7248 4743
E: info@dwdllp.com
W: dwdllp.com

[redacted]
South Tees Development Corporation/Teesworks

By email: [redacted]

Dear [redacted]

H2TEESSIDE HYDROGEN PROJECT – LAND WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES, TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

CONSULTATION ON DRAFT STATEMENT OF COMMUNITY CONSULTATION

I write on behalf of the Applicant, H2 Teesside Limited, to consult South Tees Development Corporation ('STDC')/Teesworks on the draft Statement of Community Consultation ('SoCC') for the H2Teesside Hydrogen Project.

The Applicant is proposing to apply to the Secretary of State for the Department for Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 for construction, operation and maintenance of the Project on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham.

Although STDC/Teesworks is not a local authority for the purposes of Section 43(1) of the PA 2008 and, as such, there is no statutory duty to consult STDC/Teesworks on the draft SoCC, the Applicant would welcome any comments it has on the document. The draft SoCC sets out how the Applicant proposes to consult, about the proposed application for development consent, people living within the vicinity of the land to which the Project relates. A copy of the draft SoCC accompanies this letter.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership ('NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres offshore from Teesside under the North Sea.

The low-carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emission by 2050.

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The Project will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

The Applicant would request that any comments are submitted by **15th June 2023**. Comments should be sent by email to [redacted] or by post, marked for the attention of [redacted] at DWD, 6 New Bridge Street, London, EC4V 6AB.

Further information on the Project can be found at www.h2teesside.co.uk

Yours sincerely

[redacted]

[redacted]
Partner – Head of Planning
DWD
[redacted]

Date: 17th May 2023
Your Ref: -
Our Ref: 16373

6 New Bridge Street
London EC4V 6AB
T: 020 7489 0213
F: 020 7248 4743
E: info@dwdllp.com
W: dwdllp.com

[redacted]
The Tees Valley Combined Authority

By email: [redacted]

Dear [redacted]

H2TEESSIDE HYDROGEN PROJECT – LAND WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES, TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

CONSULTATION ON DRAFT STATEMENT OF COMMUNITY CONSULTATION

I write on behalf of the Applicant, H2 Teesside Limited, to consult the Tees Valley Combined Authority ('TVCA') on the draft Statement of Community Consultation ('SoCC') for the H2Teesside Hydrogen Project.

The Applicant is proposing to apply to the Secretary of State for the Department for Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 for construction, operation and maintenance of the Project on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham.

Although the TVCA is not a local authority for the purposes of Section 43(1) of the PA 2008 and, as such, there is no statutory duty to consult the TVCA on the draft SoCC, the Applicant would welcome any comments it has on the document. The draft SoCC sets out how the Applicant proposes to consult, about the proposed application for development consent, people living within the vicinity of the land to which the Project relates. A copy of the draft SoCC accompanies this letter.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership ('NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres offshore from Teesside under the North Sea.

The low-carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emission by 2050.

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Registered Office: 6 New Bridge Street, London EC4V 6AB.fdsa

The Project will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

The Applicant would request that any comments are submitted by **15th June 2023**. Comments should be sent by email to [redacted] or by post, marked for the attention of [redacted] at DWD, 6 New Bridge Street, London, EC4V 6AB.

Further information on the Project can be found at www.h2teesside.co.uk

Yours sincerely

[redacted]

[redacted]
Partner – Head of Planning
DWD
[redacted]

[redacted]

From: [redacted]
Sent: 17 May 2023 21:32
To: [redacted]
Cc: [redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Attachments: 230517 - H2Teesside SoCC Consultation - HBC.pdf; 230517_H2Teesside SoCC_Draft for Statutory Consultation_Final.pdf

Dear [redacted],

The attached letter represents H2 Teesside Limited's statutory consultation on its draft Statement of Community Consultation (SoCC) pursuant to Section 47(2) of the Planning Act 2008.

The letter is accompanied by a copy of the draft SoCC (also attached to this email).

Any comments on the draft SoCC should be provided by **15th June 2023**.

Yours sincerely

[redacted]

[redacted]
Partner - Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
6 New Bridge Street, London, EC4V 6AB

DWD

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[redacted]

From: [redacted]
Sent: 17 May 2023 21:28
To: [redacted]
Cc: [redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation
Attachments: 230517 - H2Teesside SoCC Consultation - RCBC.pdf; 230517_H2Teesside SoCC_Draft for Statutory Consultation_Final.pdf

Dear [redacted]

The attached letter represents H2 Teesside Limited's statutory consultation on its draft Statement of Community Consultation (SoCC) pursuant to Section 47(2) of the Planning Act 2008.

The letter is accompanied by a copy of the draft SoCC (also attached to this email).

Any comments on the draft SoCC should be provided by **15th June 2023**.

Yours sincerely

[redacted]
BA (Hons) BPl. MRTPI
Partner - Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
6 New Bridge Street, London, EC4V 6AB

DWD

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[redacted]

From: [redacted]
Sent: 17 May 2023 21:30
To: [redacted]
Cc: [redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation
Attachments: 230517 - H2Teesside SoCC Consultation - STBC.pdf; 230517_H2Teesside SoCC_Draft for Statutory Consultation_Final.pdf

Dear [redacted]

The attached letter represents H2 Teesside Limited's statutory consultation on its draft Statement of Community Consultation (SoCC) pursuant to Section 47(2) of the Planning Act 2008.

The letter is accompanied by a copy of the draft SoCC (also attached to this email).

Any comments on the draft SoCC should be provided by **15th June 2023**.

Yours sincerely

[redacted]
BA (Hons) BPl. MRTPI
Partner - Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
6 New Bridge Street, London, EC4V 6AB

DWD

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[redacted]

From: [redacted]
Sent: 17 May 2023 21:34
To: [redacted]
Cc: [redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation
Attachments: 230517 - H2Teesside SoCC Consultation - STDC_Teesworks.pdf; 230517_H2Teesside SoCC_Draft for Statutory Consultation_Final.pdf

Dear [redacted]

The attached letter represents H2 Teesside Limited's statutory consultation on its draft Statement of Community Consultation (SoCC) pursuant to Section 47(2) of the Planning Act 2008.

The letter is accompanied by a copy of the draft SoCC (also attached to this email).

Any comments on the draft SoCC should be provided by **15th June 2023**.

Yours sincerely

[redacted]
BA (Hons) BPl. MRTPI
Partner - Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
6 New Bridge Street, London, EC4V 6AB

DWD

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[redacted]

From: [redacted]
Sent: 17 May 2023 21:37
To: [redacted]
Cc: [redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation
Attachments: 230517 - H2Teesside SoCC Consultation - TVCA.pdf; 230517_H2Teesside SoCC_Draft for Statutory Consultation_Final.pdf

Dear [redacted]

The attached letter represents H2 Teesside Limited's statutory consultation on its draft Statement of Community Consultation (SoCC) pursuant to Section 47(2) of the Planning Act 2008.

The letter is accompanied by a copy of the draft SoCC (also attached to this email).

Any comments on the draft SoCC should be provided by **15th June 2023**.

Yours sincerely

[redacted]
BA (Hons) BPl. MRTPI
Partner - Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
6 New Bridge Street, London, EC4V 6AB

DWD

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APPENDIX 6.4: END OF CONSULTATION ON DRAFT SOCC EMAILS DATED 20 JUNE 2023 TO RCBC, STBC, HBC, STDC AND TVCA

[redacted]

From: [redacted]
Sent: 20 June 2023 12:59
To: [redacted]
Cc:
Subject: RE: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Importance: High

Dear [redacted] just to confirm, the consultation on the draft SoCC closed on 15th June.

We are now finalising the SoCC for publication.

Should you have any questions please do not hesitate to contact me.

Kind regards

[redacted]

[redacted]
BA (Hons) BPl. MRTPI
Partner - Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
6 New Bridge Street, London, EC4V 6AB

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From: [redacted]
Sent: Wednesday, May 17, 2023 9:32 PM
To: [redacted]
Cc: [redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Dear [redacted]

The attached letter represents H2 Teesside Limited's statutory consultation on its draft Statement of Community Consultation (SoCC) pursuant to Section 47(2) of the Planning Act 2008.

The letter is accompanied by a copy of the draft SoCC (also attached to this email).

Any comments on the draft SoCC should be provided by **15th June 2023**.

Yours sincerely

[redacted]

[redacted]
BA (Hons) BPl. MRTPI
Partner - Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

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[redacted]

From: [redacted]
Sent: 20 June 2023 13:32
To: [redacted]
Cc:
Subject: RE: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Importance: High

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From: [redacted]
Sent: Wednesday, May 17, 2023 9:28 PM
To: [redacted]
Cc: [redacted]

[redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Dear [redacted]

The attached letter represents H2 Teesside Limited's statutory consultation on its draft Statement of Community Consultation (SoCC) pursuant to Section 47(2) of the Planning Act 2008.

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Yours sincerely

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[redacted]
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Partner - Head of Planning, Energy & Infrastructure

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[redacted]

From: [redacted]
Sent: 20 June 2023 13:33
To: [redacted]
Cc:
Subject: RE: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

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From: [redacted]
Sent: Wednesday, May 17, 2023 9:30 PM
To: [redacted]
Cc: [redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Dear [redacted]

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Any comments on the draft SoCC should be provided by **15th June 2023**.

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[redacted]

From: [redacted]
Sent: 20 June 2023 13:33
To: [redacted]
Cc:
Subject: RE: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Importance: High

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From: [redacted]
Sent: Wednesday, May 17, 2023 9:34 PM
To: [redacted]
Cc: [redacted]

[redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Dear [redacted]

The attached letter represents H2 Teesside Limited's statutory consultation on its draft Statement of Community Consultation (SoCC) pursuant to Section 47(2) of the Planning Act 2008.

The letter is accompanied by a copy of the draft SoCC (also attached to this email).

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Yours sincerely

[redacted]

[redacted]
BA (Hons) BPl. MRTPI
Partner - Head of Planning, Energy & Infrastructure

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[redacted]

From: [redacted]
Sent: 20 June 2023 13:34
To: [redacted]
Cc:
Subject: RE: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Importance: High

Dear [redacted] just to confirm, the consultation on the draft SoCC closed on 15th June.

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Should you have any questions please do not hesitate to contact me.

Kind regards

[redacted]

[redacted]
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Partner - Head of Planning, Energy & Infrastructure

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From: [redacted]
Sent: Wednesday, May 17, 2023 9:37 PM
To: [redacted]
Cc: [redacted]

[redacted]

Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Dear [redacted]

The attached letter represents H2 Teesside Limited's statutory consultation on its draft Statement of Community Consultation (SoCC) pursuant to Section 47(2) of the Planning Act 2008.

The letter is accompanied by a copy of the draft SoCC (also attached to this email).

Any comments on the draft SoCC should be provided by **15th June 2023**.

Yours sincerely

[redacted]

[redacted]
BA (Hons) BPl. MRTPI
Partner - Head of Planning, Energy & Infrastructure

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[redacted]

From: [redacted]
Sent: 06 June 2023 08:18
To: [redacted]
Cc: [redacted]

Subject: RE: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation 23/0508/NSIP

This document was classified as: OFFICIAL

This document was classified as: OFFICIAL

Hi [redacted]

I have reviewed and have no comments to make

[redacted]
Principal Planning Officer
Stockton-on-Tees Borough Council
[redacted] Web: www.stockton.gov.uk

From: [redacted]
Sent: 17 May 2023 21:30
To: [redacted]
Cc: [redacted]
Subject: H2Teesside - Section 47(2) of the Planning Act 2008 - Consultation on Statement of Community Consultation

Dear [redacted],

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Any comments on the draft SoCC should be provided by **15th June 2023**.

Yours sincerely

[redacted]

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Partner - Head of Planning, Energy & Infrastructure

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**********.

APPENDIX 6.5: FINAL PUBLISHED SOCC

H2 Teesside

bp

H2Teesside hydrogen project

September 2023



Statement of Community Consultation (SoCC)

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1.0 INTRODUCTION

Overview

1.1 H2 Teesside Limited (the 'Applicant'), is proposing to apply to the Secretary of State ('SoS') for the Department for Energy Security & Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') for construction, operation and maintenance of the H2Teesside hydrogen project on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham.

1.2 H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the H2Teesside Project.

1.3 H2 Teesside Limited's application will be submitted to the Planning Inspectorate ('PINS') who administer the application process on behalf of the SoS.

1.4 H2Teesside needs development consent as it is a 'Nationally Significant Infrastructure Project' by virtue of Section 14(g) and Sections 35 and 35ZA on the PA 2008.

1.5 Prior to submitting an application for development consent, applicants are required to carry out pre-application consultation in accordance with Sections 42, 47 and 48 of the PA 2008.

1.6 Section 47(1) of the PA 2008 states that an applicant for development consent must prepare a statement setting out how they propose to consult, about the proposed application, people living within the vicinity of the land to which is relates. This Statement of Community Consultation ('SoCC') sets out how the Applicant will consult the local community about H2Teesside pursuant to Section 47(1).

1.7 In accordance with Section 47(2), the Applicant has consulted the relevant local authorities – Redcar and Cleveland, Stockton-on-Tees and Hartlepool borough councils – and also the Tees Valley Combined Authority and South Tees Development Corporation on the SoCC.

1.8 Information on the development consent process can be found on the PINS website at:

https://infrastructure.planninginspectorate.gov.uk/application-process/the-process/

H2Teesside

1.9 H2Teesside (the 'Project') will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the

CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

1.10 The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent. The Secretary of State for DESNZ is expected to make a decision on the NZT development consent application in Quarter 3 2023.

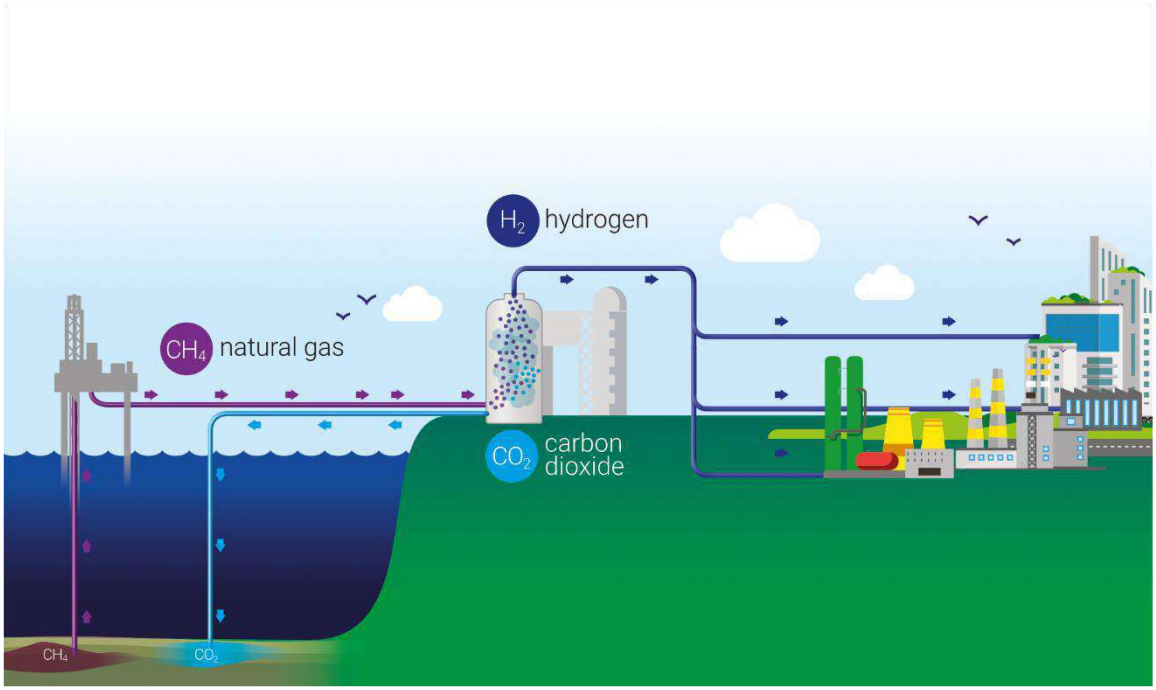
1.11 H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

1.12 The low-carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emissions by 2050.

1.13 The Project will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

1.14 bp is advancing a separate 'green' hydrogen project, known as HyGreen on Teesside. HyGreen will have an initial production capacity of circa 80 megawatts ('MW') electrical with the potential to expand up to 500 MW of hydrogen production. HyGreen will split water in an electrolyser to produce hydrogen and oxygen using renewable electricity. Some sections of the hydrogen distribution pipelines for HyGreen will be located in the same pipeline corridors as those for H2Teesside and the NEP onshore infrastructure. It is currently envisaged that all the elements of HyGreen will be consented separately under the Town and Country Planning Act 1990 and will be subject to separate pre-application consultation.

1.15 The infographic below provides an overview of the ‘blue’ hydrogen processes.



1.16 H2Teesside comprises the following main elements:

- A hydrogen production plant of up to 1.2 GW thermal to be developed in two phases.
- A natural gas supply connection for the supply of gas to the hydrogen production plant.
- An air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process.
- An electricity grid connection to provide power to the Project.
- Water supply and treatment and wastewater infrastructure.
- Hydrogen Storage
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2.
- Hydrogen distribution pipelines to supply the low carbon hydrogen across Teesside.
- Other ancillary development, including hydrogen storage and laydown facilities.

1.17 The Project involves land within the boroughs of Redcar and Cleveland south of the River Tees and Stockton-on-Tees north of the Tees on Teesside and within the borough of Hartlepool in County Durham, also north of the Tees.

1.18 The hydrogen production plant and its associated and ancillary development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) will be located within the administrative area of RCBC. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers.

1.19 Further information on the Project can be found at the Project Website: www.h2teesside.co.uk

Environmental Information

1.20 H2Teesside is an Environmental Impact Assessment ('EIA') development for the purposes of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017'. This means that an EIA of the Project will be undertaken by the Applicant. This will assess the likely significant environmental effects arising from the Project. It will also identify any mitigation that is necessary to control or reduce those environmental effects. The findings of the EIA will be documented within an Environmental Statement ('ES') that will form part of the application for development consent.

1.21 Environmental information will be made available during the pre-application consultation on the Project. This will take the form of a Preliminary Environmental Information Report ('PEIR'). The PEIR will provide information on the likely significant environmental effects of the Project, so far as known to the Applicant at that stage. The PEIR will be accompanied by a Non-Technical Summary ('NTS'). There will be an opportunity to comment upon the PEIR during the pre-application consultation. The comments received will be considered in the preparation of the ES.

Purpose of the SoCC

1.22 This SoCC has been prepared by the Applicant in accordance with Section 47 'Duty to consult local community' of the PA 2008. Section 47(1) places a statutory duty on applicants to "*prepare a statement setting out how the applicant proposes to consult, about the proposed application, people living in the vicinity of the land".* The SoCC sets out how the Applicant will consult (in accordance with Section 47) the local community on H2Teesside prior to the submission of the application for development consent.

1.23 The SoCC has been prepared with reference to guidance on pre-application consultation published by the Government (Department for Communities and Local Government – 'Planning Act 2008: Guidance on the pre-application process', March 2015), the Planning Inspectorate ('PINS') and the relevant local authorities (Redcar and Cleveland Borough Council, Stockton-on-Tees Borough Council and Hartlepool Borough Council) for the purposes of Section 47 of the PA 2008. The Applicant has consulted the relevant local authorities on the SoCC. Although there was no statutory duty to do so, the Applicant also consulted the Tees Valley Combined Authority and the South Tees Development Consultation on the SoCC.

1.24 In preparing the SoCC, the Applicant has also taken into account bp's experience of pre-application consultation on the NZT development consent application.

2.0 APPROACH TO PRE-APPLICATION CONSULTATION

Consultation Objectives

2.1 The Applicant's objectives for the pre-application consultation on H2Teesside are:

- To ensure public understanding of the design and decision-making processes for the Project.
- To create a clear understanding of the Project, given the number of net zero projects in the area, and also provide engaging messaging to help avoid confusion with other projects.
- To reach silent and/or seldom heard audiences by using varied communications methods. The Applicant will seek to identify any groups or specific stakeholders with protected characteristics so that they can be included in the consultation.
- To explain the benefits of the Project, including in terms of job creation, protection of existing industry and decarbonisation.
- To provide stakeholders with the opportunity to submit comments and feedback while the proposals are still at a formative stage, and to provide them with different ways in which to do so.
- To provide a mechanism to review the comments and feedback received and show how these have been taken into account in finalising the proposals and the application for development consent.

Consultation Stages & Timescale

2.2 During the first half of 2023 the Applicant undertook early targeted engagement with potentially affected landowners and key technical consultees and other stakeholders on the Project. This early engagement has informed initial decisions with regard to the extent of the Project Site and the scope of the ongoing EIA work.

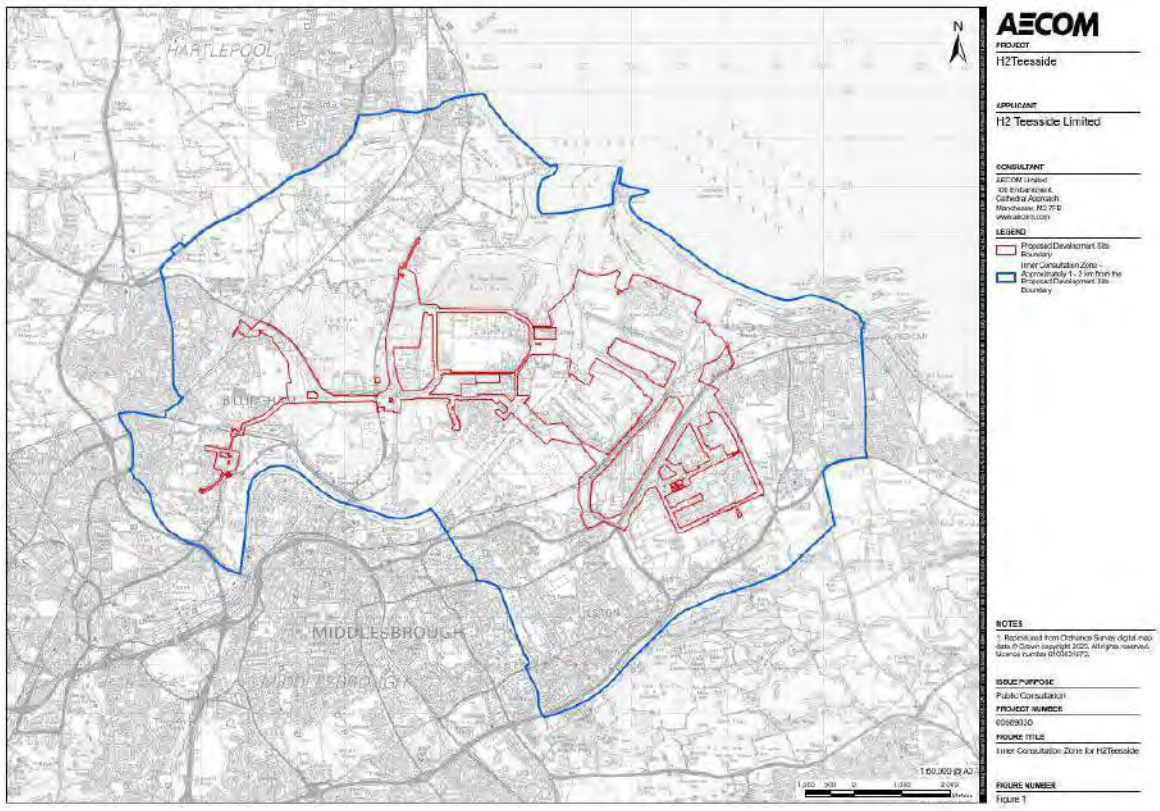
2.3 Taking account of the level and type of public engagement on recent projects on Teesside, notably NZT, the decision has been taken for the pre-application public consultation for the Project will take place as one main stage of statutory consultation in accordance with the relevant requirements of the PA 2008, notably Sections 42, 47 and 48. The statutory consultation will run for a period of six weeks.

Consultation Area

2.4 A 'Consultation Area' has been defined for the purposes of the Applicant's pre-application public consultation. The Consultation Area is divided into two zones; an Inner Consultation Zone ('ICZ') and an Outer Consultation Zone ('OCZ').

2.5 The ICZ is defined by the outer red line on **Figure 2.1**. The Project Site is indicated by the inner red line. The ICZ represents the area within which the Applicant considers there is the greatest potential for local communities to be most affected by/interested in the Project. The ICZ extends approximately 1 kilometre ('km') from the Project Site boundary. The Applicant has sought to ensure that the defined ICZ does not cut across communities and where appropriate, main roads and natural features have been used to define the edge of the ICZ. The ICZ includes over 37,000 residential and businesses and includes Redcar, Warrenby, Dormanstown, Lazenby, Grangetown, Eston, Normanby, South Bank, Billingham and Greatham.

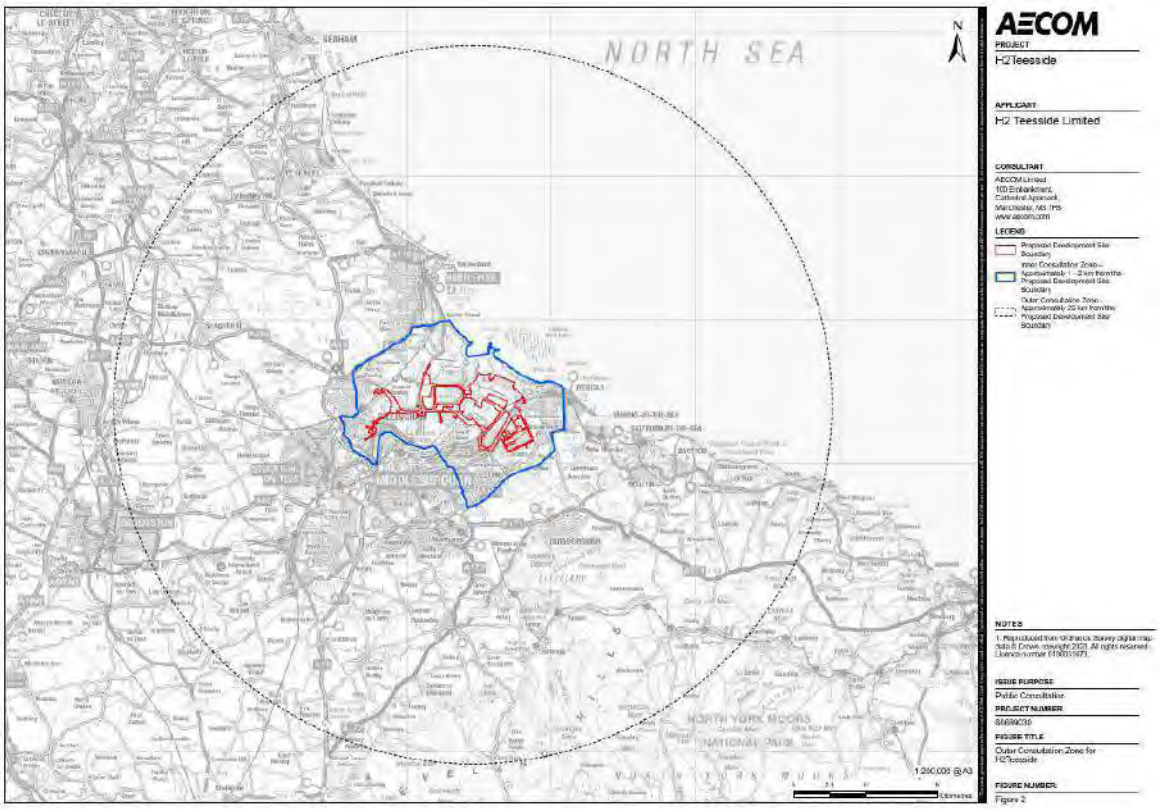
Figure 2.1 – Project Site and Inner Consultation Zone



2.6 The OCZ, has been defined with reference to the early EIA work and extends as a worst case to approximately 20km from the Project Site boundary (as defined for the purposes of the EIA) and contains all the land within the proposed development consent application site boundary for H2Teesside. It is considered to represent the maximum extent within which environmental effects could occur. The largest Study Area for the H2Teesside EIA is currently 15km from the Project Site boundary, for the identification of and assessment of impacts to Statutory Designated Ecological Sites (including for

purposes of Habitats Regulations Assessment (HRA) and also for the air quality assessment. The OCZ is shown on **Figure 2.2** below.

Figure 2.2 – Project Site and Outer Consultation Zone



What will we consult on?

2.7 The pre-application consultation will provide information on the following:

- What H2Teesside is and what it will do.
- The practical uses of hydrogen and its benefits.
- The role of carbon capture, usage and storage ('CCUS') in enabling H2Teesside.
- Decisions made on the design and layout of the Project and the options under consideration.
- The findings of the environmental assessment work undertaken at the time of the consultation, presented in the form of the PEIR.
- The proposals for avoiding, minimising and/or mitigating any likely environmental effects of the Project, to the extent defined and known at that stage.

- An update on the timeline for the Project and the key milestones, including the anticipated submission date for the development consent application.
- How comments and feedback can be provided and the deadline for the receipt of these.

3.0 CONSULTATION METHODS

3.1 The Applicant will employ a wide range of consultation methods to ensure that the local community and other key local stakeholder organisations and local political representatives are provided with the opportunity to engage with the Project and provide comments and feedback. The key consultation methods to be employed are outlined below.

Press/media releases

3.2 Press/media releases will be used to publicise the Project. A press release will be issued to the local and regional press at the start of the statutory consultation. Press releases will also provide information on how the local community can find out about the proposals and the ways in which people can provide comments and feedback.

3.3 The Applicant may also use other forms of media, such as social media, to further publicise the consultation, as considered appropriate.

Consultation leaflet and brochure

3.4 A consultation leaflet will be sent to all residents and businesses within the ICZ prior to the start of the statutory consultation. This will provide information on the Project, the ways in which information is being provided and presented, how further information and consultation materials can be requested, and how comments and feedback can be made as well as the deadline for the submission of these.

3.5 In addition to local residents and businesses, the leaflet will be sent to local political representatives, including local MPs, district councillors and parish and town councils.

3.6 A consultation brochure will also be made available during the statutory consultation within the virtual consultation room, at the public consultation events and also on the Project Website.

Newspaper notices/posters

3.7 The statutory consultation will be advertised by placing a notice in local newspapers circulating across the Consultation Area for two consecutive weeks. The local newspapers that will be used are the Northern Echo, Teesside Gazette and Darlington and Stockton Times. Posters will also be circulated to identified community groups and stakeholders across the Consultation Area, along with a request for them to be shared via their channels and displayed in public places. In accordance with Section 48 of the PA 2008, the notice will also be published in the Telegraph, London Gazette, Lloyds List and Fishing News for one week.

Site notices

3.8 The Applicant will erect site notices at appropriate intervals around the Project Site boundaries, including at intervals along the route corridors for the various connections. The site notices will notify the local community of the consultation and provide information on how to participate.

Webinars/video conferences

3.9 The Applicant will offer webinars or video conferences to the local community, community groups and representatives, and local political representatives, in order to provide another means by which people can learn about the Project, ask questions and provide comments and feedback.

Virtual consultation room

3.10 The Applicant will run an online virtual consultation room that simulates the typical approach used in public consultation events. As part of the virtual consultation room, information boards/banners will be displayed online providing information on the Project. Other consultation materials will also be made available, including the PEIR, its NTS and a Frequently Asked Questions ('FAQs') Document.

3.11 A Feedback Form will be made available via the virtual consultation room so that people can provide comments and feedback when accessing it.

Public consultation events

3.12 The Applicant will hold six physical public consultation events within the Consultation Area during September and October 2023. These will be held at suitable public venues at a variety of times, including during the day, evening and at least one event on a Saturday, to provide a range of opportunities for people to attend.

Inspection locations

3.13 Copies of the consultation materials, including the PEIR, its NTS, consultation leaflet and brochure and FAQs Document, will be accessible at locations within the Consultation Area (e.g. local authority offices and libraries) for inspection by the public. Details will be available on the newspaper and site notices and on the Project Website.

Project Website

3.14 A Project Website has been established and will be used to host all the consultation materials and to provide information on how people can provide comments and feedback and request a copy. People will also be able to complete the Feedback Form on the Website. The Website address is: www.h2teesside.co.uk

Freephone number

3.15 The Applicant will operate a Freephone number so people, including those without internet access, can contact the Project Team to leave questions about the Project, provide comments and feedback and also request hard copy consultation materials or a USB device containing the consultation materials. The Freephone service will operate 24 hours a day.

Feedback form

3.16 A Feedback Form will be made available during the consultation for people to use to submit comments and feedback. The Feedback Form will be available to complete via the virtual consultation room and also on the Project Website. Feedback Forms will also be available at the public consultation events. In addition, people will be able to request hard copies of the Feedback Form by email, post or telephone.

Freepost

3.17 The Applicant will provide a Freepost address (Freepost H2TEESSIDE) to allow people to submit comments and completed Feedback Forms by post.

4.0 RECORDING AND TAKING ACCOUNT OF CONSULTATION

Recording and analysis

4.1 All comments and feedback received to the statutory consultation (including completed Feedback Forms) will be recorded and entered into a response tracker. The comments and feedback received will then be carefully reviewed, analysed and grouped under specific topic or theme headings. Under each topic/theme heading the issues/matters requiring consideration will then be identified.

4.2 The Applicant will consider the issues/matters raised during the pre-application consultation on the Project. In having regard to the issues/matters raised the Applicant will also identify where these have resulted in any changes to the Project.

Reporting

4.3 The pre-application consultation undertaken on the Project, including the comments/feedback received to the statutory consultation and how the Applicant have had regard to them, will be documented within a Consultation Report, which will form part of the application for development consent.

4.4 Comments/feedback received to the consultation may be made public, however, no personal information will be published unless necessary. The Applicant will take reasonable care to comply with the requirements of the General Data Protection Regulation and the PINS Privacy Policy. A copy of the H2Teesside Privacy Notice can be viewed on the Project Website: http://h2teesside.co.uk/privacy

5.0 CONTACT DETAILS

5.1 You can find out more about H2Teesside by viewing the Project Website: www.h2teesside.co.uk or contacting the Project Team as follows:

- By email: info@h2teesside.net
- By post: Freepost H2TEESSIDE
- By Freephone: 0800 080 3028

APPENDIX 6.6: COMBINED SECTION 42, 47 AND 48 NOTICE, COPIES OF PUBLISHED NOTICES AND SCREENSHOT OF SOCC AND NOTICE ON PROJECT WEBSITE

THE H2TEESSIDE PROJECT

The Planning Act 2008 – Sections 42, 47 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

NOTICE OF PUBLICATION OF A STATEMENT OF COMMUNITY CONSULTATION AND NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), whose registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application (the 'Proposed Application') to the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').

2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.

3. In accordance with Section 47(6) of the PA 2008, this notice publicises where and when the Statement of Community Consultation (SoCC) can be inspected. The SoCC sets out how the Applicant will undertake its consultation on the Proposed Application. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

    - Mid-point – 454538 524086
    - North – 451524 526936
    - East – 458780 521588

- South – 456998 520748
- West – 446938 521612

5. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.

6. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:

   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. hydrogen storage;
   g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.

10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Documents

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.

12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.

13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.

14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.

15. The consultation on the proposed application will take place between **14 September and 26 October 2023**.

16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk

17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge.

Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	**Opening Times**
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**. Responses received after this date may not be considered.

22. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited

14 September 2023

September 2023 consultation documents

You can view and download the consultation documents produced for the September 2023 consultation here:

Statutory Consultation Brochure PDF / 1.1 MB

Statutory Consultation Leaflet PDF / 500 KB

Statement of Community Consultation PDF / 4.7 MB

Question and Answer Document PDF / 174.9 KB

Section 47 and 48 Notice PDF / 197.9 KB

Site Boundary and Development Areas Plans PDF / 2.7 MB

APPENDIX 7.1: CONSULTEE LISTS FOR THE FIRST AND SECOND CONSULTATIONS

First Consultation – Consultee List

Section 42(a)(aa)

No.	Consultee	Address	Sent via
1.	NSIP Consultations	Health and Safety Executive Building 2.2, Redgrave Court Merton Road Bootle Merseyside L20 7HS	Post and Email
2.	NSIP Consultations - BP6301	Health and Safety Executive Alnwick House Benton Park View Newcastle upon Tyne NE98 1YX	Post
3.	Health and Safety Executive	Redgrave Court Merton Road Bootle Merseyside L20 7HS	Email
4.	NHS England	PO Box 16738 Redditch B97 9PT	Post and Email
5.	NHS Hartlepool and Stockton-on-Tees Clinical Commissioning Group	First Floor 14 Trinity Mews North Ormesby Middlesbrough TS3 6AL	Post and Email
6.	NHS Durham Dales, Easington and Sedgefield CCG	Sedgefield Community Hospital Salters Lane Sedgefield TS21 3EE	Post and Email
7.	NHS South Tees Clinical Commissioning Group	North Ormesby Health Village First Floor 14 Trinity Mews North Ormesby Middlesbrough TS3 6AL	Post and Email
8.	NHS North East and North Cumbria Integrated Care Board	North Cumbria at 'Place' Parkhouse Building, Baron Way Kingmoor Park Carlisle, Cumbria CA6 4SJ	Email
9.	Natural England	Foss House Kings Pool 1-2 Peasholme Green York YO1 7PX	Post and Email

No.	Consultee	Address	Sent via
10.	Natural England	Natural England consultation service Hornbeam House Electra Way Crewe Business Park Crewe, Cheshire CW1 6GJ	Post and Email
11.	Natural England	Northumbria Area Team Lancaster House Hampshire Court Newcastle upon Tyne NE4 7YH	Post and Email
12.	Natural England	Email only	Email
13.	Historic England	The Engine House Fire Fly Avenue Swindon Wiltshire SN2 2EH	Post and Email
14.	Historic England	Bessie Surtees House 41-44 Sandhill Newcastle-Upon-Tyne NE1 3JF	Post and Email
15.	Cleveland Fire Brigade	Training & Administration Hub Endeavour House Queens Meadow Business Park Hartlepool TS25 5TH	Post and Email
16.	Cleveland Police	Ash House III Acres Princeton Drive Thornaby Stockton-On-Tees TS17 6AJ	Post and Email
17.	Police and Crime Commissioner Office	Shared Services c/o St Marks House St Marks Court Thornaby Stockton-on-Tees TS17 6QW	Post and Email
18.	Tees and Hartlepool Harbour Police	Teesport Grangetown Middlesborough TS6 6UD	Post and Email
19.	Billingham Town Council	Billingham Library & Customer Service Centre Billingham TS23 2LN	Post and Email
20.	Greatham Parish Council	15 Blackton Road Elwick Rise Hartlepool	Post and Email

No.	Consultee	Address	Sent via
		TS26 0QG	
21.	The Environment Agency	PO Box 544 Rotherham S60 1BY	Post and Email
22.	The Environment Agency	Tyneside House Skinnerburn Road Newcastle Business Park Newcastle-Upon-Tyne NE4 7AR	Post and Email
23.	The Equality and Human Rights Commission	Arndale House The Arndale Centre Manchester M4 3AQ	Post
24.	The Equality and Human Rights Commission	Third floor Windsor House 50 Victoria Street London SW1H 0TL	Post
25.	North Pennies AONB Partnership	1 Martin Street Stanhope Bishop Auckland County Durham CL13 2UY	Post and Email
26.	Nidderdale AONB	The Old Workhouse King Street Pateley Bridge Harrogate HG3 5LE	Post and Email
27.	Howardian Hills AONB	The Old Vicarage Bondgate Helmsley York YO62 5BP	Post and Email
28.	Homes England	One Friargate Coventry CV1 2GN	Post and Email
29.	Joint Nature Conservation Committee	Quay House 2 East Station Road Fletton Quays Peterborough PE2 8YY	Post and Email
30.	Maritime and Coastguard Agency	Spring Place 105 Commercial Road Southampton SO15 1EG	Post and Email
31.	Maritime and Coastguard Agency (Hull Marine Office)	Crosskill House Mill Lane Beverley East Yorkshire	Post and Email

No.	Consultee	Address	Sent via
		HU17 9JB	
32.	Marine Management Organisation	Lancaster House Hampshire Court Newcastle upon Tyne NE4 7YH	Post and Email
33.	Marine Management Organisation	First Floor Crosskill House Mill Lane Beverley HU17 9JB	Post and Email
34.	Civil Aviation Authority	Aviation House Beehive Ring Road Crawley West Sussex RH6 0YR	Post and Email
35.	National Highways Company Ltd	Bridge House 1 Walnut Tree Close Guildford GU1 4LZ	Post and Email
36.	Tees Valley Combined Authority	Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post and Email
37.	Stockton-on-Tees Borough Council	Highways Authority Municipal Buildings Church Road Stockton-On-Tees TS18 1LD	Post and Email
38.	Redcar and Cleveland Borough Council	Highways Authority Redcar and Cleveland House Kirkleatham Street Redcar Yorkshire TS10 1RT	Post and Email
39.	Hartlepool Borough Council	Highways Authority Level 1 Civic Centre Hartlepool TS24 8AY	Post
40.	Transport Focus	Albany House 94-98 Petty France London SW1H 9EA	Post
41.	DPTAC	The Disabled Persons Transport Advisory Committee DPTAC 2 Great Minster House Horseferry Road London SW1P 4DR	Post and Email

No.	Consultee	Address	Sent via
42.	Coal Authority	200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG	Post and Email
43.	Office of Rail and Road	Head Office One Kemble Street London WC2B 4AN	Post and Email
44.	OFGEM	10 South Colonnade Canary Wharf London E14 4PU	Post
45.	OFWAT	Centre City Tower 7 Hill Street Birmingham B5 4UA	Post
46.	Environment Agency	PO Box 544 Rotherham S60 1BY	Post and Email
47.	Canal & River Trust	National Waterways Museum Ellesmere Port South Pier Road Ellesmere Port Cheshire CH65 4FW	Post and Email
48.	Canal & River Trust	1st Floor 21 The Calls Leeds LS2 7EH	Post and Email
49.	Trinity House	Tower Hill London EC3N 4DH	Post and Email
50.	UK Health Security Agency	Wellington House 133-155 Waterloo Road London SE1 8UG	Post and Email
51.	Cleveland Local Resilience Forum	Cleveland Emergency Planning Unit St Marks House St Marks Court Thornaby Stockton on Tees TS17 6QW	Post and Email
52.	Crown Estate	1 St James's Market London SW1 4AH	Post and Email
53.	The Forestry Commission	620 Bristol Business Park Coldharbour Lane Bristol BS16 1EJ	Post and Email

No.	Consultee	Address	Sent via
54.	The Forestry Commission	Foss House Kings Pool 1-2 Peasholme Green York YO1 7PX	Post and Email
55.	The Secretary of State for Defence	Whitehall London SW1A 2HB	Post
56.	Office for Nuclear Regulation	Building 4 Redgrave Court Merton Road Bootle L20 7HS	Post and Email
57.	Active Travel England	Email only	Email
58.	Network Rail Infrastructure Limited	Waterloo General Office London SE1 8SW	Post
59.	Network Rail (High Speed) Limited	Waterloo General Office London SE1 8SW	Post
60.	National Highways (Historical Railways Estate)	37 Tanner Row York YO1 6WP	Post and Email
61.	Historical Railways Estate (c/o National Highways)	National Traffic Operations Centre 3 Ridgeway, Quinton Business Park, Birmingham B32 1AF	Post
62.	London and Continental Railways	20 Cranbourn Street, London WC2H 7AA	Post and Email
63.	Network Rail Limited	Waterloo General Office London SE1 8SW	Post
64.	Network Rail	George Stephenson House Toft Green York YO1 6JT	Post and Email
65.	Rail Safety and Standards Board	The Helicon 1 South Place London EC2M 2RB	Post
66.	The Department for Transport	Great Minster House 33 Horseferry Road London SW1P 4DR	Post and Email
67.	P&O Teesport	201 Tees Dock Rd, Middlesbrough TS6 7RT	Post and Email

No.	Consultee	Address	Sent via
68.	P&O North Sea Ferries Limited	Channel House Channel View Road Dover Kent CT17 9TJ	Post and Email
69.	PD Teesport	Statutory Harbour Authority Teesport Grangetown Middlesborough TS6 6UD	Post and Email
70.	PD Ports Ltd	Statutory Harbour Authority Chief Executive 17-27 Queen's Square Middlesborough TS2 1AH	Post
71.	NATS Limited	4000 Parkway Whiteley Farnham Hampshire PO15 7FL	Post and Email
72.	Royal Mail Group Limited	185 Farringdon Road London EC1A 1AA	Post and Email
73.	The Ministry of Defence	Whitehall London SW1A 2HB	Post and Email
74.	The Ministry of Defence Safeguarding Department	Statutory & Offshore Defence Infrastructure Organisation Kingston Road Sutton Coldfield West Midlands B75 7RL	Post and Email
75.	North East Ambulance Service NHS Foundation Trust	Bernicia House Goldcrest Way Newburn Riverside Newcastle-Upon-Tyne NE15 8NY	Post
76.	Northumbrian Water Limited	Northumbria House Abbey Road Pity Me Durham DH1 5FJ	Post and Email
77.	Northumbrian Water Limited	Leat House Pattinson Road Washington Tyne and Wear NE38 8LB	Post and Email
78.	Cadent Gas Limited	Pilot Way Ansty Coventry	Post and Email

No.	Consultee	Address	Sent via
		CV7 9JU	
79.	Last Mile Gas Limited	Fenick House Lister Way Hamilton International Technology Park Glasgow Scotland G72 0FT	Post and Email
80.	Energy Assets Pipelines Limited	Ship Canal House 98 King Street Manchester M2 4WU	Post and Email
81.	ES Pipelines Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
82.	ESP Connections Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
83.	ESP Networks Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
84.	ESP Pipelines Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
85.	ESP Utilities Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
86.	Fulcrum Pipelines Limited	2 Europa View Sheffield Business Park Sheffield S91 1XH	Post and Email
87.	Harlaxton Gas Networks Limited	Toll Bar Road Marston Grantham Lincs NG32 2HT	Post and Email
88.	GTC Pipelines Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post and Email

No.	Consultee	Address	Sent via
89.	Independent Pipelines Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
90.	Indigo Pipelines Limited	15 Diddenham Court Lambwood Hill Grazeley Reading RG7 1JQ	Post and Email
91.	Indigo Power Limited	15 Diddenham Court Lambwood Hill Grazeley Reading RG7 1JQ	Post and Email
92.	Murphy Gas Networks Limited	Hiview House Highgate Road London NW5 1TN	Post and Email
93.	Quadrant Pipelines Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
94.	National Grid Gas Plc	1-3 Strand London WC2N 5EH	Post and Email
95.	National Grid Gas Plc & National Grid Gas PLC	Network Management 1-3 Strand London WC2N 5EH	Post and Email
96.	Scotland Gas Networks Plc	Axis House 5 Londhead Drive Newbridge Edinburgh Scotland EH28 8TG	Post and Email
97.	Southern Gas Networks Plc	St Lawrence House Station Approach Horley Surrey RH6 9HJ	Post and Email
98.	Northern Gas Networks Limited	1100 Century Way Thorpe Park Business Park Colton Leeds LS15 8TU	Post and Email
99.	EDF Energy Renewables Limited	Alexander House 1 Mandarin Road Rainton Bridge Business Park	Post and Email

No.	Consultee	Address	Sent via
		Houghton Le Spring Sunderland DH4 5RA	
100.	MGT Teesside Limited	8 White Oak Square London Road Swanley BR8 7AG	Post and Email
101.	Last Mile Electricity Limited	Fenick House Lister Way Hamilton International Technology Park Glasgow Scotland G72 0FT	Post and Email
102.	Energy Assets Networks Limited	Ship Canal House 98 King Street Manchester M2 4WU	Post and Email
103.	Energy Assets Fibre Networks Limited	Ship Canal House 98 King Street Manchester M2 4WU	Post and Email
104.	ESP Electricity Limited	1st Floor Bluebird House Mole Business Park Leatherhead Surrey KT22 7BA	Post and Email
105.	Fulcrum Electricity Assets Limited	2 Europa View Sheffield Business Park Sheffield S9 1XH	Post and Email
106.	Harlaxton Energy Networks Limited	Toll Bar Road Marston Grantham Lincs NG32 2HT	Post
107.	Independent Power Networks Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
108.	Leep Electricity Networks Limited	Level 2, Metro 33 Trafford Road Manchester M5 3NN	Post
109.	MUA ELECTRICITY LIMITED	Highview House Highgate Road London NW5 1TN	Post and Email
110.	The Electricity Network Company Limited	Synergy House Windmill Avenue Woolpit	Post

No.	Consultee	Address	Sent via
		Bury St Edmunds IP30 9UP	
111.	UK Power Distribution Limited	6500 Daresbury Park Daresbury Warrington WA4 4GE	Post and Email
112.	Utility Assets Limited	7 Laxton Close Attleborough NR17 1QY	Post and Email
113.	Vattenfall Networks Limited	5th Floor 70 St Mary Axe London EC3A 8BE	Post
114.	Northern Powergrid (Northeast) PLC	Lloyds Court 78 Grey Street Newcastle-Upon-Tyne NE1 6AF	Post
115.	National Grid Electricity Transmission Plc	1-3 Strand London WC2N 5EH	Post
116.	BOC Limited (A Member of the Linde Group)	Forge 43 Church Street West Woking Surrey GU21 6HT	Post and Email
117.	BP Midstream Pipelines	1 St James's Square London SW1Y 4PD	Post
118.	British Gas Pipelines Limited	Millstream Maidenhead Road Windsor Berkshire SL4 5GD	Post
119.	British Pipeline Agency Limited	5-7 Alexandra Road Hemel Hempstead Hertfordshire HP2 5BS	Post
120.	British Telecommunications Public Limited Company	1 Braham Street London E1 8EE	Post
121.	C.A. Telecom UK Limited	Unit 2 C a Business Park Colewood Road Whitstable Kent CT5 2RP	Post and Email
122.	Centrica Energy Limited	Millstream Maidenhead Road Windsor Berkshire SL4 5GD	Post and Email

No.	Consultee	Address	Sent via
123.	C.Gen Killingholme Limited	130 Shaftesbury Avenue 2nd floor London W1D 5EU	Post and Email
124.	Centrica Storage Limited	Woodland House Woodland Park Hessle HU13 0FA	Post and Email
125.	Channel Cable Limited	Kings Parade Lower Coombe Street Croydon CR0 1AA	Post and Email
126.	CityFibre Holdings Limited	15 Bedford Street London WC2E 9HE	Post and Email
127.	Phillips 66 Limited	7th Floor 200-202 Aldersgate Street London EC1A 4HD	Post
128.	Coryton Energy Company Limited	Coryton Power Station Stanford-Le-Hope The Mannorway SS17 9GN	Post
129.	Interoute Managed Services UK Limited	Third Floor New Castle House Castle Boulevard Nottingham NG7 1FT	Post
130.	Eclipse Power Networks Limited	25 Osier Way Olney MK46 5FP	Post and Email
131.	EirGrid Interconnector Designated Activity Company	The Oval 160 Shelbourne Road Ballsbridge Dublin 4	Post
132.	Electricity North West Limited	Electricity North West Borron Street Stockport SK1 2JD	Post
133.	Envoy Asset Management Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
134.	E-ON UK Plc	Westwood Way Westwood Business Park Coventry CV4 8LG	Post
135.	Esso Petroleum Company Limited	Ermyn House Ermyn Way Leaterhead	Post

No.	Consultee	Address	Sent via
		Surrey KT22 8UX	
136.	FibreSpeed Limited	100 New Bridge Street London EC4V 6JA	Post and Email
137.	Gamma Telecom	The Scalpel, 18th Floor 52 Lime Street London EC3M 7AF	Post and Email
138.	Geo Networks Limited	100 New Bridge Street London EC4V 6JA	Post
139.	EXOLUM PIPELINE SYSTEM LTD	1st Floor 55 King William Street London EC4R 9AD	Post and Email
140.	iGas Energy PLC	Welton Gathering Centre Barfield Lane Off Wragby Road Sudbrooke Lincoln LN2 2QX	Post and Email
141.	Inovyn Enterprises Limited	Bankes Lane Office Bankes Lane PO Box 9 Runcorn Cheshire WA7 4JE	Post
142.	Petroineos Manufacturing Scotland Limited	Bo'Ness Road Grangemouth Stirlingshire FK3 9XH	Post and Email
143.	Instalcom Limited	164 Field End Road Eastcote HA5 1RH	Post and Email
144.	Interoute Communications Limited	5th Floor 40 Strand London WC2N 5RW	Post
145.	KCOM Group Limited	37 Carr Lane Hull HU1 3RE	Post
146.	Kier Integrated Services Limited	2nd Floor, Optimum House Clippers Quay Salford M50 3XP	Post
147.	Lark Energy Limited	Larkfleet House Falcon Way Southfields Business Park Bourne PE10 0FF	Post

No.	Consultee	Address	Sent via
148.	Leep Gas Networks Limited	Level 2, Metro 33 Trafford Road Manchester M5 3NN	Post
149.	LNG Portable Pipeline Services Limited	Athena House Athena Drive Tachbrook Park Warwick CV34 6RL	Post
150.	London Power Networks PLC	Newington House 237 Southwark Bridge Road London SE1 6NP	Post
151.	Mainline Pipelines Limited	27th Floor, 1 Canada Square Canary Wharf London E14 3AA	Post
152.	Manchester Jetline Limited	150 Holborn Holborn London EC1N 2NS	Post
153.	Marchwood Power Limited	Oceanic Way Marchwood Industrial Park Marchwood Southampton SO40 4BD	Post
154.	McNicholas Limited	The Wheelhouse The Green Wolviston Billingham TS22 5LN	Post
155.	National Grid Plc	1-3 Strand London WC2N 5EH	Post
156.	Northern Powergrid (Yorkshire) plc	Lloyds Court 78 Grey Street Newcastle-Upon-Tyne NE1 6AF	Post
157.	Perenco UK Limited (Purbeck Southampton Pipeline)	8 Hanover Square London W1S 1HQ	Post
158.	Premier Transmission Limited	First Floor The Arena Building 85 Ormeau Road Belfast BT7 1SH	Post
159.	RWE Generation UK PLC	Windmill Hill Business Park Whitehall Way Swindon Wiltshire	Post

No.	Consultee	Address	Sent via
		SN5 6PB	
160.	VPI Power Ltd	Building 19 Haymarket Square Edinburgh EH3 8RY	Post
161.	Sea Fibre Networks	51-54 Pearse Street Dublin 2	Post
162.	Seabank Power Limited	Severn Road Hallen Bristol BS10 7SP	Post
163.	Severn Gas Transportation Limited	Severn Power Station West Nash Road Nash Newport Gwent NP18 2BZ	Post
164.	South Eastern Power Networks Plc	Newington House 237 Southwark Bridge Road London SE1 6NP	Post
165.	Shell Pipelines	Shell Centre London SE1 7NA	Post
166.	SP Distribution PLC	320 St. Vincent Street Glasgow Scotland G2 5AD	Post
167.	SP Manweb PLC	3 Prenton Way Prenton CH43 3ET	Post
168.	Spiecapag UK Limited	Cheney & Co 310 Wellingborough Road Northampton NN1 4EP	Post
169.	SSE Pipelines Ltd (Indigo Pipelines Limited)	15 Diddenham Court Lambwood Hill Grazeley Reading RG7 1JQ	Post and Email
170.	SSE plc	Inveralmond House 200 Dunkeld Road Perth Perthshire PH1 3AQ	Post
171.	Squire Energy Limited	Sentinel House 10-12 Massetts Road Horley RH6 7DE	Post and Email

No.	Consultee	Address	Sent via
172.	Telent on behalf of Teliasonera	Point 3 Haywood Road Warwick CV34 5AH	Post
173.	GTC Infrastructure Limited	Martello Court Admiral Park St Peter Port Guernsey GY1 3HB	Post and Email
174.	Totalenergies Gas and Power Limited	Bridge Gate 55 - 57 High St Redhill Surrey RH1 1RX	Post
175.	TrafficMaster Traffic Serivces Limited	Trafficmaster Traffic Services K1 First Floor Kents Hill Business Park Milton Keynes Buckinghamshire MK7 6BZ	Post
176.	Transmission Capital Services Limited	3 More London Riverside London SE1 2AQ	Post and Email
177.	UK Power Networks (Operations) Limited	Newington House 237 Southwark Bridge Road London SE1 6NP	Post
178.	Uniper UK Limited	Compton House 2300 The Crescent Birmingham Business Park Birmingham B37 7YE	Post
179.	Utility Grid Installations Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
180.	Verizon UK Limited	Reading International Business Park Basingstoke Road Reading Berkshire RG2 6DA	Post
181.	Virgin Media Limited	500 Brook Drive Reading RG2 6UU	Post
182.	Vodafone Limited	Vodafone House The Connection Newbury Berkshire RG14 2FN	Post
183.	Interoute Vtesse Limited	25 Canada Square Canary Wharf	Post

No.	Consultee	Address	Sent via
		London E14 5LQ	
184.	Wales & West Utilities Limited	Wales & West House Spooner Close Coedkernew Newport South Wales NP10 8FZ	Post and Email
185.	NATIONAL GRID ELECTRICITY DISTRIBUTION (SOUTH WALES) PLC	Avonbank Feeder Road Bristol BS2 0TB	Post
186.	Saltfleetby Energy Limited	Building 3 Chiswick Park 566 Chiswick High Street London W4 5YA	Post
187.	ESSAR Limited	6 Lime Tree Court Straight Road Windsor SL4 2SS	Post
188.	Npower CHP Pipelines	C/O Npower Limited Westwood Way Westwood Business Park Coventry CV4 8LG	Post
189.	NHS Digital	7 & 8 Wellington Place Leeds LS1 4AP	Post and Email
190.	Health Education England	NHS England PO Box 16738 Redditch B97 9PT	Post and Email
191.	Health Research Authority	2 Redman Place Stratford London E20 1JQ	Post and Email
192.	National Institute for Health and Clinical Excellence (NICE)	2nd Floor 2 Redman Place London E20 1JQ	Post and Email
193.	NHS Blood and Transplant	500 North Bristol Park Filton Bristol BS34 7QH	Post
194.	NHS Business Services Authority	Stella House Goldcrest Way Newburn Riverside Newcastle-Upon-Tyne NE15 8NY	Post

No.	Consultee	Address	Sent via
195.	NHS Resolution	8th Floor 10 South Colonnade Canary Wharf London E14 4PU	Post and Email
196.	Leeds Community Healthcare NHS Trust	First Floor Stockdale House Headingley Office Park Victoria Road Leeds LS6 1PF	Post
197.	County Durham and Darlington NHS Foundation Trust	Darlington Memorial Hospital Hollyhurst Road Darlington County Durham DL3 6HX	Post and Email
198.	Tees, Esk and Wear Valleys NHS Foundation Trust	West Park Hospital Edward Pease Way Darlington DL2 2TS	Post
199.	North Tees and Hartlepool NHS Foundation Trust	University Hospital of North Tees Hardwick Stockton-On-Tees TS19 8PE	Post
200.	South Tees Hospitals NHS Foundation Trust	The James Cook University Hospital Marton Road Middlesbrough TS4 3BW	Post and Email
201.	Royal National Orthopaedic Hospital NHS Trust	Brockley Hill Stanmore Middlesex HA7 4LP	Post and Email
202.	Royal National Hospital for Rheumatic Diseases NSH Foundation Trust	Royal United Hospitals Bath NHS Foundation Trust Combe Park Bath BA1 3NG	Post and Email
203.	Cumbria, Northumberland, Tyne and Wear NHS Foundation Trust	St. Nicholas Hospital Jubilee Road Gosforth Newcastle-Upon-Tyne NE3 3XT	Post
204.	Anglian Water (Hartlepool Water)	Northumbria House Abbey Road Pity Me Durham DH1 5FJ	Post
205.	AWE plc	Room 20 Building F161. 2 Atomic Weapons Establishment Aldermaston	Post

No.	Consultee	Address	Sent via
		Reading RG7 4PR	
206.	East West Cable One Limited	8 The Beeches Straffan Co. Kildare Republic of Ireland Republic of Ireland	Post
207.	Sofia Offshore Wind Farm Ltd	Windmill Hill Business Park Whitehill Way Swindon Wiltshire SN5 6PB	Post
208.	SSE Renewables Wind Farms (UK) Limited	Inveralmond House 200 Dunkeld Road Perth Scotland PH1 3AQ	Post
209.	Mua Electricity Limited	Hiview House Highgate Road London NW5 1TN	Post
210.	Optimal Power Networks Limited	No.1 Forbury Place 43 Forbury Road Reading RG1 3JH	Post and Email
211.	National Grid Electricity System Operator Ltd	1-3 Strand London WC2N 5EH	Post
212.	Colas Rail	25 Victoria Street London SW1H 0EX	Post
213.	DCRail	26 Leigh Road Eastleigh England SO50 9DT	Post
214.	Direct Rail Services	Herdus House Ingwell Drive Westlakes Science & Technology Park Moor Row Cumbria CA24 3HU	Post and Email
215.	DB Cargo UK	Lakeside Business Park Carolina Way Doncaster South Yorkshire DN4 5PN	Post
216.	Freightliner	6th Floor The Lewis Building 35 Bull Street Birmingham United Kingdom B4 6EQ	Post

No.	Consultee	Address	Sent via
217.	GB Railfreight	55 Old Broad Street London EC2M 1RX	Post
218.	Mendip Rail	Bardon Hall Copt Oak Road Markfield Leicestershire LE67 9PJ	Post

Section 42(b)

No.	Consultee	Authority	Address	Sent via
1.	Stockton-on-Tees Borough Council	b	Municipal Buildings Church Road Stockton-on-Tees TS18 1LD	Post and Email
2.	Stockton-on-Tees Borough Council	b	Municipal Buildings Church Road Stockton-on-Tees TS18 1LD	Post
3.	Redcar and Cleveland Borough Council	b	Redcar and Cleveland House Kirkleatham Street Redcar TS10 1RT	Post and Email
4.	Redcar and Cleveland Borough Council	b	Redcar and Cleveland House Kirkleatham Street Redcar TS10 1RT	Post
5.	Hartlepool Borough Council	b	Level 1 Civic Centre Hartlepool TS24 8AY	Post and Email
6.	Hartlepool Borough Council	b	Level 1 Civic Centre Hartlepool TS24 8AY	
7.	Middlesbrough Council	a	PO Box 500 Middlesbrough TS1 9FT	Post
8.	Middlesbrough Council	a	Development Control Service Ground Floor Civic Centre PO Box 504 Middlesbrough TS1 9FY	Post and Email
9.	Hambleton District Council	a	Civic Centre Stone Cross Rotary Way Northallerton North Yorkshire DL6 2UU	Post and Email

No.	Consultee	Authority	Address	Sent via
10.	Hambleton District Council	a	Civic Centre Stone Cross Rotary Way Northallerton North Yorkshire DL6 2UU	Post and Email
11.	Scarborough Borough Council	a	Town Hall St Nicholas Street Scarborough YO11 2HG	Post
12.	Scarborough Borough Council	a	Planning Services Town Hall St Nicholas Street Scarborough YO11 2HG	Post and Email
13.	North York Moors National Park	d	The Old Vicarage Bondgate Helmsley York North Yorkshire YO62 5BP	Post and Email
14.	North York Moors National Park	d	The Old Vicarage Bondgate Helmsley York North Yorkshire YO62 5BP	Post and Email
15.	North Yorkshire County Council	a	County Hall Northallerton North Yorkshire DL7 8AD	Post
16.	North Yorkshire County Council	a	County Hall Northallerton North Yorkshire DL7 8AD	Post and Email
17.	Durham County Council	a	County Hall Durham County Durham DH1 5UQ	Post
18.	Durham County Council	a	County Hall Durham County Durham DH1 5UQ	Post and Email
19.	Darlington Borough Council	a	Town Hall Feethams Darlington County Durham DL1 5QT	Post and Email

No.	Consultee	Authority	Address	Sent via
20.	Darlington Borough Council	a	Economic Growth and Neighbourhood Services Room 401 Town Hall Darlington DL1 5QT	Post and Email

Section 42(d)

No.	Consultee	Address	Sent via
1.	Aggregate Industries Limited	Bardon Hall Copt Oak Road Markfield LE63 9PJ	Post
2.	Air Products (BR) Limited	Hersham Place Technology Park Molesey Road Walton on Thames KT12 4RZ	Post
3.	Air Products PLC	Hersham Place Technology Park Molesey Road Walton on Thames KT12 4RZ	Post
4.	Air Products Renewable Energy Limited	Hersham Place Technology Park Molesey Road Walton on Thames KT12 4RZ	Post
5.	Alan Reginald Bell	The Granary Yearby Road Yearby Redcar TS11 8HQ	Post
6.	Alcentra Limited	160 Queen Victoria Street London EC4V 4LA	Post
7.	Aldermore Bank plc	Apex Plaza Forbury Road Reading RG1 1AX	Post
8.	Allan Wilson Jenkinson	Clifton Moor Clifton Penrith CA10 2EY	Post
9.	Alpek Polyester UK Limited	Davies Offices Wilton International Redcar TS10 4XZ	Post
10.	Altrad Support Services Limited	Cargo Fleet Offices South Bank Middlesbrough TS6 6XJ	Post

11.	Amoco (U.K.) Exploration Limited	1-4 Wellshead Avenue Dyce Aberdeen AB21 7PB	Post
12.	Anglian Water Services Limited	Lancaster House Lancaster Way Ermine Business Park Huntington PE29 6XU	Post
13.	Anglo American Crop Nutrients Limited	Crop Nutrients Resolution House Lake View Scarborough YO11 3ZB	Post
14.	Anglo American Woodsmith (Teesside) Limited	Crop Nutrients Resolution House Lake View Scarborough YO11 3ZB	Post
15.	Anglo American Woodsmith Limited	Crop Nutrients Resolution House Lake View Scarborough YO11 3ZB	Post
16.	Anthony David Dryden	7 Sandmartin Lane Stockton-on-Tees TS20 1LP	Post
17.	Anthony Robinson	16 Caithness Road Middlesbrough TS6 0AW	Post
18.	Arrowcruit Holdings Limited	White House Farm Sandy Lane West Billingham TS22 5NB	Post
19.	Astrazeneca UK Limited	1 Francis Crick Cambridge Biomedical Campus Cambridge CB2 0AA	Post
20.	Azelis UK Limited	Axis House Tudor Road Manor Park Runcorn WA7 1BD	Post
21.	Bann 12 Limited	32 Garvaghy Road Banbridge BT32 3SZ	Post
22.	Barbara Selina Sharpe	Blackburn House Knayton Thirsk YO7 4AU	Post

23.	Barbican Real Estate Limited C/O Sigma Plantfinder Limited	Middlesbrough Road Middlesbrough TS6 6LZ	Post
24.	Barclays Bank plc	1 Churchill Place London E14 5HP	Post
25.	Barclays Security Trustee Limited	1 Churchill Place London E14 5HP	Post
26.	Barry Cackett	41 Lancaster Road Birkdale Southport PR8 2LA	Post
27.	BASF PLC BASF	4th & 5th Floors 2 Stockport Exchange Railway Road Stockport SK1 3GG	Post
28.	Beyond Housing Limited	14 Ennis Square Dormanstown Redcar TS10 5JR	Post
29.	Biffa Polymers Limited	Coronation Road Cressex High Wycombe HP12 3TZ	Post
30.	Biffa Waste Services Limited	Coronation Road Cressex High Wycombe HP12 3TZ	Post
31.	BOC Limited	Forge 43 Church Street West Woking GU21 6HT	Post
32.	BP Chemicals Limited	Chertsey Road Sunbury On Thames TW16 7BP	Post
33.	BP Exploration Operating Company Limited	Chertsey Road Sunbury On Thames TW16 7LN	Post
34.	BP International Limited	Chertsey Road Sunbury On Thames TW16 7BP	Post
35.	British Steel Limited	Administration Building Brigg Road Scunthorpe DN16 1BP	Post
36.	Cats North Sea Limited	Suite 1 7th Floor 50 Broadway	Post

		London SW1H 0BL	
37.	CF Fertilisers UK Limited	Head office Building Ince Chester CH2 4LB	Post
38.	Chapel Trustees Limited	1 New Walk Place Leicester LE1 6RU	Post
39.	Chemoxy International Limited	All Saints Refindery Cargo Fleet Road Middlesbrough TS3 6AF	Post
40.	Church Commissioners For England	Church House Great Smith Street London SW1P 3AZ	Post
41.	Citadel UTB Limited	222 Quadrangle Tower Cambridge Square London W2 2PJ	Post
42.	Clare Elizabeth Dryden	7 Sandmartin Lane Stockton-on-Tees TS20 1LP	Post
43.	COBCO 727 Limited C/O International Processplants Europe Limited Postal Pages	The Grange Business Centre Belasis Avenue Billingham TS23 1LG	Post
44.	Compass Services (UK) Limited	Parklands Court 24 Parklands Birmingham Great Park Rubery Birmingham B45 9PZ	Post
45.	ConocoPhillips (U.K.) Operator Limited	20th Floor 1 Angel Court London EC2R 7HJ	Post
46.	Cornerstone Telecommunications Infrastructure Limited	Hive 2 1530 Arlington Business Park Theale Reading RG7 4SA	Post
47.	CTW Northern Limited	Spitfire House 19 Falton Court Preston Farm Industrial Estate Stockton On Tees TS18 3TU	Post
48.	Darren Knight	Ultimate Body Shop Lee Road Middlesbrough	Post

		TS6 7AR	
49.	David Farnaby	106 Havilland Road Stockton-on-Tees TS17 9JG	Post
50.	David Horn	Ivy Court Cowpen Bewley Billingham TS23 4HR	Post
51.	David Mahon Properties Limited	1 Drumwhinney Road Kesh BT93 1SD	Post
52.	Dawn Barry	Manor House Farm Cowpen Bewley Billingham Stockton On Tees TS23 4HS	Post
53.	DCS Industrial Limited	Venture House Aykley Heads Durham DH1 5TS	Post
54.	Delphine Phylis Lynetta Gale	Hollins House Grosmont Whitby YO22 5PU	Post
55.	Den Hartogh Dry Bulk Logistics Limited	4 Beacon Way Hull HU3 4AE	Post
56.	Diane Linda Sayers	The Staple Manor House Farm Cowpen Bewley Billingham TS23 4HS	Post
57.	Donald Ward Limited	Rawdon Works Moira Road Woodville Swadlincote DE11 8DG	Post
58.	Dorman Long UK Limited	29-30 Fitzroy Square London W1T 6LQ	Post
59.	Dow Chemical Company Limited	5 Oakwater Avenue Cheadle Royal Business Park Cheadle SK8 3SR	Post
60.	Dwfco 9 Limited	Suite 101 Highfield House Cheadle Royal Business Park Cheadele SK8 3GY	Post
61.	Egdon Resources UK Limited	Blackstable House Longridge	Post

		Sheepscombe Stroud GL6 7QX	
62.	Ensus UK Limited	Enus Admind Building Middleway Wilton Redcar TS10 4RG	Post
63.	Environment Agency	Horizon House Deanery Road Bristol BS1 5AH	Post
64.	Exolum Riverside Limited	1st Floor 55 King William Street London EC4R 9AD	Post
65.	Exolum Seal Sands Limited	1st Floor 55 King William Street London EC4R 9AD	Post
66.	Fine Environmental Services Limited	Seal Sands Middlesbrough TS2 1UB	Post
67.	Fine Organics Limited	Seal Sands Middlesbrough TS2 1UB	Post
68.	Frutarom (UK) Limited	Duddery Hill Haverhill CB9 8LG	Post
69.	GDF Suez Teesside Limited	Rooms 481-499 Second Floor Salisbury House London Wall London EC2M 5SQ	Post
70.	Greenergy Biofuels Teesside Limited	198 High Holborn London WC1V 7BD	Post
71.	Hancock British Holdings Limited C/O Legalinx Limited	3rd Floor 207 Regent Street London W1B 3HH	Post
72.	Hartlepool Borough Council	Civic Centre Victoria Road Hartlepool TS24 8AY	Post
73.	Hartree Solutions (UK) Limited	2nd Floor Cardinal Place 100 Victoria Street London SW1E 5JL	Post

74.	Highfield Environmental Limited	Billingham Treatment Centre Seal Sands Link Road Billingham TS23 3NF	Post
75.	Highfield Environmental Limited care of Hackwood Secretaries Limited	1 Silk Street London EC2Y 8HQ	Post
76.	Homes and Communities Agency	4th Floor One Friargate Coventry CV1 2GN	Post
77.	Honet Limited	Lodge House Rectory Road Upton-Upon-Severn Worcester WR8 0LX	Post
78.	Huntsman (Holdings) UK	Concordia House Glenarm Road Wynyard Business Park Billingham TS22 5FB	Post
79.	Huntsman Polyurethanes (UK) Limited	Concordia House Glenarm Road Wynyard Business Park Billingham TS22 5FB	Post
80.	ICI Chemicals & Polymers Limited	The Akzonobel Building Wexham Road Slough SL2 5DS	Post
81.	ICL Europe Coöperatief U.A.	Prinsenhof Building Koningin Wilhelminaplein 30 Amsterdam 1062kr Netherlands	Post
82.	Independent Investments Limited	First Floor Jebsen House 53-61 High Street Ruislip HA4 7BD	Post
83.	Ineos Nitriles (UK) Limited	PO Box 62 Seal Sands Middlesbrough TS2 1TX	Post
84.	Ineos UK SNS Limited	Anchor House 15-19 Britten Street London SW3 3TY	Post
85.	Inovyn Chlorvinyls Limited	PO Box 9 Runcorn WA7 4JE	Post

86.	Its Testing Services (UK) Limited	Academy Place 1-9 Brook Street Brentwood CM14 5NQ	Post
87.	Johnson Matthey PLC	5th Floor 25 Farrington Street London EC4A 4AB	Post
88.	Karen Pritchard	1 Grange Road Norton Stockton-On-Tees TS20 2NS	Post
89.	Kd Pharma UK Limited	Seal Sands Middlesbrough TS2 1UB	Post
90.	Kevin Patrick David Barry	Manor House Farm Cowpen Bewley Billingham Stockton On Tees TS23 4HS	Post
91.	KWB Power Limited	2nd Floor Cardinal Place 100 Victoria Street London SW1E 5JL	Post
92.	Legal & General Assurance (Pensions Management) Limited	1 Coleman Street London EC2R 5AA	Post
93.	Lloyds Bank plc	25 Gresham Street London EC2V 7HN	Post
94.	Lv Shipping Limited	L V House Walton Avnue Felixstowe IP11 3AL	Post
95.	Lynda Headley	41 Lancaster Road Birkdale Southport PR8 2LA	Post
96.	M & G Solid Fuels LLP	Unit 9 Sandgate Industrial Estate Mainsforth Terrace Hartlepool TS25 1TZ	Post
97.	M&T Commercials Limited	28 Bagdale Whitby YO21 1QL	Post
98.	Malonic Holdings Limited	3 Noble Street London EC2V 7EE	Post
99.	Mark Robinson	10 Cranford Avenue	Post

		Middlesbrough TS6 0AU	
100.	Marlow Foods Limited	Quorn Foods Station Road Stokesley TS9 7AB	Post
101.	Merseyside Energy Recovery Limited	Suez House 13-35 Grenfell Road Maidenhead SL6 1ES	Post
102.	Merseyside Recycling and Waste Authority	7th Floor No1 Mann Island Liverpool L3 1BP	Post
103.	MGT Teesside Limited	Unit 8 White Oak Square London Road Swanley BR8 7AG	Post
104.	Michael John Gale	Hollins House Grosmont Whitby YO22 5PU	Post
105.	Mitsubishi Chemical UK Limited	Cassel Works New Road Billingham TS23 1LE	Post
106.	MPL 1 Limited	Spitfire House 19 Falcon Court Preston Farm Industrial Estate Stockton On Tees TS18 3TU	Post
107.	National Gas Transmission PLC	1-3 Strand London WC2N 5EH	Post
108.	National Grid Electricity Transmission PLC	1-3 Strand London WC2N 5EH	Post
109.	National Trails UK c/o Unit 11	Residence 2 Royal William Yard Plymouth PL1 3RP	Post
110.	National Westminster Bank plc	250 Bishopsgate London EC2M 4AA	Post
111.	Natural England	County Hall Spetchley Road Worcester WR5 2NP	Post
112.	Navigator Terminals North Tees Limited	Oliver Road Grays	Post

		North RM20 3ED	
113.	Navigator Terminals Seal Sands Limited	Oliver Road Grays Seal RM20 3ED	Post
114.	Neil Hopwood	26 Guisborough Street Middlesbrough TS6 9LA	Post
115.	Net Zero North Sea Storage Limited	Chertsey Road Sunbury On Thames TW16 7LN	Post
116.	Net Zero Teesside Power Limited	Chertsey Road Sunbury On Thames TW16 7LN	Post
117.	Network Rail Infrastructure Limited	Waterloo General Office London SE1 8SW	Post
118.	Nicky Stitson	129 Burnmoor Drive Eaglescliffe Stockton-On-Tees TS16 0HZ	Post
119.	Nippon Gases UK Limited	Gresley Way Immingham Dock Immingham DN40 2NT	Post
120.	Norpipe Oil AS c/o ConocoPhillips (U.K.) Teesside Operator Limited	Norsea House Wynyard Business Park Wynyard TS22 5TB	Post
121.	Norpipe Oil AS	Ekofiskvegen 35 4056 Tanager Rogaland Norway	Post
122.	Norpipe Petroleum UK Limited	20th Floor 1 Angel Court London EC2R 7HJ	Post
123.	Norsea Pipeline Limited	20th Floor 1 Angel Court London EC2R 7HJ	Post
124.	North Tees Land Limited	The Cube Barrack Road Newcastle Upon Tyne NE4 6DB	Post
125.	North Tees Landfill Sites (Cowpen) Limited	The Cube Barrack Road Newcastle Upon Tyne NE4 6DB	Post
126.	North Tees Limited	The Cube	Post

		Barrack Road Newcastle Upon Tyne NE4 6DB	
127.	North Tees Rail Limited	The Cube Barrack Road Newcastle Upon Tyne NE4 6DB	Post
128.	North Tees Waste Management Cowpen Limited	The Cube Barrack Road Newcastle Upon Tyne NE4 6DB	Post
129.	Northern Electric Distribution Limited	2nd Floor Lloyds Court 78 Grey Street Newcastle Upon Tyne NE1 6AF	Post
130.	Northern Electric PLC	Lloyds Court 78 Grey Street Newcastle Upon Tyne NE1 6AF	Post
131.	Northern Gas Networks Limited	1100 Century Way Colton Leeds LS15 8TU	Post
132.	Northern Gas Processing Limited	Suite 1 7th Floor 50 Broadway London SW1H 0BL	Post
133.	Northern Powergrid (northeast) PLC	Lloyds Court 78 Grey Street Newcastle Upon Tyne NE1 6AF	Post
134.	Northern Powergrid Limited	Lloyds Court 78 Grey Street Newcastle Upon Tyne NE1 6AF	Post
135.	Northern Trains Limited	George Stephenson House Toft Green York YO1 6JT	Post
136.	Northumbrian Water Limited	Northumbria House Abbey Road Pty Me Durham DH1 5FJ	Post
137.	NPL Waste Management Limited	One St Peter's Square Manchester M2 3DE	Post
138.	Oceaneering International Services Limited	100 New Bridge Street London EC4V 6JA	Post
139.	On Tower UK 5 Limited	R+	Post

		4th Floor 2 Belgrave Street Reading RG1 1AZ	
140.	One-Dyas UK Limited	8th Floor 100 Bishopsgate London EC2N 4AG	Post
141.	Openreach Limited	Kelvin House 123 Judd Street London WC1H 9NP	Post
142.	PD Teesport Limited	17-27 Queen's Square 17-27 Queen's Square Middlesbrough TS2 1AH	Post
143.	PMA Consultancy Limited	5 West Cote Farm Wold Road Barrow Upon Humber DN19 7DY	Post
144.	Polymer Industries (UK) Limited c/o: Daniel Paul Hennessy Cresswall Associates Limited	West Lancashire Investment Centre Maple View White Moss Business Park Skelmersdale WN8 9TG	Post
145.	Power Minerals Limited	Wrens Court 46 South Parade Sutton Coldfield B72 1QY	Post
146.	Principality Building Society	Principality House The Friary Cardiff CF10 3FA	Post
147.	RBC Europe Limited	100 Bishopsgate London EC2N 4AA	Post
148.	Redcar & Cleveland Borough Council	Redcar & Cleveland House Kirkleatham Street Redcar TS10 1RT	Post
149.	Redcar Bulk Terminal Limited	Time Central 32 Gallowgate Newcastle Upon Tyne NE1 4BF	Post
150.	Redcar Holdings Limited	Stirling Square 5-7 Carlton Gardens London SW1Y 5AD	Post
151.	Renew Wilton Limited	3 Noble Street London	Post

		EC2V 7EE	
152.	Richard Grainger	Mirefold Farm Kirkbridge Crakehall Beadle DL8 1PN	Post
153.	Robert Leslie Bainbridge	New Town Farm Bishopton Stockton-On-Tees TS21 1EY	Post
154.	Ronald Edward Bainbridge	Farfields Farm Long Newton Stockton-On-Tees TS21 1DH	Post
155.	RWE Generation UK PLC	Windmill Hill Business Park Whitehill Way Swindon SN5 6PB	Post
156.	Sabic Tees Holdings Limited	The Wilton Centre Wilton Redcar Cleveland TS10 4RF	Post
157.	Sabic UK Petrochemicals Limited	The Wilton Centre Wilton Redcar Cleveland TS10 4RF	Post
158.	Saltholme North Power Limited	145 Kensington Church Street London North W8 7LP	Post
159.	Saltholme South Power Limited	145 Kensington Church Street London South W8 7LP	Post
160.	Scott Bros. Enterprises Limited	Scott Business Park Haverton Hill Road Billingham TS23 1PY	Post
161.	Scott Bros. Holdings Limited	Scott Business Park Haverton Hill Road Billingham TS23 1PY	Post
162.	Seal Sands Gas Transportation Limited	14 St. George Street London W1S 1FE	Post
163.	Secure Trust Bank Public Limited Company	One Arleston Way Solihull B90 4LH	Post

164.	Sembcorp Utilities (UK) Limited	Sembcorp Energy UK Sembcorp UK Headquarters Wilton International Middlesbrough TS90 8WS	Post
165.	Seneca Global Energy Limited	Maritime House Harbour Walk Hartlepool TS24 0UX	Post
166.	Shirley Peel	Colemans Nook Bungalow Cowpen Bewley Billingham TS23 4HR	Post
167.	SITA Holdings Limited	7 Breaches Close Woodmancote Cheltenham GL52 9HY	Post
168.	SITA UK Limited	Suez House Grenfell Road Maidenhead SL6 1ES	Post
169.	SMBC Bank International Plc	100 Liverpool Street London EC2M 2AT	Post
170.	SMS Towage Limited	6 Ocean House Waterside Park Livingston Road Hessle HU13 0EG	Post
171.	SNF (UK) Limited	1 Red Hall Crescent Paragon Business Village Wakefield WF1 2DF	Post
172.	SNF Oil and Gas Limited	1 Red Hall Crescent Paragon Business Village Wakefield WF1 2DF	Post
173.	South Tees Development Corporation	Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post
174.	South Tees Developments Limited	Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post
175.	Stevens & Bolton LLP	Wey House Farnham Road Guildford GU1 4YD	Post
176.	Stockton-on-Tees Borough Council	P.O. Box 11 Muncipal Buildings	Post

		Church Road Stockton On Tees TS18 1LD	
177.	Stonelink Properties Limited	68 Grafton Way London W1T 5DS	Post
178.	Stork Technical Services	Norfolk House Pitmedden Road Dyce Aberdeen AB21 0DP	Post
179.	Suez Recycling And Recovery UK Limited	Suez House 13-35 Grenfell Road Maidenhead SL6 1ES	Post
180.	Svitzer Marine Limited	Tees Wharf Dockside Road Middlesbrough TS3 6AB	Post
181.	Tata Steel UK Limited	18 Grosvenor Place London SW1X 7HS	Post
182.	TDG (UK) Limited	Madden Road Tandragee Co.Armagh BT62 2DG	Post
183.	TDG (UK) Limited	Distribution House Eldon Way Crick Northamton NN6 7SL	Post
184.	Team Valve and Rotating Services Limited	Building 1 Hudson Quay The Halyard Middlesbrough TS3 6RT	Post
185.	Team Valve and Rotating Services Limited	Furman House Sharp Road Kendal LA9 6RU	Post
186.	Teesside Environmental Trust	19 Yarm Road Stockton-on-Tees TS18 3NJ	Post
187.	Teesside Gas & Liquids Processing	Suite 1 7th Floor 50 Broadway London SW1H 0BL	Post
188.	Teesworks Limited	Venture House Aykley Heads Durham DH1 5TS	Post

189.	Telefonica O2 UK Limited	260 Bath House Slough Berkshire SL1 4DX	Post
190.	The Executor of Ernest Binns	198 Church Lane Eston Middlesbrough TS6 9QZ	Post
191.	The King's Most Excellent Majesty in Right of His Crown C/O: The Crown Estate Commissioners	1 St James's Market London SW1Y 4AH	Post
192.	The Mission to Seafarers	First Floor 6 Bath Place London EC2A 3JE	Post
193.	The Royal Society For The Protection Of Birds	The Lodge Potton Road Sandy SG19 2DL	Post
194.	The Shlomo Memorial Fund Limited	New Burlington House 1075 Finchley Road London NW11 0PU	Post
195.	Thornton Facilities Management Limited	One St Peter's Square Manchester M2 3DE	Post
196.	Trevor Massey	1 Grange Road Norton Stockton-On-Tees TS20 2NS	Post
197.	Truckfix NE Limited	Lee Road Middlesbrough TS6 7AR	Post
198.	UK Wood Recycling Limited	Brailwood Road Bilsthorpe Newark NG22 8UA	Post
199.	Uniqema Limited	Cowick Hall Snaith Goole DN14 9AA	Post
200.	Venator Materials UK Limited	Titanium House Hanzard Drive Wynyard Park Stockton On Tees TS22 5FD	Post
201.	Vertellus Specialties UK Limited C/O Womble Bond	Draymans Way Newcastle Helix Newcastle Upon Tyne	Post

	Dickinson (UK) LLP The Spark	NE4 5DE	
202.	Vodafone Limited	Vodafone House The Connection Newbury RG14 2FN	Post
203.	WGIF (Jersey) Trustee I Limited	Third Floor Gaspe House 66-72 The Esplanade St. Helier JE1 2LH	Post
204.	WGIF (Jersey) Trustee II Limited	Third Floor Gaspe House 66-72 The Esplanade St. Helier JE1 2LH	Post
205.	Whitetower Energy Limited	First Floor Templeback 10 Temple Back Bristol BS1 6FL	Post
206.	Wilton Recovery Limited	14 Troutsdale Close Troutsdale Close Yarm TS15 9UW	Post
207.	Wilton Remediation LLP	183 First Floor St Vincent Street Glasgow G2 5QD	Post
208.	Yara UK Limited	Pocklington Industrial Estate Pocklington York YO42 1DN	Post
209.	Ylem Energy Limited	Edison House Daniel Adamson Road Salford Manchester M50 1DT	Post
210.	Zeneca Limited	3 Fontmell Close Coventry CV2 2JY	Post

Non-prescribed Bodies

No.	Consultees	Address	Sent via
1.	South Tees Development Corporation	Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post and Email
2.	RNLI	West Quay Road Poole	Post

		BH15 1HZ	
3.	RNLI	The Boathouse Ferry Road Hartlepool TS24 0RY	Post
4.	Tees Valley Transport Committee Tees Valley Combined Authority	Teesside Airport Business Suite Teesside International Airport, Darlington DL2 1NJ	Post
5.	Tees Valley Wildlife Trust	Mangrove Heritage Centre Boosbeck Saltburn Redcar and Cleveland TS12 3BZ	Post and Email
6.	Tees Valley Nature Partnership	Mangrove Heritage Centre Boosbeck Saltburn Redcar and Cleveland TS12 3BZ	Post and Email
7.	R S P B	The Lodge Potton Road Sandy SG19 2DL	Post and Email
8.	River Tees Port Health Authority	Belmont House Rectory Lane Guisborough TS14 7FD	Post and Email
9.	Centre for Environment, Fisheries and Aquaculture Science	Lowestoft Laboratory Pakefield Road Lowestoft Suffolk NR33 0HT	Post
10.	NEIFCA	Town Hall Quay Road Bridlington East Riding of Yorkshire YO16 4LP	Post and Email
11.	English Heritage (Head Office and Northeast)	The Engine House Fire Fly Avenue Swindon SN2 2EH	Post
12.	South Gare Fisherman's Association	96 Broadway East Redcar TS10 5DP	Post
13.	Teesside Environmental Trust	19 Yarm Road Eaglescliffe Stockton-on-Tees TS18 3NJ	Post
14.	Save Our Steel Group	Email only	Email

15.	Chemoxy International Limited c/o Seqens UK Limited	All Saints Refinery Cargo Fleet Road Middlesbrough TS6 3AF	Post
16.	Croda Chemicals Internationsl	Cowick Hall Snaith Goole East Yorkshire DN14 9AA	Post
17.	Venator Materials UK Limited	Titanium House Hanzard Drive Wynyard Park Stockton-on-Tees TS22 5FD	Post
18.	Hartlepool Rural Neighbourhood Plan Working Group	Email only	Email
19.	Hartlepool Mayoral Development Corporation	c/o Tees Valley Combined Authority Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post
20.	Middlesbrough Mayoral Development Corporation	c/o Tees Valley Combined Authority Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post
21.	Teesmouth Field Centre	c/o Hartlepool Power Station Tees Road Hartlepool TS25 2BZ	Email
22.	EDF Hartlepool Nuclear Power Station	Hartlepool Power Station Tees Road Hartlepool TS25 2BZ	Post

Additional Parties

No.	Consultee	Address	Sent via
1.	Suez Recycling and Recovery UK Ltd	Email only	Email
2.	Inovyn Chlorovinyls Limited	Holford Brinefields Lostock Gralam Northwich Cheshire CW9 7TD	Post and Email
3.	Aurorium UK Limited c/o: Womble Bond Dickinson (UK) Llp	The Spark Drayman's Way Newcastle Helix Newcastle Upon Tyne NE4 5DE	Post

Second Consultation – Consultee List

Section 42(a)(aa)

No.	Consultee	Address	Sent via
1.	NSIP Consultations	Health and Safety Executive Building 2.2, Redgrave Court Merton Road Bootle Merseyside L20 7HS	Post and Email
2.	NSIP Consultations - BP6301	Health and Safety Executive Alnwick House Benton Park View Newcastle upon Tyne NE98 1YX	Post
3.	Health and Safety Executive	Redgrave Court Merton Road Bootle Merseyside L20 7HS	Email
4.	NHS England	PO Box 16738 Redditch B97 9PT	Post and Email
5.	NHS Hartlepool and Stockton-on-Tees Clinical Commissioning Group	First Floor 14 Trinity Mews North Ormesby Middlesbrough TS3 6AL	Post and Email
6.	NHS Durham Dales, Easington and Sedgefield CCG	Sedgefield Community Hospital Salters Lane Sedgefield TS21 3EE	Post and Email
7.	NHS South Tees Clinical Commissioning Group	North Ormesby Health Village First Floor 14 Trinity Mews North Ormesby Middlesbrough TS3 6AL	Post and Email
8.	NHS North East and North Cumbria Integrated Care Board	North Cumbria at 'Place' Parkhouse Building, Baron Way Kingmoor Park Carlisle, Cumbria CA6 4SJ	Email
9.	Natural England	Foss House Kings Pool 1-2 Peasholme Green York YO1 7PX	Post and Email

No.	Consultee	Address	Sent via
10.	Natural England	Natural England consultation service Hornbeam House Electra Way Crewe Business Park Crewe, Cheshire CW1 6GJ	Post and Email
11.	Natural England	Northumbria Area Team Lancaster House Hampshire Court Newcastle upon Tyne NE4 7YH	Post and Email
12.	Natural England	Email only	Email
13.	Historic England	The Engine House Fire Fly Avenue Swindon Wiltshire SN2 2EH	Post and Email
14.	Historic England	Bessie Surtees House 41-44 Sandhill Newcastle-Upon-Tyne NE1 3JF	Post and Email
15.	Cleveland Fire Brigade	Training & Administration Hub Endeavour House Queens Meadow Business Park Hartlepool TS25 5TH	Post and Email
16.	Cleveland Police	Ash House III Acres Princeton Drive Thornaby Stockton-On-Tees TS17 6AJ	Post and Email
17.	Police and Crime Commissioner Office	Shared Services c/o St Marks House St Marks Court Thornaby Stockton-on-Tees TS17 6QW.	Post and Email
18.	Tees and Hartlepool Harbour Police	Teesport Grangetown Middlesborough TS6 6UD	Post and Email
19.	Billingham Town Council	Billingham Library & Customer Service Centre Billingham TS23 2LN	Post and Email
20.	Greatham Parish Council	15 Blackton Road Elwick Rise	Post and Email

No.	Consultee	Address	Sent via
		Hartlepool TS26 0QG	
21.	The Environment Agency	PO Box 544 Rotherham S60 1BY	Post and Email
22.	The Environment Agency	Tyneside House Skinnerburn Road Newcastle Business Park Newcastle-Upon-Tyne NE4 7AR	Post and Email
23.	The Equality and Human Rights Commission	Arndale House The Arndale Centre Manchester M4 3AQ	Post
24.	The Equality and Human Rights Commission	Third floor Windsor House 50 Victoria Street London SW1H 0TL	Post
25.	North Pennies AONB Partnership	1 Martin Street Stanhope Bishop Auckland County Durham CL13 2UY	Post and Email
26.	Nidderdale AONB	The Old Workhouse King Street Pateley Bridge Harrogate HG3 5LE	Post and Email
27.	Howardian Hills AONB	The Old Vicarage Bondgate Helmsley York YO62 5BP	Post and Email
28.	Homes England	One Friargate Coventry CV1 2GN	Post and Email
29.	Joint Nature Conservation Committee	Quay House 2 East Station Road Fletton Quays Peterborough PE2 8YY	Post and Email
30.	Maritime and Coastguard Agency	Spring Place 105 Commercial Road Southampton SO15 1EG	Post and Email
31.	Maritime and Coastguard Agency (Hull Marine Office)	Crosskill House Mill Lane Beverley	Post and Email

No.	Consultee	Address	Sent via
		East Yorkshire HU17 9JB	
32.	Marine Management Organisation	Lancaster House Hampshire Court Newcastle upon Tyne NE4 7YH	Post and Email
33.	Marine Management Organisation	First Floor, Crosskill House, Mill Lane, Beverley, HU17 9JB	Post and Email
34.	Civil Aviation Authority	Aviation House Beehive Ring Road Crawley West Sussex RH6 0YR	Post and Email
35.	National Highways Company Ltd	Bridge House 1 Walnut Tree Close Guildford GU1 4LZ	Post and Email
36.	Tees Valley Combined Authority	Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post and Email
37.	Stockton-on-Tees Borough Council	Highways Authority Municipal Buildings Church Road Stockton-On-Tees TS18 1LD	Post and Email
38.	Redcar and Cleveland Borough Council	Highways Authority Redcar and Cleveland House Kirkleatham Street Redcar Yorkshire TS10 1RT	Post and Email
39.	Hartlepool Borough Council	Highways Authority Level 1 Civic Centre Hartlepool TS24 8AY	Post
40.	Transport Focus	Albany House 94-98 Petty France London SW1H 9EA	Post
41.	DPTAC	The Disabled Persons Transport Advisory Committee DPTAC 2 Great Minster House, Horseferry Road, London	Post and Email

No.	Consultee	Address	Sent via
		SW1P 4DR	
42.	Coal Authority	200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG	Post and Email
43.	Office of Rail and Road	Head Office One Kemble Street London WC2B 4AN	Post and Email
44.	OFGEM	10 South Colonnade Canary Wharf London E14 4PU	Post
45.	OFWAT	Centre City Tower 7 Hill Street Birmingham B5 4UA	Post
46.	Environment Agency	PO Box 544 Rotherham S60 1BY	Post and Email
47.	Canal & River Trust	National Waterways Museum Ellesmere Port South Pier Road Ellesmere Port Cheshire CH65 4FW	Post and Email
48.	Canal & River Trust	1st Floor 21 The Calls Leeds LS2 7EH	Post and Email
49.	Trinity House	Tower Hill London EC3N 4DH	Post and Email
50.	UK Health Security Agency	Wellington House, 133-155 Waterloo Road, London SE1 8UG	Post and Email
51.	Cleveland Local Resilience Forum	Cleveland Emergency Planning Unit, St Marks House, St Marks Court, Thornaby, Stockton on Tees, TS17 6QW	Post and Email
52.	Crown Estate	1 St James's Market London SW1 4AH	Post and Email

No.	Consultee	Address	Sent via
53.	The Forestry Commission	620 Bristol Business Park Coldharbour Lane Bristol BS16 1EJ	Post and Email
54.	The Forestry Commission	Foss House, Kings Pool, 1-2 Peasholme Green, York, YO1 7PX	Post and Email
55.	The Secretary of State for Defence	Whitehall London SW1A 2HB	Post
56.	Office for Nuclear Regulation	Building 4 Redgrave Court Merton Road Bootle L20 7HS	Post and Email
57.	Active Travel England	Email	Email
58.	Network Rail Infrastructure Limited	Waterloo General Office London SE1 8SW	Post
59.	Network Rail (High Speed) Limited	Waterloo General Office London SE1 8SW	Post
60.	National Highways (Historical Railways Estate)	37 Tanner Row York YO1 6WP	Post and Email
61.	Historical Railways Estate (c/o National Highways)	National Traffic Operations Centre 3 Ridgeway Quinton Business Park Birmingham B32 1AF	Post
62.	London and Continental Railways	20 Cranbourn Street London WC2H 7AA	Post and Email
63.	Network Rail Limited	Waterloo General Office London SE1 8SW	Post
64.	Network Rail	George Stephenson House Toft Green York YO1 6JT	Post and Email
65.	Rail Safety and Standards Board	The Helicon 1 South Place London EC2M 2RB	Post
66.	The Department for Transport	Great Minster House 33 Horseferry Road London SW1P 4DR	Post and Email

No.	Consultee	Address	Sent via
67.	P&O Teesport	201 Tees Dock Rd, Middlesbrough TS6 7RT	Post and Email
68.	P&O North Sea Ferries Limited	Channel House Channel View Road Dover Kent CT17 9TJ	Post and Email
69.	PD Teesport	Statutory Harbour Authority Teesport Grangetown Middlesborough TS6 6UD	Post and Email
70.	PD Ports Ltd	Statutory Harbour Authority Chief Executive 17-27 Queen's Square Middlesborough TS2 1AH	Post
71.	NATS Limited	4000 Parkway Whiteley Farnham Hampshire PO15 7FL	Post and Email
72.	Royal Mail Group Limited	185 Farringdon Road London EC1A 1AA	Post and Email
73.	The Ministry of Defence	Whitehall London SW1A 2HB	Post and Email
74.	The Ministry of Defence Safeguarding Department	Statutory & Offshore Defence Infrastructure Organisation Kingston Road Sutton Coldfield West Midlands B75 7RL	Post and Email
75.	North East Ambulance Service NHS Foundation Trust	Bernicia House Goldcrest Way Newburn Riverside Newcastle-Upon-Tyne NE15 8NY	Post
76.	Northumbrian Water Limited	Northumbria House Abbey Road Pity Me Durham DH1 5FJ	Post and Email
77.	Northumbrian Water Limited	Leat House Pattinson Road Washington Tyne and Wear	Post and Email

No.	Consultee	Address	Sent via
		NE38 8LB	
78.	Cadent Gas Limited	Pilot Way Ansty Coventry CV7 9JU	Post and Email
79.	Last Mile Gas Limited	Fenick House Lister Way Hamilton International Technology Park Glasgow Scotland G72 0FT	Post and Email
80.	Energy Assets Pipelines Limited	Ship Canal House 98 King Street Manchester M2 4WU	Post and Email
81.	ES Pipelines Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
82.	ESP Connections Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
83.	ESP Networks Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
84.	ESP Pipelines Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
85.	ESP Utilities Limited	1st Floor Bluebird House Mole Business Park Leatherhead KT22 7BA	Post and Email
86.	Fulcrum Pipelines Limited	2 Europa View Sheffield Business Park Sheffield S91 1XH	Post and Email
87.	Harlaxton Gas Networks Limited	Toll Bar Road Marston Grantham	Post and Email

No.	Consultee	Address	Sent via
		Lincs NG32 2HT	
88.	GTC Pipelines Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post and Email
89.	Independent Pipelines Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
90.	Indigo Pipelines Limited	15 Diddenham Court Lambwood Hill Grazeley Reading RG7 1JQ	Post and Email
91.	Indigo Power Limited	15 Diddenham Court Lambwood Hill Grazeley Reading RG7 1JQ	Post and Email
92.	Murphy Gas Networks Limited	Hiview House Highgate Road London NW5 1TN	Post and Email
93.	Quadrant Pipelines Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
94.	National Grid Gas Plc	1-3 Strand London WC2N 5EH	Post and Email
95.	National Grid Gas Plc & National Grid Gas PLC	Network Management 1-3 Strand London WC2N 5EH	Post and Email
96.	Scotland Gas Networks Plc	Axis House 5 Londhead Drive Newbridge Edinburgh Scotland EH28 8TG	Post and Email
97.	Southern Gas Networks Plc	St Lawrence House Station Approach Horley Surrey RH6 9HJ	Post and Email

No.	Consultee	Address	Sent via
98.	Northern Gas Networks Limited	1100 Century Way Thorpe Park Business Park Colton Leeds LS15 8TU	Post and Email
99.	EDF Energy Renewables Limited	Alexander House 1 Mandarin Road Rainton Bridge Business Park Houghton Le Spring Sunderland DH4 5RA	Post and Email
100.	MGT Teesside Limited	8 White Oak Square London Road Swanley BR8 7AG	Post and Email
101.	Last Mile Electricity Limited	Fenick House Lister Way Hamilton International Technology Park Glasgow Scotland G72 0FT	Post and Email
102.	Energy Assets Networks Limited	Ship Canal House 98 King Street Manchester M2 4WU	Post and Email
103.	Energy Assets Fibre Networks Limited	Ship Canal House 98 King Street Manchester M2 4WU	Post and Email
104.	ESP Electricity Limited	1st Floor Bluebird House Mole Business Park Leatherhead Surrey KT22 7BA	Post and Email
105.	Fulcrum Electricity Assets Limited	2 Europa View Sheffield Business Park Sheffield S9 1XH	Post and Email
106.	Harlaxton Energy Networks Limited	Toll Bar Road Marston Grantham Lincs NG32 2HT	Post
107.	Independent Power Networks Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post

No.	Consultee	Address	Sent via
108.	Leep Electricity Networks Limited	Level 2, Metro 33 Trafford Road Manchester M5 3NN	Post
109.	MUA ELECTRICITY LIMITED	Highview House Highgate Road London NW5 1TN	Post and Email
110.	The Electricity Network Company Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
111.	UK Power Distribution Limited	6500 Daresbury Park Daresbury Warrington WA4 4GE	Post and Email
112.	Utility Assets Limited	7 Laxton Close Attleborough NR17 1QY	Post and Email
113.	Vattenfall Networks Limited	5th Floor 70 St Mary Axe London EC3A 8BE	Post
114.	Northern Powergrid (Northeast) PLC	Lloyds Court 78 Grey Street Newcastle-Upon-Tyne NE1 6AF	Post
115.	National Grid Electricity Transmission Plc	1-3 Strand London WC2N 5EH	Post
116.	BOC Limited (A Member of the Linde Group)	Forge 43 Church Street West Woking Surrey GU21 6HT	Post and Email
117.	BP Midstream Pipelines	1 St James's Square London SW1Y 4PD	Post
118.	British Gas Pipelines Limited	Millstream Maidenhead Road Windsor Berkshire SL4 5GD	Post
119.	British Pipeline Agency Limited	5-7 Alexandra Road Hemel Hempstead Hertfordshire HP2 5BS	Post

No.	Consultee	Address	Sent via
120.	British Telecommunications Public Limited Company	1 Braham Street London E1 8EE	Post
121.	C.A. Telecom UK Limited	Unit 2 C a Business Park Colewood Road Whitstable Kent CT5 2RP	Post and Email
122.	Centrica Energy Limited	Millstream Maidenhead Road Windsor Berkshire SL4 5GD	Post and Email
123.	C.Gen Killingholme Limited	130 Shaftesbury Avenue 2nd floor London W1D 5EU	Post and Email
124.	Centrica Storage Limited	Woodland House Woodland Park Hessle HU13 0FA	Post and Email
125.	Channel Cable Limited	Kings Parade Lower Coombe Street Croydon CR0 1AA	Post and Email
126.	CityFibre Holdings Limited	15 Bedford Street London WC2E 9HE	Post and Email
127.	Phillips 66 Limited	7th Floor 200-202 Aldersgate Street London EC1A 4HD	Post
128.	Coryton Energy Company Limited	Coryton Power Station Stanford-Le-Hope The Mannorway SS17 9GN	Post
129.	Interoute Managed Services UK Limited	Third Floor New Castle House Castle Boulevard Nottingham NG7 1FT	Post
130.	Eclipse Power Networks Limited	25 Osier Way Olney MK46 5FP	Post and Email
131.	EirGrid Interconnector Designated Activity Company	The Oval 160 Shelbourne Road Ballsbridge Dublin 4	Post
132.	Electricity North West Limited	Electricity North West Borron Street	Post

No.	Consultee	Address	Sent via
		Stockport SK1 2JD	
133.	Envoy Asset Management Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
134.	E-ON UK Plc	Westwood Way Westwood Business Park Coventry CV4 8LG	Post
135.	Esso Petroleum Company Limited	Ermyn House Ermyn Way Leaterhead Surrey KT22 8UX	Post
136.	FibreSpeed Limited	100 New Bridge Street London EC4V 6JA	Post and Email
137.	Gamma Telecom	The Scalpel, 18th Floor 52 Lime Street London EC3M 7AF	Post and Email
138.	Geo Networks Limited	100 New Bridge Street London EC4V 6JA	Post
139.	EXOLUM PIPELINE SYSTEM LTD	1st Floor 55 King William Street London EC4R 9AD	Post and Email
140.	iGas Energy PLC	Welton Gathering Centre Barfield Lane Off Wragby Road Sudbrooke Lincoln LN2 2QX	Post and Email
141.	Inovyn Enterprises Limited	Bankes Lane Office Bankes Lane PO Box 9 Runcorn Cheshire WA7 4JE	Post
142.	Petroineos Manufacturing Scotland Limited	Bo'Ness Road Grangemouth Stirlingshire FK3 9XH	Post and Email
143.	Instalcom Limited	164 Field End Road Eastcote HA5 1RH	Post and Email
144.	Interoute Vtesse Limited	25 Canada Square E14 5LQ	Post

No.	Consultee	Address	Sent via
145.	Interoute Communications Limited	5th Floor 40 Strand London WC2N 5RW	Post
146.	KCOM Group Limited	37 Carr Lane Hull HU1 3RE	Post
147.	Kier Integrated Services Limited	2nd Floor, Optimum House Clippers Quay Salford M50 3XP	Post
148.	Lark Energy Limited	Larkfleet House Falcon Way Southfields Business Park Bourne PE10 0FF	Post
149.	Leep Gas Networks Limited	Level 2, Metro 33 Trafford Road Manchester M5 3NN	Post
150.	LNG Portable Pipeline Services Limited	Athena House Athena Drive Tachbrook Park Warwick CV34 6RL	Post
151.	London Power Networks PLC	Newington House 237 Southwark Bridge Road London SE1 6NP	Post
152.	Mainline Pipelines Limited	27th Floor, 1 Canada Square Canary Wharf London E14 3AA	Post
153.	Manchester Jetline Limited	150 Holborn Holborn London EC1N 2NS	Post
154.	Marchwood Power Limited	Oceanic Way Marchwood Industrial Park Marchwood Southampton SO40 4BD	Post
155.	McNicholas Limited	The Wheelhouse The Green Wolviston Billingham TS22 5LN	Post
156.	National Grid Plc	1-3 Strand London	Post

No.	Consultee	Address	Sent via
		WC2N 5EH	
157.	Northern Powergrid (Yorkshire) plc	Lloyds Court 78 Grey Street Newcastle-Upon-Tyne NE1 6AF	Post
158.	Perenco UK Limited (Purbeck Southampton Pipeline)	8 Hanover Square London W1S 1HQ	Post
159.	Premier Transmission Limited	First Floor The Arena Building 85 Ormeau Road Belfast BT7 1SH	Post
160.	RWE Generation UK PLC	Windmill Hill Business Park Whitehall Way Swindon Wiltshire SN5 6PB	Post
161.	VPI Power Ltd	Building 19 Haymarket Square Edinburgh EH3 8RY	Post
162.	Sea Fibre Networks	51-54 Pearse Street Dublin 2	Post
163.	Seabank Power Limited	Severn Road Hallen Bristol BS10 7SP	Post
164.	Severn Gas Transportation Limited	Severn Power Station West Nash Road Nash Newport Gwent NP18 2BZ	Post
165.	South Eastern Power Networks Plc	Newington House 237 Southwark Bridge Road London SE1 6NP	Post
166.	Shell Pipelines	Shell Centre London SE1 7NA	Post
167.	SP Distribution PLC	320 St. Vincent Street Glasgow Scotland G2 5AD	Post
168.	SP Manweb PLC	3 Prenton Way Prenton CH43 3ET	Post

No.	Consultee	Address	Sent via
169.	Spiecapag UK Limited	Cheney & Co 310 Wellingborough Road Northampton NN1 4EP	Post
170.	SSE Pipelines Ltd (Indigo Pipelines Limited)	15 Diddenham Court Lambwood Hill Grazeley Reading RG7 1JQ	Post and Email
171.	SSE plc	Inveralmond House 200 Dunkeld Road Perth Perthshire PH1 3AQ	Post
172.	Squire Energy Limited	Sentinel House 10-12 Massetts Road Horley RH6 7DE	Post and Email
173.	Telent on behalf of Teliasonera	Point 3 Haywood Road Warwick CV34 5AH	Post
174.	GTC Infrastructure Limited	Martello Court Admiral Park St Peter Port Guernsey GY1 3HB	Post and Email
175.	Totalenergies Gas and Power Limited	Bridge Gate 55 - 57 High St Redhill Surrey RH1 1RX	Post
176.	TrafficMaster Traffic Serivces Limited	Trafficmaster Traffic Services K1 First Floor Kents Hill Business Park Milton Keynes Buckinghamshire MK7 6BZ	Post
177.	Transmission Capital Services Limited	3 More London Riverside London SE1 2AQ	Post and Email
178.	UK Power Networks (Operations) Limited	Newington House 237 Southwark Bridge Road London SE1 6NP	Post
179.	Uniper UK Limited	Compton House 2300 The Crescent Birmingham Business Park Birmingham B37 7YE	Post

No.	Consultee	Address	Sent via
180.	Utility Grid Installations Limited	Synergy House Windmill Avenue Woolpit Bury St Edmunds IP30 9UP	Post
181.	Verizon UK Limited	Reading International Business Park Basingstoke Road Reading Berkshire RG2 6DA	Post
182.	Virgin Media Limited	500 Brook Drive Reading RG2 6UU	Post
183.	Vodafone Limited	Vodafone House The Connection Newbury Berkshire RG14 2FN	Post
184.	Interoute Vtesse Limited	25 Canada Square Canary Wharf London E14 5LQ	Post
185.	Wales & West Utilities Limited	Wales & West House Spooner Close Coedkernew Newport South Wales NP10 8FZ	Post and Email
186.	NATIONAL GRID ELECTRICITY DISTRIBUTION (SOUTH WALES) PLC	Avonbank Feeder Road Bristol BS2 0TB	Post
187.	Saltfleetby Energy Limited	Building 3 Chiswick Park 566 Chiswick High Street London W4 5YA	Post
188.	ESSAR Limited	6 Lime Tree Court Straight Road Windsor SL4 2SS	Post
189.	Npower CHP Pipelines	C/O Npower Limited Westwood Way Westwood Business Park Coventry CV4 8LG	Post
190.	NHS Digital	7 & 8 Wellington Place Leeds LS1 4AP	Post and Email
191.	Health Education England	NHS England PO Box 16738	Post and Email

No.	Consultee	Address	Sent via
		Redditch B97 9PT	
192.	Health Research Authority	2 Redman Place Stratford London E20 1JQ	Post and Email
193.	National Institute for Health and Clinical Excellence (NICE)	2nd Floor, 2 Redman Place London E20 1JQ	Post and Email
194.	NHS Blood and Transplant	500 North Bristol Park Filton Bristol BS34 7QH	Post
195.	NHS Business Services Authority	Stella House Goldcrest Way Newburn Riverside Newcastle-Upon-Tyne NE15 8NY	Post
196.	NHS Resolution	8th Floor 10 South Colonnade Canary Wharf London E14 4PU	Post and Email
197.	Leeds Community Healthcare NHS Trust	First Floor Stockdale House Headingley Office Park Victoria Road Leeds LS6 1PF	Post
198.	County Durham and Darlington NHS Foundation Trust	Darlington Memorial Hospital Hollyhurst Road Darlington County Durham DL3 6HX	Post and Email
199.	Tees, Esk and Wear Valleys NHS Foundation Trust	West Park Hospital Edward Pease Way Darlington DL2 2TS	Post
200.	North Tees and Hartlepool NHS Foundation Trust	University Hospital of North Tees Hardwick Stockton-On-Tees TS19 8PE	Post
201.	South Tees Hospitals NHS Foundation Trust	The James Cook University Hospital Marton Road Middlesbrough TS4 3BW	Post and Email
202.	Royal National Orthopaedic Hospital NHS Trust	Brockley Hill Stanmore Middlesex	Post and Email

No.	Consultee	Address	Sent via
		HA7 4LP	
203.	Royal National Hospital for Rheumatic Diseases NSH Foundation Trust	Royal United Hospitals Bath NHS Foundation Trust Combe Park Bath BA1 3NG	Post and Email
204.	Cumbria, Northumberland, Tyne and Wear NHS Foundation Trust	St. Nicholas Hospital Jubilee Road Gosforth Newcastle-Upon-Tyne NE3 3XT	Post
205.	Anglian Water (Hartlepool Water)	Northumbria House Abbey Road Pity Me Durham DH1 5FJ	Post
206.	AWE plc	Room 20 Building F161.2 Atomic Weapons Establishment Aldermaston Reading RG7 4PR	Post
207.	East West Cable One Limited	8 The Beeches Straffan Co. Kildare Republic of Ireland Republic of Ireland	Post
208.	Sofia Offshore Wind Farm Ltd	Windmill Hill Business Park, Whitehill Way, Swindon, Wiltshire, SN5 6PB	Post
209.	SSE Renewables Wind Farms (UK) Limited	Inveralmond House, 200 Dunkeld Road, Perth, Scotland, PH1 3AQ	Post
210.	Mua Electricity Limited	Hiview House, Highgate Road, London, NW5 1TN	Post
211.	Optimal Power Networks Limited	No.1 Forbury Place 43 Forbury Road Reading RG1 3JH	Post and Email
212.	National Grid Electricity System Operator Ltd	1-3 Strand, London, WC2N 5EH	Post
213.	Colas Rail	25 Victoria Street	Post

No.	Consultee	Address	Sent via
		London SW1H 0EX	
214.	DCRail	26 Leigh Road Eastleigh England SO50 9DT	Post
215.	Direct Rail Services	Herdus House Ingwell Drive Westlakes Science & Technology Park Moor Row Cumbria CA24 3HU	Post and Email
216.	DB Cargo UK	Lakeside Business Park Carolina Way Doncaster South Yorkshire DN4 5PN	Post
217.	Freightliner	6th Floor The Lewis Building 35 Bull Street Birmingham United Kingdom B4 6EQ	Post
218.	GB Railfreight	55 Old Broad Street London EC2M 1RX	Post
219.	Mendip Rail	Bardon Hall Copt Oak Road Markfield Leicestershire LE67 9PJ	Post

Section 42(b)

No.	Consultee	Authority	Address	Sent via
1.	Stockton-on-Tees Borough Council	b	Municipal Buildings Church Road Stockton-on-Tees TS18 1LD	Post and Email
2.	Stockton-on-Tees Borough Council	b	Municipal Buildings Church Road Stockton-on-Tees TS18 1LD	Post
3.	Redcar and Cleveland Borough Council	b	Redcar and Cleveland House Kirkleatham Street Redcar TS10 1RT	Post and Email

No.	Consultee	Authority	Address	Sent via
4.	Redcar and Cleveland Borough Council	b	Redcar and Cleveland House Kirkleatham Street Redcar TS10 1RT	Post
5.	Hartlepool Borough Council	b	Level 1 Civic Centre Hartlepool TS24 8AY	Post and Email
6.	Hartlepool Borough Council	b	Level 1 Civic Centre Hartlepool TS24 8AY	Post
7.	Middlesbrough Council	a	PO Box 500 Middlesbrough TS1 9FT	Post
8.	Middlesbrough Council	a	Development Control Service Ground Floor Civic Centre PO Box 504 Middlesbrough TS1 9FY	Post and Email
9.	Hambleton District Council	a	Civic Centre Stone Cross Rotary Way Northallerton North Yorkshire DL6 2UU	Post and Email
10.	Hambleton District Council	a	Civic Centre Stone Cross Rotary Way Northallerton North Yorkshire DL6 2UU	Post and Email
11.	Scarborough Borough Council	a	Town Hall St Nicholas Street Scarborough YO11 2HG	Post
12.	Scarborough Borough Council	a	Planning Services Town Hall St Nicholas Street Scarborough YO11 2HG	Post and Email
13.	North York Moors National Park	d	The Old Vicarage Bondgate	Post and Email

No.	Consultee	Authority	Address	Sent via
			Helmsley York North Yorkshire YO62 5BP	
14.	North York Moors National Park	d	The Old Vicarage Bondgate Helmsley York North Yorkshire YO62 5BP	Post and Email
15.	North Yorkshire County Council	a	County Hall Northallerton North Yorkshire DL7 8AD	Post
16.	North Yorkshire County Council	a	County Hall Northallerton North Yorkshire DL7 8AD	Post and Email
17.	Durham County Council	a	County Hall Durham County Durham DH1 5UQ	Post
18.	Durham County Council	a	County Hall Durham County Durham DH1 5UQ	Post and Email
19.	Darlington Borough Council	a	Town Hall Feethams Darlington County Durham DL1 5QT	Post and Email
20.	Darlington Borough Council	a	Economic Growth and Neighbourhood Services Room 401 Town Hall Darlington DL1 5QT	Post and Email

Section 42(d)

No.	Consultee	Address	Sent via
1.	Aggregate Industries Limited	Bardon Hall Copt Oak Road	Post

No.	Consultee	Address	Sent via
		Markfield LE63 9PJ	
2.	Air Products (BR) Limited	Hersham Place Technology Park Molesey Road Walton on Thames KT12 4RZ	Post
3.	Air Products PLC	Hersham Place Technology Park Molesey Road Walton on Thames KT12 4RZ	Post
4.	Air Products Renewable Energy Limited	Hersham Place Technology Park Molesey Road Walton on Thames KT12 4RZ	Post
5.	Alan Reginald Bell	The Granary Yearby Road Yearby Redcar TS11 8HQ	Post
6.	Alcentra Limited	160 Queen Victoria Street London EC4V 4LA	Post
7.	Aldermore Bank plc	Apex Plaza Forbury Road Reading RG1 1AX	Post
8.	Allan Wilson Jenkinson	Clifton Moor Clifton Penrith CA10 2EY	Post
9.	Alpek Polyester UK Limited	Davies Offices Wilton International Redcar TS10 4XZ	Post
10.	Altrad Support Services Limited	6-7 Lyncastle Way Barleycastle Lane Appleton Warrington WA4 4ST	Post
11.	Amoco (U.K.) Exploration Limited	1-4 Wellshead Avenue Dyce Aberdeen AB21 7PB	Post
12.	Anglian Water Services Limited	Lancaster House Lancaster Way Ermine Business Park Huntington PE29 6XU	Post
13.	Anglo American Crop Nutrients Limited	17 Charterhouse Street London	Post

No.	Consultee	Address	Sent via
		EC1N 6RA	
14.	Anglo American Woodsmith (Teesside) Limited	17 Charterhouse Street London EC1N 6RA	Post
15.	Anglo American Woodsmith Limited	17 Charterhouse Street London EC1N 6RA	Post
16.	Anthony David Dryden	7 Sandmartin Lane Stockton-on-Tees TS20 1LP	Post
17.	Anthony Robinson	16 Caithness Road Middlesbrough TS6 0AW	Post
18.	Arrowcruit Holdings Limited	White House Farm Sandy Lane West Billingham TS22 5NB	Post
19.	Astrazeneca UK Limited	1 Francis Crick Cambridge Biomedical Campus Cambridge CB2 0AA	Post
20.	Azelis UK Limited	Axis House Tudor Road Manor Park Runcorn WA7 1BD	Post
21.	Bann 12 Limited	32 Garvaghy Road Banbridge BT32 3SZ	Post
22.	Barbara Selina Sharpe	Blackburn House Knayton Thirsk YO7 4AU	Post
23.	Barbican Real Estate Limited C/O Sigma Plantfinder Limited	Middlesbrough Road Middlesbrough TS6 6LZ	Post
24.	Barclays Bank plc	1 Churchill Place London E14 5HP	Post
25.	Barclays Security Trustee Limited	1 Churchill Place London E14 5HP	Post
26.	Barry Cackett	41 Lancaster Road Birkdale Southport PR8 2LA	Post
27.	BASF PLC BASF	4th & 5th Floors 2 Stockport Exchange Railway Road	Post

No.	Consultee	Address	Sent via
		Stockport SK1 3GG	
28.	Beyond Housing Limited	14 Ennis Square Dormanstown Redcar TS10 5JR	Post
29.	Biffa Polymers Limited	Coronation Road Cressex High Wycombe HP12 3TZ	Post
30.	Biffa Waste Services Limited	Coronation Road Cressex High Wycombe HP12 3TZ	Post
31.	BOC Limited	Forge 43 Church Street West Woking GU21 6HT	Post
32.	BP Chemicals Limited	Chertsey Road Sunbury On Thames TW16 7BP	Post
33.	BP Exploration Operating Company Limited	Chertsey Road Sunbury On Thames TW16 7LN	Post
34.	BP International Limited	Chertsey Road Sunbury On Thames TW16 7BP	Post
35.	British Steel Limited	Administration Building Brigg Road Scunthorpe DN16 1BP	Post
36.	Cats North Sea Limited	Suite 1 7th Floor 50 Broadway London SW1H 0BL	Post
37.	CF Fertilisers UK Limited	Head office Building Ince Chester CH2 4LB	Post
38.	Chapel Trustees Limited	1 New Walk Place Leicester LE1 6RU	Post
39.	Chemoxy International Limited	All Saints Refindery Cargo Fleet Road Middlesbrough TS3 6AF	Post
40.	Church Commissioners For England	Church House Great Smith Street London	Post

No.	Consultee	Address	Sent via
		SW1P 3AZ	
41.	Citadel UTB Limited	222 Quadrangle Tower Cambridge Square London W2 2PJ	Post
42.	Clare Elizabeth Dryden	7 Sandmartin Lane Stockton-on-Tees TS20 1LP	Post
43.	Billinginvest Inc Limited C/O International Processplants Europe Limited Postal Pages	The Grange Business Centre Belasis Avenue Billingham TS23 1LG	Post
44.	Compass Services (UK) Limited	Parklands Court 24 Parklands Birmingham Great Park Rubery Birmingham B45 9PZ	Post
45.	ConocoPhillips (U.K.) Operator Limited	20th Floor 1 Angel Court London EC2R 7HJ	Post
46.	Cornerstone Telecommunications Infrastructure Limited	Hive 2 1530 Arlington Business Park Theale Reading RG7 4SA	Post
47.	CTW Northern Limited	Spitfire House 19 Falton Court Preston Farm Industrial Estate Stockton On Tees TS18 3TU	Post
48.	Darren Knight	Ultimate Body Shop Lee Road Middlesbrough TS6 7AR	Post
49.	David Farnaby	106 Havilland Road Stockton-on-Tees TS17 9JG	Post
50.	David Horn	Ivy Court Cowpen Bewley Billingham TS23 4HR	Post
51.	David Mahon Properties Limited	1 Drumwhinney Road Kesh BT93 1SD	Post
52.	Dawn Barry	Manor House Farm Cowpen Bewley	Post

No.	Consultee	Address	Sent via
		Billingham Stockton On Tees TS23 4HS	
53.	DCS Industrial Limited	Venture House Aykley Heads Durham DH1 5TS	Post
54.	Delphine Phylis Lynetta Gale	Hollins House Grosmont Whitby YO22 5PU	Post
55.	Den Hartogh Dry Bulk Logistics Limited	4 Beacon Way Hull HU3 4AE	Post
56.	Diane Linda Sayers	The Staple Manor House Farm Cowpen Bewley Billingham TS23 4HS	Post
57.	Donald Ward Limited	Rawdon Works Moira Road Woodville Swadlincote DE11 8DG	Post
58.	Dorman Long UK Limited	29-30 Fitzroy Square London W1T 6LQ	Post
59.	Dow Chemical Company Limited	5 Oakwater Avenue Cheadle Royal Business Park Cheadle SK8 3SR	Post
60.	Dwfco 9 Limited	Suite 101 Highfield House Cheadle Royal Business Park Cheadele SK8 3GY	Post
61.	Egdon Resources UK Limited	Blackstable House Longridge Sheepscombe Stroud GL6 7QX	Post
62.	Ensus UK Limited	Enus Admind Building Middleway Wilton Redcar TS10 4RG	Post
63.	Environment Agency	Horizon House Deanery Road Bristol BS1 5AH	Post

No.	Consultee	Address	Sent via
64.	Exolum Riverside Limited	1st Floor 55 King William Street London EC4R 9AD	Post
65.	Exolum Seal Sands Limited	1st Floor 55 King William Street London EC4R 9AD	Post
66.	Fine Environmental Services Limited	Seal Sands Middlesbrough TS2 1UB	Post
67.	Fine Organics Limited	Seal Sands Middlesbrough TS2 1UB	Post
68.	Frutarom (UK) Limited	Duddery Hill Haverhill CB9 8LG	Post
69.	GDF Suez Teesside Limited	Rooms 481-499 Second Floor Salisbury House London Wall London EC2M 5SQ	Post
70.	Greenergy Biofuels Teesside Limited	198 High Holborn London WC1V 7BD	Post
71.	Hancock British Holdings Limited C/O Legalinx Limited	3rd Floor 207 Regent Street London W1B 3HH	Post
72.	Hartlepool Borough Council	Civic Centre Victoria Road Hartlepool TS24 8AY	Post
73.	Hartree Solutions (UK) Limited	2nd Floor Cardinal Place 100 Victoria Street London SW1E 5JL	Post
74.	Highfield Environmental Limited	3-5 Greyfriars Business Park Frank Foley Way Stafford ST16 2ST	Post
75.	Highfield Environmental Limited	Billingham Treatment Centre Seal Sands Link Road Billingham TS23 3NF	Post
76.	Highfield Environmental Limited	3-5 Greyfriars Business Park Frank Foley Way Stafford ST16 2ST	Post

No.	Consultee	Address	Sent via
	care of Hackwood Secretaries Limited		
77.	Homes and Communities Agency	4th Floor One Friargate Coventry CV1 2GN	Post
78.	Honet Limited	Lodge House Rectory Road Upton-Upon-Severn Worcester WR8 0LX	Post
79.	Huntsman (Holdings) UK	Concordia House Glenarm Road Wynyard Business Park Billingham TS22 5FB	Post
80.	Huntsman Polyurethanes (UK) Limited	Concordia House Glenarm Road Wynyard Business Park Billingham TS22 5FB	Post
81.	ICI Chemicals & Polymers Limited	The Akzonobel Building Wexham Road Slough SL2 5DS	Post
82.	ICL Europe Coöperatief U.A.	Prinsenhof Building Koningin Wilhelminaplein 30 Amsterdam 1062kr Netherlands	Post
83.	Independent Investments Limited	First Floor Jebsen House 53-61 High Street Ruislip HA4 7BD	Post
84.	Ineos Nitriles (UK) Limited	38 Hanes Crescent Knightsbridge London SW1X 0LZ	Post
85.	Ineos Nitriles (UK) Limited	PO Box 62 Seal Sands Middlesbrough TS2 1TX	Post
86.	Ineos UK SNS Limited	Anchor House 15-19 Britten Street London SW3 3TY	Post
87.	Inovyn Chlorvinyls Limited	Holford Brinefields Lostock Gralam Northwich Cheshire	Post

No.	Consultee	Address	Sent via
		CW9 7TD	
88.	Its Testing Services (UK) Limited	Academy Place 1-9 Brook Street Brentwood CM14 5NQ	Post
89.	Johnson Matthey PLC	5th Floor 25 Farrington Street London EC4A 4AB	Post
90.	Karen Pritchard	1 Grange Road Norton Stockton-On-Tees TS20 2NS	Post
91.	Kd Pharma UK Limited	Seal Sands Middlesbrough TS2 1UB	Post
92.	Kevin Patrick David Barry	Manor House Farm Cowpen Bewley Billingham Stockton On Tees TS23 4HS	Post
93.	KWB Power Limited	2nd Floor Cardinal Place 100 Victoria Street London SW1E 5JL	Post
94.	Legal & General Assurance (Pensions Management) Limited	1 Coleman Street London EC2R 5AA	Post
95.	Lloyds Bank plc	25 Gresham Street London EC2V 7HN	Post
96.	Lv Shipping Limited	L V House Walton Avnue Felixstowe IP11 3AL	Post
97.	Lynda Headley	41 Lancaster Road Birkdale Southport PR8 2LA	Post
98.	M & G Solid Fuels LLP	Unit 9 Sandgate Industrial Estate Mainsforth Terrace Hartlepool TS25 1TZ	Post
99.	M&T Commercials Limited	28 Bagdale Whitby YO21 1QL	Post

No.	Consultee	Address	Sent via
100.	Malonic Holdings Limited	3 Noble Street London EC2V 7EE	Post
101.	Mark Robinson	10 Cranford Avenue Middlesbrough TS6 0AU	Post
102.	Marlow Foods Limited	Quorn Foods Station Road Stokesley TS9 7AB	Post
103.	Merseyside Energy Recovery Limited	Suez House 13-35 Grenfell Road Maidenhead SL6 1ES	Post
104.	Merseyside Recycling and Waste Authority	40 Central Way Liverpool L24 2SW	Post
105.	MGT Teesside Limited	Unit 8 White Oak Square London Road Swanley BR8 7AG	Post
106.	Michael John Gale	Hollins House Grosmont Whitby YO22 5PU	Post
107.	Mitsubishi Chemical UK Limited	Cassel Works New Road Billingham TS23 1LE	Post
108.	MPL 1 Limited	Spitfire House 19 Falcon Court Preston Farm Industrial Estate Stockton On Tees TS18 3TU	Post
109.	National Gas Transmission PLC	National Grid House Warwick Technology Park Gallows Hill Warwick CV34 6DA	Post
110.	National Grid Electricity Transmission PLC	1-3 Strand London WC2N 5EH	Post
111.	National Trails UK c/o Unit 11	Residence 2 Royal William Yard Plymouth PL1 3RP	Post
112.	National Westminster Bank plc	250 Bishopsgate London EC2M 4AA	Post

No.	Consultee	Address	Sent via
113.	Natural England	County Hall Spetchley Road Worcester WR5 2NP	Post
114.	Navigator Terminals North Tees Limited	Oliver Road Grays North RM20 3ED	Post
115.	Navigator Terminals Seal Sands Limited	Oliver Road Grays Seal RM20 3ED	Post
116.	Neil Hopwood	26 Guisborough Street Middlesbrough TS6 9LA	Post
117.	Net Zero North Sea Storage Limited	Chertsey Road Sunbury On Thames TW16 7LN	Post
118.	Net Zero Teesside Power Limited	Chertsey Road Sunbury On Thames TW16 7LN	Post
119.	Network Rail Infrastructure Limited	Waterloo General Office London SE1 8SW	Post
120.	Nicky Stitson	129 Burnmoor Drive Eaglescliffe Stockton-On-Tees TS16 0HZ	Post
121.	Nippon Gases UK Limited	Gresley Way Immingham Dock Immingham DN40 2NT	Post
122.	Norpipe Oil AS c/o ConocoPhillips (U.K.) Teesside Operator Limited	Norsea House Wynyard Business Park Wynyard TS22 5TB	Post
123.	Norpipe Oil AS	Ekofiskvegen 35 4056 Tanager Rogaland Norway	Post
124.	Norpipe Petroleum UK Limited	20th Floor 1 Angel Court London EC2R 7HJ	Post
125.	Norsea Pipeline Limited	20th Floor 1 Angel Court London EC2R 7HJ	Post
126.	North Tees Land Limited	The Cube Barrack Road	Post

No.	Consultee	Address	Sent via
		Newcastle Upon Tyne NE4 6DB	
127.	North Tees Landfill Sites (Cowpen) Limited	The Cube Barrack Road Newcastle Upon Tyne NE4 6DB	Post
128.	North Tees Limited	The Cube Barrack Road Newcastle Upon Tyne NE4 6DB	Post
129.	North Tees Rail Limited	The Cube Barrack Road Newcastle Upon Tyne NE4 6DB	Post
130.	North Tees Waste Management Cowpen Limited	The Cube Barrack Road Newcastle Upon Tyne NE4 6DB	Post
131.	Northern Electric Distribution Limited	2nd Floor Lloyds Court 78 Grey Street Newcastle Upon Tyne NE1 6AF	Post
132.	Northern Electric PLC	Lloyds Court 78 Grey Street Newcastle Upon Tyne NE1 6AF	Post
133.	Northern Gas Networks Limited	1100 Century Way Colton Leeds LS15 8TU	Post
134.	Northern Gas Processing Limited	Suite 1 7th Floor 50 Broadway London SW1H 0BL	Post
135.	Northern Powergrid (northeast) PLC	Lloyds Court 78 Grey Street Newcastle Upon Tyne NE1 6AF	Post
136.	Northern Powergrid Limited	Lloyds Court 78 Grey Street Newcastle Upon Tyne NE1 6AF	Post
137.	Northern Trains Limited	George Stephenson House Toft Green York YO1 6JT	Post
138.	Northumbrian Water Limited	Northumbria House Abbey Road Pty Me Durham	Post

No.	Consultee	Address	Sent via
		DH1 5FJ	
139.	NPL Waste Management Limited	One St Peter's Square Manchester M2 3DE	Post
140.	Oceaneering International Services Limited	280 Bishopsgate London EC2M 4RB	Post
141.	On Tower UK 5 Limited	R+ 4th Floor 2 Belgrave Street Reading RG1 1AZ	Post
142.	One-Dyas UK Limited	8th Floor 100 Bishopsgate London EC2N 4AG	Post
143.	Openreach Limited	Kelvin House 123 Judd Street London WC1H 9NP	Post
144.	PD Teesport Limited	17-27 Queen's Square 17-27 Queen's Square Middlesbrough TS2 1AH	Post
145.	PMA Consultancy Limited	5 West Cote Farm Wold Road Barrow Upon Humber DN19 7DY	Post
146.	Polymer Industries (UK) Limited c/o: Daniel Paul Hennessy Cresswall Associates Limited	Office D Beresford House Town Quay Southampton SO14 2AQ	Post
147.	Power Minerals Limited	Wrens Court 46 South Parade Sutton Coldfield B72 1QY	Post
148.	Principality Building Society	Principality House The Friary Cardiff CF10 3FA	Post
149.	RBC Europe Limited	100 Bishopsgate London EC2N 4AA	Post
150.	Redcar & Cleveland Borough Council	Redcar & Cleveland House Kirkleatham Street Redcar TS10 1RT	Post

No.	Consultee	Address	Sent via
151.	Redcar Bulk Terminal Limited	Time Central 32 Gallowgate Newcastle Upon Tyne NE1 4BF	Post
152.	Redcar Holdings Limited	Stirling Square 5-7 Carlton Gardens London SW1Y 5AD	Post
153.	Renew Wilton Limited	3 Noble Street London EC2V 7EE	Post
154.	Richard Grainger	Mirefold Farm Kirkbridge Crakehall Beadle DL8 1PN	Post
155.	Robert Leslie Bainbridge	New Town Farm Bishopton Stockton-On-Tees TS21 1EY	Post
156.	Ronald Edward Bainbridge	Farfields Farm Long Newton Stockton-On-Tees TS21 1DH	Post
157.	RWE Generation UK PLC	Windmill Hill Business Park Whitehill Way Swindon SN5 6PB	Post
158.	Sabic Tees Holdings Limited	The Wilton Centre Wilton Redcar Cleveland TS10 4RF	Post
159.	Sabic UK Petrochemicals Limited	The Wilton Centre Wilton Redcar Cleveland TS10 4RF	Post
160.	Saltholme North Power Limited	145 Kensington Church Street London North W8 7LP	Post
161.	Saltholme South Power Limited	145 Kensington Church Street London South W8 7LP	Post
162.	Scott Bros. Enterprises Limited	Scott Business Park Haverton Hill Road Billingham TS23 1PY	Post

No.	Consultee	Address	Sent via
163.	Scott Bros. Holdings Limited	Scott Business Park Haverton Hill Road Billingham TS23 1PY	Post
164.	Seal Sands Gas Transportation Limited	14 St. George Street London W1S 1FE	Post
165.	Secure Trust Bank Public Limited Company	One Arleston Way Solihull B90 4LH	Post
166.	Sembcorp Utilities (UK) Limited	Sembcorp Energy UK Sembcorp UK Headquarters Wilton International Middlesbrough TS90 8WS	Post
167.	Seneca Global Energy Limited	Maritime House Harbour Walk Hartlepool TS24 0UX	Post
168.	Shirley Peel	Colemans Nook Bungalow Cowpen Bewley Billingham TS23 4HR	Post
169.	SITA Holdings Limited	7 Breaches Close Woodmancote Cheltenham GL52 9HY	Post
170.	SITA UK Limited	Suez House Grenfell Road Maidenhead SL6 1ES	Post
171.	SMBC Bank International Plc	100 Liverpool Street London EC2M 2AT	Post
172.	SMS Towage Limited	Francis House Humber Place The Marina Hull HU1 1UD	Post
173.	SNF (UK) Limited	1 Red Hall Crescent Paragon Business Village Wakefield WF1 2DF	Post
174.	SNF Oil and Gas Limited	1 Red Hall Crescent Paragon Business Village Wakefield WF1 2DF	Post
175.	South Tees Development Corporation	Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post

No.	Consultee	Address	Sent via
176.	South Tees Developments Limited	Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post
177.	Stevens & Bolton LLP	Wey House Farnham Road Guildford GU1 4YD	Post
178.	Stockton-on-Tees Borough Council	P.O. Box 11 Muncipal Buildings Church Road Stockton On Tees TS18 1LD	Post
179.	Stonelink Properties Limited	68 Grafton Way London W1T 5DS	Post
180.	Stork Technical Services	Norfolk House Pitmedden Road Dyce Aberdeen AB21 0DP	Post
181.	Suez Recycling And Recovery UK Limited	Suez House 13-35 Grenfell Road Maidenhead SL6 1ES	Post
182.	Svitzer Marine Limited	Tees Wharf Dockside Road Middlesbrough TS3 6AB	Post
183.	Tata Steel UK Limited	18 Grosvenor Place London SW1X 7HS	Post
184.	TDG (UK) Limited	Distribution House Eldon Way Crick Northampton NN6 7SL	Post
185.	TDG (UK) Limited	Distribution House Eldon Way Crick Northampton NN6 7SL	Post
186.	Team Valve and Rotating Services Limited	Furman House Sharp Road Kendal LA9 6RU	Post
187.	Team Valve and Rotating Services Limited	Furman House Sharp Road Kendal LA9 6RU	Post

No.	Consultee	Address	Sent via
188.	Teesside Environmental Trust	19 Yarm Road Stockton-on-Tees TS18 3NJ	Post
189.	Teesside Gas & Liquids Processing	Suite 1 7th Floor 50 Broadway London SW1H 0BL	Post
190.	Teesworks Limited	Venture House Aykley Heads Durham DH1 5TS	Post
191.	Telefonica O2 UK Limited	Highdown House Yeoman Way Worthing BN99 3HH	Post
192.	The Executor of Ernest Binns	198 Church Lane Eston Middlesbrough TS6 9QZ	Post
193.	The King's Most Excellent Majesty in Right of His Crown C/O: The Crown Estate Commissioners	1 St James's Market London SW1Y 4AH	Post
194.	The Mission to Seafarers	First Floor 6 Bath Place London EC2A 3JE	Post
195.	The Royal Society For The Protection Of Birds	The Lodge Potton Road Sandy SG19 2DL	Post
196.	The Shlomo Memorial Fund Limited	New Burlington House 1075 Finchley Road London NW11 0PU	Post
197.	Thornton Facilities Management Limited	One St Peter's Square Manchester M2 3DE	Post
198.	Trevor Massey	1 Grange Road Norton Stockton-On-Tees TS20 2NS	Post
199.	Truckfix NE Limited	Lee Road Middlesbrough TS6 7AR	Post
200.	Enva Wood Recycling Middlesborough Limited	Brailwood Road Bilsthorpe Newark	Post

No.	Consultee	Address	Sent via
		NG22 8UA	
201.	Uniqema Limited	Cowick Hall Snaith Goole DN14 9AA	Post
202.	Venator Materials UK Limited	Titanium House Hanzard Drive Wynyard Park Stockton On Tees TS22 5FD	Post
203.	Aurorium UK Limited	C/O Womble Bond Dickinson (UK) LLP The Spark Draymans Way Newcastle Helix Newcastle Upon Tyne NE4 5DE	Post
204.	Vodafone Limited	Vodafone House The Connection Newbury RG14 2FN	Post
205.	WGIF (Jersey) Trustee I Limited	Third Floor Gaspe House 66-72 The Esplanade St. Helier JE1 2LH	Post
206.	WGIF (Jersey) Trustee II Limited	Third Floor Gaspe House 66-72 The Esplanade St. Helier JE1 2LH	Post
207.	Whitetower Energy Limited	First Floor Templeback 10 Temple Back Bristol BS1 6FL	Post
208.	Wilton Recovery Limited	14 Troutsdale Close Troutsdale Close Yarm TS15 9UW	Post
209.	Wilton Remediation LLP	183 First Floor St Vincent Street Glasgow G2 5QD	Post
210.	Yara UK Limited	Pocklington Industrial Estate Pocklington York YO42 1DN	Post
211.	Ylem Energy Limited	Edison House Daniel Adamson Road Salford	Post

No.	Consultee	Address	Sent via
		Manchester M50 1DT	
212.	Zeneca Limited	3 Fontmell Close Coventry CV2 2JY	Post
213.	A.W. Jenkinson (Forest Products) Limited	Clifton Moor Clifton Penrith CA10 2EY	Post
214.	Air Products (Chemicals) Teesside Limited	Hersham Place Technology Park Molesey Road Walton On Thames KT12 4RZ	Post
215.	Augean North Limited	4 Rudgate Court Walton Wetherby Wetherby LS23 7BF	Post
216.	Elba Securities Limited	Ogier House 44 The Esplanade St Helier Jersey JE4 9WG	Post
217.	Falck Fire Services UK Limited	3 More London Riverside London SE1 2AQ	Post
218.	Industrial Chemicals Group Limited	Titan Works Hogg Lane Grays Essex RM17 5DU	Post
219.	Lighthouse Green Fuels Limited	1 Cornhill London EC3V 3NR	Post
220.	National Grid PLC	1-3 Strand London WC2N 5EH	Post
221.	North Sea Midstream Partner Limited	28-29 Dover Street London W1S 4NA	Post
222.	OCU Group Limited	Artemis House 6-8 Greek Street Stockport SK3 8AB	Post
223.	Statera Energy Limited	4th Floor 80 Victoria Street London SW1E 5JL	Post
224.	The Land Restoration Trust	7 Birchwood One Dewhurst Road Birchwood Warrington	Post

No.	Consultee	Address	Sent via
		WA3 7GB	
225.	Virgin Media Limited	500 Brook Drive Reading RG2 6UU	Post
226.	Kellas Midstream Limited	Suite 1 7th Floor 50 Broadway London SW1H 0BL	Post
227.	Teesside Gas Processing Plant Limited	Suite 1 7th Floor 50 Broadway London SW1H 0BL	Post

Non-prescribed Bodies

No.	Consultee	Address	Sent via
1.	South Tees Development Corporation	Teesside Airport Business Suite Teesside International Airport Darlington DL2 1NJ	Post and Email
2.	RNLI	West Quay Road Poole BH15 1HZ	Post
3.	RNLI	The Boathouse Ferry Road Hartlepool TS24 0RY	Post
4.	Tees Valley Transport Committee Tees Valley Combined Authority	Teesside Airport Business Suite Teesside International Airport, Darlington DL2 1NJ	Post
5.	Tees Valley Wildlife Trust	Mangrove Heritage Centre Boosbeck Saltburn Redcar and Cleveland TS12 3BZ	Post and Email
6.	Tees Valley Nature Partnership	Mangrove Heritage Centre Boosbeck Saltburn Redcar and Cleveland TS12 3BZ	Post and Email
7.	R S P B	The Lodge Potton Road Sandy	Post and Email

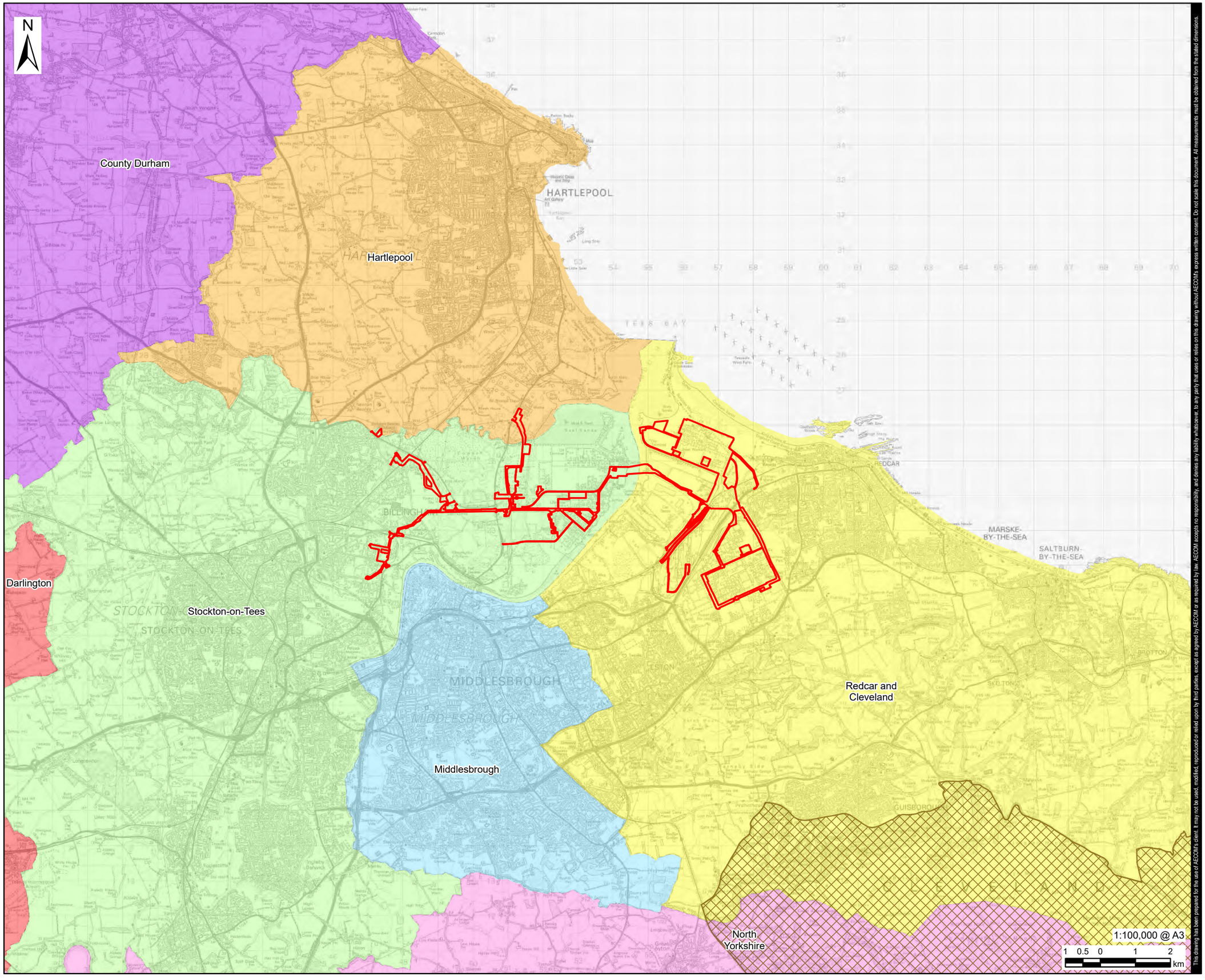
No.	Consultee	Address	Sent via
		SG19 2DL	
8.	River Tees Port Health Authority	Belmont House Rectory Lane Guisborough TS14 7FD	Post and Email
9.	Centre for Environment, Fisheries and Aquaculture Science	Lowestoft Laboratory Pakefield Road Lowestoft Suffolk NR33 0HT	Post
10.	NEIFCA	Town Hall Quay Road Bridlington East Riding of Yorkshire YO16 4LP	Post and Email
11.	English Heritage (Head Office and Northeast)	The Engine House Fire Fly Avenue Swindon SN2 2EH	Post
12.	South Gare Fisherman's Association	96 Broadway East Redcar TS10 5DP	Post
13.	Teesside Environmental Trust	19 Yarm Road Eaglescliffe Stockton-on-Tees TS18 3NJ	Post
14.	Save Our Steel Group	Email only	Email
15.	Chemoxy International Limited c/o Seqens UK Limited	All Saints Refinery Cargo Fleet Road Middlesbrough TS6 3AF	Post
16.	Croda Chemicals Internationsl	Cowick Hall Snaith Goole East Yorkshire DN14 9AA	Post
17.	Venator Materials UK Limited	Titanium House Hanzard Drive Wynyard Park Stockton-on-Tees	Post

No.	Consultee	Address	Sent via
		TS22 5FD	
18.	Hartlepool Rural Neighbourhood Plan Working Group	Email only	Email
19.	Hartlepool Mayoral Development Corporation	c/o Tees Valley Combined Authority Teesside Airport Business Suite Teesside International Airport Darlington, DL2 1NJ	Post
20.	Middlesbrough Mayoral Development Corporation	c/o Tees Valley Combined Authority Teesside Airport Business Suite Teesside International Airport Darlington, DL2 1NJ	Post
21.	Teesmouth Field Centre	c/o Hartlepool Power Station, Tees Road Hartlepool TS25 2BZ	Email
22.	EDF Hartlepool Nuclear Power Station	Hartlepool Power Station, Tees Road Hartlepool TS25 2BZ	Post

Additional Parties

No.	Consultatee	Address	Sent Via
1.	Aurorium UK Limited c/o: Womble Bond Dickinson (UK) Llp	The Spark Drayman's Way Newcastle Helix Newcastle Upon Tyne NE4 5DE	Post

APPENDIX 7.2: LOCAL AUTHORITY BOUNDARY PLAN



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AECOM

PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site
- North Yorkshire National Park

Unitary Authority

- County Durham
- Darlington
- Hartlepool
- Middlesbrough
- North Yorkshire
- Redcar and Cleveland
- Stockton-on-Tees

NOTES

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ISSUE PURPOSE

Consultation Report

PROJECT NUMBER

60689030

FIGURE TITLE

Local Authority Boundaries

FIGURE NUMBER

Figure 1

Revision: 0 Drawn: CL Checked: MAB Approved: IC Date: 2024-03-14

Filename: \\na.aecomnet.com\lfs\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\Public Consultation Materials\H2Teesside_Public_Consultation_Materials.aprx

APPENDIX 7.3: LISTS OF POLITICAL STAKEHOLDERS FOR FIRST AND SECOND CONSULTATIONS

H2Teesside - First Consultation

1-to-1 Briefings

Stakeholder Name	Stakeholder Organisation	Role	Sub-Category	Briefing type
MPs - Constituencies directly impacted by RLB				
Jacob Young	Redcar and Cleveland constituency	Redcar and Cleveland MP	MP for Redcar and Cleveland	Offer of 121
Jill Mortimer	Hartlepool Constituency	Hartlepool MP	MP for Hartlepool	Offer of 121
Alex Cunningham	Stockton North Constituency	Stockton North MP	MP for Stockton North	Offer of 121
Tees Valley Combined Authority - Directly impacted by RLB				
Ben Houchen	Tees Valley Combined Authority	Tees Valley Combined Authority Mayor	Mayor of Tees Valley	Offer of 121
Redcar and Cleveland Borough Council				
Councillor Alec Brown	Redcar and Cleveland Borough Council	Leader of the Council, Kirkleatham Ward	Local Councillor	Offer of 121
Stockton on Tees Borough Council				
Councillor Bob Cook	Stockton on Tees Borough Council	Leader of the Council, Norton South Ward	Leader of Council	Offer of 121
Hartlepool Borough Council				
Councillor Mike Young	Hartlepool Borough Council	Leader of the Council, Rural West Ward	Leader of Council	Offer of 121

H2Teesside - First Consultation

VIP Webinar Invites

Stakeholder Name	Stakeholder Organisation	Ward	Stakeholder Type	Sub-Category	Briefing type	Contact via?
Coucillor Alec Brown	Redcar and Cleveland Borough Council	Kirkleatham Ward	Political	Ward Councillor (LAB)	121	Email
Councillor Carrie Richardson	Redcar and Cleveland Borough Council	Newcomen Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Carl Quartermain	Redcar and Cleveland Borough Council	Coatham Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Lynn Pallister	Redcar and Cleveland Borough Council	Grangetown Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Lynne Rynn	Redcar and Cleveland Borough Council	Coatham Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Cllr Izzy Attwood	Redcar and Cleveland Borough Council	South Bank Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Cllr Neil Bendelow	Redcar and Cleveland Borough Council	South Bank Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Debbie Powlay	Redcar and Cleveland Borough Council	Dormanstown Ward Councillor	Political	Ward Councillor (IND)	VIP webinar	Email
Councillor Ceri Cawley	Redcar and Cleveland Borough Council	Dormanstown Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Marian Fairley	Redcar and Cleveland Borough Council	Kirkleatham Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Peter Grogan	Redcar and Cleveland Borough Council	Kirkleatham Ward Councillor	Political	Ward Councillor (CON)	VIP webinar	Email
Councillor Janine Craven	Redcar and Cleveland Borough Council	Newcomen Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Chris Jones	Redcar and Cleveland Borough Council	West Dyke Ward Councillor	Political	Ward Councillor (LIBD)	VIP webinar	Email
Councillor Malcolm Head	Redcar and Cleveland Borough Council	West Dyke Ward Councillor	Political	Ward Councillor (LIBD)	VIP webinar	Email
Councillor Mary Ovens	Redcar and Cleveland Borough Council	West Dyke Ward Councillor	Political	Ward Councillor (LIBD)	VIP webinar	Email
Councillor Niall Hargreaves	Redcar and Cleveland Borough Council	Wheatlands Ward Councillor	Political	Ward Councillor (CON)	VIP webinar	Email
Councillor Jack Symon	Redcar and Cleveland Borough Council	Wheatlands Ward Councillor	Political	Ward Councillor (CON)	VIP webinar	Email
Councillor Christopher Massey	Redcar and Cleveland Borough Council	Eston Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor David Taylor	Redcar and Cleveland Borough Council	Eston Ward Councillor	Political	Ward Councillor (CON)	VIP webinar	Email
Councillor Stephen Martin	Redcar and Cleveland Borough Council	Eston Ward Councillor	Political	Ward Councillor (CON)	VIP webinar	Email
Councillor Adam Brook	Redcar and Cleveland Borough Council	Grangetown Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
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Councillor Robert Clark	Redcar and Cleveland Borough Council	Teesville Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Margaret O'Donoghue	Redcar and Cleveland Borough Council	Teesville Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Cllr Paul McInnes	Redcar and Cleveland Borough Council	Normanby Ward Councillor	Political	Ward Councillor (CON)	VIP webinar	Email
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Councillor Jade Lavan	Redcar and Cleveland Borough Council	Zetland Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Carole Morgan	Redcar and Cleveland Borough Council	Ormesby Ward Councillor	Political	Ward Councillor (LIBD)	VIP webinar	Email
Councillor Glyn Nightingale	Redcar and Cleveland Borough Council	Ormesby Ward Councillor	Political	Ward Councillor (LIBD)	VIP webinar	Email
Councillor Ian Hart	Redcar and Cleveland Borough Council	Ormesby Ward Councillor	Political	Ward Councillor (LIBD)	VIP webinar	Email
Councillor Bob Cook	Stockton on Tees Borough Council	Norton South Ward	Political	Leader of Council	121	Email
Councillor Clare Gamble	Stockton on Tees Borough Council	Billingham North Ward	Political		VIP webinar	Email
Councillor Katie Weston	Stockton on Tees Borough Council	Billingham South Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Paul Weston	Stockton on Tees Borough Council	Billingham South Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Michelle Bendalow	Stockton on Tees Borough Council	Billingham East Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Mick Stoker	Stockton on Tees Borough Council	Billingham East Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Marc Besford	Stockton on Tees Borough Council	Billingham North Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Clare Gamble	Stockton on Tees Borough Council	Billingham North Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Ann McCoy	Stockton on Tees Borough Council	Billingham Central Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor Barry Woodhouse	Stockton on Tees Borough Council	Billingham Central Ward Councillor	Political	Ward Councillor (LAB)	VIP webinar	Email
Councillor David Reynard	Stockton on Tees Borough Council	Billingham West and Wolviston Ward Councillor	Political	Ward Councillor (CON)	VIP webinar	Email
Councillor Marcus Vickers	Stockton on Tees Borough Council	Billingham West and Wolviston Ward Councillor	Political	Ward Councillor (CON)	VIP webinar	Email

Councillor Mike Young	Hartlepool Borough Council	Rural West Ward	Political	Leader of Council	121	Email
Councillor Gordan Cranney	Hartlepool Borough Council	Seaton Ward Councillor	Political	Ward Councillor (IND)	VIP webinar	Email
Councillor Sue Little	Hartlepool Borough Council	Seaton Ward Councillor	Political	Ward Councillor (IND)	VIP webinar	Email
Councillor Leisa Smith	Hartlepool Borough Council	Seaton Ward Councillor	Political	Ward Councillor (IND)	VIP webinar	Email
Councillor Bob Buchan	Hartlepool Borough Council	Fens and Greatham Ward Councillor	Political	Ward Councillor (CON)	VIP webinar	Email
Councillor Jim Lindridge	Hartlepool Borough Council	Fens and Greatham Ward Councillor	Political	Ward Councillor (IND)	VIP webinar	Email
Councillor Philip Holbrook	Hartlepool Borough Council	Fens and Greatham Ward Councillor		Ward Councillor (LAB & Co-operative party)	VIP webinar	Email
Dee Smith	Billingham Town Council (Stockton on Tees Borough Council area)	Clerk and Responsible Financial Officer	Parish Councillor	Parish Council Clerk and Responsible Financial Officer	VIP webinar	Email
Councillor Clare Gamble	Billingham Town Council (Stockton on Tees Borough Council area)	Chairman	Parish Councillor	Parish Council Chairman	VIP webinar	Email
Christine Nowell	Newton Bewley Parish Council (Hartlepool Borough Council area)	Chairman	Parish Councillor	Parish Council Chairman	VIP webinar	Email
John Cunliffe	Greatham Parish Council (Hartlepool Borough Council area)	Clerk	Parish Councillor	Parish Council Clerk	VIP webinar	Email
Brian Walker	Greatham Parish Council (Hartlepool Borough Council area)	Chair	Parish Councillor	Parish Council Clerk	VIP webinar	Email

H2Teesside - Second Consultation

1-to-1 Briefings

Stakeholder Name	Stakeholder Organisation	Role	Sub-Category	Briefing type
MPs - Constituencies directly impacted by RLB				
Jacob Young	Redcar and Cleveland constituency	Redcar and Cleveland MP	MP for Redcar and Cleveland	Offer of 121
Jill Mortimer	Hartlepool Constituency	Hartlepool MP	MP for Hartlepool	Offer of 121
Alex Cunningham	Stockton North Constituency	Stockton North MP	MP for Stockton North	Offer of 121
Tees Valley Combined Authority - Directly impacted by RLB				
Ben Houchen	Tees Valley Combined Authority	Tees Valley Combined Authority Mayor	Mayor of Tees Valley	Offer of 121
Redcar and Cleveland Borough Council				
Councillor Alec Brown	Redcar and Cleveland Borough Council	Leader of the Council, Kirkleatham Ward	Local Councillor	Offer of 121
Stockton on Tees Borough Council				
Councillor Bob Cook	Stockton on Tees Borough Council	Leader of the Council, Norton South Ward	Leader of Council	Offer of 121
Hartlepool Borough Council				
Councillor Mike Young	Hartlepool Borough Council	Leader of the Council, Rural West Ward	Leader of Council	Offer of 121

H2Teesside - Second Consultation

VIP Webinar Invites

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Councillor Carrie Richardson	Redcar and Cleveland Borough Council	Newcomen Ward Councillor	Political	Ward Councillor (LAB)	Email
Councillor Carl Quartermain	Redcar and Cleveland Borough Council	Coatham Ward Councillor	Political	Ward Councillor (LAB)	Email
Councillor Lynn Pallister	Redcar and Cleveland Borough Council	Grangetown Ward Councillor	Political	Ward Councillor (LAB)	Email
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Cllr Izzy Attwood	Redcar and Cleveland Borough Council	South Bank Ward Councillor	Political	Ward Councillor (LAB)	Email
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Councillor Ceri Cawley	Redcar and Cleveland Borough Council	Dormanstown Ward Councillor	Political	Ward Councillor (LAB)	Email
Councillor Marian Fairley	Redcar and Cleveland Borough Council	Kirkleatham Ward Councillor	Political	Ward Councillor (LAB)	Email
Councillor Peter Grogan	Redcar and Cleveland Borough Council	Kirkleatham Ward Councillor	Political	Ward Councillor (CON)	Email
Councillor Janine Craven	Redcar and Cleveland Borough Council	Newcomen Ward Councillor	Political	Ward Councillor (LAB)	Email
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Councillor Mick Stoker	Stockton on Tees Borough Council	Billingham East Ward Councillor	Political	Ward Councillor (LAB)	Email
Councillor Marc Besford	Stockton on Tees Borough Council	Billingham North Ward Councillor	Political	Ward Councillor (LAB)	Email
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Councillor Jim Lindridge	Hartlepool Borough Council	Fens and Greatham Ward Councillor	Political	Ward Councillor (IND)	Email
Councillor Philip Holbrook	Hartlepool Borough Council	Fens and Greatham Ward Councillor		Ward Councillor (LAB & Co-operative party)	Email

APPENDIX 8.1: PRE-APPLICATION CONSULTATION NOTICE JUNE 2023

Public consultation

H2Teesside Share your views

At bp, we're backing hydrogen and carbon capture and storage to help Teesside and the UK decarbonise its industry. As part of this commitment we're planning H2Teesside – a new blue hydrogen production facility. The purpose of this consultation is to seek your views on the proposals for the project. Your feedback will inform our continuing development of the project until we're ready to submit our application for development consent.

How to find out more

- **Online:** Visit our project website where you can view our consultation documents at **h2teesside.co.uk**
- **Come talk to us at one of our consultation events:** We're holding a number of face-to-face consultation events where you can view our consultation materials and speak to members of the project team (see event dates below)
- **Online webinar:** We're holding a webinar on 28th September at 18:00. Register in advance to join the webinar at **h2teesside.co.uk**
- **Information point:** Visit one of these public venues to to view our consultation documents on a publicly accessible computer:
  - Redcar and Cleveland House, TS10 1RT
  - Stockton Central Library, TS18 1TU
  - Hartlepool Civic Centre, TS24 8AY

Come to a consultation event

Seaview Business Centre, Redcar
Thursday 21st September | 15:00-19:00
Saturday 23rd September | 13:00-17:00
Turner Street, Redcar, TS10 1AZ

St Aidan's Church Hall, Billingham
Monday 25th September | 15:00-19:00
Friday 6th October | 15:00-19:00
Tintern Ave, Stockton-on-Tees, Billingham, TS23 2DF

Inspire2Learn, South Bank
Thursday 5th October | 15:00-19:00
South Bank, Normanby Road, Middlesborough, TS6 9AE

TunedIn, Redcar
Thursday 12th October | 15:00-19:00
Majuba Road, Redcar, TS10 5BJ

How to respond

You can respond to this consultation in the following ways:

- **Online:** Fill in an online version of this form at **h2teesside.co.uk**
- **Form: Fill in the form** and hand it in at one of our consultation events
- **Freepost:** Send your completed form to **FREEPOST H2Teesside**
- **Email:** Send your response to **info@h2teesside.net**

If you are unable to provide feedback through the channels above, please call us on **0800 0803028** to discuss alternative ways of sharing your views.

The closing date for responses is 23:59 on 26th October 2023

Consultation Ads

H2 Teesside

September 2023

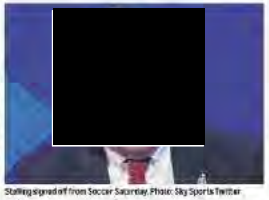
C&EA
communications and external affairs



Jeff Stelling was given a standing ovation by the pundits during his final programme. Photo: Sky Sports Twitter.

Elton leads Jeff tributes

Pamela Bilalova



Stelling signed off from Soccer Saturday. Photo: Sky Sports Twitter

Hartlepool-born Jeff Stelling has signed off from Sky Sports Soccer Saturday after anchoring the programme for almost 30 years.

Former Hartlepool Mail reporter Jeff Stelling announced his intention to stand down back in April and earmarked the final day of the Premier League season on Sunday as his last show.

During his final programme, he revealed he had messages of support from the likes of Gordon Strachan and Neil Warnock, plus a phone call from Elton John, former chairman and director of Watford.

Stelling, 68, an unapologetic Hartlepool fan who frequently celebrated their goals on Soccer Saturday, said: "Somebody asked me the other day if I'd ever been starstruck and yeah, I was starstruck when Elton John rang me at home to say 'Thank you very much for all you've done'.

"He said, 'Every week I watch the show and every week you tell me Watford are losing and every week you tell me Hartlepool are losing so I feel like we're kindred spirits. There's something in that, isn't there?'

After touching tributes from colleagues past and present in a video montage, Stelling was given a standing ovation by the panel pundits of Paul Merson, Clinton Morrison, Kris Boyd and Michael Dawson.

Stelling, who had planned to quit that year before reversing that decision, briefly hid his emotions with a mask of himself and quipped: "This is tricky because I've changed my mind – just kidding.

"I haven't changed my mind this time."

In his farewell message, the Hartlepool United Club president added: "It's been the best job that anybody could possibly have wished for. My wife takes great pleasure in saying 'You are the luckiest man ever to take a breath' and you know what? I didn't tell her this often but she's right.

"The principle success of Soccer Saturday is you lot at home, who have given us unswerving support – both for the programme and for me personally. So that's it. Soccer Saturday will be back next season. I'll be watching – when Hartlepool are not playing. From me, goodbye."

During his 30-plus years with Sky Sterling, who writes a monthly column for the Mail, also covered live snooker, darts, greyhound racing and pool.

Date set for trial

A trial has been set for a former Hartlepool recycling company accused of blame for a man's death.

Ward Recycling Limited, formerly of Windermere Road, Hartlepool, is charged with corporate manslaughter over the death of Dean Atkinson, 35, after sustaining injuries on the site in January 2020.

The company is accused of a number of Health and Safety failures, including failing to do its duty of care to provide and maintain a safe place of work and safe systems of work.

A trial lasting up to five days has been fixed for November.

That is despite the company no longer being in operation and in the control of liquidators.

The prosecution said it was considered the case is in the public interest.

Judge Howard Crowson entered a plea of not guilty on behalf of the company.

High hopes for creative cluster

"A lot of potential investment" is predicted for Hartlepool off the back of the town's growing creative industries cluster, with national broadcast organisations already in talks.

The sector was highlighted as a key area for growth at the latest meeting of the Hartlepool Development Corporation Board.

Work will build into developments around Church Street including the new state-of-the-art Northern Film and TV Studios.

Worth hosted its first major production last month.

It will also incorporate the planned production village nearby which has secured £26.5m in Levelling Up funding from Government to "catalyse" the town's fledgling screen industries sector.

Encouraging local politicians and local government chiefs have already been holding talks with the likes of BBC, ITV and Channel 4 over potential projects in the town.

Councillor Shaun Moore, Hartlepool Borough Council's cultural mayor and former leader, noted the work will have big benefits which they plan to tell residents more about.

He said: "There is a huge amount of hype and a lot of potential investment that will come off the back of this."

Conservative Tees Valley Mayor Ben Houchen, who chairs the board, said key productions were filmed across the Tees Valley over the past year, with more to come.

He said: "While we have the film studios, there's more value to be captured.

"It's what are the missing pieces of infrastructure that will drive value for us that we've got, so we're capturing more of that value here. We want to keep it all here together."

PAPER REVOLUTION

74% of paper and 83% of paper-based packaging is recycled into new products; one of the highest recycling rates of any material in Europe!

Scan for [illegible] and much more!

H2 Teesside

bp

Public consultation

H2Teesside Share your views

At bp, we're backing hydrogen and carbon capture and storage to help Teesside and the UK decarbonise its industry. As part of this commitment we're planning H2Teesside – a new blue hydrogen production facility. The purpose of this consultation is to seek your views on the proposals for the project. Your feedback will inform our continuing development of the project until we're ready to submit our application for development consent.

How to find out more

- **Online:** Visit our project website where you can view our consultation documents at h2teesside.co.uk
- **Come talk to us at one of our consultation events:** We're holding a number of face-to-face consultation events where you can view our consultation materials and speak to members of the project team (see event dates below)
- **Online webinar:** We're holding a webinar on 28th September at 18:00. Register in advance to join the webinar at h2teesside.co.uk
- **Information point:** Visit one of these public venues to view our consultation documents on a publicly accessible computer:
  - Redcar and Cleveland House, TS10 1RT
  - Stockton Central Library, TS18 1TU
  - Hartlepool Civic Centre, TS24 8AY

Come to a consultation event

Seaview Business Centre, Redcar
Thursday 21st September | 15:00-19:00
Saturday 23rd September | 13:00-17:00
Turner Street, Redcar, TS10 1AZ

Inspire2Learn, South Bank
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South Bank, Normanby Road, Middlesbrough, TS6 9AE

St Aidan's Church Hall, Billingham
Monday 25th September | 15:00-19:00
Friday 6th October | 15:00-19:00
Tintern Ave, Stockton-on-Tees, Billingham, TS23 2DF

Tunstall, Redcar
Thursday 12th October | 15:00-19:00
Majuba Road, Redcar, TS10 5BJ

How to respond

You can respond to this consultation in the following ways:

- **Online:** Fill in an online version of this form at h2teesside.co.uk
- **Form: Fill in the form** and hand it in at one of our consultation events
- **Freepost:** Send your completed form to **FREEPOST H2Teesside**
- **Email:** Send your response to info@h2teesside.net

If you are unable to provide feedback through the channels above, please call us on **0800 0803028** to discuss alternative ways of sharing your views.

The closing date for responses is 23:59 on 26th October 2023

Complaints over damp in homes

A COUNCIL said it received more than 250 complaints over damp and mould problems in private rented homes between 2020 and last year.

Redcar and Cleveland Council received 266 of the 280 complaints it received in the borough. 177 resulted in investigations by its officers.

As a result, 69 informal notices were served on landlords and owners, a report revealed.

The Government is undertaking a review of national guidance on the health impacts of damp and mould following the death of Awaab Ishak in Rochdale in 2020, with a view to issuing new guidance specifically tailored to the housing sector. Two-year-old Awaab suffered a cardiac arrest due to respiratory failure, caused by mould affecting his airway at a poorly ventilated one-bedroom flat he lived in with his parents. His family heard their relatives blamed for the damp and mould problem – even though their housing association had a backlog of hundreds of complaints about its properties. Lancaster City Secretary Michael Gove subsequently wrote to all local housing authorities requesting an assessment of damp and mould issues affecting privately rented properties in each council area.

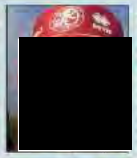
Redcar and Cleveland Council said it submitted just under two per cent of rental forms in the borough, of which there are about 10,600, but no added category was damp and mould hazards – the most serious – and just under two per cent category two hazards.

The council said a range of options in such instances were available, including working informally with owners, serving an improvement notice, or placing the home in question under "An urgent issue working informally with a property owner solves the issue, but we won't hesitate to take formal action where necessary."

Footballers fundraise in memory of Grace







Juniors' footballers from Brompton Rangers at the Riverside Stadium on Saturday. For right, Grace Sanderson

YOUNG footballers took to the Riverside Stadium on Saturday to raise money for charity in memory of a beloved teenager.

Four teams with players from both Brompton Juniors and North Yorkshire Soccer Academy joined the event at the home of Middlesbrough FC.

Two under 13s teams played a 75-minute match and two under 13 teams played an 60 minute match as part of a fundraiser for the Teenage Cancer Trust in memory of Grace Sanderson.

The 15-year-old, who was a student at Northallerton School, died in October, seven months after being diagnosed with leukaemia.

Her family have been part of the Brompton football family for many years, and Saturday's event, put on by George and John Harland from Harland Builders, has so far raised more than £1,000.

Organisers said the crowd were treated to some entertaining football across both matches with some lovely team and individual goals.

With 10 children from teams sponsored by Harland Builders playing at the Riverside, the event created memories that will last a lifetime.

To support the fund see www.justgiving.com/fundraising/annie-sanderson22.

Homes plea for Ukrainians

By Hannah Chapman
Editor

A CHARITY is holding a free public event next week in the hope of encouraging more people to consider hosting Ukrainians fleeing the war in their homeland.

Helping Heart North Yorkshire is hosting the information session in the upper room at Northallerton Town Hall from 7pm on Wednesday, June 7.

It is looking for people to come forward willing to host a Ukrainian person or family in their home for up to two months under the UK's Homes for Ukraine sponsorship scheme.

The charity said since the Russian invasion, Ukrainians have been arriving in the town and learning to adapt to life in the UK.

Some are now moving on from living with sponsors to independent accommodation and many have other family and friends, desperate to flee the ongoing war for temporary respite.

Next week's event will provide information about what being a sponsor entails, and will be attended by various local forces leads, as well as Ukrainians living in the area.

Representatives from some of the many organisations which offer a range of practical and emotional wellbeing support to both Ukrainians and their sponsors will also be present.

Sponsor Claire Bell said: "For us it was the most exhausting, but rewarding experience. Our guest embraced living in the UK and is keen to contribute to the country that 'rescued' her. The culture she comes from is very different to ours and her observations about the UK make us very proud of the country we live in and the kind hearteedness of the UK residents is complete strangers."

Admission is free to the event and everyone is welcome. Help-ing Heart North Yorkshire has been supporting Ukrainians since April 2022 and provides a fortnightly hub with refreshments at Northallerton Rugby Club, financial, practical and general wellbeing support to Ukrainians, host sponsors, as well as hosting social and special events.

To contact the charity, call coordinator Alison Shepherd on 07795 242855 or see www.helpingheartnorthyorkshire.co.uk



Australia's oldest band to play concert in North Yorkshire



Tanfield Town Band will play in Thirsk next week

THIRSK Methodist Church is about to host a unique brass band concert.

On Thursday, June 8 at 7.30pm, performers from the small town of Tanfield, in the Browns Valley near Adelaide, will give a charity concert as part of their current UK tour.

The prize-winning band, which is the oldest brass band in the Southern Hemisphere, has made the journey to take part in the great Whit Friday-based contest. Held annually in Saddleworth, it brings together in friendly competition a vast range of bands from all over the world and has been called "the greatest free show on earth".

Tanfield will be playing alongside all the famous names in brass, including all of the Yorkshire brass such as Black Dyke Mills Brighouse and Rastrick, and Grimethorpe Colliery.

Local composer Philip Wilby, internationally acclaimed for his brass band and choral compositions, has composed this with Holy Blood House in Thirsk, through which the charity has been able to book the band for free, as part of its UK tour.

Admission to the concert is free. Holy Blood will be providing interval refreshments and suggesting donations of £10 towards its work as a centre for health and pastoral care.

Drawing from the rich traditional German heritage of the Barossa Valley, the band includes players from across Australia and Europe.

Its repertoire varies through classical and brass band pieces, with a particular penchant for "normal" music. However, a typical programme might also include arrangements of songs by Tom Jones and Lady Gaga.

H2 Teesside

bp

Public consultation

H2Teesside Share your views

At bp, we're backing hydrogen and carbon capture and storage to help Teesside and the UK decarbonise its industry. As part of this commitment we're planning H2Teesside – a new blue hydrogen production facility. The purpose of this consultation is to seek your views on the proposals for the project. Your feedback will inform our continuing development of the project until we're ready to submit our application for development consent.

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St Aidan's Church Hall, Billingham
Monday 25th September | 15:00-19:00
Friday 6th October | 15:00-19:00
Tintern Ave, Stockton-on-Tees, Billingham, TS23 2DF

Tunedin, Redcar
Thursday 12th October | 15:00-19:00
Majuba Road, Redcar, TS10 5BJ

How to respond

You can respond to this consultation in the following ways:

- **Online:** Fill in an online version of this form at h2teesside.co.uk
- **Form: Fill in the form** and hand it in at one of our consultation events
- **Freepost:** Send your completed form to **FREEPOST H2Teesside**
- **Email:** Send your response to info@h2teesside.net

If you are unable to provide feedback through the channels above, please call us on **0800 0803028** to discuss alternative ways of sharing your views.

The closing date for responses is 23:59 on 26th October 2023

APPENDIX 8.2: PRE-APPLICATION ADVERTISEMENT DETAILS

Reimagining Teesside

OOH Teesside Airport, Darlington Station, and Paid Social

Teesside Airport

Additional large formats

STORY 1 - OP3

1728px

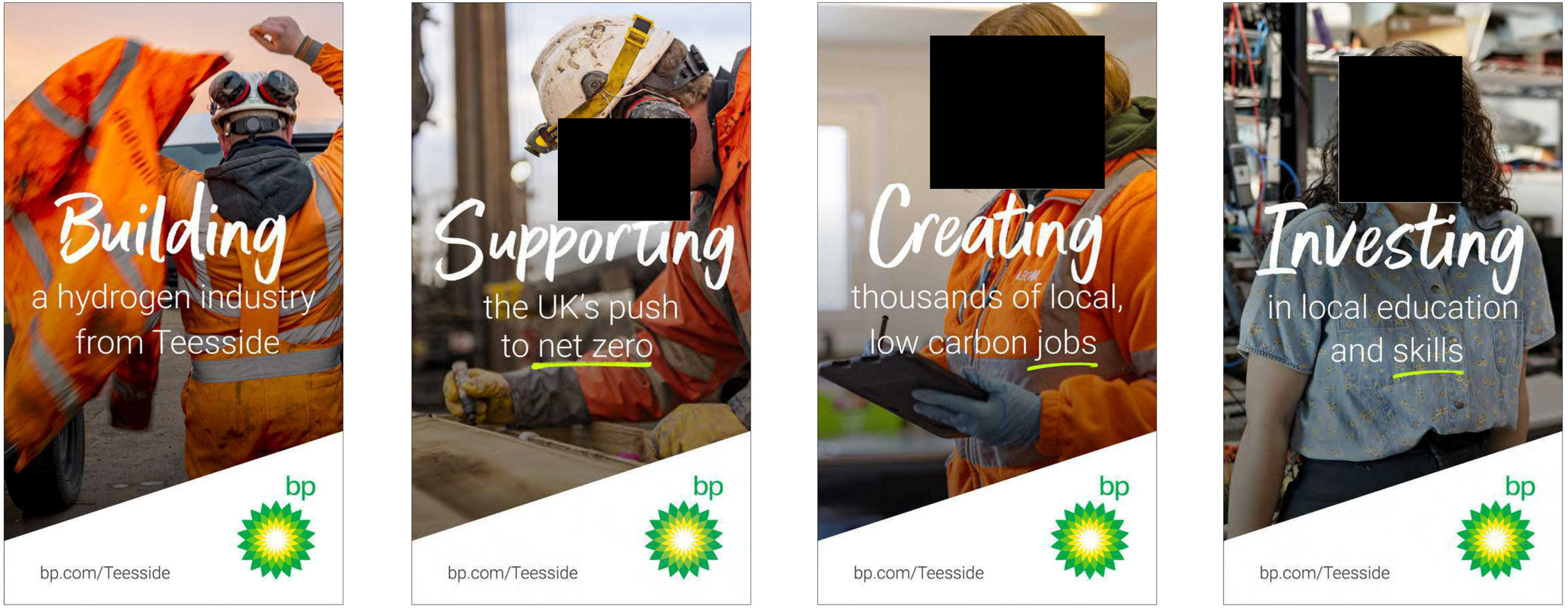


576px

Darlington Train Station | Teesside Airport

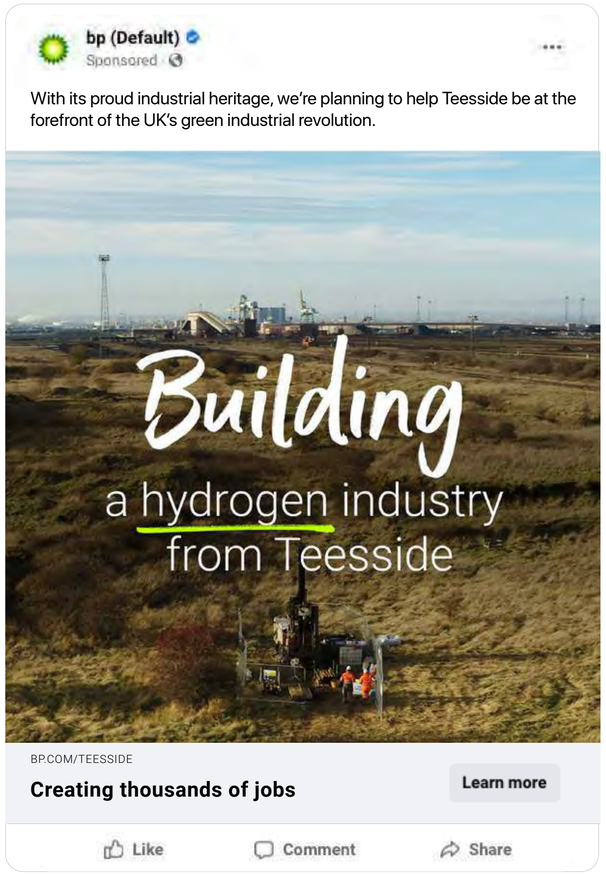
Check in TV displays (static and video)

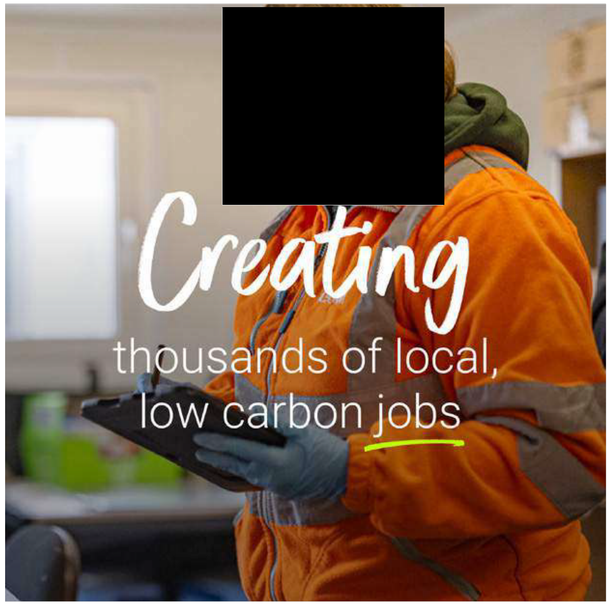
STORIES 1, 2,3,4



Social

Carousel



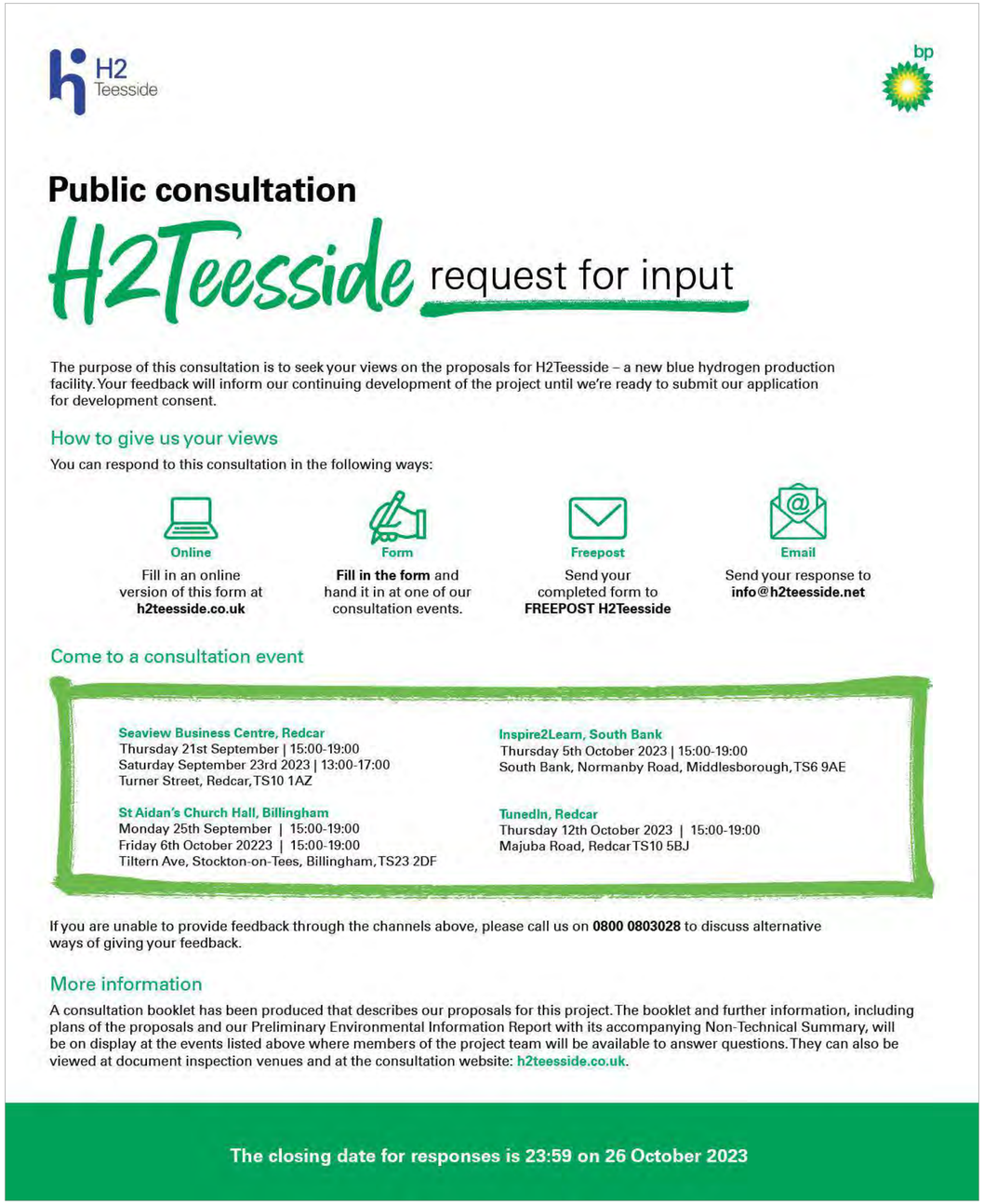






Consultation Ad

Print



H2 Teesside

bp

Public consultation

H2Teesside request for input

The purpose of this consultation is to seek your views on the proposals for H2Teesside – a new blue hydrogen production facility. Your feedback will inform our continuing development of the project until we're ready to submit our application for development consent.

How to give us your views

You can respond to this consultation in the following ways:

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Form
Fill in the form and hand it in at one of our consultation events.

Freepost
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Email
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If you are unable to provide feedback through the channels above, please call us on **0800 0803028** to discuss alternative ways of giving your feedback.

More information

A consultation booklet has been produced that describes our proposals for this project. The booklet and further information, including plans of the proposals and our Preliminary Environmental Information Report with its accompanying Non-Technical Summary, will be on display at the events listed above where members of the project team will be available to answer questions. They can also be viewed at document inspection venues and at the consultation website: h2teesside.co.uk.

The closing date for responses is 23:59 on 26 October 2023

APPENDIX 9.1: FIRST CONSULTATION - SECTION 46 NOTIFICATION DATED 11 SEPTEMBER 2023 AND LETTER TO PINS DATED 28 NOVEMBER 2023

Date: 11 September 2023
Your Ref: EN070010
Our Ref: 16373

6 New Bridge Street
London EC4V 6AB
T: 020 7489 0213
F: 020 7248 4743
E: info@dwdllp.com
W: dwdllp.com

National Infrastructure
The Planning Inspectorate
Temple Quay House
2 The Square
Bristol, BS1 6PN

FAO: [redacted]

By email to: [redacted]

Dear [redacted]

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

NOTIFICATION IN ACCORDANCE WITH SECTION 46 'DUTY TO NOTIFY SECRETARY OF STATE OF PROPOSED APPLICATION' OF THE PLANNING ACT 2008

I write on behalf of H2 Teesside Limited (the 'Applicant') in connection with the H2Teesside hydrogen project (the 'Project').

The Applicant is proposing to submit an application (the 'Proposed Application') seeking development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for the construction, operation and maintenance of the Project on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total.

DWD is the trading name of Dalton Warner Davis LLP, a Limited Liability Partnership. Registered in England No. OC304838.
Registered Office: 6 New Bridge Street, London EC4V 6AB.fdsa

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ, in Q1 2024.

This letter represents the Applicants' notification to the SoS of the proposed application pursuant to Section 46 'Duty to notify secretary of state of proposed application' of the PA 2008.

Section 42 'Duty to consult' of the PA 2008 requires prospective applicants for development consent to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. The Applicant will commence consultation pursuant to Section 42 by issuing a letter (the 'Consultation Letter') accompanied by consultation documents (the 'Consultation Documents') to the persons specified in the PA 2008 and in regulations made pursuant to the PA 2008 on or around 14 September 2023.

A notice pursuant to Section 48 'Duty to publicise' of the PA 2008 will be published as follows:

- Telegraph – 14 September 2023
- London Gazette – 14 September 2023
- Lloyds List – 15 September 2023
- Fishing News – 14 September 2023
- Northern Echo – 15 and 22 September 2023
- Teesside Gazette – 14 and 21 September 2023
- Darlington and Stockton Times – 14 and 21 September 2023

In accordance with Regulation 13 'Pre-application publicity under Section 48 (duty to publicise)' of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017' (the 'EIA Regulations'), the Applicant will also send a copy of the Section 48 Notice to the relevant consultation bodies and to any person notified to the Applicant in accordance with EIA Regulation 11(1((c) on or around 14 September 2023.

The deadline stated in the Consultation Letter (and on the Section 48 Notice) for the receipt of comments and representations on the Proposed Application is 11:59pm on 26 October 2023.

The Consultation Documents that are to be provided to the persons specified in the PA 2008 and in regulations made pursuant to the PA 2008 (and other 'non-prescribed persons') will be accessible via the download link that accompanies their Consultation Letter (and via the Project Website: www.h2teesside.co.uk) and include:

- a plan showing the extent of the Project Site edged in red and the development areas of the Site (Figures 4-1 to 4-8) of the Preliminary Environmental Information Report);
- the Preliminary Environmental Information Report and its Non-Technical Summary;
- a Consultation Brochure;

- a Consultation Leaflet, which has been sent to people living within the vicinity of the Project Site; and

- the Section 48 Notice that is being published.

The Consultation Documents, along with example versions of the Consultation Letter can be downloaded from the following fileshare link:

https://dwd.ctit.co/url/ucndwihs47v95qrx

I look forward to receiving the SoS's acknowledgement of the Applicant's notification to the SoS of the proposed application pursuant to Section 46 'Duty to notify secretary of state of proposed application' of the PA 2008. In the meantime, should you have any questions please do not hesitate to contact with myself or my colleague [redacted]

Yours sincerely,

[redacted]

[redacted]
Partner – Head of Planning
DWD – on behalf of H2 Teesside Limited
[redacted]

THE H2TEESSIDE PROJECT

The Planning Act 2008 – Sections 42, 47 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

NOTICE OF PUBLICATION OF A STATEMENT OF COMMUNITY CONSULTATION AND NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), whose registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application (the 'Proposed Application') to the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').

2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.

3. In accordance with Section 47(6) of the PA 2008, this notice publicises where and when the Statement of Community Consultation (SoCC) can be inspected. The SoCC sets out how the Applicant will undertake its consultation on the Proposed Application. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

    - Mid-point – 454538 524086
    - North – 451524 526936
    - East – 458780 521588

- South – 456998 520748
- West – 446938 521612

5. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.

6. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:

   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. hydrogen storage;
   g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.

10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Documents

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.

12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.

13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.

14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.

15. The consultation on the proposed application will take place between **14 September and 26 October 2023**.

16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk

17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge.

Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	**Opening Times**
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**. Responses received after this date may not be considered.

22. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited

14 September 2023

Date: 28th November 2023
Your Ref: EN070009
Our Ref: 16373

69 Carter Lane
London
EC4V 5EQ

[redacted]
Case Manager
National Infrastructure (Energy)
The Planning Inspectorate
Temple Quay House
2 The Square
Bristol, BS1 6PN

By email: [redacted]

Dear [redacted]

THE H2TEESSIDE PROJECT

LAND WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES, TEESSIDE AND WITHIN THE BOROUGH OF HARTLEPOOL, COUNTY DURHAM

SECTION 46 'DUTY TO NOTIFY THE SECRETARY OF STATE OF PROPOSED APPLICATION' OF THE PLANNING ACT 2008

I write on behalf of H2 Teesside Limited (the 'Applicant') in respect of the H2Teesside Project.

It has come to our attention that we did not notify the Secretary of State as required by Section 46 of the Planning Act 2008 (the 'PA 2008') on or before the Applicant commencing its Section 42 consultation in relation to the H2Teesside Project in September 2023.

The Applicant's intention had been to notify the Secretary of State (the 'SoS') in accordance with Section 46 of the PA 2008 on 11th September 2023 in advance of the Section 42 consultation commencing on 14th September 2023. A copy of the letter that was prepared to notify the SoS (the 'Section 46 Letter') and the Section 48 Notice that was to be enclosed with it accompanies this letter. Due to an administrative error, the Section 46 Letter was not then subsequently submitted to the SoS on or before the start of the Section 42 consultation on 14th September 2023, as it should have been.

Whilst it is acknowledged that Section 46 of the PA 2008 has not been complied with in this instance, we do not consider that any persons have been prejudiced by the failure to submit the Section 46 Letter to the SoS for the reasons set out below.

Section 46 only requires an applicant to supply the SoS with the same information that is to be provided to the Section 42 consultees on or before commencing the Section 42 consultation. There is no requirement for the SoS to review or approve that information, nor is there a requirement for the SoS to consent to the start of the Section 42 consultation. In addition, Section 46 does not require the applicant to notify the SoS before commencing the Section 47 community consultation or be sent any information that is required to be sent pursuant to a published Statement of Community Consultation ('SoCC'). Neither does Section 46 require the applicant to notify any other persons of the start of the consultation. Furthermore:

DWD is the trading name of DWD Property and Planning Limited a subsidiary of RSK Environment Limited.
Registered in England No. 15174312.
Registered Office: Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR

- The Applicant consulted the relevant persons pursuant to Section 42(a), (aa), (b) and (d) of the proposed application. Letters were sent to the Section 42 consultees on 14th September 2023 providing details of how to access the consultation documents and accompanied by a copy of the Section 48 Notice. The letters were also emailed to the Section 42 consultees where email addresses were available. The letters confirmed that comments should be submitted by 26th October 2023, therefore providing more than the required 30 days.
- A Section 42 Site Notice was erected at points around the proposed application site boundary. The notices were in place for the start of the Section 42 consultation and were inspected periodically throughout the consultation period to ensure that they remained in place.
- A Section 48 Notice was published in the Telegraph, London Gazette and Fishing News on 14th September, Lloyds List on 15th September, Northern Echo on 15th and 22nd September, Teesside Gazette on 14th and 21st September and Darlington and Stockton Times on 14th and 21st September.
- The community consultation was carried out over the period 14th September to 26th October 2023 in accordance with the SoCC published pursuant to Section 47(6). A range of consultation methods, as set out in the SoCC, were employed for the community consultation, including a newsletter and consultation brochure, social media, project website, virtual consultation room and face-to-face consultation events.

The Applicant therefore carried out a comprehensive and robust statutory consultation exercise in accordance with Sections 42, 48 and 47 of the PA 2008 during September and October 2023.

The Applicant will be carrying out further statutory consultation on the H2Teesside Project from mid-December 2023 until late January 2024. This relates to a number of changes to the proposed application site boundary, as a result of further design development and technical assessments. This further consultation will comprise the following:

- The issue of letters to all the identified Section 42 consultees providing details of how to access the relevant information. This includes the previous consultation documents, including the Preliminary Environmental Information Report ('PEIR'), as being still the preliminary environmental information of relevance to the H2Teesside Project, and an Update Leaflet referred to below, which will include information on the extent to which changes to the proposed application site alter the environmental effects reported in the PEIR.
- For land interests, the Section 42 letter will include information (including supporting plans) on how the proposed application site boundary has changed.
- Erection of Section 42 Site Notices around the proposed application site boundary.
- Publication of a further Section 48 Notice in the Telegraph, London Gazette, Fishing News and Lloyds List for one week and the Northern Echo, Teesside Gazette and Darlington and Stockton Times for two consecutive weeks.
- An Update Leaflet, which will accompany the Section 42 letters, to be uploaded to the project website, advertised on social media and updates to the project website, and through letters to residents and businesses within the Inner Consultation Zone defined in the published SoCC.

The Applicant will notify the SoS pursuant to Section 46 prior to commencing the further Section 42 consultation detailed above, meaning that the SoS will then have full access to the consultation material that has been available to Section 42 consultees at both stages of consultation.

The above approach has been endorsed by the Project's legal advisors, Pinsent Masons LLP, as a meaningful way to ensure that the Project's overall approach is consistent with Part 5 of Chapter 2 of the PA 2008.

Should you have any questions or require further clarification please do not hesitate to contact me.

Yours sincerely

[redacted]

[redacted]
Director – Head of Planning
DWD
[redacted]

Enc. Section 46 Letter dated 11 September 2023 & Section 48 Notice dated 14 September 2023

APPENDIX 9.2: FIRST CONSULTATION - PINS SECTION 46 ACKNOWLEDGEMENT DATED 29 NOVEMBER 2023

The Planning Inspectorate

National Infrastructure Planning
Temple Quay House
2 The Square
Bristol, BS1 6PN

Customer Services: 0303 444 5000
e-mail: [redacted]

By email only

Your Ref:

Our Ref: EN070009

Date: 29 November 2023

Dear [redacted]

Planning Act 2008 (as amended) – Section 46 and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 8

Proposed application by H2 Teesside Limited for an Order Granting Development Consent for the H2Teesside.

Acknowledgement of receipt of information concerning proposed application

Thank you for your letter of 28 November 2023 and the following documentation:

- Section 46 Notice
- Sections 42, 47 and 48 Combined Notice

I acknowledge that you have notified the Planning Inspectorate of the proposed application for an Order granting development consent for the purposes of section 46 of the Planning Act 2008 and supplied the information for consultation under section 42. The following reference number has been given to the proposed application, which I would be grateful if you would use in subsequent communications:

EN070009

I also acknowledge notification in accordance with Regulation 8(1)(b) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 that you propose to provide an environmental statement in respect of the Proposed Development.

I will be your point of contact for this application – contact details are at the top of this letter.

The role of the Planning Inspectorate in the application process is to provide independent and impartial advice about the procedures involved and to have open discussions with potential applicants, statutory bodies and others about the processes and requirements of

disability confident EMPLOYER

the regime. It is important that you keep us accurately informed of your timetable and any changes that occur.

We will publish advice we give to you or other Interested Parties on our website and, if relevant, direct parties to you as the Applicant. We are happy to meet at key milestones and/or provide advice as the case progresses through the Pre-application stage.

Once you have prepared draft documents we are able to provide technical advice, in particular on the draft Development Consent Order, Explanatory Memorandum, the Consultation Report and any draft Habitats Regulations Assessment. You may therefore wish to build this into your timetable.

In the meantime, you may wish to have regard to the guidance and legislation material provided on our website including the Infrastructure Planning (Fees) Regulations 2010 (as amended) and associated guidance, which you will need to observe closely in establishing the correct fee to be submitted at the successive stages of the application process.

When seeking to meet your pre-application obligations you should also be aware of your obligation under the current data protection legislation to process personal data fairly and lawfully.

If you have any further queries, please do not hesitate to contact me.

Yours sincerely

[redacted]

[redacted]
Case Manager

This decision was made by officials on behalf of the Secretary of State under delegated powers.

This communication does not constitute legal advice.

Please view our Privacy Notice before sending information to the Planning Inspectorate.

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APPENDIX 10.1: FIRST CONSULTATION - SECTION 42 LETTERS 1 AND 2

Date: 14 September 2023

Insert address

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

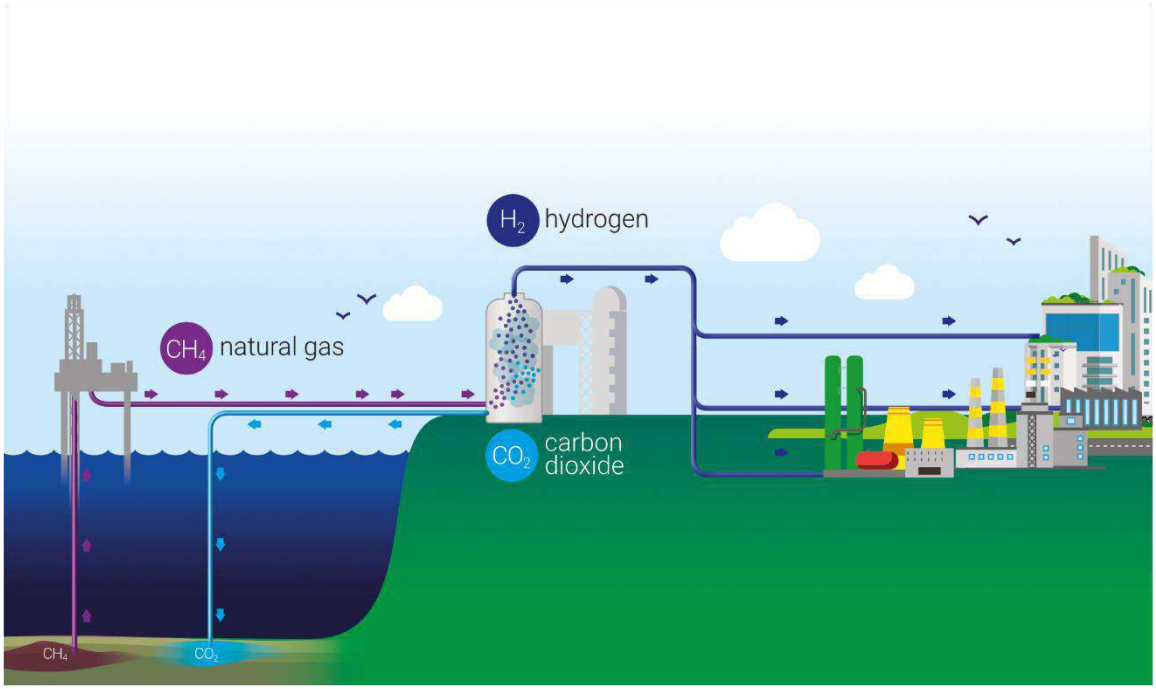
H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emission by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

bp is advancing a separate 'green' hydrogen project, known as HyGreen on Teesside. HyGreen will have an initial production capacity of circa 80 megawatts ('MW') electrical with the potential to expand up to 500 MW of hydrogen production. HyGreen will split water in an electrolyser to produce hydrogen and oxygen using renewable electricity. Some sections of the hydrogen distribution pipelines for HyGreen will be located in the same pipeline corridors as those for H2Teesside and the NEP onshore infrastructure. It is currently envisaged that all the elements of HyGreen will be consented separately under the Town and Country Planning Act 1990 and it has been the subject of a separate pre-application consultation exercise, which finished in early July 2023. It is envisaged that the application for HyGreen will be submitted in late 2023.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the Consultation Documents that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than 26 October 2023. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult' & EIA Regulation 13 'Pre-application publicity under Section 48 (duty to publicise)'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent (granted in the form of a 'Development Consent Order' or 'DCO') to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and other interests in land. The consultation must be carried out prior to submitting the application for development consent to PINS.

The Applicant has identified a number of persons and organisations, which it is required to consult for the purposes of Section 42 of the PA 2008. It has been determined that you or your organisation is, or may be, a 'prescribed person' for the purposes of Section 42. The Applicant therefore wishes to seek your views on its proposals for H2Teesside.

Section 48 of the PA 2008 'Duty to publicise' also requires applicants for development consent to publicise their proposed application by publishing a notice (a 'Section 48 Notice') once in a national newspaper, once in the London Gazette, and in the case of a project like H2Teesside that involves tidal waters in the UK marine area, in the Lloyds List and an appropriate fishing journal, and for at least two successive weeks in a local newspaper circulating in the vicinity of the land to which the project relates. The Section 48 Notice for the Project is being published as follows:

- Telegraph – 14 September 2023
- London Gazette – 14 September 2023
- Lloyds List – 15 September 2023
- Fishing News – 14 September 2023
- Northern Echo – 15 and 22 September 2023
- Teesside Gazette – 14 and 21 September 2023
- Darlington and Stockton Times – 14 and 21 September 2023

Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017' (the 'EIA Regulations') requires applicants, at the same time as publishing the Section 48 Notice, to send a copy of that notice to the 'consultation bodies' and to any person notified to the applicant by the SoS under EIA Regulation 11(1)(c).

A copy of the Section 48 Notice that is being published is therefore appended to this letter in accordance with EIA Regulation 13.

The Applicant

H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.

bp is already an established global hydrogen leader and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

The Project Site

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of

Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

- Mid-point – 454538 524086
- North – 451524 526936
- East – 458780 521588
- South – 456998 520748
- West – 446938 521612

Plans are available within the 'Consultation Documents' (see further below) showing the current Project Site boundary.

Project Description

The proposed application will, amongst other matters, seek development consent for the construction, operation and maintenance of:

- a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
- a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
- an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
- an electricity grid connection to provide power to the Project;
- water supply and treatment and wastewater infrastructure;
- hydrogen storage;
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.

Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS').

Consultation Documents

The Consultation Documents relating to the Project, including plans and maps showing the nature and location of the Project can be downloaded via the below link to a secure fileshare site:

https://dwd.ctit.co/url/ucndwihs47v95qrx

The Consultation Documents comprise:

- A plan showing the extent of the Project Site edged in red and the development areas of the Site (Figures 4-1 to 4-8 of the PEIR);
- the PEIR;
- the NTS of the PEIR;
- a Consultation Brochure;
- a Consultation Leaflet, which has been sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023.

The Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of when and where the consultation events are taking place can be found on the Project Website.

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the consultation documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: **www.h2teesside.co.uk**

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory

duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice

Date: 14 September 2023

Insert address

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008

H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

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The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be

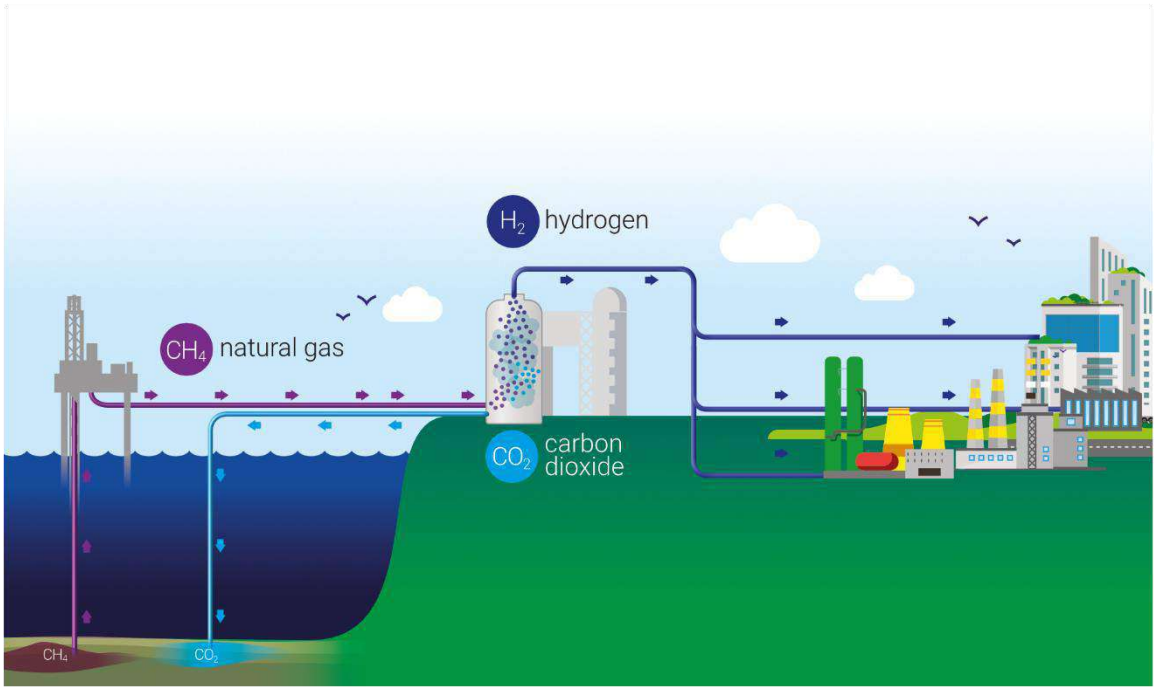
taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses on Teesside. By replacing the use of natural gas the Project will help existing heavy industry on Teesside reduce its carbon dioxide emissions, consistent with the Government's objective to decarbonise the UK economy and achieve its legally binding target of net zero greenhouse gas emission by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

bp is advancing a separate 'green' hydrogen project, known as HyGreen on Teesside. HyGreen will have an initial production capacity of circa 80 megawatts ('MW') electrical with the potential to expand up to 500 MW of hydrogen production. HyGreen will split water in an electrolyser to produce hydrogen and oxygen using renewable electricity. Some sections of the hydrogen distribution pipelines for HyGreen will be located in the same pipeline corridors as those for H2Teesside and the NEP onshore infrastructure. It is currently envisaged that all the elements of HyGreen will be consented separately under the Town and Country Planning Act 1990 and it has been the subject of a separate pre-application consultation exercise, which finished in early July 2023. It is envisaged that the application for HyGreen will be submitted in late 2023.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the Consultation Documents that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than 26 October 2023. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and other interests in land. The consultation must be carried out prior to submitting the application for development consent to PINS.

Although you do not fall within any of the categories of person specified by the PA 2008 and in regulations made pursuant to the Act, the Applicant considers that you may still have an interest in the Project and accordingly wishes to seek your views on its proposals for H2Teesside.

The Applicant

H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.

bp is already an established global hydrogen leader and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

The Project Site

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Plans are available within the 'Consultation Documents' (see further below) showing the current Project Site boundary.

Project Description

The proposed application will, amongst other matters, seek development consent for the construction, operation and maintenance of:

- a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
- a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
- an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
- an electricity grid connection to provide power to the Project;
- water supply and treatment and wastewater infrastructure;
- hydrogen storage;

- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

The hydrogen production plant and its associated and ancillary development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.

Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS').

Consultation Documents

The Consultation Documents relating to the Project, including plans and maps showing the nature and location of the Project can be downloaded via the below link to a secure fileshare site:

https://dwd.ctit.co/url/ucndwihs47v95qrx

The Consultation Documents comprise:

- A plan showing the extent of the Project Site edged in red and the development areas of the Site (Figures 4-1 to 4-8 of the PEIR);
- the PEIR;
- the NTS of the PEIR;
- a Consultation Brochure;
- a Consultation Leaflet, which has been sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023.

The Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of when and where the consultation events are taking place can be found on the Project Website.

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the consultation documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice

APPENDIX 10.2: FIRST CONSULTATION – SECTION 42 SITE NOTICE AND SITE NOTICE LOCATIONS PLAN

THE H2TEESSIDE PROJECT

The Planning Act 2008 – Sections 42 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), whose registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application (the 'Proposed Application') to the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').

2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.

3. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

    - Mid-point – 454538 524086
    - North – 451524 526936
    - East – 458780 521588
    - South – 456998 520748
    - West – 446938 521612

5. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.

6. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:

    a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
    b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
    c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
    d. an electricity grid connection to provide power to the Project;
    e. water supply and treatment and wastewater infrastructure;
    f. hydrogen storage;
    g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
    h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
    i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.

10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

Consultation Documents

11. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.

12. The consultation on the proposed application will take place between **14 September and 26 October 2023**.

13. The Consultation Documents (which comprise the PEIR, a Non-Technical Summary of the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk

14. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the consultation documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

15. Digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	**Opening Times**
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

16. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address

where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

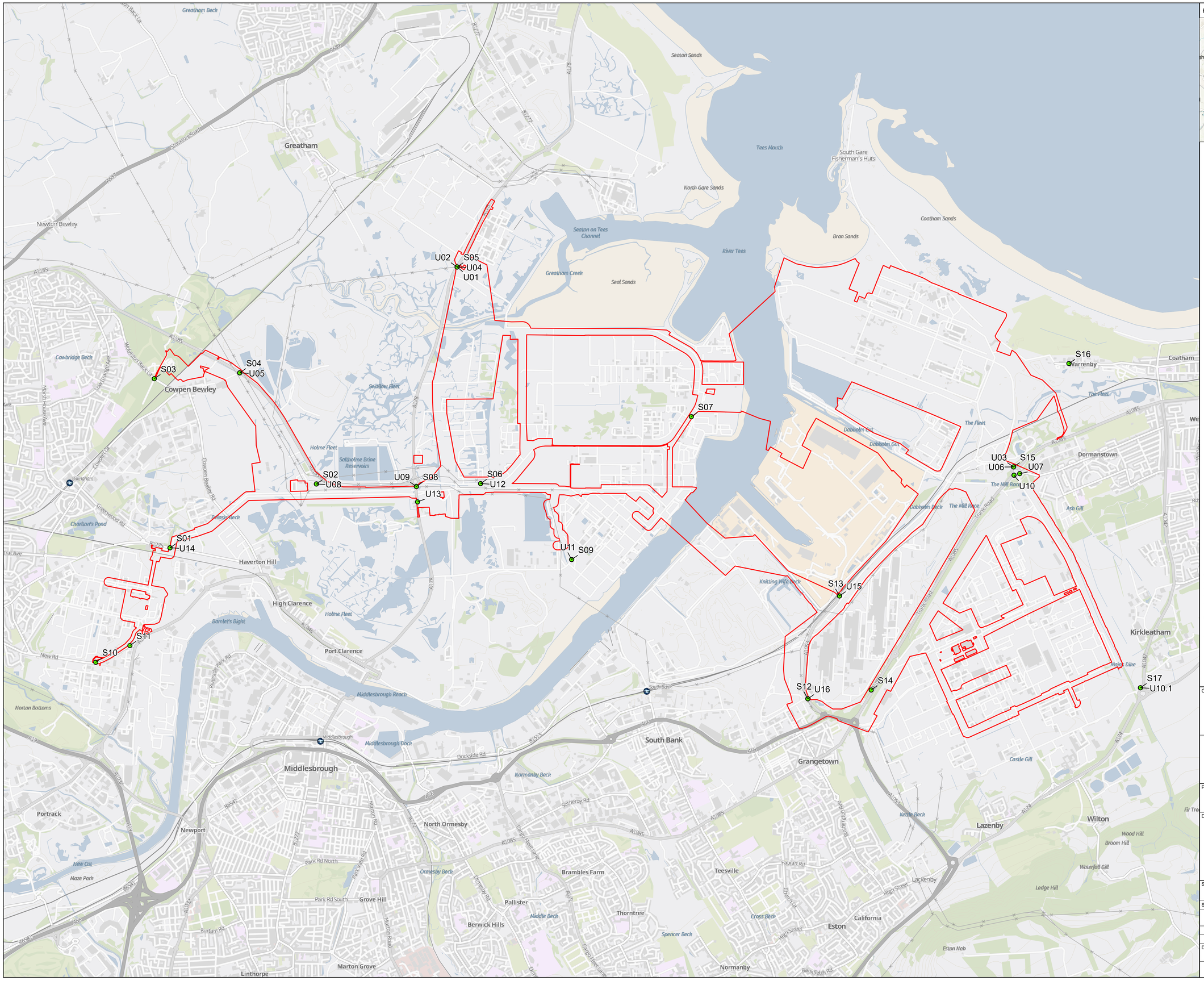
17. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

18. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**. Responses received after this date may not be considered.

19. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited

14 September 2023



KEY PLAN



Key

- Notice Locations
- Order Limits

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Client: H2 Teesside

N

Designer: Ardent

Project: H2 TEESIDE

Drawing Title: SITE NOTICE PLAN OVERVIEW

Status	Revision
DRAFT	000
	Date 01/09/2023
Scale 1:20,000 @ A1	Spatial Reference System: British National Grid

0 250 500 1,000 1,500 2,000 Metres

Drawn By	Checked By	Approved By
J.NEYE-SWIFT	N/A	J.WITHINGTON

Drawing reference: 073_ARDG_H2T_Notice_Overview

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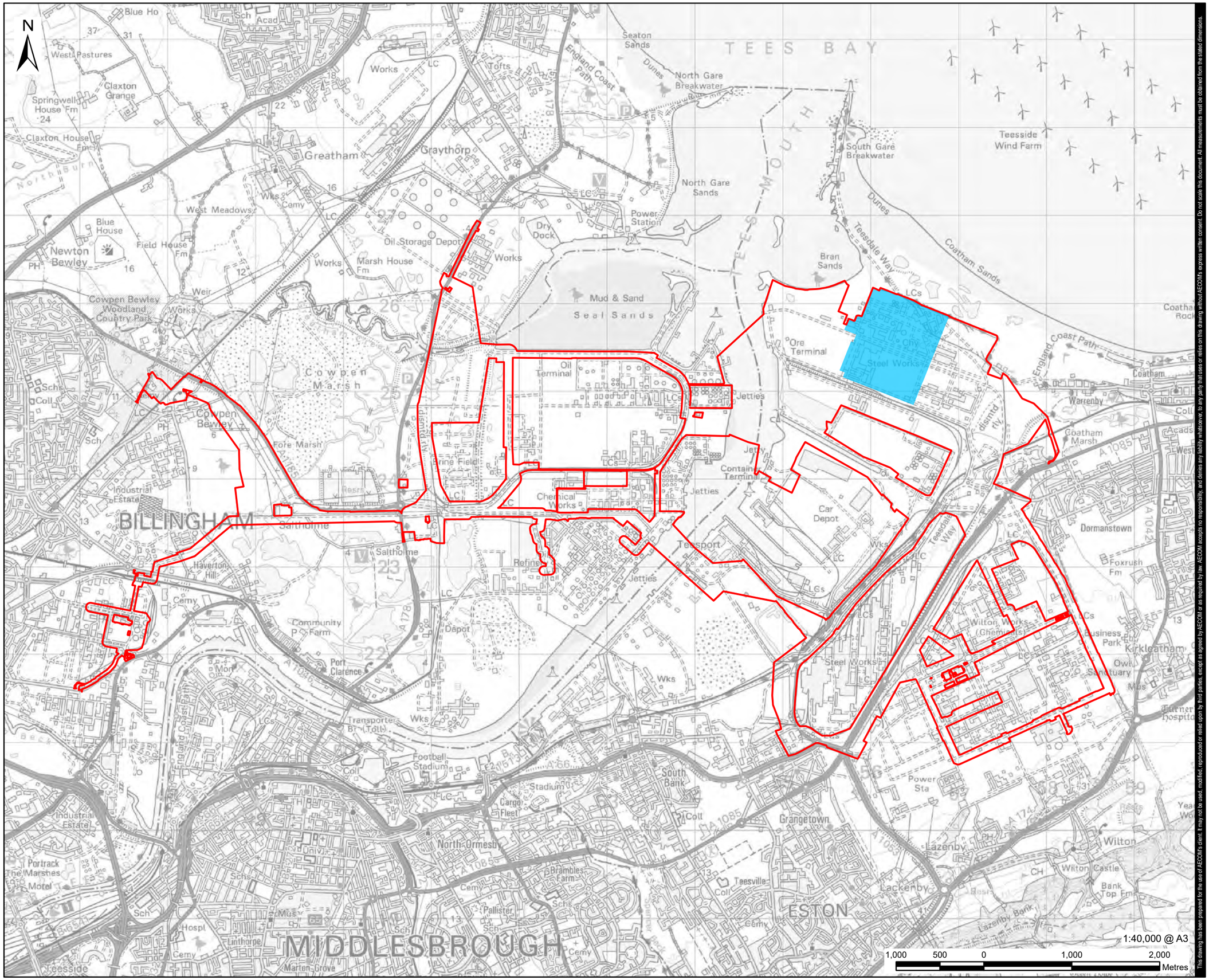
Plot Date: 09 January 2024 14:18
File Name: C:\Users\JakeN\Ardent Management Ltd\Projects - Aecom - H2 Teesside\P16 - GIS & CAD Files\073_ARDG_Teesside\ArcPro Projects\Notice Plans\ARDG_Teeside_Site_Notices.aprx

APPENDIX 10.3: FIRST CONSULTATION – PLANS, CONSULTATION LEAFLET AND BROCHURE AND PRELIMINARY ENVIRONMENTAL INFORMATION REPORT AND NON-TECHNICAL SUMMARY

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04

Filename: \\na.aecomnet.com\ls\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_ProposedDevelopment.aprx



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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

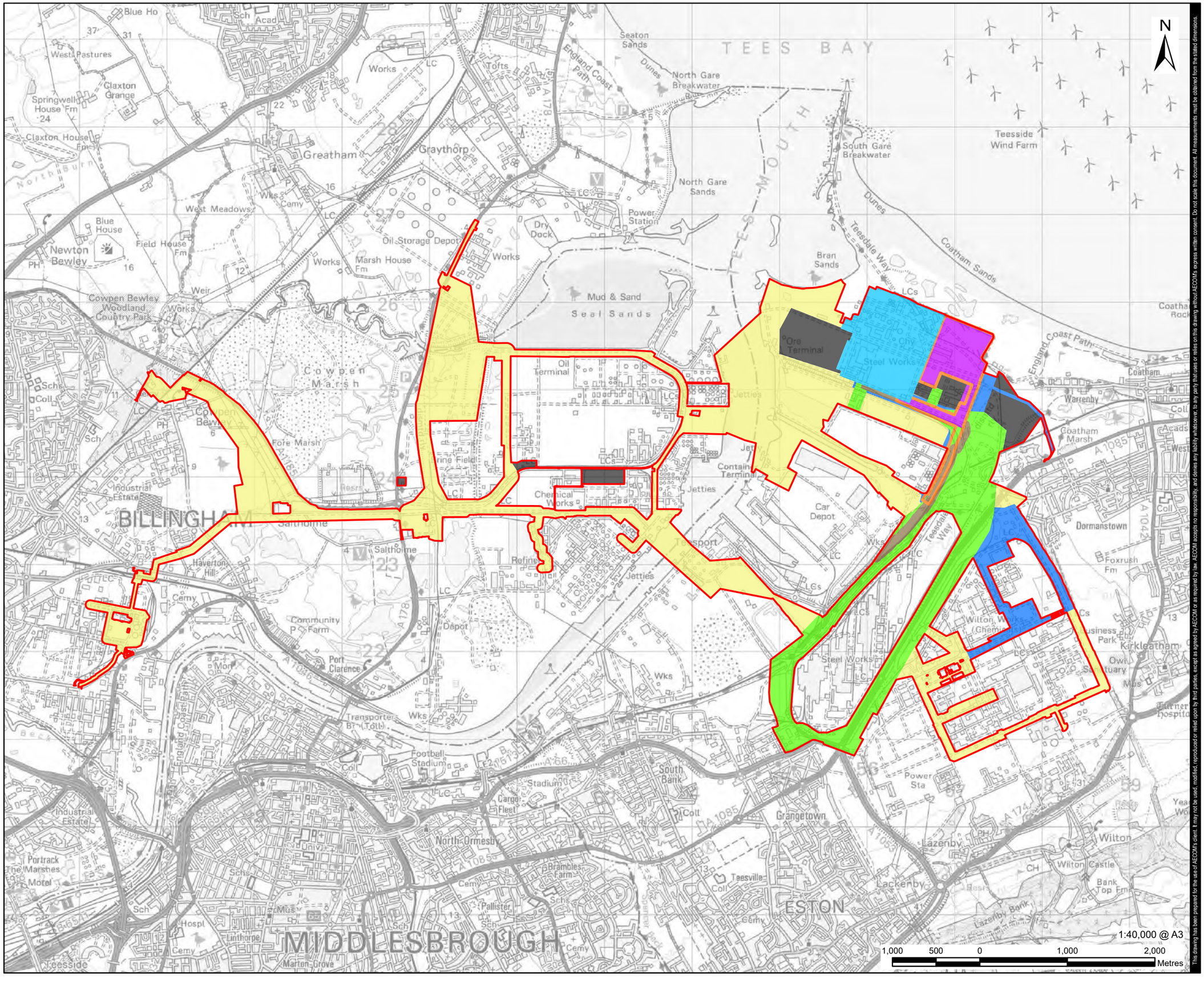
Proposed Development Site Boundary (including location of the Main Site)

FIGURE NUMBER

Figure 4-1

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04

Filename: \\ra.aecomnet.com\fs\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP0011\VOL 1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_ProposedDevelopment.aprx



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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Main Site
- CO_2 Export Corridor
- Electrical Connection Corridor
- Hydrogen Pipeline Corridor
- Indicative Temporary Construction Laydown Areas
- Natural Gas Connection Corridor
- Other Gases Connection Corridor (O_2 and N_2)
- Water Connection Corridor

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

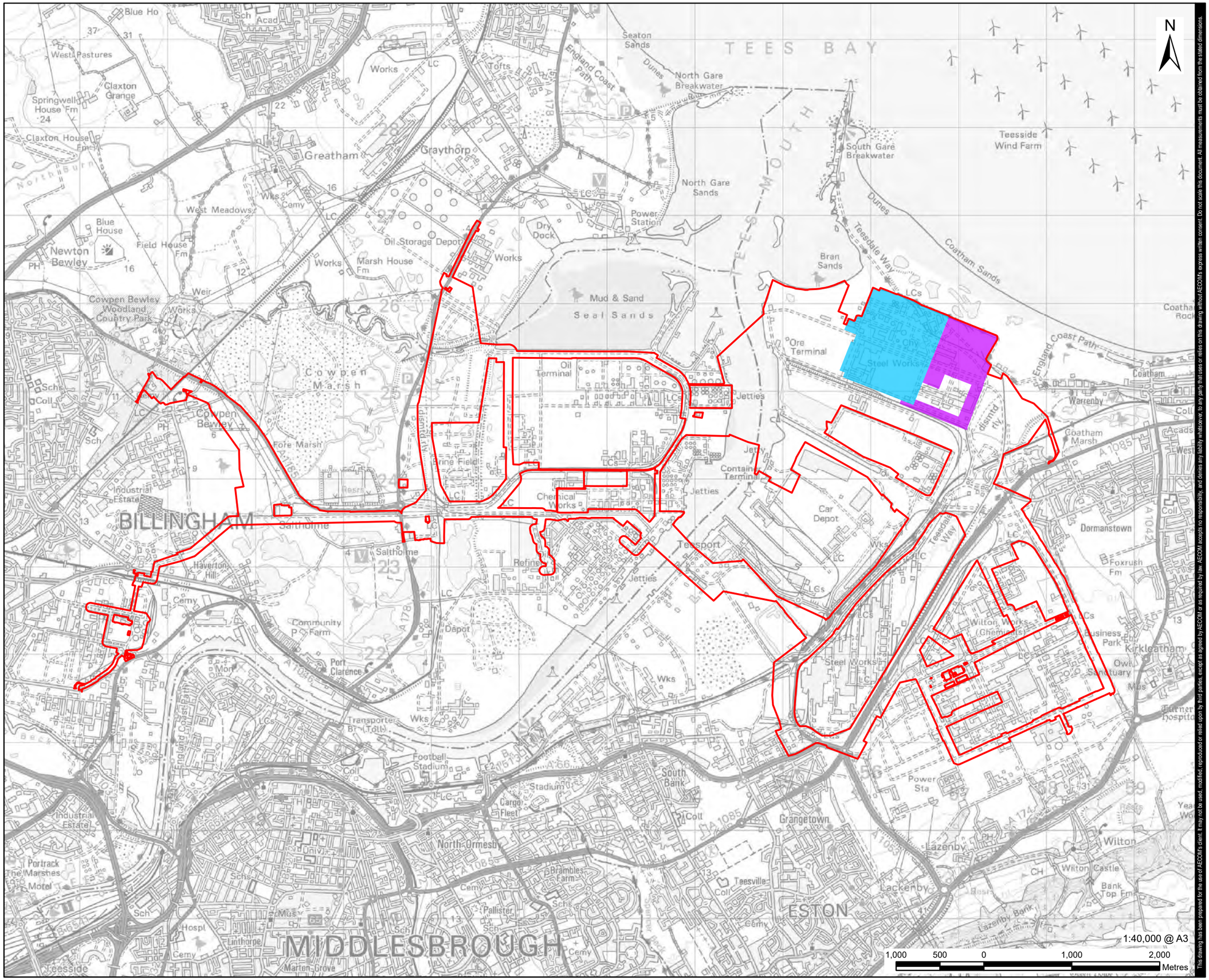
Parts of the Proposed Development Site

FIGURE NUMBER

Figure 4-2

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04

Filename: \\na.aecomnet.com\ls\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_ProposedDevelopment.aprx



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H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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100 Embankment,
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Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- CO_2 Export Corridor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

CO_2 Export Corridor

FIGURE NUMBER

Figure 4-3

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04

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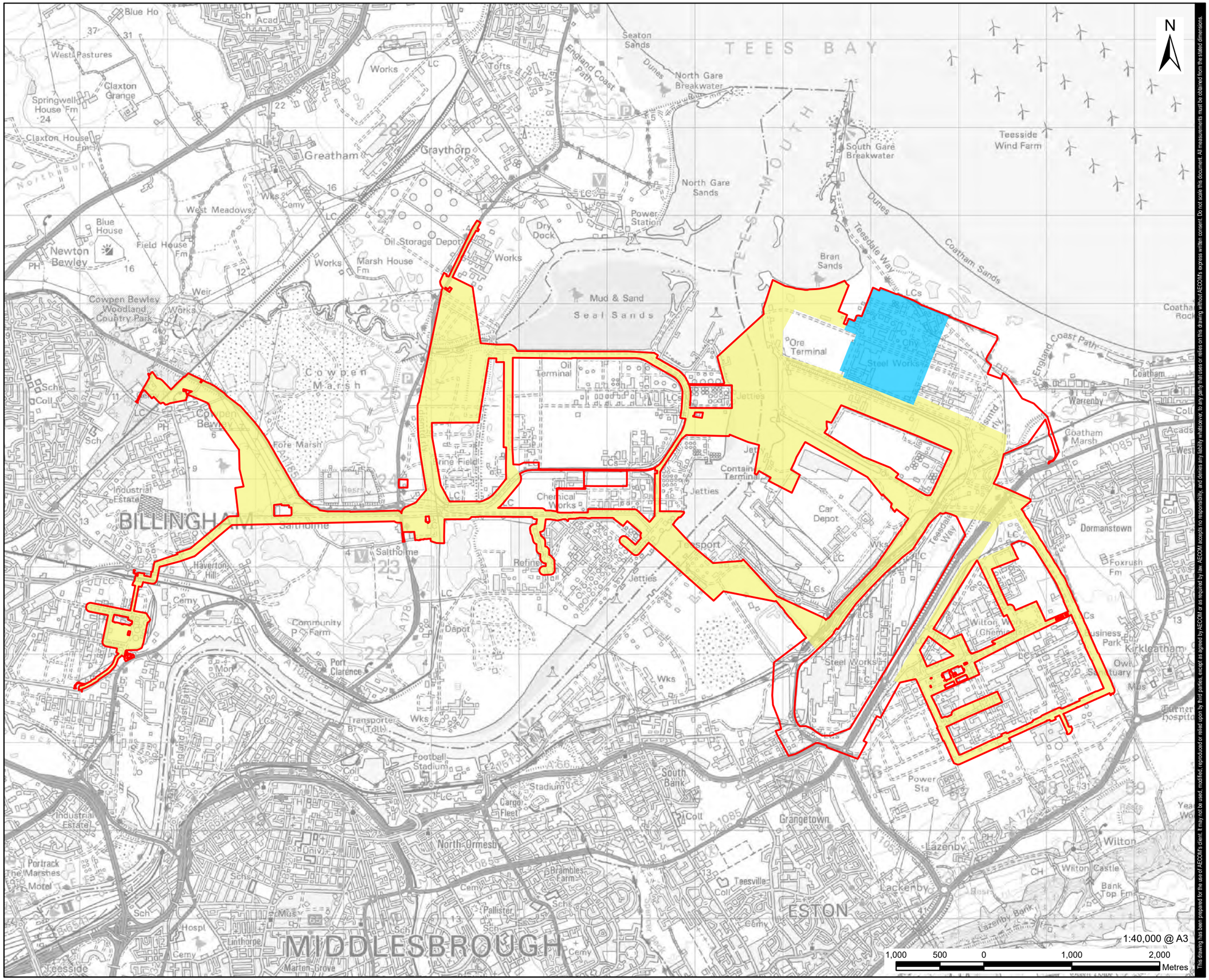

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- Hydrogen Pipeline Corridor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Hydrogen Pipeline Corridor

FIGURE NUMBER

Figure 4-4

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04

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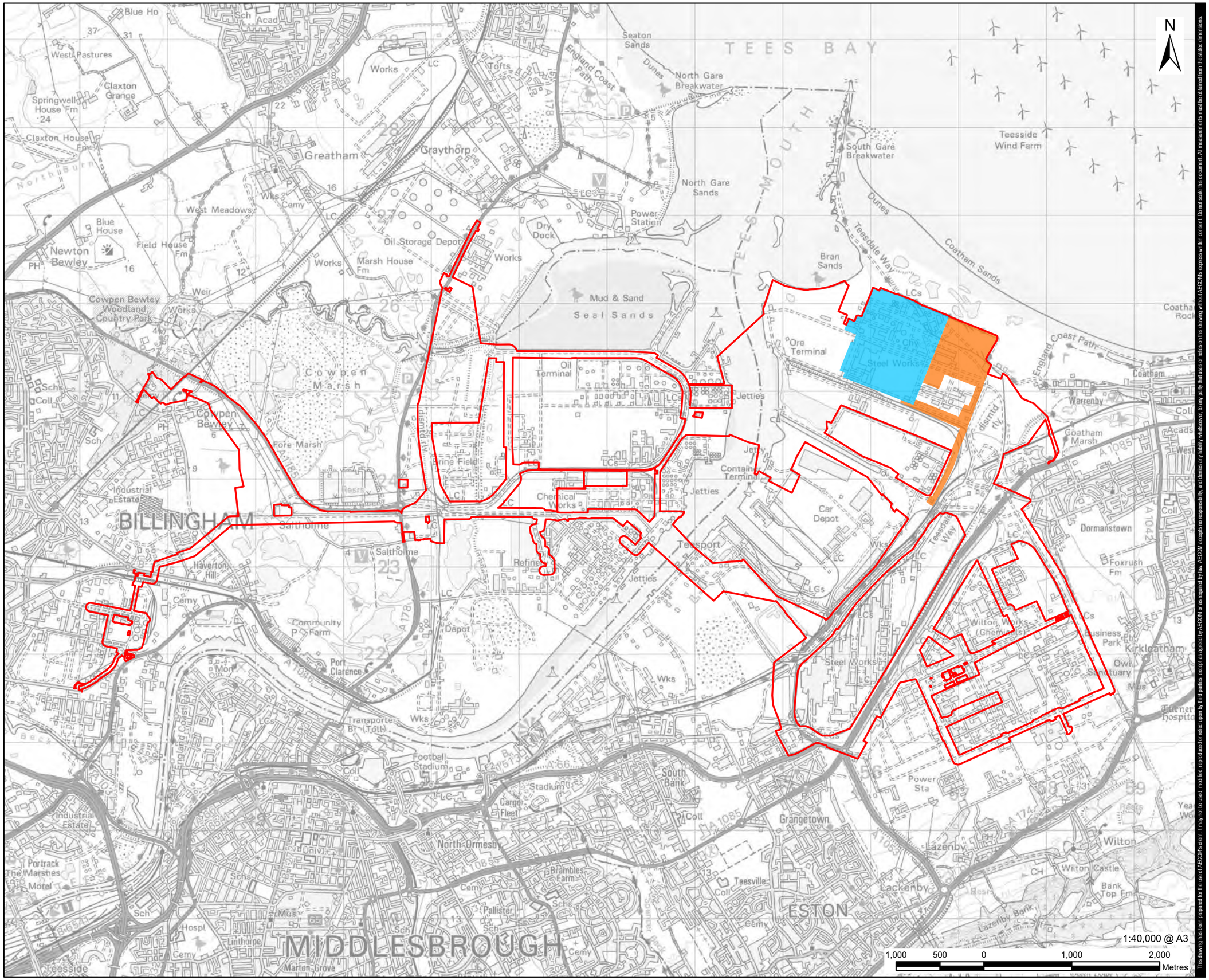

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- Natural Gas Connection Corridor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Natural Gas Connection Corridor

FIGURE NUMBER

Figure 4-5

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04

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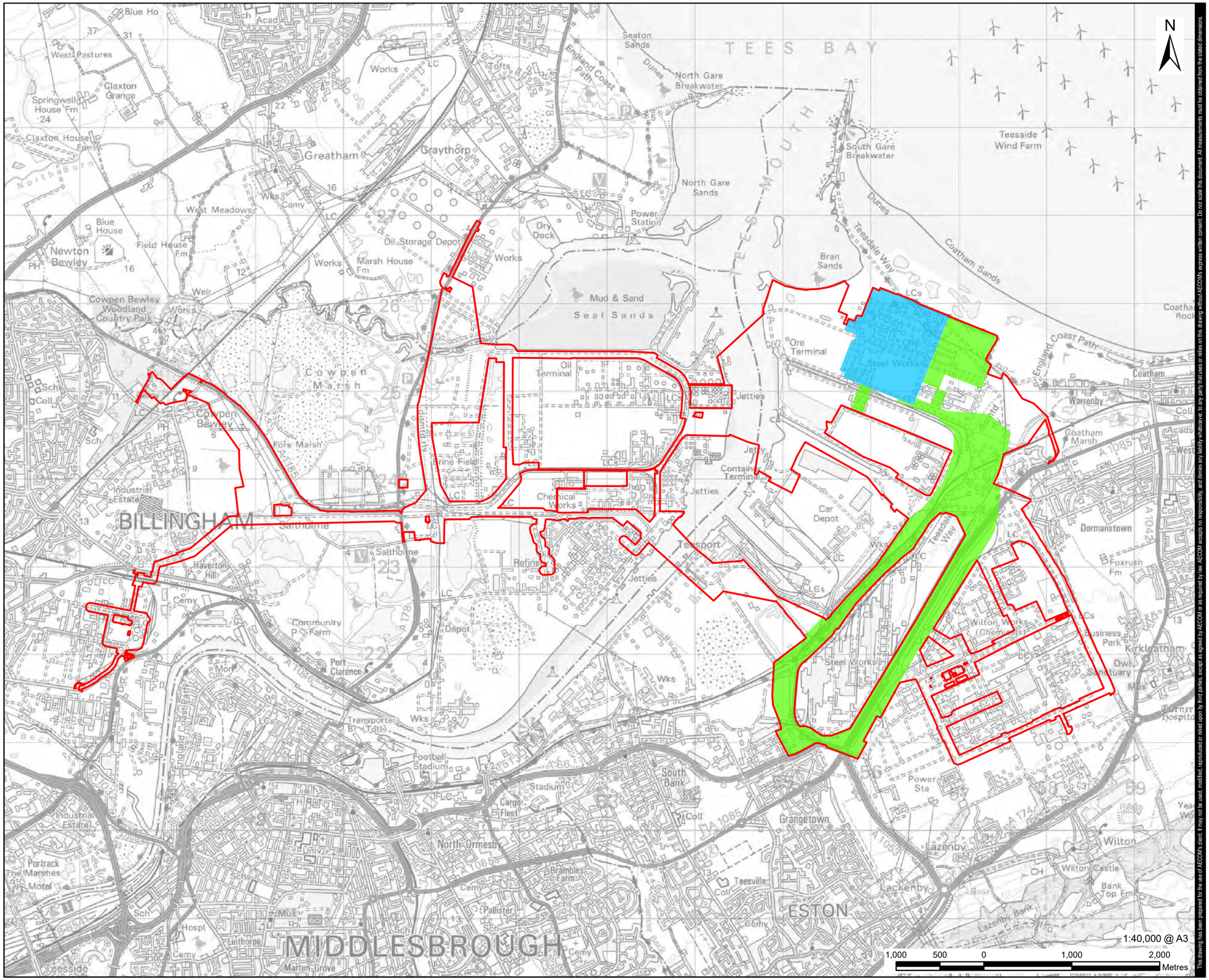

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- Electrical Connection Corridor

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Electrical Connection Corridor

FIGURE NUMBER

Figure 4-6

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04

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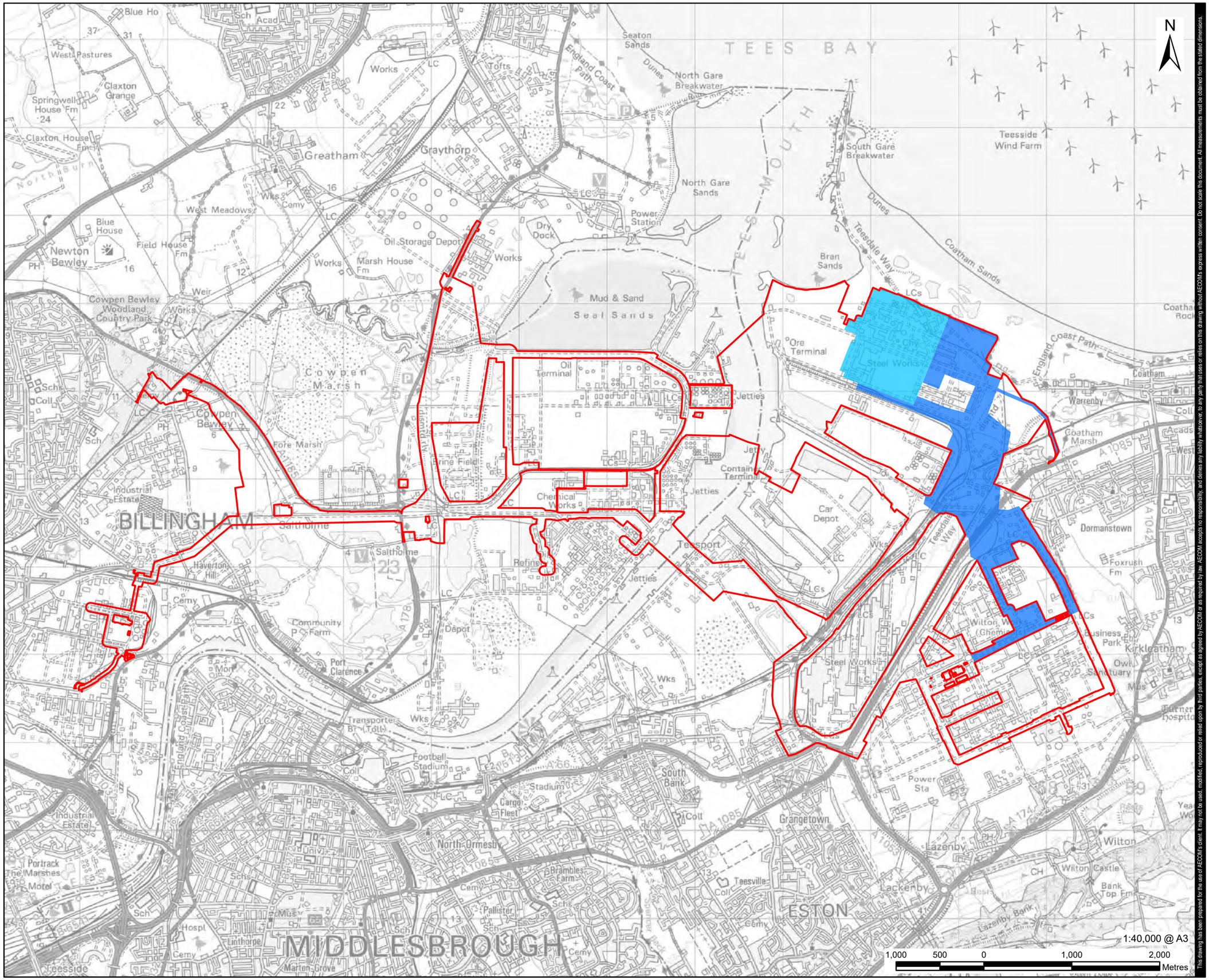

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- Water Connection Corridor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Water Connections Corridor

FIGURE NUMBER

Figure 4-7

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04

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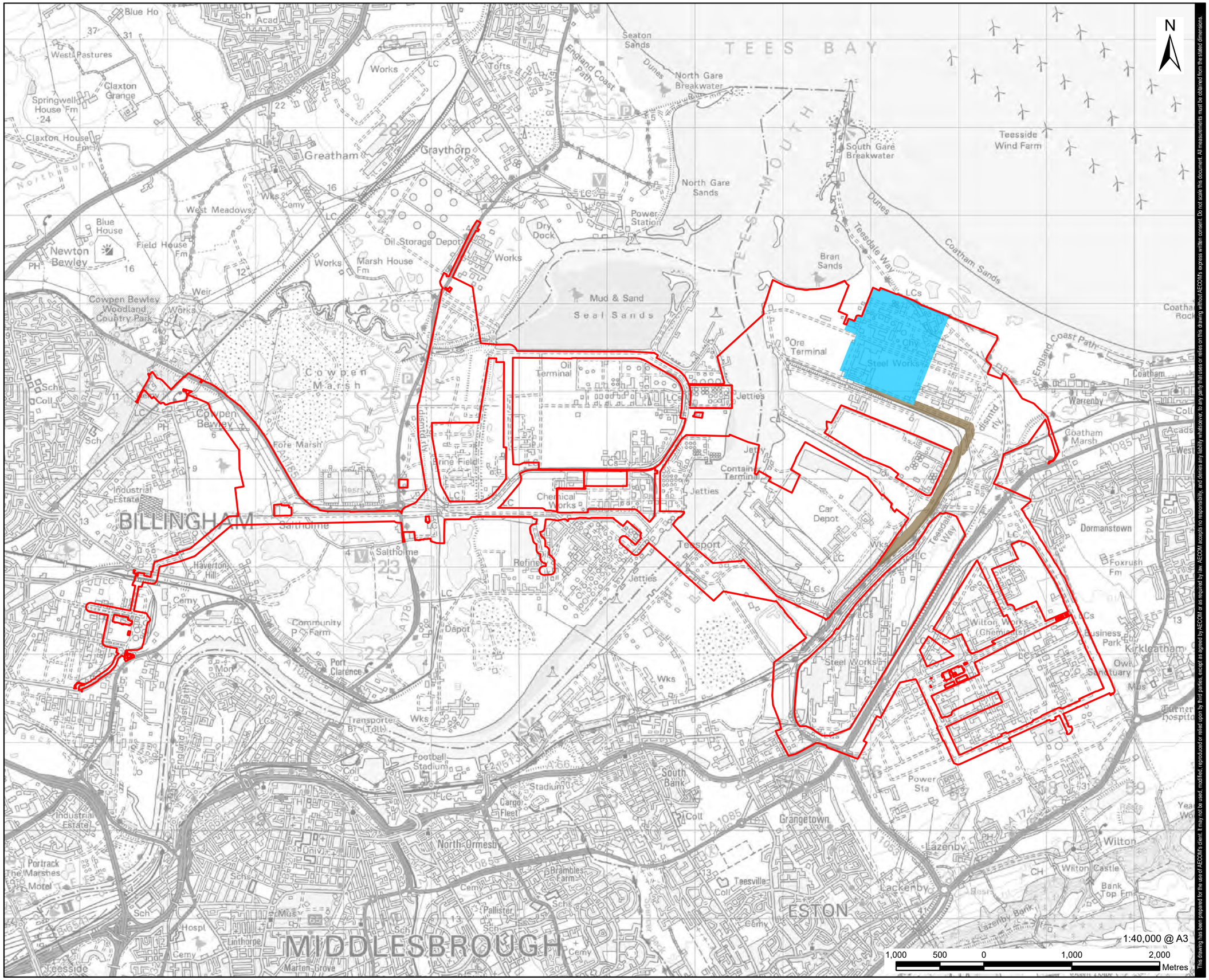

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- Other Gases Connection Corridor (O_2 and N_2)

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Other Gases Connection Corridor (O_2 and N_2)

FIGURE NUMBER

Figure 4-8

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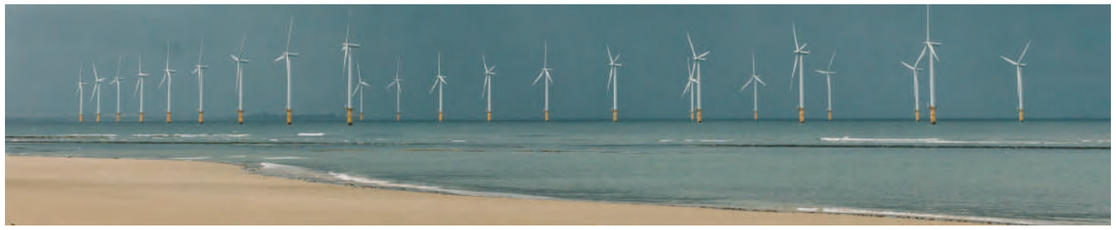
Next steps

The Secretary of State for Energy Security and Net Zero has directed that H2Teesside is a project of national significance which should be consented through a type of planning consent called a Development Consent Order (DCO).

Consulting local communities and stakeholders before applying for a DCO is a key requirement of the process. This consultation is known as a statutory consultation and is your opportunity to comment on our proposals so we can consider your feedback as we finalise our proposals and DCO application.

Once the consultation closes on 26 October 2023, we'll review all feedback and have regard to it in finalising the design of H2Teesside and our DCO application.

We'll set out a summary of the responses and set out how your feedback has helped shape our proposals in a Consultation Report which will be submitted as part of our DCO application.



Timeline

Autumn 2023	We're holding our statutory consultation on our proposals for H2Teesside.
Early 2024	We plan to submit our Development Consent Order application to the Planning Inspectorate. They will review the application to determine whether it should be accepted for examination and will invite Interested Parties to submit representations.
Mid 2024	Six month examination period starts.
Late 2024	The Planning Inspectorate will conclude their examination of our DCO application.
2025	The Secretary of State will announce their decision as to whether to grant development consent for H2Teesside.
	Subject to the DCO application being granted, construction of H2Teesside is planned to commence in 2025.
2028	It is planned that H2Teesside would start commissioning by 2028.

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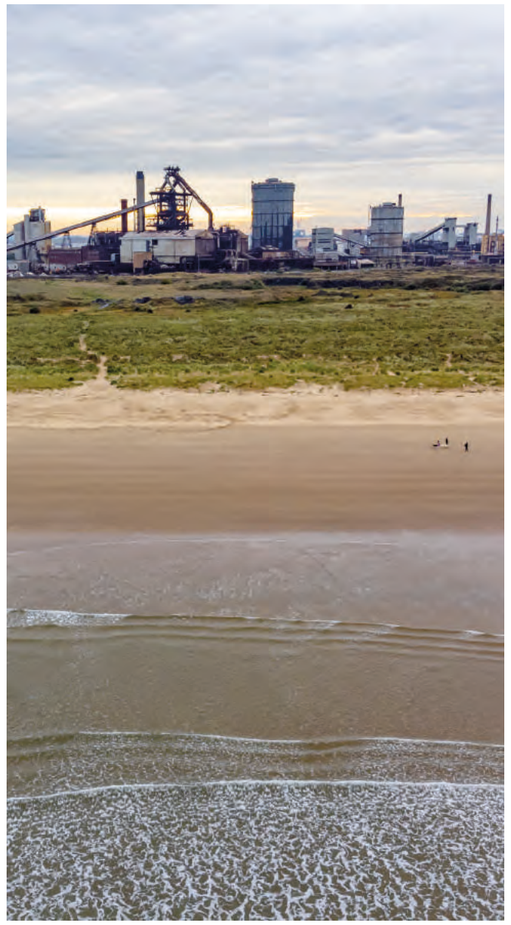
H2 Teesside

Have your say on our proposals for a new blue hydrogen production facility in Teesside.



At bp, we're taking action through transformative projects that will help us to achieve our net zero ambitions.

We're backing hydrogen with carbon capture and storage to help decarbonise power and industry in Teesside and the UK. As part of this, we're proposing to construct **H2Teesside** – a blue hydrogen production facility.

Hydrogen is set to play an essential role in decarbonising industries in the UK, particularly those that are difficult and expensive to electrify.

We're holding a public consultation on our proposals for H2Teesside.

H2Teesside is a proposed blue hydrogen production facility in Teesside. It aims to be one of the biggest blue hydrogen production facilities in the UK, delivering economic growth for Teesside and the domestically-produced low carbon hydrogen that the UK needs.

Working with the local community is important to us, so we want to hear your views on our current design. We'll then submit our Development Consent Order (DCO) application to the Planning Inspectorate.

We've recently held a consultation on our proposals for **HyGreen Teesside** which aims to be one of the biggest green hydrogen production facilities in the UK.

This consultation on our proposals for **H2Teesside** is separate and we encourage you to take part so we can hear your views on our plans.

Contact us

You can get in touch with us in the following ways: info@h2teesside.net 0800 0803028

You can also use these details to request alternative formats of our consultation materials.

See how you can find out more about our project and have your say in this leaflet…

H2Teesside leaflet A4 4pp CMYK 2 31/08/2023 15:08

What is blue hydrogen?

Blue hydrogen, sometimes referred to as carbon-capture and storage enabled low carbon hydrogen, is hydrogen that is extracted from natural gas. H2Teesside will convert methane in natural gas into CO_2 and H_2. The vast majority of CO_2 produced as part of the process will be captured and stored permanently beneath the North Sea, preventing it from entering the atmosphere. H2Teesside will capture and store approximately two million tonnes of CO_2 per year.

Developing low carbon energy in Teesside

Teesside has a long and proud history of industrial activity, ranging from steelmaking to chemicals. The region continues to play a key role in UK industry today, with Teesside's leading industrial businesses contributing millions of pounds to the local and UK economy each year.

Key to achieving the UK government's commitment to net zero by 2050 will be ensuring carbon intensive sectors in areas like Teesside, which accounts for around 6% of the UK's industrial emissions, are able to decarbonise.

The Teesside industrial cluster is a tightly packed area, making it a great location to decarbonise effectively and efficiently. Low carbon blue hydrogen produced at H2Teesside will help surrounding industrial companies meet their commitments to reducing their greenhouse gas emissions, and support the decarbonisation of Teesside's industry.

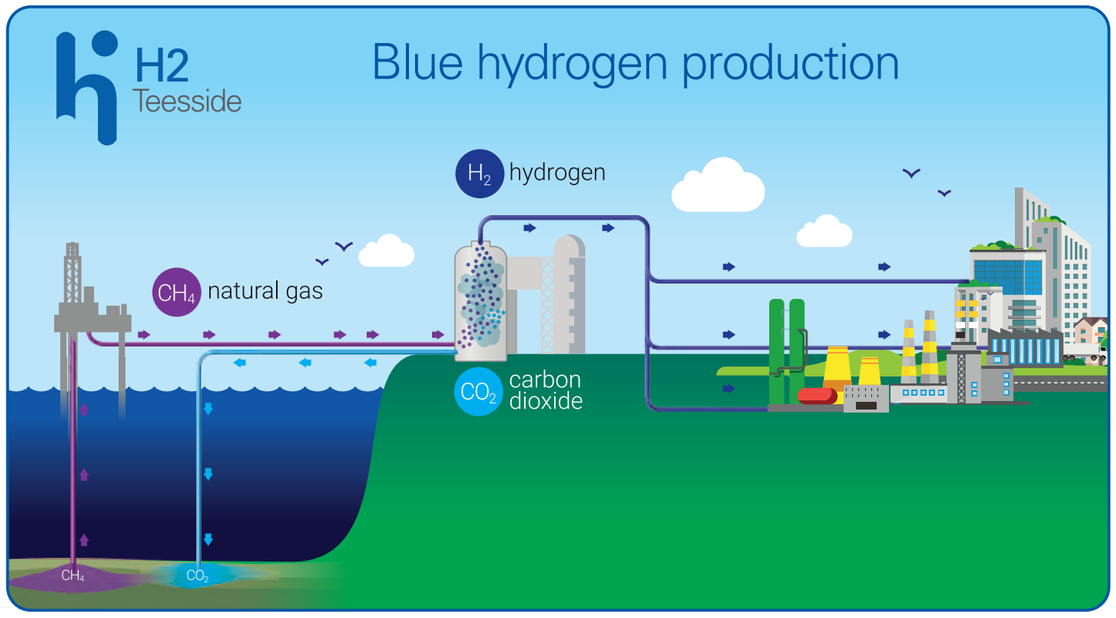
Teesside is already a UK energy hub, with access to gas from UK gas fields and offshore wind supply, helping ensure national energy security. H2Teesside, along with its sister project HyGreen Teesside and other proposed projects in the area, can help Teesside become the UK's leading hydrogen hub.

Benefits for the local community

We believe H2Teesside will deliver significant benefits to the local community in Teesside.

As well as contributing to local economic development, the quality of jobs and upskilling opportunities provided by H2Teesside will help support local people. This project will also safeguard jobs in local industries and attract new business to the area.

We're working with local councils, authorities, and educators to create a legacy in the region with a number of initiatives, including a dedicated skills programme for H2Teesside. This programme will provide £19.5 million in funding and aim to reach more than 5,000 people, inspiring the next generation of talent, ensuring local people benefit from job opportunities and seeing knowledge and innovation.



How to find out more

Online

All of our consultation materials will be available to view on the H2Teesside project website from 14 September 2023: www.h2teesside.co.uk

Consultation events

We're holding a series of face-to-face events where you can view our consultation materials and speak to members of the project team.

Venue	Dates and times		Address
Seaview Business Centre, Redcar	Thursday 21st September Saturday 23rd September	15:00 – 19:00 13:00 – 17:00	Turner Street, Redcar, TS10 1AZ
St Aidan's Church Hall, Billingham	Monday 25th September Friday 6th October	15:00 – 19:00 15:00 – 19:00	Tintern Ave, Stockton-On-Tees, Billingham, TS23 2DF
Inspire2Learn, South Bank	Thursday 5th October	15:00 – 19:00	South Bank, Normanby Road, Middlesborough, TS6 9AE
TunedIn, Redcar	Thursday 12th October	15:00 – 19:00	Majuba Road, Redcar TS10 5BJ

Online webinar

We're holding a webinar on 28th September 2023 at 18:00. Register in advance to join the webinar at www.h2teesside.co.uk

Information points

Visit one of these venues to view our consultation documents on a publicly accessible computer.

Information point	Opening Times
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 09:00 to 18:00; Thursday 09:00 to 17:00; Friday 09:00 to 18:00; Saturday 09:30 to 12:30
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday, Tuesday and Wednesday 08:30 to 18:00; Thursday 08.30 to 20:00; Friday 08:30am to 18:00; Saturday 09.30 to 16:00
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 09:00 to 17:00; Fridays 09:00 to 16:30

How to have your say

We want to hear your views on our proposals for H2Teesside. You can respond to this consultation in the following ways:

Online Fill in our response form at www.h2teesside.co.uk

In person: Fill in a hard copy response form at one of our consultation events

Post: Write to us or send your response form to **FREEPOST H2Teesside**

Email: Write to us or send your completed response form to info@h2teesside.net

Please submit your feedback by **23:59 on 26 October 2023**

H2 Teesside

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H2Teesside

Statutory consultation brochure

14 September to 26 October 2023

H2 Teesside

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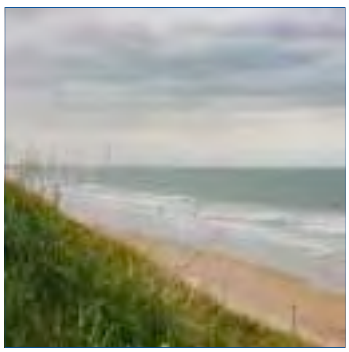


H2Teesside – statutory consultation

Thank you for taking the time to find out more about our proposals for a blue hydrogen production facility on Teesside.

Consulting local communities and stakeholders is a really important step in developing our proposals for H2Teesside. This consultation is your opportunity to comment on our proposals so we can consider your feedback as we finalise our plans and prepare our application for consent to construct and operate H2Teesside.

In this brochure we describe our proposals, including the benefits that H2Teesside could bring, and provide an overview of the likely environmental effects. We also explain where you can find further information and how you can provide feedback.

The consultation is taking place between Thursday 14 September 2023 and Thursday 26 October 2023. **Please provide any feedback by 23:59 on 26 October 2023.**

Further details on how to get involved are available on page 22 of this document.

This consultation

The purpose of this consultation is to understand the views of the local community and stakeholders on our proposals. It is known as a statutory consultation because there are certain requirements we must meet in line with the planning process for H2Teesside.

The Secretary of State for Energy Security and Net Zero has directed that H2Teesside is a project of national significance, which should be consented through a type of planning consent called a Development Consent Order (DCO). We therefore need to make an application for a DCO to construct and operate H2Teesside. Further information on this process can be found on page 21 of this document.

The project is an Environmental Impact Assessment (EIA) development, requiring us to submit an Environmental Statement as part of the DCO application. We're currently undertaking the EIA and as part of this process, have prepared a preliminary assessment of the likely significant effects of the project. The outcome of these assessments is presented in a document known as a Preliminary Environmental Information Report ('PEIR') which is available to view as part of this consultation. In addition to this, we have also prepared a Non-Technical Summary document which is a shorter and more accessible version of the PEIR. Further information on how to view these documents can be found on page 22.







H2 Teesside

Welcome

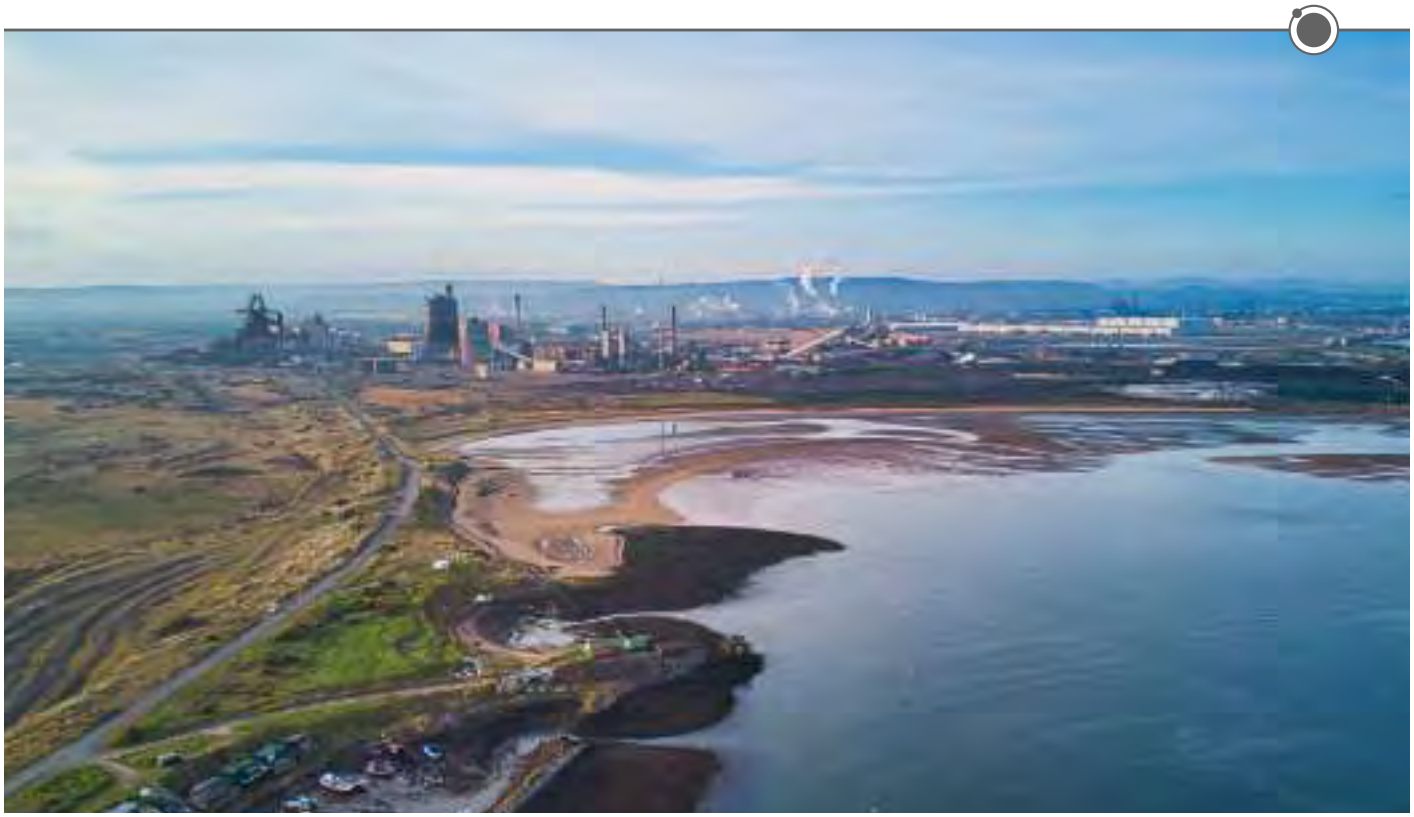
At bp, we're taking action through transformative projects that will help us to achieve our net zero ambitions.

We're backing hydrogen with carbon capture and storage to help decarbonise industry in Teesside and the UK. As part of this, we're proposing to build and operate H2Teesside – a blue hydrogen production facility on Teesside.

Hydrogen is set to play an essential role in decarbonising industries in the UK, particularly those that are difficult to electrify.

H2Teesside aims to be one of the biggest blue hydrogen production facilities in the UK, delivering economic growth for Teesside and the domestically-produced low carbon hydrogen that the UK needs.

Along with its sister project HyGreen Teesside and a number of other proposed projects in the area, H2Teesside can strengthen Teesside's development into the UK's leading hydrogen hub, creating new high-quality jobs, supporting local education and skills development and kick-starting a highly-skilled UK-based hydrogen supply chain.



What is blue hydrogen?

H2Teesside is a proposed large-scale blue hydrogen production facility, to be located on derelict industrial land on Teesside.

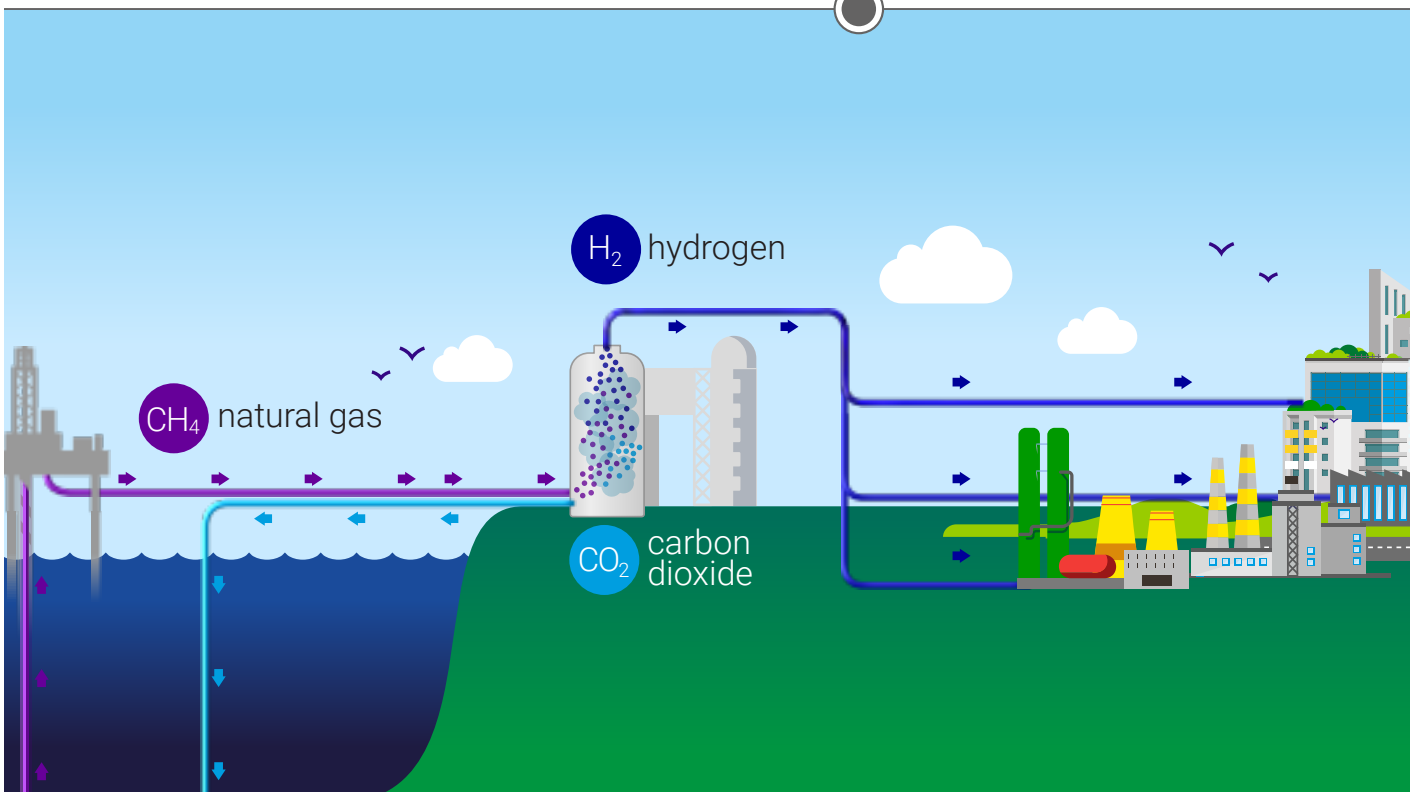
Low carbon hydrogen can help us get to net zero:

- It can play an essential role in decarbonising industries that are difficult to electrify – for example chemicals production or as feedstock for fertiliser production.
- Blue hydrogen, integrated with carbon capture and storage, can provide the scale and reliability required for industrial processes.
- It can also be used as a low-carbon fuel for power generation.
- Hydrogen can also help to decarbonise transport, such as heavy-duty fleets.

Hydrogen will be key to a net zero future, but does not occur in sufficient quantities in nature. This means it must be produced through industrial practices.

What is Blue Hydrogen?

- Blue hydrogen, sometimes referred to as carbon capture and storage enabled low carbon hydrogen, is hydrogen that is obtained from natural gas (methane).
- H2Teesside will convert methane in natural gas into CO_2 and H_2.
- At least 95% of the CO_2 produced as part of this process will be captured and stored permanently beneath the North Sea, preventing it from entering the atmosphere.
- H2Teesside will capture and send for storage approximately two million tonnes of CO_2 per year.



H2 Teesside

Capturing carbon

Carbon Capture and Storage (CCS) is the term for a group of technologies that remove CO_2 from sources such as industrial processes and power plants, transport it – most often by pipeline – and then securely store it. These technologies remove the majority of CO_2 emissions at source.

CO_2 is compressed, transported, and injected into rock formations. These rock formations have interconnected pores where the CO_2 becomes trapped and locked in place, preventing it from being released into the atmosphere.

H2Teesside and CCS

The CO_2 captured by H2Teesside will be sent for secure long-term storage to the **Endurance store**, located approximately 145km off the coast of Teesside under the North Sea, via the **Northern Endurance Partnership pipeline**.

The Northern Endurance Partnership (NEP) is the CO_2 compression, transportation and storage project which will deliver the onshore and offshore infrastructure needed to capture carbon from a range of emitters across Teesside and the Humber and transport it to the Endurance store.

The Endurance carbon store is the name of a geological feature – a saline aquifer – under the North Sea. It has the capacity to store 450 million tonnes of CO_2.

Why blue hydrogen?

In the UK Hydrogen Strategy (published August 2021), the UK Government set out an approach to support green hydrogen and blue hydrogen in parallel, aiming to enable the rapid growth of the sector while bringing costs down.

Producing green hydrogen relies on the availability of a sufficient, reliable supply of low carbon electricity, produced via methods such as wind and solar power. The current scale at which renewable and low carbon energy is produced, presents significant challenges to producing green hydrogen at an industrial scale, in the timescales in which it is required.

Blue hydrogen is being promoted as a necessary and low cost option, which can make use of existing infrastructure across the Teesside region, advancing the UK's energy transition.



Why Teesside?

Teesside has a long and proud history of industrial activity, ranging from steelmaking to chemicals. The region continues to play a key role in UK industry today, with Teesside's leading industrial businesses contributing millions of pounds to the local and UK economy each year.

Key to achieving the UK government's commitment to net zero by 2050 will be ensuring carbon intensive sectors in areas like Teesside, which accounts for around 5% of the UK's industrial emissions, are able to decarbonise.

The Teesside industrial cluster is a tightly packed area, making it a great location to decarbonise effectively and efficiently. Low carbon blue hydrogen produced at H2Teesside will help surrounding industrial companies meet their commitments to reducing their greenhouse gas emissions, and support the decarbonisation of Teesside's industry.

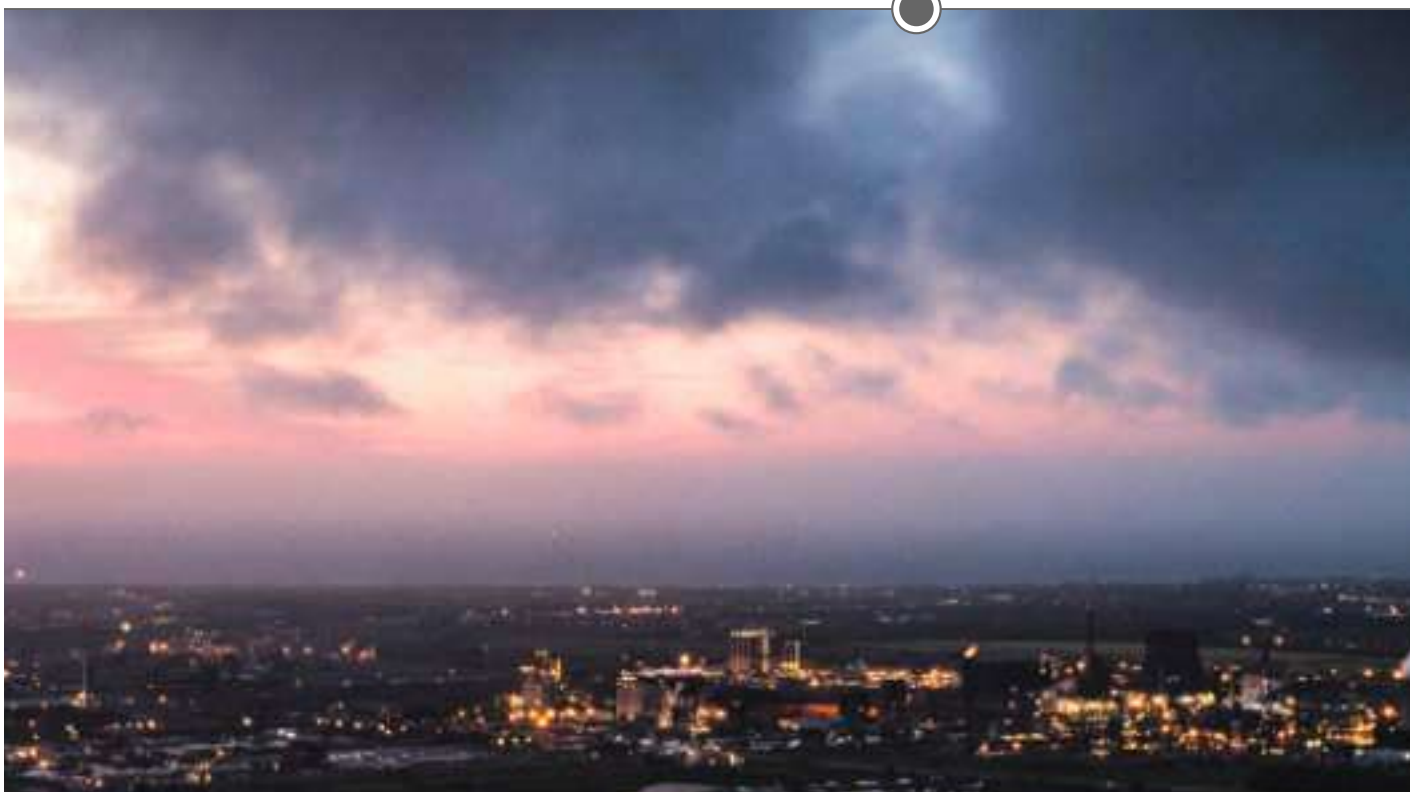
We're seeing strong interest from potential industrial users (known as offtakers) for hydrogen from H2Teesside to help decarbonise industry.

Developing a world-class hydrogen and CCS hub

Teesside is already a UK energy hub, with access to gas from UK gas fields and offshore wind supply, helping ensure national energy security. H2Teesside along with its sister project HyGreen Teesside and other proposed projects in the area can help Teesside become the UK's leading hydrogen hub.

H2Teesside could deliver over 10% of the UK Government's target of developing 10GW of hydrogen production by 2030.

The low carbon hydrogen produced by bp's projects on Teesside will play an important role in delivering on the country's bold ambitions to boost energy security.



H2 Teesside

The project site

The current extent of the proposed development site boundary is shown below, in orange. Land at the former Redcar Steelworks, within the administrative boundary of Redcar and Cleveland Borough Council, will contain the main blue hydrogen production facility and ancillary infrastructure, whilst the connection corridors extend into the administrative areas of Stockton-on-Tees Borough Council and Hartlepool Borough Council.

The 'Main Site' is shown in green on the plan below.

Proposed development site boundary

Main site

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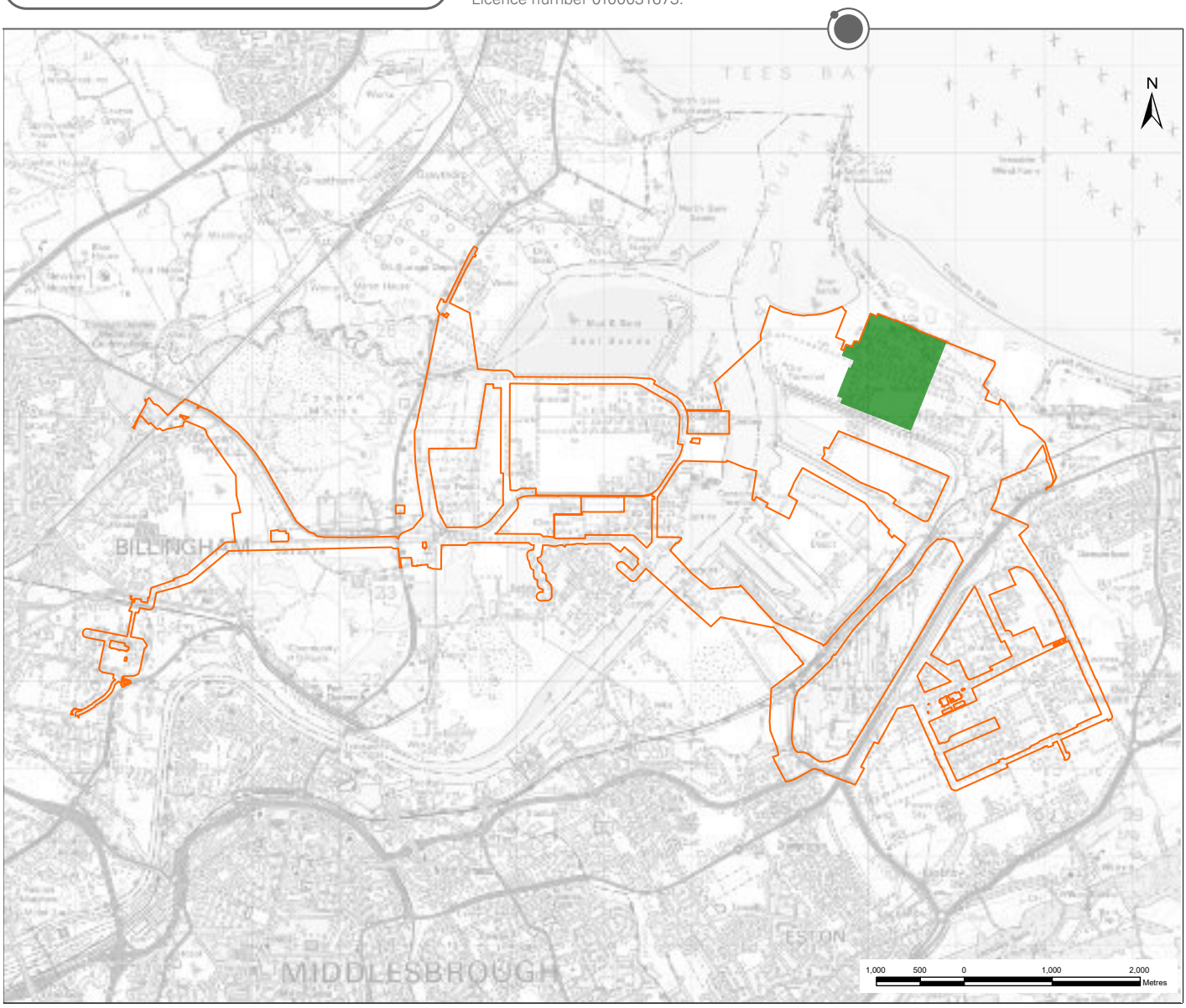


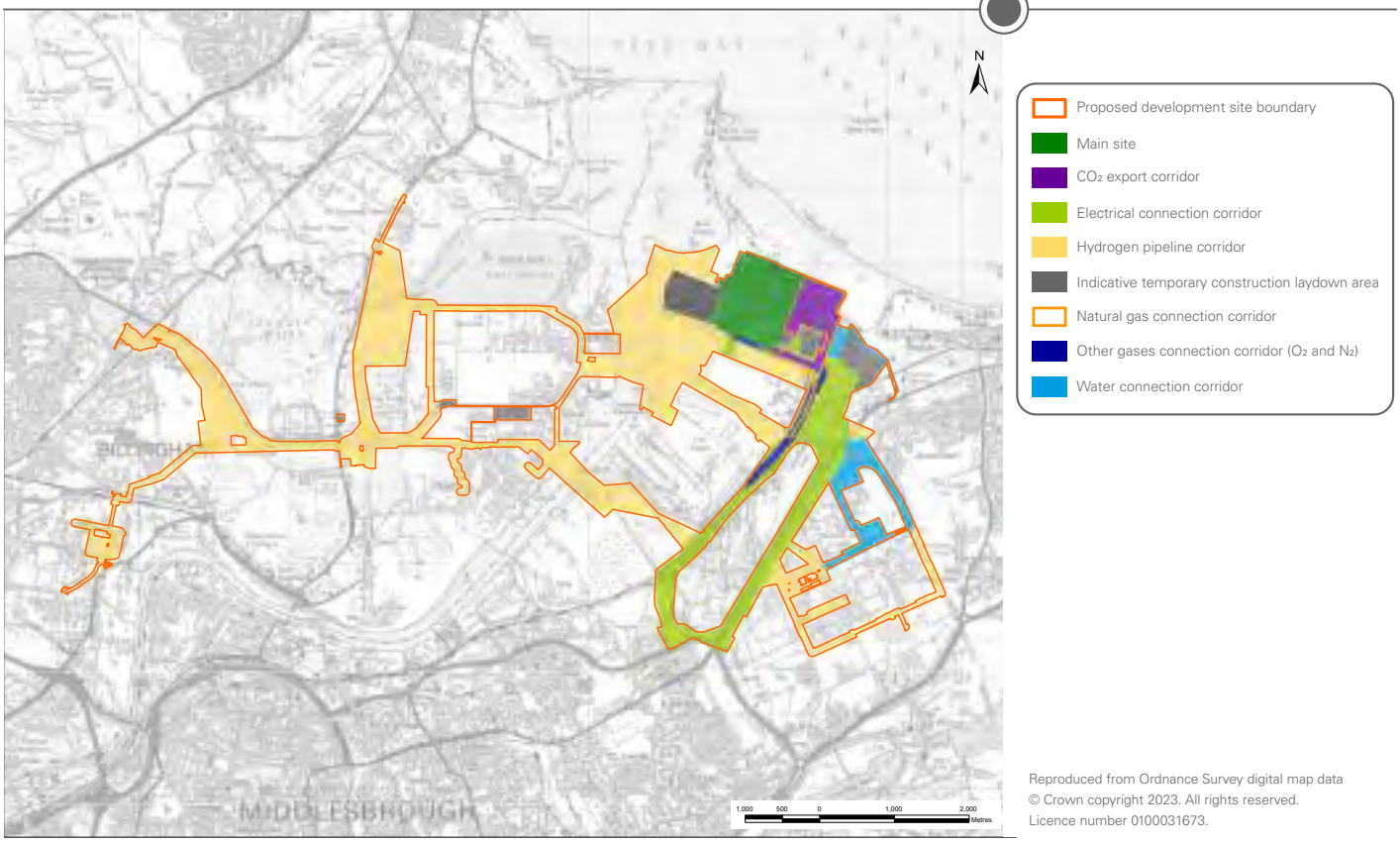
The pipeline and connection corridors

To allow the facility to operate, a number of pipeline connections need to be developed. These consist of five main connections:

- **Natural gas supply connection corridor:** This pipeline would be used to transport natural gas from the existing national gas transmission network to the production facility.
- **Electrical Connection corridor:** These connections would bring electrical power to the production facility.
- **Water connection corridor:** These connections would be used to supply water to the production facility and to discharge treated waste water from the production facility.
- **CO_2 export connection corridor:** This pipeline would be used to transport CO_2 captured at H2Teesside, to the NEP development to the east. Compression, transportation and geological storage of CO_2 from H2Teesside will be managed and operated by NEP and is not part of the H2Teesside project.
- **Hydrogen export pipeline corridor:** This pipeline network would be used to transport hydrogen to potential offtakers across the Tees valley.

Land will also be required for construction working areas and compounds, and accesses by land and water. Other connections (such as for other gases) may also be required.

The corridors shown on the plan are areas that our pipelines and connections would be placed within. As we continue to engage with stakeholders and progress our design, we will refine and reduce these areas accordingly. As part of this statutory consultation, we would welcome any feedback you have on these corridors.



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Constructing the hydrogen pipeline network

As we progress the design for H2Teesside, we're considering various route options and construction methodologies for the proposed hydrogen pipeline network.

At this stage of design development, we expect the **natural gas supply connection** and the **electrical connections** to be installed below ground.

The **CO_2 export connection** and **water connections** may be entirely above ground, below ground, or a combination of the two. As we develop the design, we will determine the route and construction methodology having regard to stakeholder feedback as well as environmental and engineering considerations.

Various route options and construction methodologies are being considered for the **hydrogen pipeline network**. We're currently considering:

Using existing pipeline corridors

For various parts of the pipeline corridor, we're looking at where we can use existing infrastructure. For the majority of the hydrogen pipeline corridor south of the River Tees, it is proposed to follow existing established pipeline corridors (generally above ground) where possible. North of the River Tees, our preferred option is to follow Sembcorp's existing link line above ground pipeline corridor through Seal Sands to Billingham. Other corridors in North Tees will require the construction of new underground pipelines or repurposing existing disused pipelines.

Trenchless construction methods

Only trenchless methods (such as Horizontal Directional Drilling (HDD) and micro-tunnelling) are being considered for the crossing of the River Tees and Greatham Creek due to their environmental sensitivity. The proposed trenchless technologies would be below the river/estuary bed at a depth to prevent impacts on river channel integrity, habitats and infrastructure.

As well as these watercourse crossings, it is likely that trenchless techniques may also be required in some cases for crossings of railways, roads and utilities infrastructure. Trenchless methods are also being considered in other areas that are particularly environmentally sensitive.

Open cut trench

Whilst trenchless methods are proposed for environmentally sensitive areas, for the majority of underground pipeline construction in other areas conventional open cut trenching techniques are proposed. Once the pipeline has been installed, the ground would be reinstated.

The construction methods we will use are subject to ongoing design work, discussions with landowners and statutory consultees, and will be informed by feedback to this consultation and further environmental surveys and understanding of constraints.

Further information is available in Chapter 4 (Proposed Development) and Chapter 5 (Construction Programme and Management) of our PEIR.

Making blue hydrogen

Step 1

Natural gas would be transported to the main site via a pipeline, where it will be pre-reformed with steam over a catalyst bed, to break down the methane to carbon oxides (CO/CO_2) and hydrogen (H_2).

Step 2

This gas, known as syngas, would then be reformed further using pure O_2 and more steam in an Auto Thermal Reformer (ATR).

Step 3

After cooling, the syngas would be reacted in water-gas shift reactors, to generate H_2 and CO_2.

Step 4

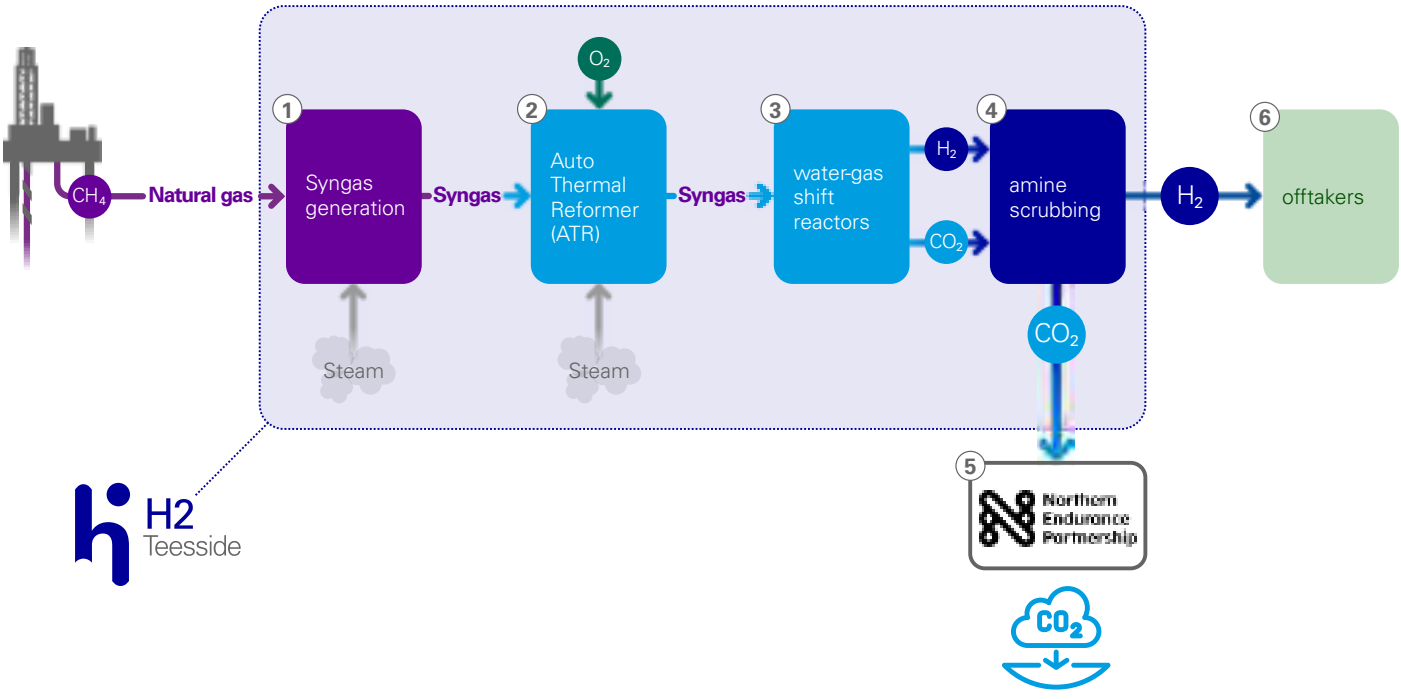
The CO_2 would be removed from the gas via scrubbing with amine, which will be regenerated to yield a CO_2 stream.

Step 5

This CO_2 would be compressed, dehydrated and then exported utilising NEP infrastructure on the Net Zero Teesside site to the east of the Main Site. The captured CO_2 will be further compressed by NEP to be in dense phase for transportation and will be exported using infrastructure to the NEP Endurance store beneath the North Sea. The infrastructure required for export and storage is subject to a separate consent.

Step 6

The resulting low carbon H_2 would be purified and compressed and conditioned, before exporting to potential offtakers, via the new proposed hydrogen pipeline system.



H2 Teesside

Preliminary Environmental Information

We are undertaking an Environmental Impact Assessment (EIA) that enables us to understand and assess the potential effects of the construction and operation of H2Teesside on local communities and the environment. It will also help us identify the ways impacts can be avoided or reduced.

The findings of our EIA will be presented in a document known as an Environmental Statement, which will be submitted as part of our Development Consent Order application. To help inform this consultation, we have undertaken a preliminary assessment of the likely significant effects and details can be found in the Preliminary Environmental Information Report.

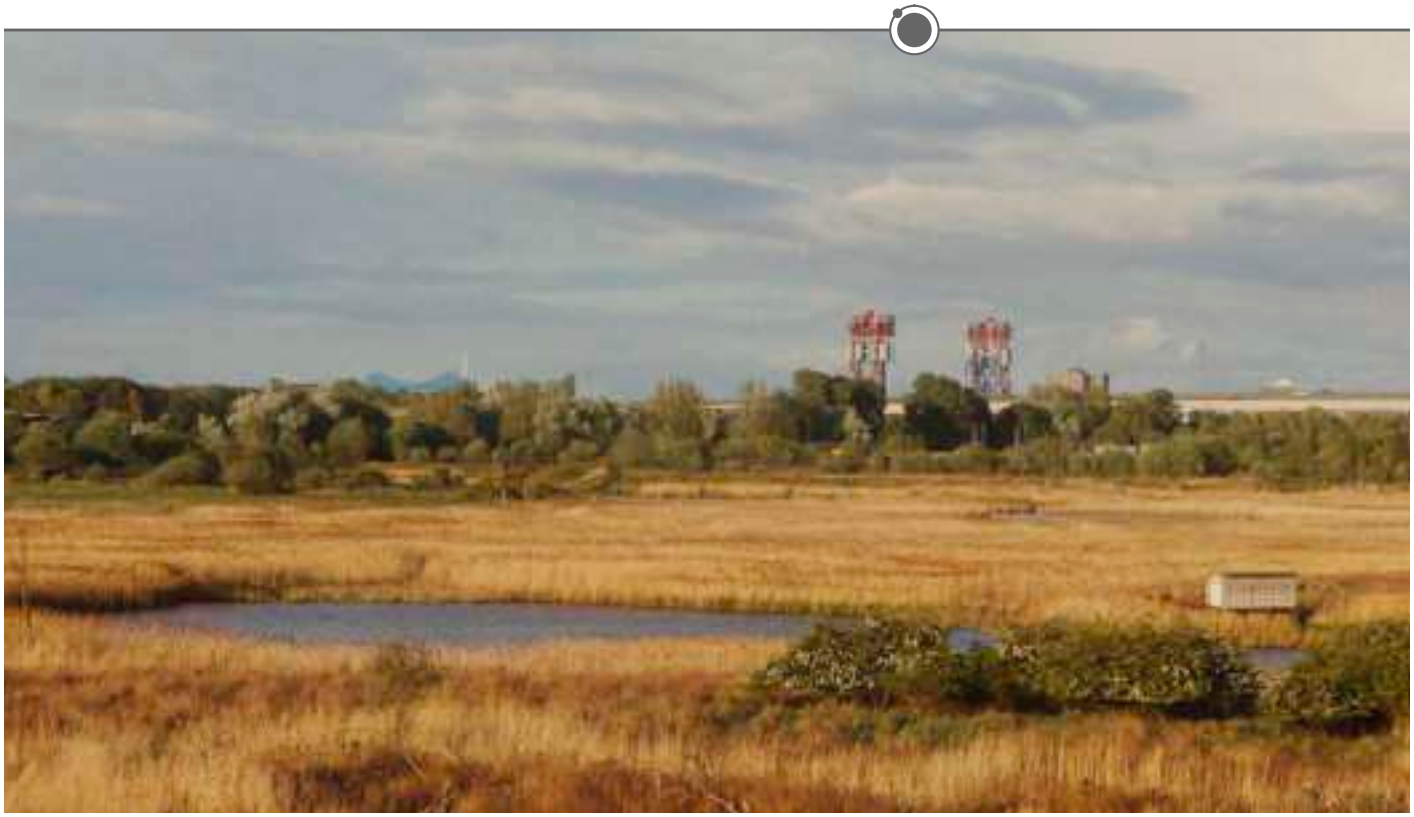
Further details of where you can view a copy of this report and the shorter Non-Technical Summary can be found in the 'Find out more' section of this brochure on page 22. We've summarised the 'significant effects' that have been identified in the Preliminary Environmental Information Report on the next pages.

What is a Preliminary Environmental Information Report?

The Preliminary Environmental Information Report (PEIR) sets out the potential environmental effects of H2Teesside across a number of different topics, based on the preliminary assessment work we've done to date.

The topics covered by the PEIR are set out in the following pages. We have summarised the possible 'significant effects' our proposals could have. 'Significant effects' is a technical term, which is used in EIA to identify environmental factors that require further assessment. Identifying a 'significant effect' in the PEIR does not mean it will definitely happen. By identifying them at this stage, we can explore opportunities to manage the potentially significant effects.

Further detail on each topic area can be found in the PEIR Non-Technical Summary or the individual topic chapters of the PEIR. These documents are available to view online at www.h2teesside.co.uk or at our in-person events.



Preliminary Environmental Information

Below we've listed the topic areas that are covered by the Preliminary Environmental Information Report and summarised the potential 'significant effects' that have been identified.

Identifying a 'significant effect' in the PEIR does not mean it will definitely happen. By identifying them at this stage, we can explore opportunities to manage the potentially significant effects.

You can find out more in our PEIR and the accompanying Non-Technical Summary.

Air quality

Our preliminary air quality assessment uses screening tools and computer models to predict the potential air quality impact of H2Teesside, and its associated traffic movement. This assessment has considered both the effect on human health and ecology.

Construction: Through the use of a Construction Environmental Management Plan (CEMP) to control potential construction dust, no significant effects are predicted.

Operation: Our assessments have not identified any potential significant effects during operation on human health. We have considered the effects of air quality on ecology as part of our Ecology and Nature Conservation assessment. See Chapter 12 of the PEIR for more information.

Our assessments do not predict any significant air quality effects as a result of traffic during construction or operation.

See Chapter 8 of our PEIR for more information.

A Construction Environmental Management Plan (CEMP) sets out measures that aim to ensure adverse effects of construction on the environment and local communities are minimised. The CEMP will be referenced throughout when discussing construction effects, with more detailed information provided on page 19.

Surface water, flood risk and water resources

Our preliminary assessment considers the effects of H2Teesside on the surface water environment (inland, transitional and coastal), flood risk and water.

Construction: Our assessment has assumed a worst-case scenario for construction works, leading to a potentially significant effect related to several watercourse crossings. This will be reassessed before our DCO application is submitted, once more detailed information on construction methods is known and appropriate mitigation identified to reduce or prevent significant adverse effects.

Operation: As with construction, we have assumed a worst-case scenario relating to operational discharges from H2Teesside, leading to a potential significant effect relating to water quality. This will be reassessed before our DCO application is submitted. Appropriate mitigation will be identified to reduce or prevent significant adverse effects, once more information on water treatment is known.

See Chapter 9 of our PEIR for more information.

H2 Teesside



Geology, hydrogeology and contaminated land

Our preliminary assessment considers H2Teesside's potential effects on geology, hydrogeology (groundwater) and contaminated land.

Construction: With appropriate planning of our construction activities and by implementing a CEMP, no significant adverse effects are predicted.

Operation: Operating H2Teesside in accordance with our Environmental Permit and the DCO requirements, no significant adverse effects are predicted.

See Chapter 10 of our PEIR for more information.



Noise and vibration

Our preliminary assessment considers H2Teesside's potential noise and vibration effects on identified local noise sensitive 'receptors', such as places where people live and work.

Construction: During the construction period, noise and vibration control measures will be implemented through the CEMP. Best practice construction methods will be used to reduce noise and vibration effects. With these measures in place, no significant adverse effects are predicted.

Operation: As we design H2Teesside, we will consider measures such as orientating plant within the site away from sensitive areas and screening to reduce noise. This, in addition to the placement of limits on noise emissions from plant and equipment will reduce noise effects, thereby avoiding significant effects.

See Chapter 11 of our PEIR for more information.



Ecology and nature conservation (including aquatic ecology) and ornithology

Our preliminary assessment considers H2Teesside's potential impacts and likely significant effects on ecology as well as an assessment covering breeding and wintering birds.

Construction: During construction, we'll aim to avoid impacts on ecological receptors through measures such as:

- Using trenchless technologies to install pipelines where appropriate.
- Making use of existing infrastructure.
- Implementing measures in the CEMP.
- Having an Ecological Clerk of Works on site to monitor construction activity.

Our preliminary assessment indicates construction activity has the potential to generate significant adverse effects, but this is based on a precautionary approach. It does not take into consideration site-specific mitigation or habitat management measures. We will work with Natural England and other stakeholders to develop these mitigation measures, which will aim to reduce the potential effects.

Operation: As we progress the design of H2Teesside, we will include measures to reduce potentially significant effects on ecology. These measures include avoiding sensitive ecological habitats, appropriate lighting design, and other design measures. H2Teesside also has the potential to provide significant beneficial effects through the creation of new habitats, new ponds and increasing biodiversity.

See Chapters 12 and 13 of our PEIR for more information.

Marine ecology and nature conservation

Our preliminary assessment considers H2Teesside's potential impacts on marine ecology.

Construction: Due to the temporary and short-term nature of potential construction impacts, combined with the limited nature of the works impacting the marine environment, combined with the measures with the CEMP, no significant effects are predicted on marine ecology.

Operation: No potential effects on marine ecology have been identified.

See Chapter 14 of our PEIR for more information.

Traffic and transportation

Our preliminary traffic and transport assessment has considered the predicted number of vehicle movements generated during the construction and operation of H2Teesside, and the capacity and sensitivity of the local roads.

Construction: There will be a small, temporary increase in traffic flows, including HGVs, on the roads leading to the Main Site and Connection Corridor areas north and south of the River Tees. However, these impacts are not expected to be significant.

Operation: H2Teesside is predicted to generate very low traffic flows during operation, which will not generate any significant transport effects.

See Chapter 15 of our PEIR for more information.

Landscape and visual amenity

Our preliminary assessment of the potential effects of H2Teesside on the landscape and views uses the maximum possible dimensions for H2Teesside, so that our assessment is based upon a worst-case scenario.

Construction: Given the other large scale industrial developments in the local area and the temporary nature of construction activity, no significant effects to the landscape character of the area are predicted.

Our preliminary assessment does indicate that construction activities could generate significant effects at two viewpoints – the England Coastal Path at Warrenby and Redcar Seafront. Although construction activities will be visible from other visual receptors, they would be viewed in the context of an area containing a high number of large-scale industrial structures. For some viewpoints, low level construction activities would be screened by other buildings, vegetation or land.

Operation: No significant effects are predicted to the landscape character during operation, as the area around H2Teesside has previous and existing similar industrial development.

Our assessment indicates that moderate adverse significant effects are expected at one viewpoint – the England Coastal Path at Warrenby, arising from the close proximity of the Main Site. Due to the scale of the development, it is not possible to eliminate the visual impacts associated with the facility. Mitigation is required to reduce the visual intrusion of the development in the landscape and minimise impact on visual amenity as far as reasonably practicable through appropriate design. No significant effects are expected at residential properties during operation.

See Chapter 16 of our PEIR for more information.

H2 Teesside

Cultural heritage

Our preliminary assessment considers H2Teesside's potential impacts on cultural heritage assets, including archaeology, built heritage and historic landscape.

Construction: Features relating to a Romano-British settlement have been recorded within the Hydrogen Pipeline Corridor. We will develop a programme of archaeological evaluation and mitigation prior to construction to ensure the reporting, protection and management of any archaeological discovery. With these proposed measures, no significant effects are expected.

Operation: No potentially significant cultural heritage effects have been identified during H2Teesside's operation.

See Chapter 17 of our PEIR for more information.

Socio-economics and land use

Our preliminary assessment considers H2Teesside's potential effects on employment, local business and the local population.

Construction: Construction employment from H2Teesside's construction phase is predicted to have a significant beneficial, short-term effect on local employment.

Operation: Operation employment from H2Teesside's operation phase is predicted to have a minor beneficial effect on local employment.

See Chapter 18 of our PEIR for more information.

Climate change

Our preliminary assessment considers H2Teesside's potential effects on the climate, and the potential impact of future climate change on H2Teesside and the surrounding environment.

Greenhouse gas emissions

The hydrogen produced at H2Teesside will enable a transition to a lower carbon economy, due to the reduced carbon emissions of hydrogen when compared to using natural gas and diesel as fuels. Our assessment shows that H2Teesside has an overall net benefit effect when considering its associated reduced greenhouse gas emissions.

Climate change resilience

Climate change resilience measures would be included in the design of H2Teesside. No significant resilience risks have been identified.

See Chapter 19 of our PEIR for more information.

Major accidents and disasters

Our preliminary assessment considers major accidents and disasters that have the potential to arise during H2Teesside's construction, operation and decommissioning.

Major accidents are incidents such as fires and explosions, that can result in serious harm to people, and damage to property and the environment.

Disasters can be naturally occurring events such as earthquakes, flooding and landslides.

The engineering design, construction and operation of H2Teesside will take into account industry standards and potential risks to ensure that these are minimised to 'as low as reasonably possible'. Such measures include fire detection and protection measures, gas detection and pressure monitoring, and locating electrical equipment above predicted flood levels.

See Chapter 20 of our PEIR for more information.

Materials and waste

Our preliminary assessment considers the potential impacts associated with H2Teesside's use of materials and its waste production.

Construction: Due to the previous uses of the main site, there is the potential for some contaminated material from former uses excavated during construction that could be classed as hazardous. If this needs to be disposed of in hazardous waste landfill, this would reduce the country's hazardous landfill capacity. As a result, this has been identified as a potentially significant effect.

Operation: No significant material and waste effects during operation have been identified.

See Chapter 21 of our PEIR for more information.

Human health

Our preliminary assessment of the potential effects of H2Teesside on human health considers the wellbeing of communities in Redcar and Cleveland, Hartlepool and Stockton on Tees.

The construction and operation mitigation measures proposed for other topics (e.g. Noise and Vibration, Air Quality), no significant effects are predicted during the construction or operation of H2Teesside.

See Chapter 22 of our PEIR for more information.

H2 Teesside

Cumulative and combined effects

Our preliminary assessment has indicated several developments in the vicinity of H2Teesside that could generate cumulative impacts. Chapter 23 of the PEIR has established a list of these potential developments. This list will continue to be updated and a full assessment will be prepared and included in the ES submitted with the DCO Application for H2Teesside.

See Chapter 23 of our PEIR for more information.



Minimising disruption

As with any large project, we understand there may be some disruption during the construction stage, and we'll be seeking to minimise this wherever possible.

A Construction Environmental Management Plan (CEMP) will be produced as part of the DCO, which would ensure that any adverse effects of construction on the environment and local communities are minimised. The CEMP establishes a framework, within which an appointed contractor will plan, implement, and deliver environmental management, mitigation and monitoring requirements during construction.

Examples of controls and procedures in the CEMP would include:

- Measures to minimise noise and vibration, such as using quiet and low vibration equipment, acoustic barriers and considering construction methodology to reduce noise levels where possible.
- Measures for protection of any sensitive/protected species that may be encountered during construction works, to ensure compliance with relevant legislation and best practice.
- Measures to control and limit dust, such as using wheel washing for vehicles entering and leaving construction sites, and the use of road sweepers to remove any material from local roads.
- Minimising visual disturbance by ensuring temporary site lighting is only used where necessary for safety and security.

In addition to the CEMP, we will also prepare a Construction Traffic Management Plan which will set out measures to reduce the impact of traffic during the construction period, such as specifying haulage routes to keep construction traffic on the most suitable roads.

The final routeing for the project connections and the construction methodology will take account of existing apparatus and pipelines, and we will seek to avoid and manage any potential conflicts.



Benefits for Teesside

We believe our proposals have the potential to deliver significant benefits to Teesside and the local community.

H2Teesside will:

- Support economic development and regeneration in the Teesside area, strengthening Teesside's development into the UK's leading hydrogen hub.
- Support the development of a highly skilled UK-based hydrogen supply chain.
- Help safeguard jobs in existing local industries, by helping Teesside decarbonise its industry and attract new businesses to the region.
- Support approximately 1300 jobs (direct and indirect) during its construction phase. It will also support up to 130 permanent jobs once both phases are operational.
- Assist with the regeneration of the former steelworks site.

Investing in green skills

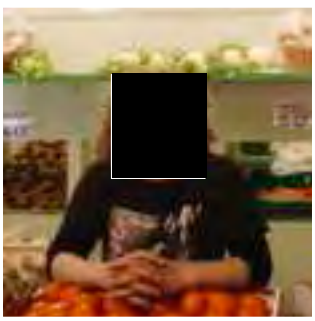
We're working with local authorities and educational institutions to create a legacy in the region. This includes:

- Investing in green skills by launching a **dedicated skills programme for H2Teesside**. The programme will provide £19.5 million in funding and aim to reach more than 5,000 people, inspiring the next generation of talent, ensuring local people benefit from job opportunities and seeding knowledge and innovation.
- Supporting the development of the new **Clean Energy Education Hub at Redcar & Cleveland College**.
- Supporting the **Redcar & Cleveland College Teesside Clean Energy Technician scholarship programme** which will offer 20 school leavers the chance to earn while they learn on a bespoke two-year engineering programme.
- Expanding our collaboration with the **Skills Builder Partnership** to support schools on Teesside. The programme brings together educators, employers and skills-building organisations around a shared approach to building the essential skills for success.







The planning process

The Secretary of State for Energy Security and Net Zero has directed that H2Teesside is a project of national significance which should be consented through a type of planning consent called a Development Consent Order (DCO).

We therefore need to make an application for a DCO to the Planning Inspectorate who are responsible for administering the application process on behalf of the Secretary of State, who is ultimately responsible for deciding whether development consent should be granted.

Consulting local communities and stakeholders before applying for a DCO is a key part of the process. This consultation is known as a statutory consultation and is your opportunity to comment on the project so we can consider your feedback as we finalise our proposals and the DCO application.

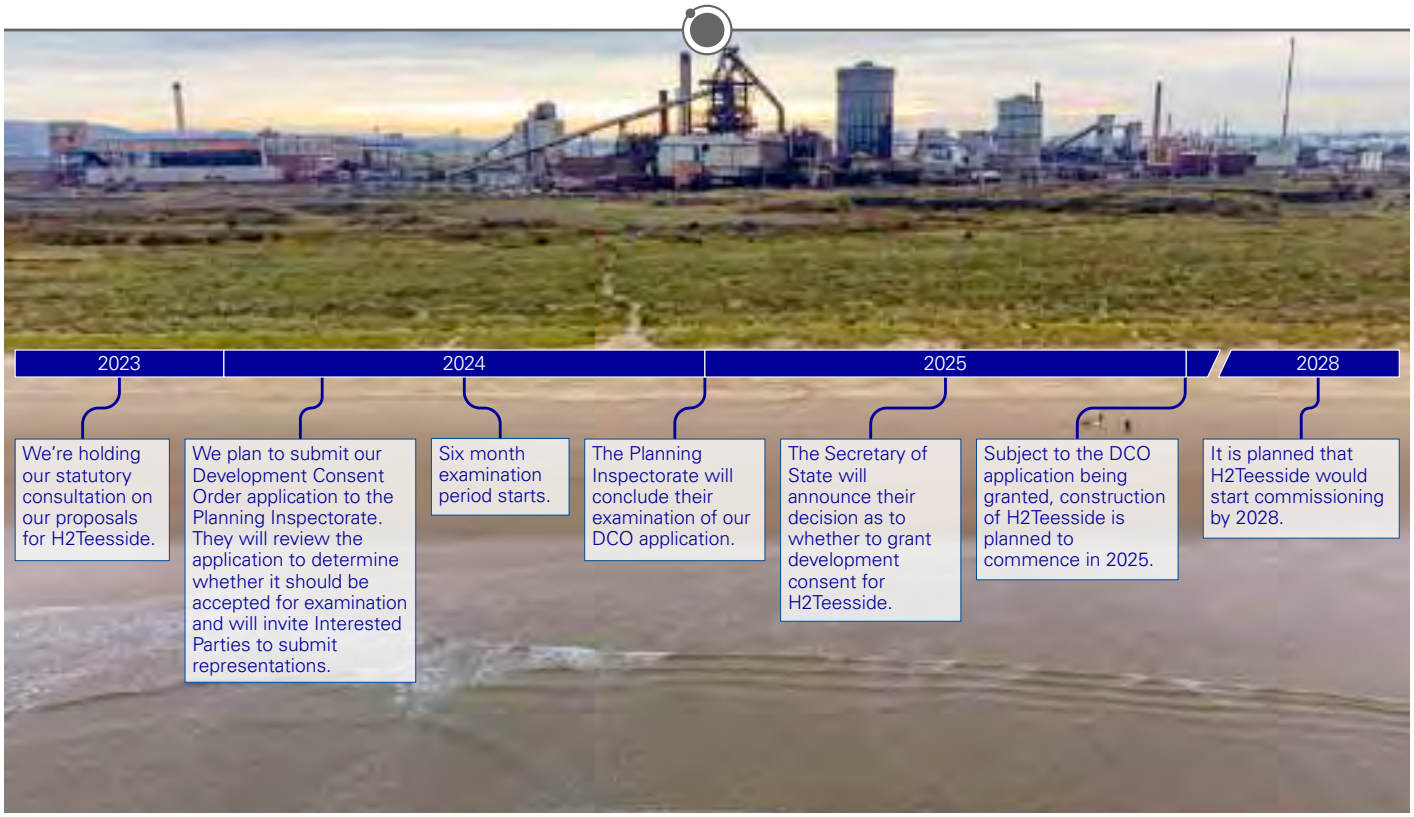
When we submit our application, the Planning Inspectorate will review it and determine whether it meets the requirements to be accepted for examination. If it does, one or more planning inspectors, known as the Examining Authority, will be appointed to examine the application. Anyone with an interest in the application can register to take part in the process and make representations in writing or at a hearing.

Following the examination process, the Examining Authority will prepare a report setting out a recommendation as to whether development consent should be granted. The Secretary of State will then consider this recommendation and make the final decision on whether to grant development consent.

Next steps

Once the consultation closes on 26 October 2023, we'll review all feedback and have regard to it in finalising the design of H2Teesside and our DCO application.

We'll set out a summary of the responses and set out how your feedback has helped shape our proposals in a Consultation Report which will be submitted as part of our DCO application.



H2 Teesside

Find out more

Online

All of our consultation materials will be available to view on the H2Teesside project website from 14 September 2023: www.h2teesside.co.uk

Consultation events

We're holding a series of face-to-face events where you can view our consultation materials and speak to members of the project team.

Venue	Dates and times		Address
Seaview Business Centre, Redcar	Thursday 21st September Saturday 23rd September	15:00 – 19:00 13:00 – 17:00	Turner Street, Redcar, TS10 1AZ
St Aidan's Church Hall, Billingham	Monday 25th September Friday 6th October	15:00 – 19:00 15:00 – 19:00	Tintern Ave, Stockton-On-Tees, Billingham, TS23 2DF
Inspire2Learn, South Bank	Thursday 5th October	15:00 – 19:00	South Bank, Normanby Road, Middlesborough, TS6 9AE
TunedIn, Redcar	Thursday 12th October	15:00 – 19:00	Majuba Road, Redcar TS10 5BJ

Online webinar

We're holding a webinar on 28th September 2023 at 18:00.
Register in advance to join the webinar at www.h2teesside.co.uk

Information points

Visit one of these venues to view our consultation documents on a publicly accessible computer.

Information point	Opening Times
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 09:00 to 18:00; Thursday 09:00 to 17:00; Friday 09:00 to 18:00; Saturday 09:30 to 12:30
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday, Tuesday and Wednesday 08:30 to 18:00; Thursday 08.30 to 20:00; Friday 08:30am to 18:00; Saturday 09.30 to 16:00
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 09:00 to 17:00; Fridays 09:00 to 16:30

Have your say

We want to hear your views on our proposals for H2Teesside.
You can respond to this consultation in the following ways:

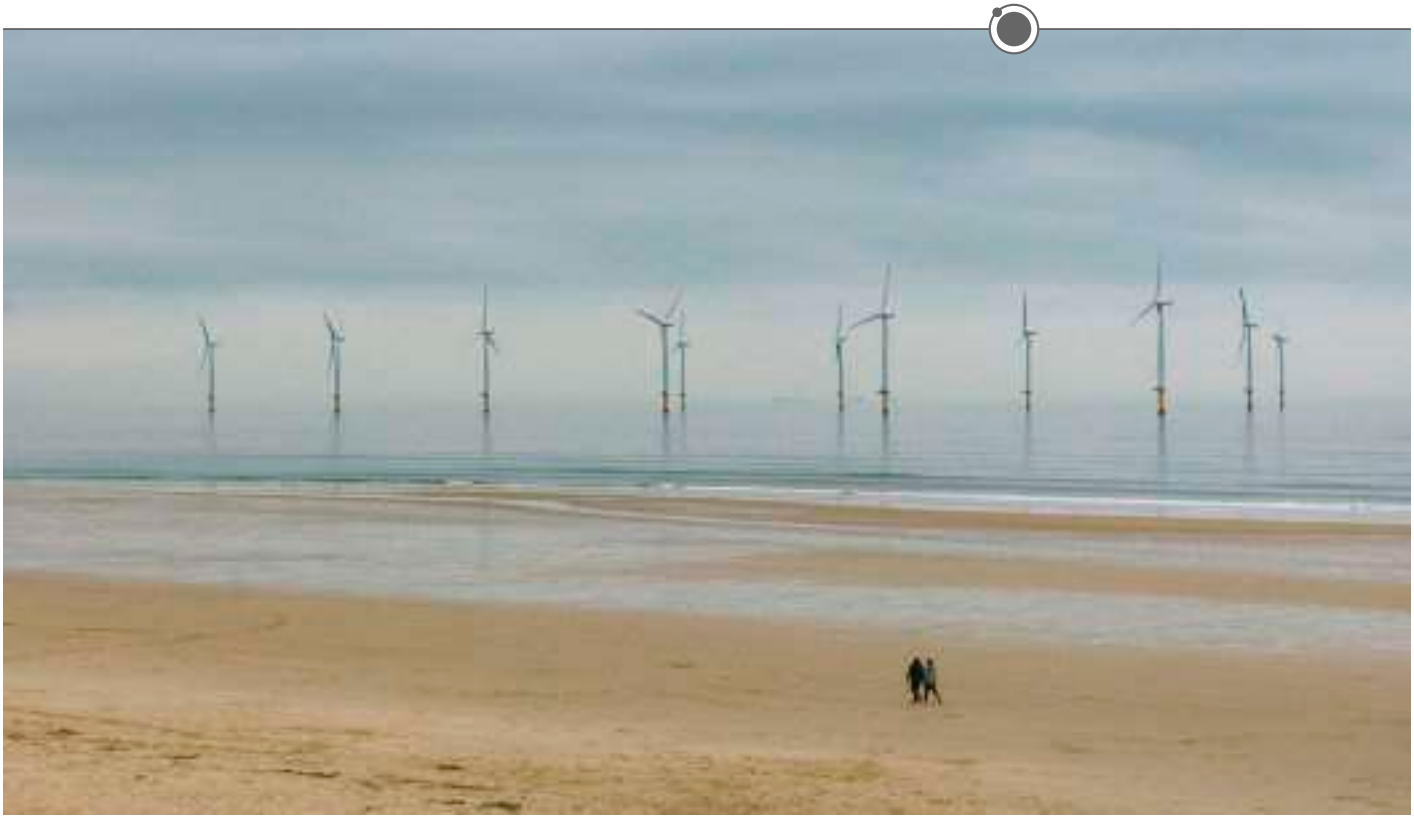
Online: Fill in our response form at www.h2teesside.co.uk

In person: Fill in a hard copy response form at one of our consultation events

Post: Write to us or send your response form to FREEPOST H2Teesside

Email: Write to us or send your completed response form to info@h2teesside.net

Please submit your feedback by **23:59 on 26 October 2023**

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1.0 INTRODUCTION

1.1 Background

1.1.1 This Preliminary Environmental Information (PEI) Report has been prepared by AECOM Ltd (AECOM) on behalf of H2 Teesside Limited (the Applicant), a bp company, in relation to a proposed DCO Application (the Application) to be made to the Secretary of State (SoS) for the Department of Energy Security and Net Zero (DESNZ) seeking a Development Consent Order (DCO) for the construction, operation (including maintenance where relevant) and decommissioning of H2Teesside. It has been prepared to inform statutory consultation with members of the public and other stakeholders, based on the preliminary environmental information available at this time.

1.1.2 H2Teesside is an approximately 1.2-Gigawatt Thermal (GWth) Carbon Capture & Storage (CCS) enabled Hydrogen Production Facility and associated connections (the Proposed Development) on land in Teesside in Redcar and Cleveland, Stockton-on-Tees, and Hartlepool (hereafter referred to as the Proposed Development Site), see Figure 1-1: Proposed Development Site Location Plan (PEI Report, Volume II).

1.1.3 This PEI Report presents:

- a description of the Proposed Development;
- the likely significant environmental effects of its construction, operation (including maintenance) and decommissioning based on the preliminary environmental information available at the time of writing;
- the measures identified to avoid, prevent or reduce and, if possible, offset adverse effects; and
- reasonable alternative sites, technologies and layouts considered to date, and an indication of the primary reasons for selecting the option chosen, taking into account the effects of the Proposed Development on the environment.

1.1.4 This PEI Report also includes a Non-Technical Summary (NTS) (PEI Report, Volume IV) of the information provided in this PEI Report.

1.1.5 This PEI Report is provided to support consultees in developing an informed view of the likely significant environmental effects of the Proposed Development.

1.1.6 The Proposed Development Site and its surroundings are described in Chapter 3: Description of the Existing Environment (PEI Report, Volume I). A more detailed description of the Proposed Development (at this preliminary assessment stage) is provided in Chapter 4: Proposed Development (PEI Report, Volume I).

1.2 The Applicant

1.2.1 The Applicant is H2 Teesside Limited, a bp company, who will be the lead developer and operator for the Hydrogen Production Facility (the 'Production Facility') and new hydrogen pipelines. The Proposed Development will support the decarbonisation of

UK-produced natural gas in Teesside for use in industrial applications, thus helping to achieve national targets in relation to net zero. It will also be a key contributor to restoring manufacturing jobs in the Tees Valley.

1.2.2 The Proposed Development will export carbon dioxide (CO_2) to the Northern Endurance Partnership (NEP) offshore storage facility via NEP infrastructure on the adjacent Net Zero Teesside (NZT) site, including the high-pressure compression facility and the CO_2 export pipeline. At the time of writing, a decision on the NZT application for development consent is anticipated on the 14th September 2023, and it is expected that NEP (offshore) consultation will begin before the end of 2023.

1.3 The Proposed Development

1.3.1 The Proposed Development comprises the construction, operation (including maintenance) and decommissioning of a an approximately 1.2 GWth Production Facility with associated Carbon Capture, a hydrogen transport pipeline network and utility connections, on land in Redcar and Cleveland, Stockton-on-Tees, and Hartlepool on Teesside.

1.3.2 The Proposed Development comprises the Production Facility together with the hydrogen gas (H_2) pipeline network to deliver low carbon H_2 to offtakers who may potentially use the H_2 in the future, and the CO_2 export, natural gas, electricity, water, oxygen (O_2) and nitrogen (N_2) connections required for the facility to operate. The proposed Production Facility will produce low carbon hydrogen which is compliant with the UK Government's Low Carbon Hydrogen Standard (DESNZ, April 2023) which defines what constitutes 'low carbon hydrogen' up to the point of production. The intent of the standard is to ensure new low carbon hydrogen production makes a direct contribution to the UK's greenhouse gas (GHG) emissions reduction targets.

1.3.3 The Proposed Development is subject to ongoing technical studies; however, it is expected to comprise the Production Facility with a design capacity of up to 1.2 GWth Lower Heating Value (LHV), across two phases of development (up to 600 Megawatt thermal (MWth) per phase).

1.3.4 The Production Facility and associated infrastructure which form part of the Proposed Development will be located on the 'Main Site'. The Main Site is proposed to be located on land formerly part of the Redcar Steelworks.

1.3.5 The proposed hydrogen transport pipelines and other connections (the 'Connection Corridors') will cross other third-party land where required. Together, the Main Site and Connection Corridors are referred to as the 'Proposed Development Site'. The Proposed Development Site is shown on Figure 1-1: Site Location Plan (PEI Report, Volume II). The location of the Main Site, Hydrogen Pipeline Corridor and other indicative Connection Corridors are shown on Figures 4-1 to 4-8 (PEI Report, Volume II).

1.3.6 This PEI Report and the subsequent Environmental Statement (ES) which will accompany the DCO Application relate to development solely within the Proposed Development Site.

1.4 The Development Consent Process

1.4.1 Under the Planning Act 2008 (PA 2008), development consent can be granted in the form of a DCO for certain types of 'Nationally Significant Infrastructure Projects' (NSIPs) by the relevant SoS – in the case of energy infrastructure projects this is the SoS for DESNZ.

1.4.2 Section 14 "*Nationally significant infrastructure projects: general*" of the PA 2008 confirms the types of projects that are NSIPs, which require a DCO. Section 14 does not include the construction and operation of H_2 production facilities but does include the "*construction of a pipe-line other than by a gas transporte*r" that would require "*authorisation under … the Pipe-lines Act 1962"*. According to the Pipe-Lines Act, a cross-country pipeline means a pipeline whose length exceeds, or is intended to exceed 16.093 km (i.e. 10 miles). A pipeline is defined as a pipe or system of pipes for the conveyance of anything other than air, water, water vapour or steam. Therefore, the Proposed Development hydrogen pipeline as currently proposed would require development consent.

1.4.3 Although works to construct the Proposed Development, including the Production Facility, do not fall under the definition of a NSIP, the Applicant sought a direction under Section 35 of the PA 2008 from the SoS to give a direction for all the elements of the Proposed Development to be treated as development for which development consent is required.

1.4.4 On the 22nd of December 2022, the SoS took the decision within the conditions as required by section 35A of the PA 2008 and issued a direction under sections 35(1) and 35ZA that the Production Facility and any aspect of the hydrogen pipelines that are not automatically a NSIP are to be treated as development for which development consent is required. The other aspects of the Proposed Development are being brought forward as 'Associated Development' to that development.

1.4.5 As a result of the above, the Applicant is required to obtain a DCO to construct and operate the Proposed Development under the PA 2008. Section 37 governs the form, content and accompanying documents that are required as part of a DCO application. The requirements are implemented through the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) (the APFP Regulations), which state that an application must be accompanied by an ES, where a development requires an Environmental Impact Assessment (EIA) also known as an 'EIA development' under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the EIA Regulations).

1.4.6 A DCO Application for the Proposed Development will be submitted to the Planning Inspectorate ('the Inspectorate') who will examine the Application and make a recommendation to the SoS for DESNZ pursuant to the PA 2008, who will subsequently determine whether a DCO should be granted.

1.5 Environmental Impact Assessment (EIA) and the Purpose of the PEI Report

The EIA Scoping Process

1.5.1 On 30th March 2023, the Applicant notified the SoS in writing under Regulation 8(1)(b) of the EIA Regulations that it intends to provide an ES in respect of the Proposed Development. The Proposed Development is 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the DCO Application.

1.5.2 The purpose of the EIA Scoping process is to determine which topics should be included in the EIA and the level of detail to which they should be assessed. An EIA Scoping Report distinguishes the priority issues to be addressed at the assessment stage (i.e. within the ES). It also identifies those matters, where possible, which do not need to be assessed in detail and can be 'scoped out'. An EIA Scoping Report for the Proposed Development and a request for an EIA Scoping Opinion pursuant to Regulation 10 of the EIA Regulations was submitted to the Inspectorate on 6th April 2023.

1.5.3 The EIA Scoping Report presented within Appendix 1A (PEI Report, Volume III) was developed with reference to standard guidance and best practice. It was further informed by the EIA team's experience of working on similar projects. The EIA Scoping Report sets out:

- details of the Proposed Development and the Proposed Development Site;
- a summary of alternatives considered;
- a summary of existing and future baseline conditions;
- an outline of the likely environmental effects of the Proposed Development;
- a description of the matters to be scoped in and out of the EIA;
- proposed assessment methods; and
- the proposed structure of the ES.

1.5.4 The SoS's Scoping Opinion was received on 17th May 2023 and is presented within Appendix 1B (PEI Report, Volume III). The matters raised have been reviewed and are taken into consideration in the relevant technical assessments. Further details on the EIA Scoping Opinion are set out in Chapter 2: Assessment Methodology (PEI Report, Volume I).

The PEI Report

1.5.5 Following the completion of an EIA Scoping Report and the publication of the SoS Scoping Opinion, the EIA for the Proposed Development is reported in two stages:

- a PEI Report is prepared to inform consultation with the public and other stakeholders regarding the Proposed Development, based on the preliminary environmental information available at the time of consultation; and
- an ES is prepared to report the final outcomes of the EIA process and will accompany the DCO Application.

1.5.6 This document is the PEI Report which has been prepared to satisfy the requirements of Regulation 12(2) of the EIA Regulations. In accordance with Regulation 12(2)(b), the PEI Report presents *the "information referred to in Regulation 14(2) which… is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)".* Regulation 14(2) describes the information required to be included in an ES.

1.5.7 Table 1-1 identifies where the information defined by Regulation 14(2) can be found within this PEI Report.

Table 1-1: Location of Information Required by Regulation 14(2) within this PEI Report

SPECIFIED INFORMATION	LOCATION WITHIN PEI REPORT
a) a description of the proposed development comprising information on the site, design, size and other relevant features of the development.	Volume I Chapter 3: Description of the Existing Environment, Chapter 4: Proposed Development, Chapter 5: Construction and Programme Management, and Chapter 6: Alternatives and Design Evolution, and supporting figures and (where relevant) appendices to these chapters in Volumes II and III.
b) a description of the likely significant effects of the proposed development on the environment.	Volume I Chapters 8 to 23, 'Likely Impacts and Effects' sections.
c) a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment.	Volume I Chapter 4: Proposed Development and Chapters 8 to 23, 'Development Design and Impact Avoidance' and 'Mitigation and Enhancement Measures' sections.
d) a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment.	Volume I Chapter 6: Need, Alternatives and Design Evolution.
e) a non-technical summary of the information referred to in subparagraphs (a) to (d).	Volume IV: Non-Technical Summary (NTS).

SPECIFIED INFORMATION	LOCATION WITHIN PEI REPORT
f) any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.	Baseline conditions relevant to each assessment are described in Volume I Chapters 8 to 23, 'Baseline Conditions' sections. Assessment methods are described in Volume I Chapter 2: Assessment Methodology and Chapters 8 to 23, 'Assessment Methodology and Significance Criteria' sections. Any limitations and/or difficulties with the assessments are described in Volume I Chapters 8 to 23, 'Limitations or Difficulties' sections. Reference lists detailing sources used are included at the end of each PEI Report chapter.

1.5.8 The Inspectorate's Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (Planning Inspectorate, 2020) states:

> *"A good PEI document is one that enables consultees (both specialist and non-specialist) to understand the likely environmental effects of the Proposed Development and helps to inform their consultation responses on the Proposed Development during the pre-application stage".*

1.5.9 To enable consultees to understand the likely environmental effects of the Proposed Development, this PEI Report presents preliminary findings of the environmental assessments undertaken to date. This allows consultees the opportunity to provide informed comment on the Proposed Development, the assessment process, and preliminary findings prior to the finalisation of the DCO Application and the ES. The Applicant is seeking the views of consultees on the information contained within this report and there is opportunity within the process up to submission of the DCO Application for both the EIA and the Proposed Development design to have regard to comments received.

1.5.10 It should be noted that this PEI Report does not constitute a full ES, but rather presents the findings of the EIA process to date. The information presented in this PEI Report describes the current extent of the environmental assessment work undertaken based on the available information. It is considered that the PEI Report presents sufficient preliminary environmental information to enable consultees to develop an informed view of the Proposed Development and its likely significant environmental effects.

1.5.11 Following statutory consultation, this PEI Report will be developed into the ES, taking into consideration comments raised during consultation. The ES will be submitted as

part of the DCO Application, alongside other related assessments and documents including (but not limited to) a Nutrient Neutrality Assessment, Water Framework Directive (WFD) Assessment, Biodiversity Net Gain (BNG) Report and Habitats Regulations Assessment (HRA).

1.6 Structure of this PEI Report

1.6.1 The structure of this PEI Report reflects the proposed format of the ES and covers the assessment topics agreed through the EIA Scoping process.

1.6.2 Volume I of the PEI Report is structured into chapters as follows:

- Chapters 1 and 2: an introduction to the PEI Report and the EIA methodology and approach;
- Chapters 3 – 6: a description of the Proposed Development Site and Proposed Development, including information on construction timescales and alternatives;
- Chapter 7: a description of relevant legislation and planning policy;
- Chapters 8 – 22: preliminary assessments of the likely significant effects of the Proposed Development (taking into account any mitigation measures proposed) in relation to the environmental topics scoped into the EIA;
- Chapter 23: preliminary assessment of potential interrelationships between the topics covered in Chapters 8 – 22 (combined effects) and between the Proposed Development and other planned developments in the vicinity of the Proposed Development Site (cumulative effects); and

1.6.3 Volumes II and III of the PEI Report comprise the figures and technical appendices that accompany and support the content of Volume I.

1.6.4 Volume IV is a separate document that has been prepared to provide a non-technical summary of this PEI Report.

1.7 Consultation

1.7.1 Consultation is integral to the preparation of DCO applications and to the EIA process. The views of the consultation bodies, stakeholders and the local community serve to focus the environmental assessments and to identify specific issues that require further investigation, as well as to inform aspects of the design of the Proposed Development. Consultation is an ongoing process, and the publication of this PEI Report forms an important part of that process.

1.7.2 The Act requires DCO applicants to undertake statutory pre-application consultation on their proposals. There are a number of requirements as to how this consultation must be undertaken that are set out in the Act and related Regulations, including:

- Section 42 of the Act requires the Applicant to consult with 'prescribed persons', which includes certain consultation bodies such as the Environment Agency (EA), Marine Management Organisation (MMO) and Natural England, relevant statutory undertakers, relevant local authorities, those with an interest in the land, as well as those who may be affected by the development.

- Section 47 of the Act requires the Applicant to consult with the local community regarding the development. Prior to this, the Applicant must agree a Statement of Community Consultation (SoCC) with the relevant local authorities. The SoCC must set out the proposed community consultation and, once agreed with the relevant local authorities, a SoCC notice must be published in local newspapers circulating within the vicinity of the land in question (the Proposed Development Site). The consultation must then be undertaken in accordance with the agreed SoCC.
- Section 48 of the Act places a duty on the Applicant to publicise the Application in the 'prescribed manner' in a national newspaper, The London Gazette, local newspapers circulating within the vicinity of the land (the Proposed Development Site), and certain marine publications.
- Section 49 of the Act places a duty on the Applicant to take account of any relevant responses received to the consultation and publicity that is required by Sections 42, 47, and 48 of the Act.

1.7.3 The Applicant has consulted with the Inspectorate and with the local authorities in which the Proposed Development Site sits, namely Redcar & Cleveland Borough Council (RCBC), Stockton-on-Tees Borough Council (SoTBC), and Hartlepool Borough Council (HBC). Consultation with local authorities has included submission of a data request to the Lead Local Flood Authorities (LLFA) the EA and Natural England and contact with relevant representatives from the local authorities to agree representative photo viewpoint locations and noise and air quality monitoring locations.

1.7.4 The Applicant has also continued to engage in informal consultation with the EA and Natural England, to discuss data requests, design options and potential mitigation measures.

1.7.5 The Applicant is undertaking a formal Section 42 and Section 47 consultation (including agreeing a SoCC with the local authorities and issuing Section 48 notices), which will commence at the same time as the publication of this PEI Report.

1.7.6 The issues that have been raised through consultation and how these have been considered and addressed within the design evolution of the Proposed Development and the EIA process will be detailed in the ES.

1.7.7 The pre-application consultation undertaken by the Applicant will be documented within a Consultation Report that will form part of the DCO Application. This will include a separate section on EIA-related consultation as recommended within the Inspectorate Advice Note Fourteen: Compiling the Consultation Report (Planning Inspectorate, 2021).

1.8 References

- Department for Energy Security & Net Zero (2023). *UK Low Carbon Hydrogen Standard: Guidance on the greenhouse gas emissions and sustainability criteria, Version 2* [Online]. Available at: https://www.gov.uk/government/publications/uk-low-carbon-hydrogen-standard-emissions-reporting-and-sustainability-criteria.
- *Planning Act 2008* (c. 29). London: The Stationery Office [Online]. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents.
- *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017* (SI 2017/571). London: The Stationery Office [Online]. Available at: https://www.legislation.gov.uk/uksi/2017/572/contents/made.
- The Planning Inspectorate (2020). *Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements* [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements/.
- The Planning Inspectorate (2021). *Advice Note Fourteen: Compiling the Consultation Report* [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-fourteen-compiling-the-consultation-report/.

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2.0 ASSESSMENT METHODOLOGY

2.1 Environmental Impact Assessment (EIA) Approach and Scope

2.1.1 This Preliminary Environmental Information (PEI) Report has been prepared to satisfy the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the EIA Regulations) in relation to the proposed Development Consent Order (DCO) Application (the Application) outlined within Chapter 1: Introduction (PEI Report, Volume I).

2.1.2 In preparing this PEI Report, reference has been made to the following Planning Inspectorate ('the Inspectorate') advice notes:

- Advice Note Three: EIA Consultation and Notification (Planning Inspectorate, 2017);
- Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (Planning Inspectorate 2020);
- Advice Note Nine: Rochdale Envelope (Planning Inspectorate, 2018);
- Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects (Planning Inspectorate, 2022); and
- Advice Note Seventeen: Cumulative Effects Assessment relevant to nationally significant infrastructure projects (Planning Inspectorate, 2019).

2.1.3 Reference has also been made to the Scoping Opinion received from the Secretary of State (SoS), dated 17th May 2023 (Appendix 1B: Scoping Opinion, PEI Report, Volume III), and the advice contained within it regarding assessment methodology, topics and presentation of the Environmental Statement (ES).

2.1.4 In response to the Scoping Opinion, this PEI Report includes preliminary assessments (as presented in Chapters 8 to 23 (PEI Report, Volume I)) of the following environmental topics:

- air quality;
- surface water, flood risk and water resources;
- geology, hydrogeology and contaminated land;
- noise and vibration;
- ecology and nature conservation (including aquatic ecology);
- ornithology;
- marine ecology;
- traffic and transport;
- landscape and visual amenity;
- cultural heritage;

- socio economics and land use;
- climate change;
- major accidents and disasters;
- materials and waste;
- human health; and
- cumulative and combined effects.

2.1.5 In addition to the above, the ES will be submitted alongside other related assessments and documents including (but not limited to) a Nutrient Neutrality Assessment, Water Framework Directive (WFD) Assessment, Biodiversity Net Gain (BNG) Report and Habitats Regulations Assessment (HRA).

2.1.6 The Scoping Opinion (Appendix 1B: Scoping Opinion, PEI Report, Volume III) confirmed that a number of topics or specific matters within topics do not need to be considered as part of the EIA for the Proposed Development and can be scoped out. Clarifications and responses to any queries raised in the Scoping Opinion are addressed in Chapters 2, 4 and 8 - 23 (PEI Report, Volume I).

2.2 Proposed Development Phasing

2.2.1 The assessment considers the phased approach for the construction of the Proposed Development. It is proposed that Phase 1 and Phase 2 are constructed sequentially, with a level of flexibility in the construction programme to account for potential overlap (anticipated to be limited). Based on this phased approach, each environmental topic may have slightly different worst-case assumptions as set out in each chapter.

2.2.2 Phase 1 construction works will include the Production Facility at the Main Site (Phase 1 components) and the various utility connections required, including CO_2 export pipeline to Northern Endurance Partnership (NEP) infrastructure on the adjacent NZT site, and the natural gas, water, nitrogen (N_2), oxygen (O_2), and electricity connections. Phase 1 will also include the construction of the majority of the hydrogen pipeline, except for short additional spurs of the hydrogen pipeline which will be constructed as part of Phase 2.

2.2.3 Phase 2 construction at the Main Site will include the infrastructure required for the second Hydrogen Unit train to increase the capacity of the Production Facility. The additional Phase 2 infrastructure will be constructed within the Main Site, adjacent to the Phase 1 previously constructed infrastructure.

2.3 PEI Report

2.3.1 This PEI Report presents a description of the Proposed Development and its likely significant effects on the environment during construction and operation (including maintenance where relevant) and decommissioning, based on the preliminary environmental information available at the time of the assessment (August 2023). It

also details measures to avoid, prevent or reduce and, if possible, offset such effects and the alternatives considered to date.

2.3.2 This PEI Report includes a summary of the following activities in a level of detail considered sufficient for the purposes of this consultation and based on the information available:

- establishing the baseline conditions;
- consultation with statutory and non-statutory consultees and stakeholders;
- consideration of relevant local, regional, and national planning policies and guidelines;
- review and presentation of legislation relevant to EIA or technical topics;
- consideration of technical standards for the development of significance criteria;
- application of specialist assessment methodologies;
- design review;
- review of secondary information, previous environmental studies and surveys, publicly available information and databases;
- application of expert opinion;
- physical surveys and monitoring undertaken to date;
- desktop studies undertaken;
- modelling and calculations; and
- providing reference to current guidance.

2.3.3 These activities enable the prediction of impacts in relation to the baseline, and a prediction based on the information available of the likely significance of effects associated with the Proposed Development on environmental resources and receptors.

2.3.4 An environmental resource is any material, service, or information from the environment that is valuable to society. This can refer to anything that people find useful in their environment, or surroundings. Examples of environmental resources are minerals, forests, land, oceans, rivers etc.

2.3.5 Receptors are defined in the context of the Source Pathway Receptor model. Environmental impacts start at a Source which follows a Pathway that affects the Receptor such as humans, property, wildlife and their habitats, landscape, atmosphere, water, etc. For example, construction dust (source) – wind carries it (pathway) – it is deposited on a residential property (receptor).

2.3.6 The term ‘impact’ refers to changes arising from the Proposed Development, whereas the term ‘effect’ is used to describe the result of the impact on a receptor.

2.3.7 The technical chapters within this PEI Report (Chapters 8 – 23 (PEI Report, Volume I)) each follow the same structure for ease of reference, which is:

- introduction;
- legislation and planning policy context;
- assessment methodology and significance criteria;
- baseline conditions;
- development design and impact avoidance;
- likely impacts and effects;
- mitigation and enhancement measures;
- limitations and difficulties;
- residual effects and conclusions; and
- references.

2.4 Study Areas: Spatial Scope of Assessment

2.4.1 The assessment chapters of this PEI Report (Chapters 8 – 23 (PEI Report, Volume I)) describe, as necessary, their spatial scope which is the geographical coverage that defines where impacts as a result of the Proposed Development may occur. It includes the physical extent of the proposed works (defined by order limits), the nature of the baseline environment and the regional, national and local planning and policy context for the Proposed Development. For example, any potential effects on archaeology would be confined to those areas physically disturbed by the works, whilst the effects of noise or visual intrusion could potentially be experienced at some distance. The significance of effects also varies spatially – many effects will only be significant locally (i.e. in the immediate vicinity of the site) whilst others may be significant at a project-wide level as described above.

2.4.2 Each assessment chapter of this PEI Report includes a rationale for determining the specific area within which the assessment is focussed. The study areas are a function of the nature of the impacts and locations of potentially affected environmental resources or receptors. Each assessment chapter includes a description and where necessary a figure illustrating the study area used for that assessment and identifying the location of relevant resources and receptors.

2.5 Assessment Years and Assessment Scenarios: Temporal Scope of Assessment

2.5.1 The temporal scope covers the time period over which changes to the environment and the resultant effects are predicted to occur; they are typically defined as either being temporary or permanent. The approach to assessment has been to assess the environmental impacts of the Proposed Development during construction, operation (including maintenance) and eventual decommissioning.

2.5.2 Where effects are dependent on longer term considerations, the temporal scope is extended beyond the opening year of the Proposed Development to take account of the longer-term nature of effects which might occur.

2.6 Baseline Conditions (Including Future Baseline)

2.6.1 To assess the potential impacts and effects of the Proposed Development, it is necessary to determine the environmental conditions ('baseline conditions') that currently exist on the Proposed Development Site and its surrounding area to determine their relative value, importance or sensitivity towards change. Baseline conditions are determined using the results of site surveys and investigations or desk-based data searches, or a combination of these, as appropriate.

2.6.2 It is also relevant for the EIA to consider future baseline conditions taking account of any planned or likely changes to the existing baseline that may occur prior to construction of the Proposed Development.

2.6.3 The 'existing baseline' considers the period 2021 – 2023 since this is the period in which the baseline studies for the EIA have been and are being undertaken. 'Future baseline' conditions are also predicted for each assessment scenario, whereby the conditions anticipated to prevail in future were the Proposed Development not to proceed are identified. These 'future baseline' conditions can then be compared against the predicted conditions with the Proposed Development.

2.6.4 The assessment scenarios that are being considered for the purposes of the EIA (and presented in this PEI Report) are:

- existing baseline (without the Proposed Development) – the years that baseline data has been collected (as above);
- future baseline (without the Proposed Development) – for comparison with the construction, opening, operation and decommissioning scenarios listed below, respectively;
- construction of the Proposed Development – Chapters 8 – 23 (PEI Report, Volume I) identify and assess the relevant 'worst case' construction scenario for each topic (accounting for known information) and, where necessary, particular chapters identify the relevant period or 'peak' of activity within the proposed construction programme;
- opening and/or operation of the Proposed Development (where opening represents the start of operation) – as for construction, Chapters 8 – 23 (PEI Report, Volume I) identify and assess the relevant 'worst case' scenario for each topic (accounting for known information); and
- decommissioning of the Proposed Development.

2.7 Development Design, Impact Avoidance and Mitigation

2.7.1 Measures that have been integrated into the Proposed Development to avoid, reduce or offset adverse environmental effects are described in Chapters 8 – 23 (PEI Report, Volume I). Such measures include refinement of the design and layout of the Proposed Development to avoid impacts on sensitive receptors, and adherence to relevant legislation, guidance, and best practice. The assessment of impacts and effects has been undertaken on the basis of these measures being implemented (i.e. they are 'embedded mitigation').

2.7.2 The key aspects where the Proposed Development design has evolved to this point are described in Chapter 6: Need, Alternatives and Design Evolution (PEI Report, Volume I).

2.7.3 Once the likely effects of the Proposed Development have been identified and quantified, consideration has then been given to the need for any further mitigation (over and above anything identified within the Proposed Development Design and Impact Avoidance sections of each technical chapter) that may be required to mitigate any likely significant adverse effects identified, as well as whether the effects and any mitigation need to be monitored and kept under review. These measures are then described in the Mitigation and Enhancement Measures sections of Chapters 8 – 23 (PEI Report, Volume I). The residual effects after the implementation of mitigation are then assessed and presented at the end of Chapters 8 – 23 (PEI Report, Volume I).

2.7.4 Implementation of the impact avoidance and minimisation measures relied on in the assessment will be secured through the most appropriate means. In many cases this will be through the DCO, such as via setting the limits of deviation (e.g. specific Above Ordnance Datum (AOD) heights and fixed grid references for emission points) or through DCO requirements (similar to planning conditions) in relation to mitigation measures. Measures may also be secured through other means, such as via existing legislation or the environmental permit that will be required to operate the Proposed Development.

2.8 Impact Assessment Methodology and Significance Criteria

2.8.1 Impacts are defined as changes arising from the Proposed Development. Consideration of the result of these impacts on environmental receptors enables the identification of associated effects and their classification. Where relevant, effects have been classified both:

- before the application of addition mitigation measures (but including embedded mitigation measures and general best practice); and
- after additional mitigation measures have been applied.

2.8.2 Effects after the application of mitigation are referred to as ‘residual effects’, which may or may not remain significant.

2.8.3 The classification of effects has been undertaken with due regard to the following:

- extent (local, regional, or national) and magnitude of the impact;
- duration (short-term, medium-term, or long-term);
- nature (direct or indirect, reversible or irreversible);
- whether the effects occur in isolation, or are cumulative and/or interactive;
- performance against environmental quality standards and in the context of relevant legislation, standards, and accepted criteria;
- number of receptors affected;

- sensitivity of receptors;
- compatibility with environmental policies; and
- professional experience and judgement of the assessor.

2.8.4 Further details are provided in Chapters 8 – 23 (PEI Report, Volume I).

2.8.5 Where it has not been possible to quantify effects, qualitative assessments have been undertaken based on available knowledge and professional judgement. Where any uncertainty exists, this has been noted in the relevant technical chapter within the Limitations and Difficulties section of Chapters 8 – 23 (PEI Report, Volume I).

2.8.6 To enable comparison between technical topics and aid understanding of the EIA findings, standard terms are used wherever possible to classify effects throughout this PEI Report (i.e. major, moderate, minor or negligible), whilst effects are described as being adverse, neutral or beneficial. Where the quality standards for each technical discipline result in deviations in the standard assessment methodology, these are described and justified in the relevant chapters, as required.

2.8.7 Definitions of the standard terms are:

- negligible – imperceptible effect to an environmental resource or receptor;
- minor – slight, very short or highly localised effect;
- moderate – limited effect (by extent, duration or magnitude);
- major – considerable effect (by extent, duration or magnitude) or more than a local scale or in breach of recognised acceptability, legislation, policy or standard;
- adverse – detrimental or negative effects to an environmental resource or receptor;
- neutral – effects to an environmental resource or receptor that are neither positive or negative; and
- beneficial – advantageous or positive effect to an environmental resource or receptor.

2.8.8 Schedule 4 of the EIA Regulations requires an Environmental Statement to include: "*a description of the likely significant effects of the development on the environment*", but it does not provide advice as to how to derive significance or what level of significance is significant. For this assessment moderate and major effects are considered to be '*significant*'.

2.8.9 Each of the technical chapters within this PEI Report provide a further description and definition of the assessment criteria relevant to each topic. Where possible, this has been based upon quantitative and accepted criteria (for example British Standards), together with the use of value judgement and expert interpretation to classify likely effects.

2.8.10 In general, the classification of an effect is based on the magnitude of the impact (very low – high) and the sensitivity or importance of the receptor (very low – high), using the matrix outlined in Table 2-1. The specific definitions of magnitude and

receptor sensitivity (sometimes referred to as 'importance') vary by topic but typically, magnitude is a function of the spatial extent, duration, frequency and severity of the effect, and receptor/ resource sensitivity is defined by considering factors such as sensitivity to change, adaptability, tolerance, ability to recover and current value/ quality.

2.8.11 Where there are deviations away from this matrix (due to the technical guidance for a specific assessment topic), this is highlighted within the relevant technical chapter and the reason for the variation is explained.

Table 2-1: Classification of Effects

MAGNITUDE OF IMPACT	SENSITIVITY/IMPORTANCE OF RECEPTOR			
	HIGH	MEDIUM	LOW	VERY LOW
HIGH	Major	Major	Moderate	Minor
MEDIUM	Major	Moderate	Minor	Negligible
LOW	Moderate	Minor	Negligible	Negligible
VERY LOW	Minor	Negligible	Negligible	Negligible

2.8.12 In the context of the Proposed Development, short-term effects are those associated with the site preparation and construction phase and effects associated with the decommissioning phase, which will cease at the end of each of those phases.

2.8.13 Medium-term effects are those associated with the completed Proposed Development, which extend within the operational phase but only last for a few months or years during the operational phase.

2.8.14 Long-term effects are those associated with the completed, operational development and which last for the duration of the operational phase.

2.8.15 Effects may also be permanent (irreversible) or temporary (reversible) and either direct (caused by direct interaction of the Proposed Development with a resource or receptor) or indirect (caused by the Proposed Development generating a further process or complex interaction, often at a distance, which then affects a resource or receptor).

2.9 Transboundary Effects

2.9.1 The United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment in a Transboundary Context (referred to as the Espoo Convention) requires that assessments are extended across borders between Parties of the Convention when a planned activity may cause significant adverse transboundary impacts.

2.9.2 SoS undertook an initial transboundary screening exercise for the Proposed Development under Regulation 32 of the EIA Regulations. Based on the information available from the Applicant at the scoping stage, the screening concluded that the Proposed Development is unlikely to have a significant effect either alone or cumulatively on the environment in any European Economic Area (EEA) state. A copy of the matrix is provided in Appendix 2A of the EIA Scoping Opinion presented in Appendix 1B (PEI Report, Volume III). At this stage it is not anticipated that there would be any significant transboundary effects associated with the Proposed Development. However, the potential transboundary effects will be reviewed and confirmed in the ES.

2.10 Cumulative and Combined Effects

2.10.1 In accordance with the EIA Regulations, consideration is given to the potential for cumulative and combined effects to arise as a result of the Proposed Development.

2.10.2 Cumulative effects are those that accrue from a number of development activities. The impacts of the Proposed Development have been considered in conjunction with the potential impacts from other projects or activities which are reasonably foreseeable in terms of delivery. This includes, but is not limited to, projects that have submitted applications for planning permission or development consent (including those that have not yet been approved) in locations where environmental impacts could act together with those associated with the Proposed Development to create a more significant overall effect on a receptor or resource, where sufficient environmental information is available.

2.10.3 Combined effects are those resulting from a single development, in this case the Proposed Development, on any one receptor or resource that may collectively cause a greater effect (such as the combined effects of noise and air quality/dust impacts during construction on local residents).

2.10.4 Cumulative and combined effects are discussed in Chapter 23: Cumulative and Combined Effects (PEI Report, Volume I).

2.11 Consultation

2.11.1 An EIA Scoping Opinion was requested from the Inspectorate in April 2023, with a response received on 17th May 2023. A high-level summary of responses to the Scoping Opinion comments relevant to the assessment methodology is provided in Table 2-2.

Table 2-2: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	<u>Assessment methodology and significance criteria</u> The Scoping Report states that methods used in assessment will be outlined in each aspect chapter by reference to published standards, guidelines, and criteria. For some aspect sections in the Scoping Report, no reference is made to the standards proposed to be used so the Inspectorate is not able to provide substantive comment. The ES should describe the standards and guidelines used for each aspect and explain why these are appropriate to the assessment.	This PEI Report includes information regarding the relevant standards and guidelines for each topic. This information will also be included within the ES.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Baseline conditions</u> The Inspectorate notes that Main Sites A and B appear to partially overlap with the Order Limits of the NZT project. Any implications for the future baseline arising in the event of commencement of development authorised by the NZT DCO, should it be made, should be described in the ES.	Due to the expected timeframes for the project, Net Zero Teesside (NZT) will be considered within the cumulative effects assessment later in the EIA process and reported in the ES, rather than the future baseline.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Transboundary</u> The Inspectorate on behalf of the SoS has considered the Proposed Development and concludes that the Proposed Development is unlikely to have a significant effect either alone or cumulatively on the environment in a European Economic Area State. In reaching this conclusion the Inspectorate has identified and considered the Proposed Development's likely impacts including consideration of potential pathways and the extent, magnitude, probability, duration, frequency and reversibility of the impacts.	It is noted that the Inspectorate considers that the likelihood of transboundary effects resulting from the Proposed Development is so low, therefore not warranting the issue of a detailed transboundary screening. However, a simple transboundary screening will be

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		The Inspectorate considers that the likelihood of transboundary effects resulting from the Proposed Development is so low that it does not warrant the issue of a detailed transboundary screening. However, this position will remain under review and will have regard to any new or materially different information coming to light which may alter that decision. Note: The SoS' duty under Regulation 32 of the 2017 EIA Regulations continues throughout the application process. The Inspectorate's screening of transboundary issues is based on the relevant considerations specified in the Annex to its Advice Note Twelve, available on our website at http://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/.	undertaken later in the EIA process and reported in the ES.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Study areas</u> Each ES aspect chapter should describe the study area used in the assessment. It should explain how the extent of the study area has been established by reference to guidelines and discussions with statutory consultation bodies as relevant. The ES should include a figure(s) to identify the final study areas for each aspect, including the location of receptors considered.	The relevant study areas are described in this PEI Report and will also be described within the ES. This includes an explanation of how they have been established. They are shown on the plans accompanying the PEI Report. Similar plans will accompany the ES.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Matters scoped into the assessment</u> For the avoidance of doubt, as there is no summary table identifying matters scoped in or out of the aspects listed below, this Scoping Opinion is adopted on the basis that the impacts on receptors listed at the specified paragraphs in the	This is noted. In addition to the topics outlined in the Scoping Opinion, the following topics have also been scoped in and assessed in the PEI Report:

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		Scoping Report are scoped into the assessment subject to the Inspectorate's comments at 1.0.4: • Surface water, flood risk and water resources – paragraph 6.3.20. • Geology, hydrogeology and contaminated land – paragraph 6.4.88. • Ecology and nature conservation – paragraph 6.6.18. • Marine ecology – paragraph 6.8.24. • Traffic and transportation – paragraph 6.9.10. • Landscape and visual amenity – paragraph 6.10.8. • Cultural heritage – paragraph 6.11.10. • Socio-economics and land use – paragraph 6.12.21. • Climate change – paragraph 6.13.15. • Materials and waste – paragraph 6.15.7.	• air quality; • noise and vibration; • ornithology; • major accidents and disasters; • population and human health; and • cumulative and combined effects.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Impact from de watering</u> The Scoping Report does not specify if dewatering would be required in the construction of the Proposed Development. The ES should describe the likely need for dewatering, identify sensitive receptors which may be affected and assess any likely significant effects. The ES and associated management plan documents should set out the minimum environmental requirements that have been assessed and that contractors will be required to apply when managing dewatering discharges.	Dewatering will be required for the construction of the Proposed Development. The ES will describe the need for it, identify sensitive receptors which may be affected, assess any likely significant effects and recommend appropriate mitigation measures if required.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	<u>CEMP</u> The Inspectorate welcomes the commitment to submit a framework CEMP with the ES. In addition to the matters listed at paragraph 3.13.7 of the Scoping Report, the Inspectorate advises that the framework CEMP should contain details of all measures referred to in the ES required to mitigate construction impacts, unless these are secured by alternative mechanisms (in which case this should be explained, and the alternative mechanism confirmed). The ES should clearly describe the efficacy of proposed measures and any residual effects following implementation, and it should also assess any inter-related effects of the mitigation measures, e.g. the presence of any noise screening required to be considered in landscape and visual impact assessment.	This is noted and the requested information will be included within the Framework Construction Environmental Management Plan (CEMP) which will accompany the ES. The ES will clearly describe the efficacy of the proposed measures and any residual effects following implementation, and any effects associated with the mitigation measures themselves.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Operational environmental management plan (OEMP)</u> The Scoping Report references use of an environmental management plan during operation to mitigate potential significant adverse effects. The Applicant should provide a draft/ outline version of an OEMP containing details of any measures referred to in the ES and demonstrate how these will be secured through the dDCO or an alternative legal mechanism.	The Scoping Report references the requirement of environmental management during operation and not the preparation of a draft OEMP at this stage. Therefore, an OEMP will not form part of the DCO application. The Applicant and appointed Contractor will be responsible for the preparation of an OEMP prior to the start of operation.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	<u>Avoidance / mitigation measures</u> The Scoping Report makes reference to the use of avoidance measures to reduce effects to not significant (e.g. avoidance of tree / linear habitat feature removal). The ES should set out any measures relied upon to avoid significant effects and demonstrate how these will be secured through the dDCO or other legal mechanism.	The ES will clearly outline embedded and proposed additional mitigation measures and how they will likely be secured.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Monitoring</u> The Scoping Report references monitoring of mitigation in several aspect sections. Where the ES concludes that monitoring is required, the Applicant should provide a document that describes the monitoring activities, who has responsibility for them, frequency, any trigger points for remedial action and how it is secured through the dDCO or other legal mechanism.	The Landscape and Biodiversity Management Plan (LBMP) will detail immediate and long-term commitments to manage the planting, protection and enhancement of biodiversity in and around the Proposed Development. The LBMP will include design plans, programmes, specifications, monitoring requirements, remedial actions and responsibilities. Any other monitoring recommended will be detailed within the relevant chapter(s) of the ES and the CEMP.

2.12 References

- *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017* (SI 2017/571). London: The Stationery Office [Online]. Available at: https://www.legislation.gov.uk/uksi/2017/572/contents/made.
- The Planning Inspectorate (2017). *Advice Note Three: EIA Notification and Consultation* [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-three-eia-notification-and-consultation-2/.
- The Planning Inspectorate (2018). *Advice Note Nine: Rochdale Envelope* [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/.
- The Planning Inspectorate (2019). *Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects* [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/.
- The Planning Inspectorate (2020). *Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements* [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements/.

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3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

3.1 Introduction

3.1.1 The purpose of this chapter of the Preliminary Environmental Information (PEI) Report is to provide a summary of the existing environment at the Proposed Development Site and its surroundings. Further relevant details are presented within the baseline sections of each of the topic chapters as presented within this PEI Report (refer to Chapters 8 to 22 (PEI Report, Volume I)).

3.2 Site Location

3.2.1 The Proposed Development Site is shown on Figure 1-1: Site Location (PEI Report, Volume II). The area within this boundary is defined and referred to as the '*Proposed Development Site'*. The final Proposed Development Site for the purposes of the Development Consent Order (DCO) Application will be refined through on-going studies, having regard to responses to the Applicant's consultation. The final Proposed Development Site will be referred to as the 'Order Limits' in the DCO Application.

3.2.2 The Main Site will be located at '*The Foundry*' site within the Teesworks development site, as shown by Figure 4-1: Proposed Development Site Boundary (including location of the Main Site) (PEI Report, Volume II).

3.2.3 The Proposed Development Site is located primarily within the administrative boundaries of Redcar and Cleveland Borough Council (RCBC) and Stockton-on-Tees Borough Council (STBC). The Hydrogen Pipeline Corridor extends further north-west to include land within the administrative boundary of Hartlepool Borough Council (HBC).

3.2.4 This chapter is supported by Figures 3-1 to 3-4 (PEI Report, Volume II).

3.3 The Site

3.3.1 For the purposes of the PEI Report, the Proposed Development Site is split into the Main Site which is the location of the Production Facility together with the associated carbon capture and compression facilities and ancillary infrastructure (refer to Figure 4-1, PEI Report, Volume II); and the Associated Development which include the following:

- CO_2 Export Corridor (refer to Figure 4-3 in PEI Report, Volume II);
- Hydrogen Pipeline Corridor (refer to Figure 4-4 in PEI Report, Volume II);
- Natural Gas Connection Corridor (refer to Figure 4-5 in PEI Report, Volume II);
- Electrical Connection Corridor (refer to Figure 4-6 in PEI Report, Volume II);
- Water Connections Corridor (including wastewater treatment and disposal infrastructure) (refer to Figure 4-7 in PEI Report, Volume II); and
- Other Gases (Oxygen and Nitrogen) Connection Corridor (refer to Figure 4-8 in PEI Report, Volume II).

3.3.2 Further detail regarding the Proposed Development is contained within Chapter 4: Proposed Development (PEI Report, Volume I).

3.3.3 The Proposed Development Site encompasses an area of approximately 1,400 hectares (ha). It is indicative at this stage and subject to revision. The land required for the Proposed Development will be subject to appraisal and refinement as the preparation of the DCO Application progresses.

3.3.4 The final layout that will be incorporated within the Proposed Development Site will be determined through ongoing studies of potential constraints and discussions with relevant stakeholders.

3.3.5 Any existing structures currently located within the Main Site are expected to be demolished (by others under a separate consent) prior to commencement of works associated with the Proposed Development. Therefore, these demolition works do not form part of the Proposed Development and will not be assessed as part of the Environmental Impact Assessment (EIA).

3.4 Environmental Receptors

3.4.1 Numerous environmental receptors have been identified within and in the vicinity of the Proposed Development Site (pursuant to the Study Areas as outlined in the various technical chapters in the PEI Report, Volume I). All distances presented herein are given as the shortest distance between the receptor and the closest point of the relevant part of the Main Site.

3.4.2 The Main Site comprises approximately 91 ha of land in total for Phase 1 and Phase 2. It is not anticipated that all this land will be required, but it is presented as a worst-case scenario until the layout of the Proposed Development is confirmed within this area.

3.4.3 The Main Site comprises former industrial land that was used for steel making production, including a mix of industrial buildings. As of June 2023, much of the site infrastructure including industrial buildings and overhead pipes are either demolished or in the process of being dismantled. A combination of hardstanding and road networks remain on the Main Site, surrounded by informal vegetation (primarily grass), with occasional shrubs and small trees.

3.4.4 The topography of the Main Site is relatively flat, with typical ground levels of between 6 - 8 m Above Ordnance Datum (AOD).

3.4.5 The following environmental resources/receptors have been identified in the vicinity of the Main Site.

Residential

3.4.6 The Main Site is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 1.3 km east of the Main Site, in Warrenby.

3.4.7 Dormanstown is located approximately 1.3 km to the south-east of the Main Site, whilst Redcar is located approximately 2.6 km to the east.

3.4.8 The main residential areas in the vicinity of the Main Site are illustrated indicatively on Figure 3-1 (PEI Report, Volume II).

Traffic and Transport

3.4.9 The Tees Valley Line, a passenger railway, runs approximately 0.9 km south-east of the Main Site. The mothballed Redcar British Steel railway station (no longer operational) is located approximately 1.2 km to the south-west.

3.4.10 There are no Public Rights of Way (PRoWs) within the Main Site. The England Coast Path, a National Trail, runs approximately 1.3 km east of the Main Site. The Teesdale Way Long Distance Route runs adjacent to the Main Site along its northern boundary. There are no other National Trails within 5 km of the Main Site.

3.4.11 Whilst the Main Site is located within access land in the England Coastal Margin defined by the Countryside and Rights of Way (CRoW) Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW Act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

3.4.12 Further information on receptors relevant to traffic and transportation located in the vicinity of the Proposed Development Site is presented in Chapter 15: Traffic and Transport (PEI Report, Volume I). In addition, PRoW that are not within the Main Site are illustrated on Figure 3-1 (PEI Report, Volume II).

Ecology

3.4.13 Within 15 km of the Main Site there are:

- Three Special Protection Areas (SPAs):
  - Teesmouth and Cleveland Coast SPA located immediately north of the Main Site;
  - North York Moors SPA located approximately 12.2 km south-east of the Main Site; and
  - Northumbria Coast SPA located approximately 13.5 km north-west of the Main Site.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site located immediately north of the Main Site; and
  - Northumbria Coast Ramsar Site located approximately 13.5 km north-west of the Main Site.
- Two Special Areas of Conservation (SACs):
  - North York Moors SAC located approximately 12.2 km south-east of the Main Site; and
  - Durham Coast SAC located approximately 13.5 km north-west of the Main Site.
- Two National Nature Reserves (NNRs):
  - Teesmouth NNR located approximately 1.6 km west of the Main Site; and

- Durham Coast NNR located approximately 12.5 km north-west of the Main Site.

3.4.14 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Main Site.

3.4.15 There is one Site of Special Scientific Interest (SSSI) within 5 km of the Main Site, that being Teesmouth and Cleveland Coast SSSI, which is located adjacent to the Main Site.

3.4.16 There is one Local Nature Reserve (LNR) within 5 km of the Main Site, that being the Seaton Dunes and Common LNR which is located approximately 3.1 km to the north-west.

3.4.17 All the above statutory designated ecological sites are illustrated on Figure 3-4 (PEI Report, Volume II).

3.4.18 Non-statutory designated ecological sites are described in Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I) and shown on Figure 3-3 (PEI Report, Volume II).

3.4.19 Further information on ecological receptors located in the vicinity of the Proposed Development Site is presented in the section *'Baseline Conditions'* of Chapter 12: Ecology and Nature Conservation (including aquatic ecology), Chapter 13: Ornithology and Chapter 14: Marine Ecology (PEI Report, Volume I) and their associated figures in PEI Report, Volume II.

Hydrology and Flood Risk

3.4.20 The River Tees (a Main River) discharges to the North Sea via the Tees Estuary at Tees Mouth and is located approximately 0.9 km west of the Main Site. Other watercourses within 1 km of the Main Site include:

- Dabholm Gut[1] a man-made tidal inlet located approximately 0.7 km south of the Main Site;
- The Fleet located approximately 0.8 km east of the Main Site; and
- The Mill Race located approximately 0.9 km south-east of the Main Site.

3.4.21 The Environment Agency *'Flood map for planning'* (Environment Agency, 2022) indicates that the whole of Main Site is located within Flood Zone 1 that is defined as '*land having a less than 0.1% annual exceedance probability (AEP) of river or sea flooding'*.

3.4.22 Further information on hydrology and flood risk receptors located in the vicinity of the Proposed Development Site is presented in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I) and illustrated on Figures 3-2 and 9-1 to 9-5 (PEI Report, Volume II).

Geology and Hydrogeology

3.4.23 The Main Site is underlain by a sequence of Made Ground, Tidal Flat Deposits and Glacial Till (Boulder Clay)/Glacio-lacustrine deposits, underlain by Triassic Mercia

[1] Also referenced on early mapping sources as Dabholm Cut. For the purposes of this report, this watercourse/feature is referred to consistently as Dabholm Gut. It is fed by a combined discharge from number of watercourses and the permitted discharge from Bran Sands Wastewater Treatment Works (WwTW).

Mudstone bedrock in the north-west, Triassic Penarth Formation in the centre and Jurassic Redcar Mudstone Formation in the south-east.

3.4.24 The Main Site is located over 5 km south-east of the nearest aquifer Source Protection Zone (SPZ). There are no Nitrate Vulnerable Zones (NVZs), Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences located within 1 km of the Main Site.

3.4.25 Further information on geology and hydrogeology receptors located in the vicinity of the Proposed Development Site is presented in Chapter 9: Surface Water, Flood Risk and Water Resources, Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I) and illustrated on Figures 9-1 to 9-5 and 10-1 to 10-23 (PEI Report, Volume II).

Cultural Heritage

3.4.26 There are no designated heritage assets within the Main Site.

3.4.27 There are 59 listed buildings within 5 km of the Main Site. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable circa 10 metres north-west of Marsh Farmhouse'), located approximately 1.3 km to the east of the Main Site at Warrenby.

3.4.28 There are four conservation areas within 5 km of the Main Site as follows:

- Coatham Conservation Area, Redcar, located approximately 2.5 km east of the Main Site;
- Kirkleatham Conservation Area, located approximately 3.8 km south-east of the Main Site;
- Seaton Conservation Area, located approximately 4.6 km north-west of the Main Site; and
- Wilton Conservation Area located approximately 5 km south-east of the Main Site.

3.4.29 There are no scheduled monuments, world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of the Main Site.

3.4.30 Further information on cultural heritage receptors located in the vicinity of the Proposed Development Site is presented in Chapter 17: Cultural Heritage (PEI Report, Volume I) and illustrated on Figures 3-1, and 17-1 to 17-4 (PEI Report, Volume II).

Landscape

3.4.31 The Main Site is located within the Tees Lowlands National Character Area (NCA).

3.4.32 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Main Site and the surrounding area.

3.4.33 Further information on landscape receptors located in the vicinity of the Proposed Development Site is presented in Chapter 16: Landscape and Visual Amenity (PEI Report, Volume I) and illustrated on Figures 16-1 to 16-2 (PEI Report, Volume II).

3.5 References

- Britain from Above (2023). *Map* [online]. Available at: https://britainfromabove.org.uk/en/map?country=global&view=map#0,262466.52493474324,609599.6708161779.
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4.0 PROPOSED DEVELOPMENT

4.1 Introduction

4.1.1 The Proposed Development comprises the construction, operation (including maintenance where relevant) and decommissioning of an approximately 1.2-Gigawatt Thermal (GWth) Lower Heating Value (LHV) Carbon Capture and Storage (CCS) enabled a Hydrogen Production Facility (the 'Production Facility') located in Teesside, along with the pipeline infrastructure required to supply hydrogen (H_2) to offtakers (customers) and the necessary utility connections.

4.1.2 This chapter is supported by Figures 4-1 - 4-8 (PEI Report, Volume II) which show the components of the Proposed Development, including the Main Site (the Foundry) and the Connection Corridors.

4.2 Proposed Development Overview

4.2.1 The Production Facility is an approximately 1.2 GWth LHV (Phase 1, 600-Megawatt thermal (MWth) LHV and Phase 2, 600 MWth LHV) Carbon, Capture and Storage (CCS) enabled Production Facility located in the Teesside industrial cluster area. In addition to the Production Facility, the Proposed Development includes the following:

- H_2 distribution pipelines to supply H_2 to various offtakers in Teesside and within the surrounding area;
- an Air Separation Unit (ASU) (located on the Main Site) to supply oxygen (O_2) and nitrogen (N_2) for the H_2 production process;
- O_2 and N_2 supply pipelines (as an alternative to the proposed ASU) to supply O_2 and N_2 for the H_2 production process, from an existing nearby third party ASU;
- carbon dioxide (CO_2) capture and compression facilities and a connection to the Northern Endurance Partnership (NEP) CO_2 gathering pipeline network for transportation of captured CO_2 to permanent storage;
- a natural gas supply connection for the supply of gas to the Production Facility;
- on-site, above ground H_2 storage not exceeding 11 tonnes;
- an electrical grid connection to provide power to the Proposed Development;
- water supply and treatment infrastructure;
- wastewater treatment and disposal infrastructure;
- other utilities connections, telecommunications, and other associated and ancillary infrastructure; and
- temporary construction and laydown areas.

4.2.2 The Production Facility will be located on the 'Main Site', as referred to in this PEI Report.

4.2.3 Demand for H_2 produced by H2Teesside will come from multiple end users, including supporting fuel switching from natural gas to H_2 within process heat, steam raising and power generation applications, therefore reducing CO_2 emissions from these industries.

4.2.4 The proposed capture technology uses an amine-based solvent to absorb CO_2 produced by the H_2 production process, with an anticipated design carbon capture rate in excess of 95%. This process is also known as '*pre-combustion amine-based absorption regeneration'*. The design capture rate will be defined in the Environmental Permit that will be required to operate the Proposed Development. H2Teesside will connect via a short CO_2 export connection to the NEP compression and pipeline infrastructure on the adjacent Net Zero Teesside (NZT) site. Based on current projections, H2Teesside will have the capacity to continuously export approximately 1.4 megatonnes (Mt) of dehydrated and compressed CO_2 per year per phase or use up to approximately 2.8 Mt/year once both phases are operational (100% utilisation) to NEP for offshore underground storage with no temporary CO_2 storage required on site.

4.2.5 At this stage in the design of the Proposed Development, there are still options being considered for various components. The design of the Proposed Development incorporates a necessary degree of flexibility to allow for the future selection of the preferred technology and layout at the Main Site, as well as the routing of the hydrogen pipeline and other connections. This will evolve as design and commercial agreements progress during the preparation of the DCO Application.

4.2.6 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken using the principles of the 'Rochdale Envelope' as set out in Advice Note Nine (The Inspectorate, 2018) where appropriate. This involves assessing the maximum (or where relevant, minimum) parameters for those elements of the Proposed Development where there is currently uncertainty in the final design (for example, building dimensions or operational modes), as set out in Section 4.9. Where this approach is being applied in the assessment, this is confirmed within the relevant chapters of this PEI Report. Justification for the need to retain flexibility in certain parameters is also outlined in this chapter and in Chapter 6: Alternatives and Design Evolution (PEI Report, Volume I). As such, this PEI Report represents a reasonable worst-case assessment of the potential impacts of the Proposed Development at its current stage of design.

4.2.7 Details regarding the construction phase of the Proposed Development are included in Chapter 5: Construction Programme and Management (PEI Report, Volume I). At this stage, a detailed construction programme is not available, as this is normally determined by the Engineering Procurement and Construction (EPC) contractor who has not yet been appointed. However, an indicative construction programme has been developed and is presented within Chapter 5: Construction Programme and Management (PEI Report, Volume I) on which the potential environmental effects of the construction of the Proposed Development have been assessed.

4.2.8 The Production Facility elements of the Proposed Development will be constructed in two 'phases', each comprising a single Auto Thermal Reformer (ATR) unit, carbon capture facilities and utilities. The first phase will be constructed, commissioned, and operated initially, with the second phase expected to be commenced during the Phase 1 commissioning period once the first unit is operational and when required by demand.

4.2.9 The following sections describe the Proposed Development in more detail as required for the purposes of this PEI Report and provide where possible a brief description of any optionality still being considered by the Applicant for each element.

4.3 Components of the Proposed Development

Hydrogen Production Facility

Overview

4.3.1 The Production Facility will be designed taking account of Best Available Techniques (BAT) as set out in the UK Government's guidance on emerging techniques for H_2 production with carbon capture (Environment Agency, 2023). The Production Facility will utilise natural gas as the feedstock. The natural gas will be converted to a syngas over a catalyst in Pre-Reformers and Autothermal Reformers (ATRs) with the addition of steam and O_2.

4.3.2 Although the syngas from the ATR is rich in H_2, it also contains high concentrations of carbon monoxide (CO). Therefore, this syngas will be further reacted in water-gas shift reactors to convert the CO using steam into H_2 and CO_2. The CO_2 will be removed from the gas via contact with an amine-based solvent, which will absorb (capture) the CO_2. The solvent will then be further regenerated to yield a CO_2 stream that will be compressed to medium pressure, dehydrated, and then exported to the NEP compression infrastructure on the NZT site to the east of the Main Site.

4.3.3 The captured CO_2 will be further compressed to high pressure by NEP to "dense phase" for transportation by a new pipeline to the NEP Endurance store beneath the North Sea. The onshore infrastructure required for compression and export (the high-pressure compression plant and CO_2 export pipeline) is subject to a separate consent, both through DCO for the NZT DCO Project (for which a decision on whether a DCO has been granted is expected in the second half of 2023) and consenting of the offshore elements under the Energy Act 2008 and the Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020. The conditioned and compressed CO_2 will be transported offshore by NEP for storage at the Endurance underground store beneath the North Sea located approximately 145 km to the east/south-east of the Proposed Development Site. Geological storage and offshore CO_2 transportation will be managed and operated by NEP and would be subject to separate consents.

4.3.4 The low-carbon H_2 rich stream will be purified to >98 purity mol% H_2 and compressed and conditioned before being exported to offtakers located in the Teesside region via the proposed purpose-built hydrogen pipeline system.

4.3.5 Two potential technology options have been identified for consideration, as part of the Proposed Development. These are referred to as Case A (which involves ATR reforming) and Case B (which utilises an alternative proprietary Low Carbon Hydrogen technology) (see Section 4.10 below). Under Case A, steam required in the process will be raised in the ATR reformed gas boilers. The steam will be used to heat several process streams: in the heater, O_2 preheater, process condensate heater and the CO_2 dryer. If there is any excess steam, this could be used by a steam turbine generator (STG) to be installed on the Main Site, to power the Production Facility. Case B will not generate excess steam. An indicative schematic of the H_2 production process is provided in Plate 4-1[1].

4.3.6 The power generated by the steam turbine generator would not exceed 50 megawatts (MW) for both phases of the Proposed Development.

Production Capacity

4.3.7 Production is expected to build during the initial 12-18 months of operation in line with offtaker demand. The peak H_2 export rate for each phase is expected to be 600 MWth LHV (or approximately 22 tonnes/hr) with the associated peak CO_2 export rate being 161,710 kg/hr. For Phase 1 and 2 combined this equates to approximately 1.2 GWth LHV (44,350 kg/hr) peak H_2 production and export and 323,420 kg/hr CO_2 export.

4.3.8 Once commissioned and operational, the Production Facility will be designed to operate twenty-four hours per day, seven days per week (including when only Phase 1 is built) until decommissioning, with brief exceptions for planned outages such as for maintenance and repair.

[1] Plate 4-1 shows the H_2 production process for Case A. Case B is similar but includes an additional heating step.

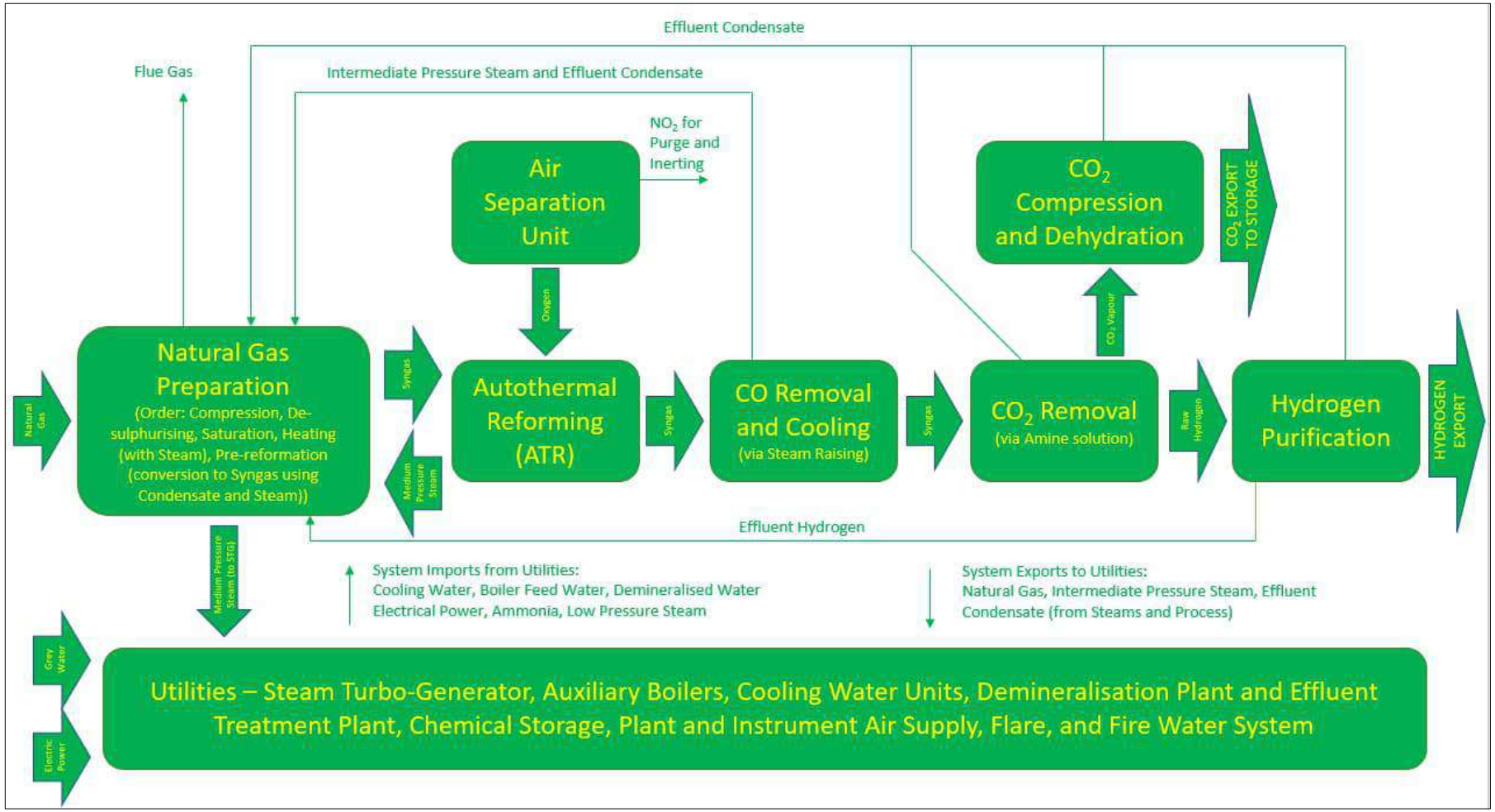

Plate 4-1: H_2 Production Process Schematic (Indicative for Case A)[1]

4.3.9 An outline description of the process infrastructure required for the operation of the Production Facility is presented below:

- a new Above Ground Installation (AGI) on the Main Site to receive natural gas which is common for both Phase 1 and Phase 2;
- a new AGI on the Main Site at the point of export of CO_2 which is common for both Phase 1 and Phase 2;
- a Hydrogen Unit in each phase where the main process of reforming occurs. Each Hydrogen Unit includes the following component units;
  - inlet natural gas compression;
  - pre-treatment to remove sulphur species;
  - pre-reformer to reform longer hydrocarbons to methane, H_2, CO and CO_2;
  - shift reactors for conversion of CO to H_2 and CO_2 and heat recovery in the form of steam for reuse in the process;
  - CO_2 absorber to separate the majority of the CO_2 from the syngas mixture;
  - compressors to increase the pressure of the CO_2 prior to drying (dehydration);
  - compressor where raw H_2 is recycled for input back into the natural gas feed for pre-treatment; and
  - a methanator and H_2 drying unit or Pressure Swing Adsorber (PSA) where raw H_2 is further purified and dehydrated and prepared for export to the pipeline networks, after passing through a compressor to achieve the required pipeline pressure of 40 bara and cooled to 30°C for export.

4.3.10 In addition, the following ancillary infrastructure may be required for the Proposed Development for each phase and in each Case (except where noted):

- Air Separation Units (ASU) for the compression and separation of air, which is passed through a rectification column to produce O_2 for use in the ATR. It also includes provision of liquid O_2 and liquid N_2 storage for back up. As an alternative, options to utilise O_2 and N_2 from a nearby supplier which would remove the requirement for an onsite ASU and onsite liquid storage are being investigated. This is subject to further discussions with the O_2 and N_2 provider and detailed design work, therefore the construction of new O_2 and N_2 ('Other Gases') pipelines to that potential supplier is included within the Proposed Development.
- Cooling Water Circulation System including cooling cells, pumps and circuit piping to supply cooling water where it is needed throughout the Production Facility. This will require topping up from time to time due to losses from evaporation and blowdown. Detail regarding the options for sourcing of water is included under 'Water Connections', below.

- Auxiliary Boiler to raise steam; depending upon the selected syngas licensor, these will either be natural gas fired and only used during start-up of the Production Facility or using an H_2 rich fuel fitted with SCR and in continuous operation.
- A Steam Turbine Generator (STG) (Case A only) which utilises steam produced in the process under Case A to produce electricity to help power the Production Facility. The power generated by the STG will not satisfy the total demand of the Production Facility, therefore electrical power will also be imported from the grid continuously.
- A Process Water Pre-treatment Plant will be used to pre-treat water from the Northumbrian Water raw water supply prior to the demineralisation stage and may include Dissolved Air Flotation (DAF) in case of use of River Water or treated Effluent, Ultrafiltration (UF) (for removal of fine solids) and reverse osmosis (RO) for removal of ions or other suitable pre-treatment technologies. This plant may be operated by the Applicant or another party. Any solids will be sent off site.
- A Demineralisation Plant to be used to treat water supplied to the Production Facility, stripped process condensate, flare knockout liquid and steam condensate from power generation and blowdown. This process would produce demineralised water (DMW) which will be pumped to all locations where it is required within the Production Facility, including for boiler feed water; therefore, this water will be used to produce H_2 and make up losses from the steam system.
- A Bio-treatment Plant, which will treat process condensate to reduce nitrogen concentration using nitrification and denitrification. The treated process condensate will be reused as makeup water in the Raw Water Pre-Treatment Plant. Any solids will be sent off site.
- An Effluent Treatment Plant (ETP), which will consist of an oily water separator, neutralisation sump, storm water sump and any other suitable treatment to meet agreed discharge standards. All oily water effluents produced by the Production Facility will be sent to the oil water separator. Post-separation, the liquid effluent will be sent to a Minimum Liquid Discharge Plant (MLD) on the Main Site that may consist of Ultrafiltration (UF) and Closed-Circuit Reverse Osmosis Plant (CCRO), this plant will produce a stream of clean water that will be reused in the process and a brine stream that will be tankered from Site to a suitable third party disposal site. Alternative options are to treat this effluent to an appropriate level associated with the use of BAT and disposed of via the NZT outfall. Any oily solids will be sent for disposal offsite.
- Flare, any fluid released from Production Facility during an emergency will be collected in the flare header system and sent to the flare drum where any liquid associated with the gas is separated. The gas from the flare drum will be sent to the flare system where it will be safely disposed by combustion. The liquid collected in the drum will be pumped by the flare pump to the ETP.
- A Fire Water System consisting of a fire water tank (supplied by grey or raw water), pumps and firefighting system.

- Emergency Diesel Generator, emergency diesel generator which would be operated in the event of emergency to support safe shutdown of the plant and will be intermittently energized for periodic testing purpose.
- Chemical Storage for additives and fuel such as aqueous ammonia (NH_3), amines and diesel, which are imported by tanker.

4.3.11 In addition, there will be above ground pressurised H_2 storage shared between each phase, including high pressure compression and let down facilities.

4.3.12 The proposed approach for water supply and management is summarised under 'Water Connections', below.

4.3.13 In addition to the above, the following components and facilities will be incorporated into the layout of the Main Site as required:

- Main Site entrance (main access with gated entry) as well as a secondary access point(s) and emergency access;
- internal access roads;
- vehicle turning areas;
- internal and external storage areas;
- workshop and maintenance stores;
- a control room and administration buildings;
- lighting;
- car parking; and
- lorry holding and security inspection areas.

4.3.14 The Production Facility will be fenced securely with some internal operations having further internal fencing installed around them as required.

CO_2 Export Connection Corridor

4.3.15 CO_2 captured and compressed after analysing and metering will be exported from H2Teesside to the NEP CO_2 gathering network on the adjacent NZT site via a CO_2 export connection pipeline of up to 22" diameter at a Maximum Operating Pressure (MOP) of 28 barg. There will be an AGI at each end of the connection pipeline for metering, analysing and pigging. This export connection including the two AGIs is part of the Proposed Development and is being consented under this DCO.

4.3.16 At this stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the CO_2 export options for the Main Site are shown on Figure 4-3: CO_2 Export Corridor (PEI Report, Volume II) to account for all options. It is expected that the extents of these will be refined further as the preparation of the EIA progresses. At this stage in the design development, the CO_2 export connection may be entirely above or below ground or a combination of the two. As a reasonable worst-case, open-cut construction methods have been assessed.

Natural Gas Supply Connection

4.3.17 Natural gas will need to be imported to the Production Facility for use in the reforming process. The exact routing of this connection is subject to ongoing design. However, at this stage, it is anticipated that a 24" pipeline will be constructed which will connect the Production Facility at the Main Site to an existing pipeline.

4.3.18 The natural gas connection may be entirely above or below ground or a combination of the two. At this stage it is assumed that below ground construction of the natural gas connection will use open-trench techniques dependent upon engineering and environmental constraints. As a reasonable worst-case, open-cut methods have been assessed unless otherwise stated.

4.3.19 At this stage in the design and assessment process and in applying the Rochdale Envelope approach, the potential areas required for the gas connection options have been depicted as a broad corridor (as shown by Figure 4-5: Natural Gas Connection Corridor (PEI Report, Volume II)) to account for all options. It is expected that the extent of this will be refined further, and the routing options reduced as the EIA progresses.

Hydrogen Pipeline Corridor

4.3.20 A gaseous phase hydrogen pipeline network is required to connect various potential industrial offtakers across the Tees Valley to the Production Facility at the Main Site, as shown on Figure 4-4: Hydrogen Pipeline Corridor (PEI Report, Volume II).

4.3.21 Once processed to the required specification and compressed at the Main Site, H_2 would be exported using the proposed hydrogen pipeline, at up to 24" diameter and with a MOP of up to 49 barg. The Hydrogen Pipeline Corridor would require a crossing under the River Tees to export to offtakers located to the northern side of the river. The hydrogen pipelines would run up to end-of-line AGIs including metering and pigging skids and tie-in points with the relevant offtaker (likely to be, but not necessarily having to be) within the offtakers' site boundaries. At this stage, any works beyond these AGIs and tie-in points are assumed to be progressed separately by the relevant offtaker.

4.3.22 Various route options and construction methodologies are being considered throughout the proposed hydrogen pipeline network with a reasonable worst case assessed where options are being considered. This includes trenchless crossings of watercourses or railway lines (using Horizontal Directional Drilling (HDD) for example), below ground open trench (buried), the installation of new or existing above ground support structures, and the repurposing and reuse of existing pipelines (where possible). This is subject to ongoing design work, discussions with landowners and statutory consultees, and is being informed by environmental sensitive receptors and constraints and surveys. Further details are included in Chapter 5: Construction Programme and Management.

4.3.23 At the north-western extent of the hydrogen pipeline network various route and construction options are being considered and assessed with a reasonable worst case assessed where options are being considered. Several options are also being considered for crossing under the River Tees, including the construction of a new

trenchless crossing (by HDD, using a micro-bored tunnel (MBT)) or repurposing an existing pipeline.

4.3.24 Since the preparation of the EIA Scoping Report, further refinement of the hydrogen pipeline route options and construction methodologies has been carried out, informed by engineering feasibility work, the outcome of environmental studies and consultation with statutory consultees such as Natural England and the Environment Agency (EA). Further detail on this is presented in Chapter 6: Need, Alternatives and Design Evolution (PEI Report, Volume I).

4.3.25 Table 4-1 provides a summary of the route options and construction methodologies being considered based on the studies carried out to date. However, the selection of a final route and construction methodology is the subject of on-going studies which will continue as the EIA progresses.

4.3.26 Ultimately, a single route option to each offtaker will be selected. Final routing and methodologies will take into consideration the location of sensitive environmental receptors including but not limited to statutory designated sites within the area. Where possible, the selected route will seek to avoid environmentally sensitive areas and utilise existing established pipeline routes, and/or the least intrusive construction methodologies (e.g., trenchless methods, as opposed to open-cut trench).

Table 4-1: Hydrogen Pipeline Routing Optionality and Construction Methodologies

CONSTRUCTION METHODOLOGY	REQUIREMENT IN RELATION TO CURRENT ROUTING OPTIONS	COMMENTARY
Open cut trench-buried	Currently being considered as a construction methodology for some sections of the network.	Whilst trenchless methods are proposed to avoid sensitive areas, open cut trenching (resulting in buried pipelines) is still proposed to be used within less sensitive areas (while considering where appropriate, the environmental impacts of this method and development of appropriate mitigation). Alternative construction methodologies are being considered where possible to reduce the amount of open cut required.
Trenchless (HDD/MBT)	Trenchless crossings (either HDD/MBT) are proposed for all of the River Tees crossing options, and for the	The hydrogen pipeline corridor in the Greatham Creek area interfaces with various environmentally sensitive receptors and constraints. No other scenario is being considered other than trenchless

CONSTRUCTION METHODOLOGY	REQUIREMENT IN RELATION TO CURRENT ROUTING OPTIONS	COMMENTARY
	crossing of Greatham Creek. Trenchless technologies are also currently being considered in other areas, where the pipeline corridor crosses particularly sensitive areas. Proposed Development will also include trenchless crossing of some roads, utilities infrastructure and public railways where there are no existing crossings.	methods for the crossing of Greatham Creek or the River Tees. The proposed trenchless technologies will be at a depth sufficient to minimise the risk of damage or harm to the watercourse.
Utilising existing pipeline corridors and other pipeline infrastructure	Currently being considered for various parts of the hydrogen pipeline corridor. Once the hydrogen pipeline crosses the River Tees the preferred and most likely option will be to follow the existing link line corridor through North Tees to Billingham.	For the majority of the Hydrogen Pipeline Corridor, it is proposed to route along existing established pipeline corridors (generally above ground) where possible. It is anticipated that new pipelines would be installed in parallel and working to one side of the existing pipelines. The design and installation methodology would need to be formally agreed with existing asset owners and routing carefully coordinated with other developers who plan to use these corridors, including the possibility of repurposing existing pipelines.

4.3.27 Where optionality is maintained, as a reasonable worst-case, it has been assumed that open-cut methods will be required for the crossings of minor watercourses and drains. In such cases, it is assumed that flow would be temporarily over-pumped, diverted around or flumed through the working area and the watercourse fully reinstated as before.

4.3.28 The extent of the Hydrogen Pipeline Corridor has been depicted as a broad corridor (as shown by Figure 4-4: Hydrogen Pipeline Corridor (PEI Report, Volume II)). In places where the Hydrogen Pipeline Corridor includes areas of existing operational

land or facilities (e.g., in the area around Wilton International) this does not imply that it is proposed to carry out works or lay pipelines in all these areas. At this stage the corridor covers a wider area until the specific routes, offtakers, and construction methodologies are refined as the design progresses. The extent of the Hydrogen Pipeline Corridor and the routing options have been refined slightly since submission of the EIA Scoping Report and will continue to be refined as the EIA progresses.

Electrical Connection Corridor

4.3.29 An electricity supply would also be required for both Cases (although for Case A, a proportion of its energy requirements may be generated onsite via the STG). Various options are being considered which include a connection to existing and proposed 66 kilovolt (kV) substations at Teesworks or connection to NZT's electrical network. 'There is also potential to connect at other substations, operated locally by Northern Power Grid, such as Lackenby and/or Grangetown 66kV substations. The final decision on substation/connection choice will be subject to design development and further work based on constructability and electrical network resilience and capacity. The electrical connection will be installed below ground.

4.3.30 The size and location of any connection will be determined in consultation with the relevant stakeholders. The final decision of connection will be subject of commercial agreement and technical feasibility, constructability, electrical network resilience and capacity. These discussions will be ongoing as the EIA progresses.

4.3.31 At this stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the electrical connection option has been depicted as a broad corridor (as shown by Figure 4-6: Electrical Connection Corridor (PEI Report, Volume II)) to account for all options. It is expected that the extent of this will be refined further as the EIA progresses.

Water Connections

4.3.32 Plate 4-2 summarises the ‘base case’ for water management. The blue boxes relate to the treatment of source water, whilst the green boxes relate to wastewater treatment. The options being considered are described in further detail in the following text.

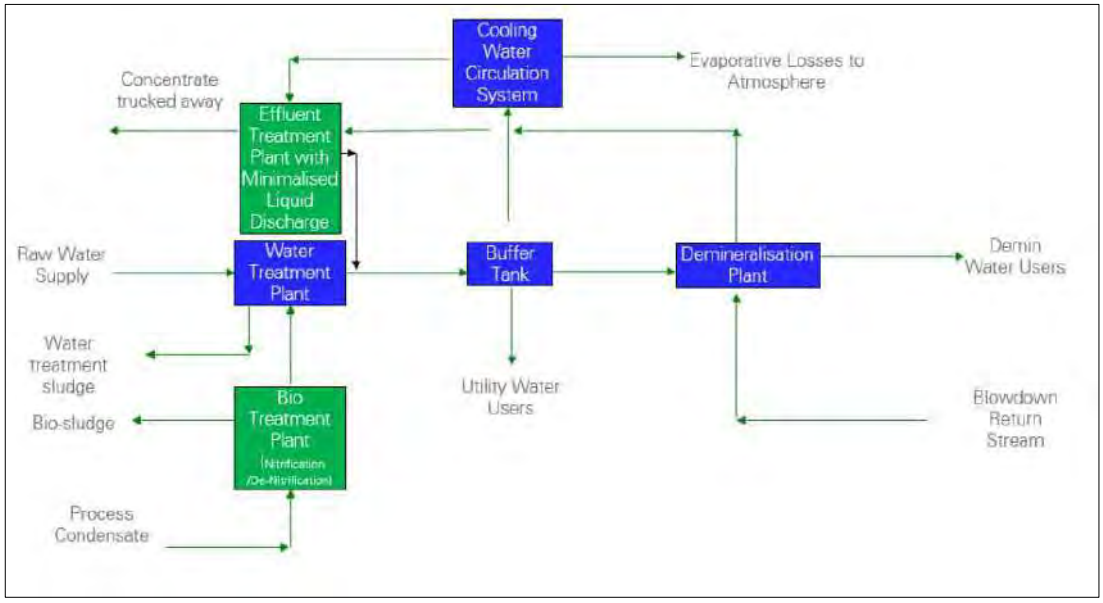

Plate 4-2: Water Management Options (Indicative)

Water Supply

4.3.33 Water supply and discharge connections are required for the process at the Production Facility, including for cooling water purposes and discharge of treated effluent.

4.3.34 It is expected that water (for process and sanitary uses) will be supplied via either:

- the existing NWL raw water supply to the Teesworks site; or
- a new connection to the existing NWL raw water supply either via tie in to NZT infrastructure or the installation of a new connection.

4.3.35 Alternatively, during the operation of the Proposed Development, use of reclaimed water (treated effluent) from a local Wastewater Treatment Works (WwTW) (Bran Sands) could be a potential viable option. Testing and evaluation is required for this alternative, therefore this is considered as a future opportunity and would require construction of a pipeline between the Main Site and Bran Sands WwTW but is not included in the DCO application.

4.3.36 As outlined earlier in this chapter, a Raw Water Pre-treatment Plant will be used to pre-treat the source water prior to the demineralisation stage and the Demineralisation Plant will be used to treat water supplied to the Production Facility, stripped process condensate, flare knockout liquid and steam condensate from power generation and blowdown.

4.3.37 The Proposed Development also allows for a pipeline for the supply of demineralised water via a new pipeline connection to the Wilton International site.

4.3.38 At this stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the water connection options currently proposed for the Main Site has been depicted as a broad corridor, as shown by Figure 4-7: Water Connections Corridor (PEI Report, Volume II) to account for all options. It

is expected that the extents of these will be refined further as the EIA progresses. The water connections may be entirely above or below ground or a combination of the two; as a reasonable worst-case, open-cut methods have been assessed.

Wastewater Disposal

4.3.39 There are a number of wastewater streams that would be created within the Main Site that need to be handled appropriately, so that they can be treated and reused, namely:

- process wastewater (which is a process condensate stream from the reforming process);
- cooling tower blowdown (as part of the cooling water system);
- demineralisation plant rejects (as part of the demineralised water plant);
- other streams under non-ordinary operations, such as oily water (during maintenance), first flush stormwater/ firewater and clean second flush stormwater and firewater; and
- domestic/sanitary effluent.

4.3.40 The process wastewater would be treated in a Bio-treatment Plant while the other wastewater streams would be treated in an Effluent Treatment Plant. Both would be located on the Main Site. The treated wastewater from both the Bio-treatment Plant and Effluent Treatment Plant would be reused as makeup water in the Water Treatment Plant.

4.3.41 Two options are under consideration in terms of process effluent management. The first option is based on Minimalised Liquid Discharge (MLD) from the Effluent Treatment Plant. In this scenario, treated wastewater from the Effluent Treatment Plant will be reused as makeup water in the Raw Water Pre-Treatment Plant. A liquid waste stream containing salts and residual nutrients would be taken offsite for disposal. The second option is an alternative to MLD and requires discharge of process effluent to the NZT outfall in Tees Bay under NZT's Environmental Permit and subject to a nutrient neutrality assessment and identified mitigations, as required. Uncontaminated surface water runoff would be discharged to Tees Bay via the NZT outfall.

4.3.42 Discharge of domestic/sanitary effluent would be to the local sewage system for treatment with a tie-in to Bran Sands or export to Marske-by-the-Sea sewage treatment works by tanker. In terms of waste disposal from the water plant, sludge from the Raw Water Pre-Treatment Plant, Bio-treatment Plant may be processed at Bran Sands WwTW. With Brine from the Effluent Treatment Plant being discharged to a suitable site, which does not discharge to a designated site.

4.3.43 Clean stormwater could be discharged to Dabholm Gut under an existing pipeline and using NWL infrastructure at Bran Sands, or directly using a separately consented pipeline. Alternative options for clean stormwater that are being explored are to use land drain to discharge into the Tees, or via the NZT outfall that discharges into Tees Bay, or via the Teesworks drainage system.

4.3.44 It is recognised that any discharge of treated effluent to the receiving water must comply with the Water Framework Directive (WFD) and Natural England's policy on Nutrient Neutrality.

4.3.45 The Water (including wastewater) Connections Corridor includes a pipeline between the Main Site and Bran Sands WwTW, as well as a potential connection to NZT and a demineralised water plant at Wilton.

4.3.46 At this stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the water connection options currently proposed for the Main Site has been depicted as a broad corridor, as shown by Figure 4-7: Water Connections Corridor (PEI Report, Volume II) to account for all options. It is expected that the extents of these will be refined further as the EIA progresses. The wastewater connections may be entirely above or below ground or a combination of the two; as a reasonable worst-case, open cut methods have been assessed.

4.4 Other Gases Connections

4.4.1 Other gas connection pipelines may be required for the transportation of compressed O_2 and N_2 for use at the Production Facility, should a third-party ASU be used to supply the required gases.

4.4.2 At this stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the other gases connection options currently proposed for the Main Site have been depicted as a broad corridor, as shown by Figure 4-8: Other Gases Connection Corridor (O_2 and N_2) (PEI Report, Volume II)). It is expected that the extents of this these will be refined further as the EIA progresses. The connections for other gases may be entirely above or below ground or a combination of the two; as a reasonable worst-case, open-cut methods have been assessed.

4.5 Hydrogen Storage

4.5.1 On-Site above ground storage of H_2, located at the Main Site, will be utilised to provide resilience to the hydrogen production network. The hydrogen storage will have a capacity of approximately 5 tonnes usable volume (up to 11 tonnes total inventory for 100 bar storage pressure), which is common (shared) for Phases 1 and 2 of the Proposed Development. As this exceeds the relevant threshold, permission will be sought from the Hazardous Substances Authority, Health and Safety Executive (HSE) and Local Planning Authority (LPA) for storage, under the Control of Major Accident Hazards (COMAH) and Hazardous Substance Consent regimes respectively.

4.5.2 Off-site storage of H_2 is not required for the Proposed Development. Should there be the requirement for off-site storage, it is expected that this would be owned and operated by a third-party provider who would be responsible for any consenting requirements.

4.6 Material Storage

4.6.1 Chemicals required for the operation of the Production Facility would need to be stored and used at the Main Site. Some of these materials may be classed as hazardous. Where any substance could pose a risk to the environment through its uncontrolled release (e.g., through the surface water drainage system), appropriate containment facilities would be used including (but not limited to) bunds and concrete surfaces appropriately designed and sized for their intended use. Chemical storage will comply with requirements under the site's Environmental Permit.

4.6.2 An inventory of materials to be stored on the Main Site would be finalised through the detailed design. However, where storage of hazardous materials, individually or in-combination exceeds the relevant thresholds, separate permissions will be sought from the Hazardous Substances Authority, HSE and LPA for their storage, under the COMAH and Hazardous Substance Consent regimes respectively. All chemical storage will be regulated by the EA through an environmental permit that will be required for the operation of the Proposed Development.

4.6.3 Further information regarding hazardous substances likely to be present during the operational phase of the Proposed Development, including their transport and storage, is included at Chapter 20: Major Accidents and Disasters (PEI Report, Volume I).

4.7 Operational Access Requirements

15.1.1 The Main Site would be accessed from Steel House Gate roundabout on the A1085 Trunk Road, a dual carriageway road running north-east to south-west between Redcar and the A1053 Tees Dock Road. The road is subject to the national speed limit. Travelling south-west from the Main Site access, the A1085 Trunk Road provides a link to the A1053 Tees Dock Road, which in turn connects to the A174 to the south and the A66 to the north. The A1053 Tees Dock Road and A174 are part of National Highways core network.

15.1.2 Access routes to the Hydrogen Pipeline Corridor network north of the River Tees are assumed via the A1046 Haverton Hill Rd/Port Clarence Road and the B1275. Access routes to Connection Corridors south of the River Tees are assumed via the A1085 Trunk Road and Steel House Gate roundabout.

4.8 Design Parameters

4.8.1 The design of the Proposed Development is iterative and may change as the EIA process progresses. The evolution of the Proposed Development at this stage is presented in Chapter 6: Alternatives and Design Evolution (PEI Report, Volume I). This will be refined during the EIA and reported in the ES.

4.8.2 A number of the design aspects and features of the Proposed Development cannot be confirmed until the EPC construction contractor has been appointed. For example, the building sizes may vary depending on the contractor selected and their specific configuration and selection of plant. Focussed use of the Rochdale Envelope approach has been adopted to define appropriate parameters for use in the EIA.

4.8.3 Maximum parameters have been devised to enable the EIA to progress in the absence of the final design information and to enable the compilation of a robust assessment based on a reasonable and appropriate worst-case option.

4.8.4 The flare will be the tallest element of the Proposed Development; a maximum height of 100 m for the flare (i.e., ≤108 m AOD[2]) has been considered. All other structures on the Main Site will be 60 m high or less. All development associated with the Production Facility will fall within the confines of the Main Site, as illustrated on Figure 4-2: Parts of the Proposed Development Site (PEI Report, Volume II).

4.8.5 Existing ground levels at the Main Site are approximately 6-8 m AOD. Development platform elevations post site clearance and remediation will not be lower than 7.1 mAOD, and final finished floor levels are the subject of on-going studies. For the purposes of this PEI Report, assumptions have been made where required. Further information on the limits of deviation will be provided in the ES.

4.9 Proposed Development Operation

Operational Modes

4.9.1 Two potential technology options have been identified for consideration, as part of the Proposed Development. These are referred to as Case A (which involves ATR based reforming) and Case B (which utilises an alternative proprietary low carbon hydrogen technology). Only one of these technologies will be selected. A summary of the key differences between Case A and Case B is provided in Table 4-2.

Table 4-2: Key Differences Between Case A and Case B

	CASE A	CASE B
Technology	Autothermal Reforming (ATR)	Proprietary Gas Heated Reformer (GHR) – ATR combination process
Process heat integration	Process heat is used to generate power (via steam turbine)	Process heat is used to drive reforming reaction in a GHR
Hydrogen purity	> 98 mol%	> 99 mol%
Process condensate	Stripped with steam to the reduce the methanol/ NH_3 content prior to water treatment	No stripper column and thus has a higher methanol/ NH_3 compositional potential in the process condensate. An additional biological treatment step is required as part of the water treatment configuration.

[2] Worst case heights above ordnance datum for the Main Site elements used in the LVIA assume a maximum development platform level of 8 m AOD following site clearance and associated earthworks. The worst-case assessed for Air Quality for emissions points is lower and outlined within Chapter 8: Air Quality (PEI Report, Volume I).

	CASE A	CASE B
Liquid effluent flow	Higher	Lower
Cooling water flow	Higher	Lower
Gaseous effluent flow	Lower	Higher
Natural gas consumption	Higher	Lower
Power import	Lower	Higher
Overall energy efficiency	Lower	Higher

Hours of Operation

4.9.2 Once commissioned and operational (including for Phase 1 only), the Production Facility will be designed to operate twenty-four hours a day, seven days per week until decommissioning, with brief exceptions for planned outages such as for maintenance and repair.

Staff

4.9.3 Peak workforce numbers during operation will be a maximum of approximately 120 staff (if both Phase 1 and Phase 2 of the Proposed Development are progressed). Operations staffing will be on a shift basis to be spread over a 24-hour period. Normally staff levels would be 40-50 peak during the week, however, during 28-day maintenance periods which are likely to occur approximately every four years, there would be up to 400 people on-site.

Maintenance

4.9.4 The objective of plant maintenance is to ensure the Production Facility and the connections operate safely and reliably. Routine maintenance will be planned and scheduled via the maintenance management system with major overhauls occurring approximately once every four years on each unit. These maintenance activities will require additional contractors to work on-site. The contractors would access the Proposed Development Site via the main entrance.

4.9.5 Inspection and maintenance activities are key criteria for determining the footprint and layout of the Production Facility. The maintenance strategy to be adopted will use established methods such as Risk Based Inspection (RBI) and Reliability Centred Maintenance (RCM). Therefore, to support the maintenance strategy for the Production Facility, each major element would have appropriate access and laydown areas, whilst the internal road layout for the Main Site would enable free movement for cranes and heavy lifting equipment.

4.9.6 Pipelines will be subject to an Integrity Management Plan that will include, but not limited to, Inline Inspection (ILI), Cathodic Protection (CP) surveys, visual inspections, and maintenance of associated equipment at frequencies informed by RBIs.

4.9.7 It is anticipated that an integrated Operations and Maintenance (O&M) team would have the responsibility for daily operations, including troubleshooting and effecting minor repairs on the plant. Major O&M interventions are likely to be outsourced, whilst major equipment items are likely to be serviced by original equipment manufacturers.

4.9.8 All major maintenance activities requiring significant equipment outages will be coordinated to occur during the planned routine turnaround (TAR). Equipment requiring routine maintenance outside of this timeframe will be spared and fitted with sufficient isolation to facilitate the activity whilst plant production continues.

Hazard Prevention and Emergency Planning

4.9.9 To protect human health, site activities will be safely and responsibly managed on-site. A Health and Safety Plan covering the works, commissioning and operation of the Proposed Development will be prepared by the operator. For design and construction, a competent and adequately resourced Principal Designer (under the Construction (Design and Management) Regulations) and Principal Contractor will be appointed. The Applicant will ensure that its own staff, designers and contractors follow the Approved Code of Practice (ACoP) laid down by the CDM Regulations 2015.

4.9.10 Written procedures clearly describing responsibilities, actions and communication channels will be available for operational personnel dealing with emergencies. Procedures will be externally audited, and contingency plans written in preparation for any unexpected complications.

4.9.11 Depending on the volumes of hazardous materials stored within the Proposed Development Site, a Hazardous Substances Consent and, if necessary, a COMAH Licence will be obtained. This will introduce additional hazard prevention and emergency planning procedures. At this stage, it is anticipated that the Production Facility will qualify as a Top Tier COMAH establishment.

External Lighting

4.9.12 Some external lighting (and signage) would be required to ensure the Production Facility can operate safely at all times. It would be at the appropriate luminance required to provide safe working conditions. Lighting would be designed, positioned and directed to prevent or minimise light disturbance to sensitive receptors (human and ecological) and low-energy fittings would be used where possible.

4.9.13 An Indicative Lighting Strategy will be prepared and submitted as part of the DCO Application and used as the basis of assessment in the ES. The strategy will require the final lighting scheme to be designed in accordance with relevant standards, such as the Guidance Notes for the Reduction of Obtrusive Light (2021) published by the Institute of Lighting Engineers and/or Chartered Institution of Building Services Engineers (CIBSE) requirements, as appropriate. This will ensure that safe working

conditions are provided, whilst reducing light pollution and the visual impact on the local environment.

Environmental Management During Operation

4.9.14 The Production Facility will require an Environmental Permit and activities will comply with this under the Environmental Permitting (England and Wales) Regulations 2016 so that any impacts of emissions to air, soil, surface and groundwater, to the environment and human health are minimised and avoided where possible. In addition, when granted, the DCO will include Requirements to control *inter alia* landscaping and biodiversity protection management and enhancement; public rights of way and access land; surface and foul water drainage; flood risk mitigation; contaminated land and groundwater; archaeology; protected species; noise and vibration.

4.9.15 The Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

4.9.16 Any requirements for sampling and analysis of pollutants will be undertaken where required in accordance with the Environmental Permit.

Heavy Goods Vehicle Movements and Traffic

15.1.3 During the operational phase of the Proposed Development, it is anticipated that there would be a maximum workforce of approximately 120 staff that will be required on a shift basis to be spread over a 24-hour period (if both Phase 1 and Phase 2 of the Proposed Development are progressed). Staff will travel to and from work in a variety of directions. The ES will make reasonable assumptions about the regional distribution of journeys to and from the Proposed Development Site. Operational (including maintenance) traffic movements (including HGVs) are expected to be very low – significantly lower than those experienced during the construction period.

4.9.17 Natural gas would be delivered by pipeline. Other operational and maintenance consumables will be managed to be kept as low as is reasonably practicable thereby minimising traffic movements.

4.9.18 For further detail regarding expected traffic movements during construction and operation please refer to Chapter 15: Traffic and Transport (PEI Report, Volume I).

4.10 Proposed Development Decommissioning

4.10.1 The Phase 1 and Phase 2 production facilities will each have a design life of 25 years. However, the operational life could be longer subject to market conditions and plant condition. At the end of its operational life, the most likely scenario would be that the Proposed Development would be decommissioned, with all above ground structures on the Main Site removed, and the ground remediated as required by the

Environmental Permit to facilitate future re-use. The Applicant will assess at that time whether any infrastructure should be retained for future use.

4.10.2 For the purposes of this assessment, the same design life is assumed apply for the hydrogen pipeline and utility connections.

4.10.3 A Decommissioning Plan (including Decommissioning Environmental Management Plan) would be produced pursuant to a DCO Requirement. The Decommissioning Environmental Management Plan would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated. This will include details of how surface water drainage should be managed during decommissioning and demolition. The DEMP would be secured by a Requirement on the draft DCO, if granted. The Decommissioning Plan will include an outline programme of works.

4.10.4 During decommissioning and demolition there will be a requirement for the provision of office accommodation and welfare facilities.

4.10.5 Any demolition contractor would have a legal obligation to consider decommissioning and demolition under the CDM Regulations 2015, or the equivalent prevailing legislation at that time.

4.10.6 Decommissioning activities will be conducted in accordance with the appropriate guidance and legislation at the time of the Proposed Development's closure. All decommissioning and demolition activities will be undertaken in accordance with the waste hierarchy. Materials and waste produced during decommissioning and demolition would be stored in segregated areas to maximise reuse and recycling. All materials that cannot be reused or recycled would be removed from the Proposed Development Site and transferred to suitably permitted waste recovery/disposal facilities. It is anticipated that a large proportion of the materials resulting from demolition will be recycled and a record kept demonstrating that the maximum level of recycling and reuse has been achieved.

4.10.7 Upon completion of the decommissioning programme the relevant regulatory authority at the time (e.g., the EA) will be invited to witness a post-decommissioning inspection by site staff. All records from the decommissioning process will be made available for inspection by the EA and other relevant statutory bodies, in accordance with the Environmental Permit requirements.

4.11 Elements of the Proposed Development Consented under a Deemed Marine Licence

4.11.1 In England, the Marine and Coastal Access Act 2009 (MCAA) provides that a Marine Licence (ML) is required for certain 'licensable activities' within the UK Marine Area (Section 42, MCAA). For the purposes of the EIA, the marine environment is defined as any area seaward of the mean high-water springs (MHWS) mark of any tidally influenced water body. This includes intertidal zones, which are periodically exposed by the tide and subtidal zones which are always submerged.

4.11.2 It is acknowledged that for the purposes of marine consenting, the UK Marine Area (Section 42, Marine and Coastal Access Act 2009) also includes areas that are

temporarily or permanently separated from the natural course of the tide (i.e., by a lock gate or other similar means).

4.11.3 MLs can be issued via a 'standalone' Marine Licence Application (MLA) or a licence 'deemed' within the body of the DCO (i.e. a Deemed Marine Licence (DML)). The Marine Management Organisation (MMO) is the body responsible for issuing, revoking, and enforcing a ML, other than where a licence is in the form of a DML, in which case, it will be granted by the powers of the SoS.

4.11.4 Some aspects of the Proposed Development could require a ML, namely the construction and operation of the crossing of the River Tees for the proposed hydrogen pipeline, and the potential for crossings of Greatham Creek below MHWS, north of the Tees and to the west of the Main Site. The design work for all crossings is ongoing. However, currently it is proposed that the crossing under the Tees would be constructed using either HDD or MBT techniques, thereby minimising disturbance during construction. For crossing Greatham Creek the use of HDD techniques is being considered. For other minor crossings various construction methodologies are being considered.

4.11.5 Preliminary advice using the MMO's online interactive assistance tool identifies that an MLA will not be required for trenchless crossings of the River Tees and Greatham Creek on the basis that it involves the construction of bored tunnels wholly under the seabed and will not significantly adverse any part of the environment of the UK marine area or the living resources it supports. This preliminary assessment will need to be confirmed including through consultation with the MMO.

4.11.6 If an MLA is required, the Application will include a request to secure the ML for activities below MHWS via a DML. The scope of the DML will be discussed and agreed in consultation with the MMO during the DCO Application process but these activities have been considered in this PEI Report and will be assessed in the ES.

4.11.7 The Application will therefore include a request to secure the ML for activities below MHWS via a DML. The scope of the DML will be discussed and agreed in consultation with the MMO during the DCO Application process.

4.12 Consultation

4.12.1 An EIA Scoping Opinion was requested from the Planning Inspectorate ('the Inspectorate') in April 2023, with a response received on 17th May 2023. A high-level summary of responses to the Scoping Opinion comments relevant to the description of the Proposed Development is provided in Table 4-3.

Table 4-3: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	<u>CO_2 export via Northern Endurance Partnership (NEP) infrastructure.</u> The Scoping Report states that CO_2 from the Proposed Development would be exported to an offshore facility via NEP infrastructure on the adjacent Net Zero Teesside (NZT) site. NZT development consent order (DCO) application was due to be determined by the Secretary of State on 10 May 2023 but the Inspectorate notes that a new deadline of no later than 14 September 2023 was set on 9 May 2023. The ES should clearly describe the relationship between the Proposed Development and any connected projects including the offshore CO_2 facility. This should include the extent to which the Proposed Development is dependent on their delivery and the development timelines of the other projects, with an explanation of how these will be coordinated.	A high-level summary of this information is included in this chapter. Further detail will be included within the ES.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Natural resources</u> The Scoping Report states that natural gas, oxygen (O_2), nitrogen (N_2) and water will be required for the operational phase of the Proposed Development. Paragraph 2.1.2 states that O_2 and N_2 will be from local sources; an	This PEI Report chapter includes a description of how these resources will be transported to the site and included in the assessment of likely significant effects in Chapters 8-23 (PEI Report, Volume I) Further information regarding this, along with estimates of the

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		alternative option for O_2 and N_2 supply from an air separation unit (ASU) is also identified (paragraph 3.1.1). The ES should include an estimate of the likely volume of the different natural resources, including those identified above, that will be required in the operation of the Proposed Development, how these will be transported to the site, and an assessment of any likely significant effects arising from the use of such resources.	likely quantities of natural resources required, will be included in the ES.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Carbon Capture</u> The Scoping Report states that CO_2 would be captured at a rate in excess of 95%, which is anticipated to be secured through an environmental permit. Should the draft DCO (dDCO) allow for the generating station component to operate independently of the carbon capture, a worst case assessment of likely significant effects should be undertaken. If assessments in the ES rely on a capture rate of 95% it should be clear how this would be secured in the dDCO.	We appreciate that the Production Facility on its own without carbon capture would be a reasonable worst case, however, due consideration is not given to this scenario during normal operations (i.e., excluding commissioning and start up) as this does not align with bp's strategy of transforming to an integrated energy company. Teesside is at the forefront of efforts to achieve the government's ambitious target for the UK to be the world's first major economy to be net zero, by 2050, therefore the Proposed Development without carbon capture is not a viable option being considered and this will be secured by a requirement in the DCO.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Flexibility</u> The Inspectorate notes the Applicant's desire to incorporate flexibility into their dDCO and its intention to apply a 'Rochdale Envelope' approach for this purpose.	These comments are noted and Planning Inspectorate Advice Note 9: Rochdale Envelope has been considered. As outlined in Chapter 2: Assessment Methodology (PEI Report, Volume I) and other relevant PEI Report

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		This includes options for the various required connection corridors required as part of the project, eg CO_2 export, hydrogen, natural gas, electrical and water connection. Paragraph 3.1.7 states that it is expected that optionality would be reduced, and preferred options confirmed prior to submission of an application. Paragraph 3.1.8 describes that some aspects and features will not be confirmed until an engineering, procurement and construction contractor has been appointed, ie post grant of any DCO. In this instance, it is stated that the Rochdale Envelope will be adopted to define appropriate parameters for use in the EIA. The Applicant should make every attempt to narrow the range of options and explain clearly in the ES which elements of the Proposed Development have yet to be finalised and provide the reasons. At the time of application, any Proposed Development parameters should not be so wide-ranging as to represent effectively different developments. The parameters should use the maximum envelope within which the built development may be undertaken to ensure a worst case assessment. The ES should identify the parameters that have been assumed as the worst case scenario for each aspect scoped in to the assessment and ensure that interactions between aspects are taken into account relevant to those scenarios.	chapters, the 'Rochdale Envelope' approach has been adopted. However, optionality has already been reduced, and will continue to be reduced further as the design and the EIA progresses. The ES will clearly define any optionality in the design at that stage and the reasoning for it. The worst-case design parameters will be narrowed as far as reasonably possible, clearly outlined, and assessed. Interactions between different topics will be assessed. The Inspectorate's comments relating to alternatives are noted and considered elsewhere within this table.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		The development parameters should be clearly defined in the dDCO and in the accompanying ES. The Applicant, in preparing an ES, should consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the Proposed Development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of Regulation 14 of the EIA Regulations. The Inspectorate draws the Applicant's attention to Advice Note 9: Rochdale Envelope, which states that "it will be for the authority responsible for issuing the development consent to decide whether it is satisfied, given the nature of the project in question, that it has 'full knowledge' of its likely significant effects on the environment." Please also note the Inspectorate's comments regarding alternatives at ID 2.1.17 of this Scoping Opinion. It should be noted that if the Proposed Development materially changes prior to submission of the DCO application, the Applicant may wish to consider requesting a new scoping opinion.	
The Inspectorate	Scoping Opinion 17th May 2023	<u>Phasing</u> The Scoping Report states that the Proposed Development would be phased, with a total design capacity of 1.2 gigawatt (GW) thermal for hydrogen production facility	As outlined in Chapter 2: Assessment Methodology (PEI Report, Volume I), the ES will include an assessment of any likely significant effects arising from the phased nature of the Proposed Development, including risks of

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		across two phases of up to 600 megawatt (MW) thermal in each phase. Table 3-2 of the Scoping Report provides an indicative construction timeline, with Phase 1 commencing mid-2025 and lasting approximately 2 years and Phase 2 commencing late 2027/ early 2028 and lasting 2-3 years. The ES should include an assessment of any likely significant effects arising from the phased nature of the Proposed Development, including risks of major accidents from the proximity of construction activity to the operational hydrogen production plant. Measures required to mitigate any significant effects should be clearly described in drafts of the construction environmental management plan (CEMP) and/ or operational environmental management plan (OEMP) submitted with the application.	major accidents from the proximity of construction activity to the operational hydrogen production plant. If required, appropriate mitigation measures will be clearly outlined in the Framework CEMP.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Hydrogen production facility-built parameters</u> Section 3.2 of the Scoping Report describes the above ground infrastructure that is likely to be required as part of the hydrogen production facility but does not specify any built parameters. The ES should confirm the final parameters (minimum and maximum height, width, length and depth) and location of each component of above ground infrastructure and assess any likely significant effects resulting from their construction, operation/ maintenance, or decommissioning.	Information regarding maximum heights is provided in this PEI Report chapter. More detailed information, including minimum and maximum heights, widths, lengths and depths will be included within the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	<u>Construction working width and pipeline trenches</u> The ES should define the applicable parameters for the construction working width and the pipeline trenches, including depth, or apply a worse case. It should be clear how these parameters are secured through the dDCO. Where significant effects are identified the ES should set out the mitigation proposed to avoid, reduce or offset such effects including where appropriate the specification of construction methods and / or limitations placed on construction activities, and how this would be secured. The Applicant's attention Is drawn to the Environment Agency's (EA) comments in Appendix 2 regarding pipeline design [reproduced below for reference]. "Pipeline Design • Where the pipeline crosses a flood defence structure below ground, designs for the pipeline must include a load case for the top water level. This may be different at each location. The pipeline must also be at a suitable depth to ensure the stability of the flood defence structure, this is to be demonstrated in submitted designs; • The scoping report states the pipeline will not cross our flood defence structure above ground. If this is to change, loading to our asset will need to be considered and the design must not impede access for routine	These parameters will be outlined within the ES and the worst case will be assessed. Appropriate mitigation measures will be outlined. It is anticipated that the design parameters will be secured by Requirement in the draft DCO. The EA's comments regarding pipeline design have been noted and will be considered throughout the design process.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		maintenance and inspections of the flood defence structure; • If the pipeline crosses a watercourse above ground, it must be appropriately designed and positioned to prevent accumulation of debris and localised increases in water levels; • Where the pipeline is to utilise existing pipework that crosses watercourses, it is expected that modifications to the structure will be made where possible for improved conveyance and reduce debris accumulation; and • Where ground levels near a flood defence are to be disturbed on either a permanent or temporary basis, designs must not allow additional water to pond at the toe of the flood defence."	
The Inspectorate	Scoping Opinion 17th May 2023	<u>Special crossings</u> The Scoping Report outlines that a range of crossing methodologies are under consideration for the natural gas supply and hydrogen pipeline corridors. This could include open cut and/ or trenchless methodologies depending on engineering and environmental constraints. The ES should confirm the minimum and maximum depths of the crossings. The ES should clarify whether it is intended to adopt a similar approach in respect of any below ground	The ES will clearly outline the proposed construction methodologies for each pipeline (including the utility connections), including the proposed minimum and maximum depths of crossings. Open cut trenching will not be used to cross flood defences. Trenchless technologies will be used instead. When selecting the preferred construction methodologies, the potential environmental effects are

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		routeing for the electrical, water and other gases connections. Table 3-1 of the Scoping Report confirms that only trenchless techniques are being considered for crossings of the River Tees and horizontal directional drilling (HDD) or use of existing pipeline for Greatham Creek. The Inspectorate welcomes the use of trenchless techniques in environmentally sensitive areas but notes that trenchless techniques have different land requirements; the full range of environmental effects should be considered when determining a preferred construction method. The ES should confirm the crossing methodologies assumed for each connection corridor. If flexibility is sought regarding the use of open cut or trenchless techniques, the ES should assess the available options or identify and assess a worst case scenario as relevant to each aspect and identify relevant mitigation, and how this would be secured. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding construction methodologies, including those affecting existing flood defences [reproduced below for reference]. "Pipeline Construction • Open trench methodology is not permitted when crossing a flood defence. Excavations near the footprint	being considered, along with other factors such as engineering feasibility, land acquisition and cost. If optionality in construction methodology is maintained at ES stage, an appropriate worst-case will be assessed. Appropriate mitigation measures will be identified and clearly stated where required. The EA's comments regarding pipeline construction have been noted and will be considered throughout the design process.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		of a flood defence must remain a safe distance away from the toe of the defence to ensure stability of the defence. This must be demonstrated in submitted designs; and • Directional drilling would be permitted when crossing a flood defence provided: – The drilling operation does not affect the stability of the flood defence structure by inducing a geotechnical failure, including when it is retaining flood water; and – The drilling or permanent works do not provide a conduit for water seepage underneath the flood defence structure, including when it is retaining flood water."	
The Inspectorate	Scoping Opinion 17th May 2023	<u>Electrical connection corridor</u> The Scoping Report states that in addition to on-site electricity generated from the Steam Turbine Generator, an alternative supply will be required with options under consideration. Paragraph 3.6.4 of the Scoping Report states that the electrical connection could be above or below ground or a combination. The ES should confirm the final parameters for the selected electrical connection. If above ground, this should include the maximum number, height and locations of any pylons,	This information will be included within the ES. Current information on this topic is set out in Chapter 5: Construction Programme and Management (PEI Report, Volume I).

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		and length of overhead line. The assessment of likely significant effects should take account of this infrastructure alongside the plan and other associated infrastructure.	
The Inspectorate	Scoping Opinion 17th May 2023	<u>Construction access</u> The ES should identify the locations of access routes to site for construction and maintenance of the connection corridors. Any likely significant effects resulting from their construction, operation and decommissioning should be assessed.	This information will be included within the ES. A plan will accompany the ES, showing the locations of construction access points. Current information on this topic is set out in Chapter 5: Construction Programme and Management (PEI Report, Volume I).
The Inspectorate	Scoping Opinion 17th May 2023	<u>Construction deliveries</u> The Scoping Report indicates that options are being explored for construction materials to be delivered by boat and/ or rail. The ES should include an assessment of the worst case allowed for in the dDCO.	In addition to road access, the Applicant is investigating opportunities to make use of existing river and rail infrastructure; in particular, the use of the existing RBT quayside is considered in the PEI Report. Further information regarding this will be included within the ES.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Temporary working areas and construction compounds</u> The ES should identify the location and size of the temporary working areas for the connection corridors, as well as the temporary construction compounds. Any likely significant effects resulting from their use should be assessed.	Preliminary information regarding temporary working areas, laydown areas and construction compounds is included within Chapter 5: Construction Programme and Management (PEI Report, Volume I). Further detail will be included within the ES. A plan will accompany the ES, showing the locations of construction access points and laydown areas.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	<u>Site clearance and remediation</u> Site A would be carried out by Teesworks under a separate consent. It is therefore not proposed to assess this within the ES. The ES should make clear the scope and status of the consent for site remediation, as well as the timescales for the works, and a clear description of how and at what point the baseline has been defined for the purpose of assessment. For Main Site B these powers would be sought within the DCO application, and an assessment is proposed within the ES, should this site be selected. The ES should include an assessment of any likely significant effects arising from site clearance and remediation works, for which powers are sought within the dDCO and confirm how this is to be secured. The ES should include information about works required to facilitate development that is proposed outside of the DCO application, including their scope and extent, status of any relevant consents required, timescales and degree of certainty.	The proposed approach for the remediation of the Main Site (the Foundry) is outlined at Section 4.8 of this PEI Report chapter. Further information will be outlined clearly in the ES. Main Site B (RBT) is no longer under consideration and as such is not discussed further.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Waste</u> In order to inform a robust assessment of likely significant effects, the ES should provide information on the storage, management and disposal of waste, including tunnel arisings. Any assumptions in this regard, for example traffic	This information will be included in the ES. Current information on this topic is set out in Chapter 5: Construction Programme and Management, Chapter 10: Geology, Hydrogeology and Contaminated Land; Chapter

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		movements, waste handling and contaminated land, should be clearly stated in the ES.	15: Traffic and Transport and Chapter 21: Materials and Waste, (PEI Report, Volume I)
The Inspectorate	Scoping Opinion 17th May 2023	Lighting In addition to operational lighting, the ES should clearly describe the location and design of lighting required along the construction working widths and at construction compounds. Any likely significant effects should be assessed.	This information will be included in the ES. Current information on this topic is set out in Chapter 5: Construction Programme and Management (PEI Report, Volume I).
The Inspectorate	Scoping Opinion 17th May 2023	Decommissioning The ES assessment of impacts resulting from decommissioning should be proportionate but include a description of the process and methods of decommissioning, land use requirements and estimated timescales. A description of any assumptions made in the assessment, eg about the approach to retention or removal of pipelines, should be provided. Any decommissioning associated with dismantling and replacing elements of the Proposed Development once they reach the end of their design life should be assessed if significant effects are likely to occur. The Inspectorate notes paragraph 4.2.3 of the overarching NPS for Energy (NPS EN-1), which states that the ES should cover the environmental effects arising from decommissioning of the project.	This information will be included in the ES. Current information on this topic is set out in Chapter 5: Construction Programme and Management (PEI Report, Volume I).

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	<u>Alternatives</u> The Scoping Report identifies that several alternative options are under consideration, including two sites (Main Site A and Main Site B) for the hydrogen production plant. Paragraph 4.3.7 of the Scoping Report states that if alternatives still exist at the time of application, the ES will consider and assess the worst-case impacts. The Inspectorate's comments at ID 2.1.4 about flexibility apply equally to alternatives. For the avoidance of doubt, the ES should consider the worst-case impacts and identify mitigation as required for any options that are sought within the dDCO.	Design options that are still under consideration at the time of preparation of the ES will be clearly outlined the worst-case will be assessed – see Chapter 6: Need, Alternatives and Design Evolution in this PEI Report. Main Site B (RBT) is no longer under consideration.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Easements</u> The description of the physical characteristics of the Proposed Development in the ES should include the details of required easements, to ensure that the extent of the likely impacts from the Proposed Development (for example, sterilisation of mineral resource) is fully understood.	This information will be included in the DCO application.
The Inspectorate	Scoping Opinion 17th May 2023	<u>Hydrogen pipeline safety criteria</u> The ES should explain what design guidelines and safety criteria are being followed for the hydrogen pipeline, and how any health and safety risks would be managed during operation/ maintenance. The Inspectorate notes that hydrogen is an emerging technology and that the	This information will be included in the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		regulatory framework and standards are likely to continue to evolve. Please also refer to the Inspectorate's comments at ID 3.13.3 of this Scoping Opinion.	

4.13 References

- Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast) (Text with EEA relevance) (2010). *Official Journal* L334. P17.
- Institution of Lighting Professionals (2021). *Guidance Note 1 for the reduction of obtrusive light 2021* [online]. Available at: https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2021/.
- International Organization for Standardization (2015). *ISO 14001:2015 Environmental Management Systems*. Geneva: International Organisation for Standardisation.
- *Marine and Coastal Access Act 2009* (c. 23). London: The Stationery Office.
- *The Construction (Design and Management) Regulations 2015* (SI 2015/51). London: The Stationery Office.
- *The Control of Major Accident Hazards Regulations 2015* (SI 2015/483). London: The Stationery Office.
- *The Energy Act 2008*. London: The Stationery Office.
- *Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020* (SI 2020/1497). London: The Stationery Office.
- *The Pipelines Safety Regulations 1996* (SI 1996/825). London: The Stationery Office.
- The Planning Inspectorate (2018). *Advice Note 9: Rochdale Envelope* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope./
- Environment Agency (2023*). Emerging techniques for hydrogen production with carbon capture* [online]. Available at: https://www.gov.uk/government/publications/emerging-techniques-for-hydrogen-production-with-carbon-capture.

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TABLES

Table 5-1: Indicative Construction Programme for the Proposed Development 5

5.0 CONSTRUCTION PROGRAMME AND MANAGEMENT

5.1 Introduction

5.1.1 This chapter of the Preliminary Environmental Information (PEI) Report summarises the construction phase of the Proposed Development.

5.1.2 This chapter includes preliminary information on the expected construction programme and methods of working, based on current understanding at this stage in the design of the Proposed Development. At this stage, a detailed construction programme is not available as this is normally determined by the Engineering Procurement and Construction (EPC) contractor which has not yet been appointed. Where construction details cannot be confirmed at this stage, reasonable worst-case estimates have been made based on experience gained on similar developments and professional judgement.

5.1.3 All construction works will be undertaken in accordance with the Construction Design and Management Regulations (2015).

5.2 Construction Programme Scenarios

5.2.1 The construction programme is anticipated to commence shortly after the Development Consent Order (DCO) is granted (projected to be in Q2 2025) and after the Final Investment Decision (FID).

5.2.2 It is envisaged that the Proposed Development would be constructed in two Phases as outlined in Chapter 4: Proposed Development (PEI Report, Volume I). A single hydrogen production unit, on-site hydrogen storage and supporting utilities (Phase 1) would be constructed and commissioned first, with the second separate Phase 2 hydrogen production unit, on-site hydrogen storage and supporting utilities constructed thereafter. The H_2 pipeline network will be constructed and completed to facilitate transportation of hydrogen to offtakers.

5.2.3 Early enabling works for Phase 1 are expected to start in Q2 of 2025, with the main civils works beginning in Q3 of 2025. Construction of Phase 1 is likely to last approximately 32 – 36 months and is expected to be complete in early 2028.

5.2.4 The early enabling works for Phase 2 may overlap with commissioning for Phase 1 in Q1 2028. It is expected that the main civils works for Phase 2 will begin in Q2 of 2028 (after Phase 1 is commissioned) and be completed by the end of 2030. It is assumed that there will be no overlap between the main construction phases of Phases 1 and 2.

5.2.5 If the duration of the construction of Phase 2 is extended when compared to that for Phase 1 due to potential overlaps in Phase 1's operation and Phase 2's construction activities, ongoing management of the simultaneous operation and construction activities and minimisation of the associated risks and impacts would be required.

5.2.6 This PEI Report assesses construction, commissioning, operation and decommissioning of the Proposed Development and considers its phased nature. As

outlined in Chapters 2 and 4 (PEI Report, Volume I), the ES will include an assessment of any likely significant effects arising from the phased nature of the Proposed Development, including risks of major accidents from the proximity of construction activity to the operational hydrogen production plant.

5.2.7 Phase 1 construction works will include the Production Facility at the Main Site (Phase 1 components), associated on-site storage and the various utility connections required, including CO_2 export pipeline to Northern Endurance Partnership (NEP) infrastructure on the adjacent NZT site, the gas, water and electricity connections. Phase 1 will also include the construction of the majority of the hydrogen pipeline, except for short additional spurs of the hydrogen pipeline which will be constructed as part of Phase 2.

5.2.8 Phase 2 construction at the Main Site will include the infrastructure required for the second Hydrogen Production Unit to increase the capacity of the Production Facility. The additional Phase 2 infrastructure will be constructed within the Main Site, adjacent to the Phase 1 previously constructed infrastructure, and is likely to include:

- an additional Hydrogen Unit (up to 600 MWth);
- an additional cooling water circulation system;
- an additional Air Separation Unit (ASU) (if required);
- expansion of the demineralisation plant as required;
- additional connections and pipe racking as required within the Main Site;
- construction of a new flare or connection to the flare constructed as part of Phase 1; and
- short additional spurs of the hydrogen and natural gas pipelines and the electrical connection (including sub-stations) within the Main Site.

5.2.9 The key stages of the construction programme (including Phase 1 and 2) are outlined at a high level in Table 5-1. It is anticipated that within this high-level programme the following activities would take place following site preparation and remediation works to be undertaken by Teesworks in advance of site handover:

- construction of temporary construction laydown areas;
- construction of the Production Facility (Phase 1) – Main Site works (including new ASU if required);
- construction of utility connections tie ins for natural gas, electricity, water supply and discharge, CO_2 export, N_2 and O_2 import;
- construction of hydrogen pipeline and spurs;
- plant, utility and hydrogen pipeline Commissioning (Phase 1);
- construction of Production Facility Phase 2 elements (as described in paragraph 5.2.6); and
- Phase 2 plant and network commissioning.

5.2.10 The Production Facility will be located on the Main Site, which is part of the site of the former Redcar Steelworks. It is brownfield land that currently contains some above and below ground structures and redundant services associated with the former works and earlier development on the site. However, any demolition works to clear the Site will be undertaken by Teesworks prior to and irrespective of the Proposed Development taking place. Any remediation works required to create a suitable development platform would be undertaken by the Teesworks before the commencement of the construction of the Proposed Development on the Main Site, with the landowner obtaining all necessary consents and permits.

5.2.11 It is common for much of the groundwork (for example piling and pouring of concrete slabs) to be completed prior to the erection of any above ground structures. The erection of civil and structural components (such as cladding and external civil works) usually continues whilst mechanical erection is ongoing. However, the detailed phasing of construction is the responsibility of the appointed contractor and can vary dependent on plant layout and procurement of key equipment.

5.2.12 The Environmental Statement (ES) will include an assessment of the likely significant environmental effects of undertaking required 'enabling works' on the Main Site (including targeted remedial works).

Table 5-1: Indicative Construction Programme for the Proposed Development

DEVELOPMENT PHASE	2025				2026				2027				2028				2029				2030			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Enabling Works Phase 1																								
Construction Phase 1																								
Phase 1 Operation Commences																								
Enabling Works Phase 2																								
Construction Phase 2																								
Phase 2 Operation Commences																								

5.3 Construction Methods

Construction Equipment

5.3.1 For the purposes of this PEI Report and the environmental assessments that will be presented in the ES (in particular for the noise assessment presented in Chapter 11: Noise and Vibration (PEI Report, Volume I)), worst case estimates will be made for the types and numbers of plant and machinery likely to be used on the Main Site during the construction period, as well as the potential use of piling at the Main Site.

5.3.2 Plant is likely to include (but not be limited to) the following:

- mobile plant and civils equipment;
- heavy lifting equipment (including cranes);
- concrete batching plant; and
- mobile power generating equipment.

5.3.3 There may be a requirement for point of use generators for site power during construction. Details of the number of generators, sizing and modes of operation are not yet available. These will be defined by the appointed contractor, as appropriate. Depending on aggregated plant capacities, an environmental permit or medium combustion plant permit will be applied for from the Environment Agency (EA), which will regulate emissions from the generators. Alternatively, site construction power may be provided by Teesworks or by a potential connection to the National Grid.

Site Clearance and Remediation

5.3.4 Site preparation and remedial works at the Main Site would be completed by Teesworks prior to the commencement of construction of the Proposed Development. Teesworks would obtain the necessary consents and permits to do this work. The scope of works anticipated to be undertaken by Teesworks' demolition and civils contractor includes:

- demolition of existing structures within the boundary of the Main Site and construction compounds and laydown areas within the Teesworks site (within the Proposed Development Site);
- turn-over of made ground within the boundary of the Main Site and construction compounds and laydown areas within the Teesworks site to a depth of up to 2.5m below ground level (bgl), including removal of derelict underground structures and obstructions and removal and treatment of historic environmental contamination as required;
- targeted removal of additional underground obstructions and remediation as requested by the Applicant; and
- placement of suitable material (either reused excavation spoil or imported fill) to form the appropriate platform levels for development.

5.3.5 The proposed remediation works will be subject to further review following the assessment of ground condition information.

5.3.6 Further remedial measures may be required during the construction phase of the Proposed Development. These would be localised, targeted remediation works. As such, these works are considered and assessed within this PEI Report as a reasonable worst-case scenario.

Main Site Civil Works

5.3.7 The Applicant's selected Contractor will commence with piling and excavation for the main foundations of the Proposed Development. The piling method to be utilised will be dependent on the findings of ongoing studies and ground investigations and any mitigation measures required to reduce impacts upon sensitive receptors (particularly ecological receptors including birds in the Teesmouth and Cleveland Coast SPA), fish and marine mammals.

5.3.8 A Piling Risk Assessment and associated Piling Methodology will be undertaken in accordance with EA guidance (EA, 2001) to consider and mitigate the risks of causing new pollutant linkages and/or worsening existing linkages with respect to risks to controlled waters during construction of the Proposed Development.

5.3.9 The main plant components for the Production Facility are likely to be a hybrid of modular and stick build. The modular elements would be constructed partially off-site and over-sized (classified as Abnormal Indivisible Loads – AILs). The exact routing of these is not known at this stage, but it is assumed these where required would be delivered by ship either to Teesport or via the Redcar Bulk Terminal (RBT) wharf.

5.3.10 Following ground and civils works, the contractor would commence the installation of plant. Erection of facilities and plant installation would be carried out as concurrent activities, noting that not all facilities would be erected prior to the commencement of plant installation. Large plant may be first placed on foundations with steelwork erected around it thereafter.

5.3.11 Mitigation of noise from piling works may be either through the choice of piling method or the seasonal timing of piling works, depending on the nature of the piling activity and the distance to the sensitive receptors. An assessment would be undertaken of potential noise and vibration effects from piling to determine the degree of mitigation that would be required in the ES. Control of noise during construction would be controlled under the DCO through the CEMP.

Spoil Management

5.3.12 Spoil material generated during construction would be stored temporarily within the Proposed Development Site. Re-use of spoil would be based on obtaining the necessary consents and permits to do this work. Any spoil which cannot be re-used would be removed from site for re-use or disposal. If necessary, suitable measures will be put in place to prevent sediment being washed off-site, with the stockpiles being monitored/measured for wash away. Further details of the measures which will be implemented will be included in a Framework Construction Environmental

Management Plan (CEMP) which will form part of the ES. The CEMP will be prepared by the Contractor prior to construction in accordance with the Framework CEMP.

5.3.13 Soils will be managed in accordance with the Department for Environment, Food and Rural Affairs (Defra) Construction Code of Practice for the Sustainable Use of Soil on Development Sites (Defra, 2009) to minimise impacts on soil structure and quality. Appropriate measures to minimise short-term and long-term impacts on land drainage will be discussed with each landowner (where relevant, principally for the Hydrogen Pipeline Corridor). These measures will also be included in the Framework CEMP. Measures for the management of any contaminated soils will also be set out in the Framework CEMP. HGV traffic associated with export of soils has been accounted for in the traffic movements assessed in Chapter 15 Traffic and Transportation (PEI Report, Volume I).

5.3.14 Additionally, the Framework CEMP will incorporate measures to prevent an increase in flood risk during the construction works in land within Flood Zones 2 or 3 (including the presence of a small number of construction compounds).

Construction Laydown Areas and Welfare Facilities

5.3.15 To optimise the management of construction, construction compounds and laydown areas are required, for activities including (but not limited to) equipment and material storage, site offices, welfare facilities, car parking, environmental/waste handling areas, vehicle wheel wash areas, and operational activities such as concrete batching.

5.3.16 The location of construction compounds has been selected based on the following requirements:

- to support the type, scale and complexity of the works;
- to facilitate materials deliveries and storage in key locations;
- to be in suitable proximity to worksites and existing transport infrastructure, such as the strategic road network, rail and river access, to optimise vehicle movements and minimise impact on the environment and community;
- to provide the necessary facilities and operations capability to the project's construction workforce;
- to be close to the existing transport networks to enable the project's workforce to commute to their place of work; and
- taking account of feedback from stakeholders and landowners.

5.3.17 Based on these requirements, at this stage, it has been identified that around 12 construction compounds/laydown areas are required for construction of the Proposed Development.

5.3.18 The construction compounds and laydown areas would be required for varying amounts of time in support of Phase 1 and Phase 2 construction, depending upon their specific use and location. Some would be required for the full duration of the construction phase.

5.3.19 Project offices, welfare facilities and workshops would be constructed from a mix of single and modular units. These would be stacked where practicable to minimise the surface area taken up at ground level. The project anticipates units being stacked up to an equivalent maximum height of five units (approximately 15 m), with potential for viewing areas at the top of some.

5.3.20 Designated contractor parking is expected to be included in proximity to the Main Site. Details will be provided in the ES.

5.3.21 Water would be supplied by tanker and stored on-site. Sanitary facilities would be provided, and waste stored for off-site disposal.

5.3.22 Site clearance, levelling and ground preparation works for construction compounds and laydown areas may be required to provide a suitable working area. The surface material of laydown areas would be permeable to allow rainwater to percolate to ground, with suitably bunded locations identified as storage areas for any hazardous, polluting materials or chemicals to prevent the risk of pollution.

5.3.23 Habitats that would be temporarily lost or damaged during construction will be Compensated for in line with the Indicative Landscape and Biodiversity Management Plan included in the DCO application and Biodiversity Net Gain. Associated requirements for the protection of retained vegetation (e.g., during vehicle movements and construction/re-instatement works), vegetation restoration soil protection and handling, and temporary soil storage will be specified in the CEMP. These specifications will reflect current industry good practice and be location specific.

5.3.24 The locations of construction compounds and laydown areas will be refined as the design process progresses. Further information, including a plan showing the locations of proposed construction compounds and laydown areas, will be submitted with the ES. The use of these laydown areas will be assessed in the ES using conservative assumptions regarding the nature of activities to be undertaken.

Construction of Connection Corridors

Hydrogen Pipeline Corridor

5.3.25 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), a gaseous phase hydrogen pipeline network is required to connect various potential industrial offtakers across the Tees Valley to the Production Facility at the Main Site, as shown on Figure 4-4: Hydrogen Pipeline Corridor (PEI Report, Volume II).

5.3.26 Once processed to the required specification and compressed at the Main Site, H_2 would be exported using the proposed hydrogen pipeline, at up to 24” diameter and with a Maximum Operating Pressure (MOP) of up to 49 barg.

5.3.27 Various route options and construction methodologies are being considered throughout the proposed hydrogen pipeline network, including trenchless crossings (such as Horizontal Directional Drilling (HDD)), below ground open trench (buried), the installation of new or existing above ground support structures, and the repurposing and reuse of existing pipelines (where possible).

5.3.28 The pipelines will primarily be above ground, installed utilising existing support infrastructure (i.e., existing pipe racks, sleeper tracks, culverts and pipe bridges), within the linkline corridor operated by Sembcorp. If a pipe rack is at capacity, it is proposed that the pipe rack would be expanded to accommodate the additional line. It is anticipated that cranes would be used to lift sections of new pipeline into position with temporary crash decks used to protect existing pipelines during these operations. Existing disused pipelines would be repurposed and reused where possible.

5.3.29 Construction activities within the Hydrogen Pipeline Corridor where it is proposed to use existing pipeline corridors may include the following:

- survey of proposed new pipeline route, including dilapidation surveys;
- undertaking of ground surveys (e.g. topographical, EIA and geotechnical);
- obtain associated access permits and clearance certification;
- access roads and protection of existing infrastructure/pipelines;
- ground preparation and management of any associated excavation works;
- installation of new pipeline sections;
- construction of new pipe bridges and modification of existing;
- management of lifting operations for the positioning and installation of steelwork, piping sections, valves, materials and concrete supports etc;
- installation of temporary pig launching / receiving facilities;
- non-destructive testing of pipe work by radiography, magnetic particle inspection and ultrasonic;
- thickness surveys;
- hydrostatic piping testing;
- corrosion protection preparation and coating (including structural steel work supports) and installation of cathodic protection;
- electrical, control and instrumentation works;
- commissioning;
- reinstatement of fence lines, railing, supports, walkways and any other obstacles temporarily removed or modified by prior agreement to allow for construction and safe works access; and
- site clean-up.

5.3.30 For other connections the pipeline will be constructed using open-cut techniques. A working width of approximately 35 m is assumed at this stage. The method of installation for the sections of buried pipeline is expected to involve:

- segregating a working area using suitable fencing and safety signage;

- removal of topsoil if present and stockpile for reuse;
- laying out sections of pipe adjacent to pipeline route;
- welding pipeline joints together and test welds;
- coating pipe joints and perform checks;
- excavating a trench to the required depth with battered sides or suitable trench supports to suit the temporary works design and stockpile excavated material for reuse;
- installation of pipe bedding material at base of trench;
- lifting sections of pipeline into trench;
- installation of packing material around the pipe;
- backfill of the trench with excavated material and if required remove surplus material from site; and
- replacement of topsoil and reinstatement to agreed standards.

5.3.31 Where optionality is maintained, as a reasonable worst-case, it has been assumed that open-cut methods would be required.

5.3.32 Trenchless methods (such as HDD and micro-tunnelling) are being considered for the crossing of the River Tees and Greatham Creek due to their environmental sensitivity. The proposed trenchless technologies would be below the river/estuary bed at a depth to prevent impacts on river channel integrity, habitats and infrastructure (including other bores and tunnels).

5.3.33 For HDD drilling would involve the installation of sheet piles at the drilling site to provide anchorage for the drill rig. The first stage of the process would be to install a mud return line offset from the proposed pipeline using the drill rig. Following this, a pilot hole would be drilled along the proposed pipeline alignment. A reamer/hole opener would then be attached to the drill and working in the direction from the stringing site back to the drill site the bore diameter would be incrementally increased. Cleaning runs would then be used to remove any cuttings and obstructions in the bore. Finally, the reamer/hole opener would be attached to the pull head and the pipestring would be pulled back through the HDD bore. On the HDD stringing site, sections of pipe would be lifted into position using a crane, welded and coated sequentially until the full length of pipe is installed. Drill mud would be collected in the lagoon on the drill site as the pipe is pulled back for processing and removal from site to a licensed waste disposal facility. Excavations would then be backfilled, and temporary haul roads, plant and equipment removed.

5.3.34 Boring of a Micro-Bored Tunnel (MBT) is likely to require an area at the launch site to be prepared to allow excavation of a shaft to the required launch depth. The shaft should be supported by concrete rings to prevent soil slump to ensure integrity of the tunnel bore. The shaft allows for the installation and launch of the tunnel boring machine. The opposite end of the tunnel trajectory is likely to have a sloped entry point to allow for the installation of the pre-welded & tested pipe string. The MBT

head is designed to self-propel from the base of the shaft along a design trajectory surfacing at a specific point on the pre-constructed arrival ramp. The boring machine is likely to be driven by hydraulic fluid from a diesel-powered hydraulic pump system. Cuttings from the MBT machine will return along its own internal conveyor via slurry pumps with gravity separation in a slurry pond at the launch location. Separated solid material will be removed by road for re-use or disposal at a suitably permitted facility. Liquid wastes (including waste drilling mud) will be removed by tanker and disposed of at a suitability permitted facility. Upon completion, the MBT drill head will be removed from the tunnel. A pre-welded and tested pipe may be pulled from the exit point across its full length. Once fully installed, works at the shaft end will commence to install a single length of pre-welded and tested pipe between the pipe in the base of the shaft up to ground level. Once the weld is confirmed as good, then works to reinstate the removed spoil into the shaft and remediate the land at the exit from the tunnel will be undertaken. Following installation of the pipe strings into the tunnel, the work site will be demobilised, and the tunnel heads capped, with the surrounding land reinstated.

5.3.35 As well as these watercourse crossings, the Proposed Development is likely to include trenchless crossings of railways, roads and utilities infrastructure (by HDD), and trenchless methods are also being considered in other areas that are particularly environmentally sensitive.

5.3.36 The recommended construction methodologies are subject to ongoing design work, discussions with landowners and statutory consultees, and informed by environmental sensitive receptors and constraints and surveys.

CO_2 Export Connection Corridor

5.3.37 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), CO_2 captured and compressed after metering would be exported from H2Teesside to the NEP CO_2 gathering network on the adjacent NZT site via a CO_2 export connection pipeline of up to 22" diameter at a MOP of 28 barg.

5.3.38 At this stage in the design development, the CO_2 export connection may be entirely above or below ground or a combination of the two, using construction methods similar to those described for the Hydrogen Pipeline Corridor. As a reasonable worst-case, open-cut construction methods have been assessed.

Natural Gas Connection

5.3.39 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), natural gas would need to be imported to the Production Facility for use in the reforming process. At this stage, it is anticipated that a 24" pipeline would be constructed which would connect the Production Facility at the Main Site to an existing pipeline.

5.3.40 It is assumed that the gas connection would be constructed by the Contractor, with works coordinated with National Grid. The construction of the Minimum Offtake Connection (MOC) from the National Grid Above Ground Installation (AGI) will be undertaken by a National Grid approved contractor.

5.3.41 The natural gas connection may be entirely above or below ground or a combination of the two, using construction methods similar to those described for the Hydrogen Pipeline Corridor. As a reasonable worst-case, open-cut methods have been assessed.

5.3.42 The Natural Gas Connection Corridor is shown by Figure 4-5: Natural Gas Connection Corridor (PEI Report, Volume II)).

Electrical Connection Corridor

5.3.43 The Proposed Development would connect to the grid at an existing substation, at Teesworks or the NZT electrical connection. There is also potential to connect at other substations locally such as Lackenby and Grangetown. The connection between the Proposed Development and the sub-station would comprise high voltage electrical cables and control system cables.

5.3.44 It is anticipated that electrical cables would be routed below ground and installed using an open-cut methodology at a depth of approximately 1.1 m and overlain by suitable protective tiles and warning tape, using techniques similar to those described for the Hydrogen Pipeline Corridor. The Electrical Connection Corridor is shown by Figure 4-6: Electrical Connection Corridor (PEI Report, Volume II)).

Water Connections

5.3.45 The Water Connections are described in Chapter 4 Proposed Development (PEI Report, Volume I) and Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I). At this stage in the design and assessment process, it is considered that the water and wastewater connections may be entirely above or below ground or a combination of the two, using construction methods similar to those described for the Hydrogen Pipeline Corridor. As a reasonable worst-case, open cut methods have been assessed. The corridor is shown by Figure 4-7: Water Connections Corridor (PEI Report, Volume II).

Other Gases Connections

5.3.46 As outlined in Chapter 4: Proposed Development, other gas connection pipelines may be required for the transportation of compressed O_2 and N_2 for use at the Production Facility, should a third-party ASU be used to supply the required gases. The corridor is shown by Figure 4-8: Other Gases Connection Corridor (O_2 and N_2) (PEI Report, Volume II)). At this stage in the design and assessment process, it is considered that these connections may be entirely above or below ground or a combination of the two, using construction methods similar to those described for the Hydrogen Pipeline Corridor. As a reasonable worst-case, open-cut methods have been assessed.

Construction Staff

5.3.47 Based on an initial estimate, it is considered likely that construction workforce peak numbers will be approximately 1,300 people per day for both Phases 1 and 2. This includes workers associated with both the Main Site and pipeline connections. Please refer to Chapter 15: Traffic and Transportation and Chapter 18: Socio economics and Land Use (PEI Report, Volume I) for further detail regarding this.

5.3.48 Construction staff are anticipated to travel to the Proposed Development via the existing trunk road and local networks. The Applicant will seek to maximise sustainable transport options such as public transport (including rail), cycling and car sharing in accordance with policy. This will be as outlined within a Framework Construction Workers Travel Plan that will accompany the ES.

5.3.49 Further detail regarding the approach to the Framework Construction Workers Travel Plan is presented within Chapter 15: Traffic and Transportation (PEI Report, Volume I).

Site Access

5.3.50 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), the Main Site would be accessed from the A1085 Trunk Road, a dual carriageway road running north-east to south-west between Redcar and the A1053 Tees Dock Road. The road is subject to the national speed limit. Travelling south-west from the Main Site access, the A1085 Trunk Road provides a link to the A1053 Tees Dock Road, which in turn connects to the A174 to the south and the A66 to the north. The A1053 Tees Dock Road and A174 are part of National Highways core network.

5.3.51 Access routes to the Hydrogen Pipeline Corridor network north of the River Tees are assumed via the A1046 Haverton Hill Road/Port Clarence Road and the B1275, with compound access points proposed off the A178 Seaton Carew Road, A1185, Nelson Avenue, Cowpen Bewley Road and the unnamed road to Seal Sands (commonly known as Seal Sands Road). Access routes to the Main Site and Connection Corridors south of the River Tees are assumed via the A1085 Trunk Road "Steel House Gate" roundabout.

5.3.52 At this stage it is assumed that all construction HGVs associated with the Main Site would arrive/depart the site from Tees Dock Road via the A1053/A66/Tees Dock Road roundabout. At the junction with the A1053/A66/Tees Dock Road, it is assumed that 50% would head west on the A66 and 50% would head south on the A1053 then west on the A174. Alternatively, HGV traffic could access the A1085 Trunk Road from the Lackenby Steelworks entrance (accessed from the Main Site via the internal Teesworks road network) from where traffic could route via the A66 or A1053 as above. For further detail regarding access, please refer to Chapter 15: Traffic and Transport (PEI Report, Volume I).

5.3.53 Construction access routes for the hydrogen pipeline and connection corridors are yet to be finalised. Access points would be identified at suitable locations along the pipeline routes located north of the River Tees to ensure that disturbance is kept to a minimum for laydown, stockpiling, welfare facilities and parking.

5.3.54 Options for transportation of AILs during construction using the local ports are still being considered. The nearest commercial port to the Proposed Development Site is Teesport which could be used for the import of containerised equipment or modular plant. Use of modular plant would minimise the number of HGV movements required for their transportation. The use of the existing wharf at RBT for the transportation of abnormal loads would be considered for modular plant. Consideration would be given to the appropriate port and any required AIL routes during the design process.

5.3.55 The Applicant is also exploring the use of railways for the import of materials to the Main Site and associated connection corridors. The potential for reopening the mothballed Redcar British Steel railway station on the Tees Valley Line for construction worker access is under consideration by the landowner.

Construction Traffic

5.3.56 The principal vehicle movements associated with the Proposed Development construction phase will be managed in accordance with a Framework Construction Traffic Management Plan. Refer to Chapter 15: Traffic and Transportation (PEI Report, Volume I) for further detail regarding this.

5.3.57 The volume of construction vehicles associated with the delivery of plant and the labour force has not been fully determined at this stage, but as a worst-case scenario at this stage, daily staff numbers are anticipated to be approximately 1,300 for both Phases 1 and 2 during the peak month of construction. This equates to approximately 1,300 two-way vehicle movements per day (650 arriving and 650 departing) during the peak construction period, based upon an average car occupancy for workers of 2.

5.3.58 During the peak month, the volume of construction HGVs on the network is predicted to be 1,330 (730 and 600 of these are associated with the Main Site and Connection Corridors respectively). This equates to 67 per day (rounded from 66.5) based on 20 working days per month (37 and 30 of which are associated with the Main Site and Connection Corridors respectively).

5.3.59 For further detail please refer to Chapter 15: Traffic and Transportation (PEI Report, Volume I).

Construction Working Hours

5.3.60 Core construction working hours would generally be weekdays 07:00 to 19:00 and Saturday 07:00 to 16:00, plus, up to one hour before and/or after for mobilisation (start-up and close down) procedures. These standard working hours would apply to all works authorised under the DCO except in specific circumstances; it is likely that some construction activities will require 24 hour working at certain times.

5.3.61 This is principally for construction activities that cannot be stopped, such as large concrete pours or activities that are required to be carried out at night to maintain the development schedule (e.g., radiography). It also includes:

- some repair and maintenance work;
- tunnelling and below ground shaft works;
- some material movements;
- emergency or short notice working;
- abnormal loads and police escort loads;
- security; and
- monitoring (non-intrusive environmental and construction monitoring).

5.3.62 Where on-site works are to be conducted outside the core hours, they would comply with any restrictions agreed with the local planning authorities, particularly regarding the control of noise and traffic.

5.3.63 As a worst-case, in line with the above, some twenty-four-hour working have been assessed in this PEI Report, including Chapter 11: Noise and Vibration (PEI Report, Volume I), assuming less noisy activities occur at night. Chapter 11: Noise and Vibration sets out specific mitigation and control measures required to prevent disturbance from such night-time construction activities. Activities that could generate a noise nuisance would not be undertaken at night, including but not limited to sheet piling, piling, use of impact wrenches, concrete scabbling, use of reversing sirens and concrete jack hammering.

Storage of Construction Plant and Materials

5.3.64 There would be laydown areas with temporary surfaces positioned close to access roads on the Proposed Development Site (mainly in vicinity of the Main Site) where materials would be unloaded and then transported to the area of works. It is not envisaged that these would be used for long term storage of materials (storage would be for six months or less). At the end of each shift, small mobile plant would be returned to a secure overnight plant storage area where drip trays would be utilised under the various types of plant, if required.

5.3.65 Storage areas for flammable/toxic corrosive materials would be in a separate, locked, bunded and fenced off area. Material data sheets will be available for all these materials and the Control of Substances Hazardous to Health (COSHH) assessments kept within the relevant risk assessment for the task, all subject to the Applicant's approval.

5.3.66 Although options to utilise existing site power are also being explored, temporary generators are likely to be required during construction, with mobile generators being used along the construction corridors.

Lighting

5.3.67 Construction temporary site lighting is proposed to enable safe working on the construction site in hours of darkness. Construction lighting will be designed so as not to cause a nuisance outside of the Proposed Development Site in relation to views from residential receptors or light disturbance to ecological receptors. A construction lighting design for working in sensitive areas north of the Tees will be included in the DCO application.

Wheel Wash Facilities

5.3.68 A self-contained wheel wash would be installed and used by vehicles prior to exiting the Proposed Development Site and prior to them joining the public highway. For loads unable to use the fixed wheel wash, a localised wheel washing facility would be set up to cater for these, to minimise effects on the local highway network.

Framework Construction Environmental Management Plan (CEMP) and Site Waste Management Plan (SWMP)

5.3.69 A Framework CEMP will be included within the ES accompanying the DCO Application. It will set out the key measures to be employed during the Proposed Development construction phase to control and minimise the impacts on the environment. This will include industry best practice measures, and specific measures set out in this PEI Report.

5.3.70 The purpose of the Framework CEMP is to:

- ensure nuisance levels as a result of construction and operation activities are kept to a minimum;
- comply with regulatory requirements and environmental commitments; and
- ensure procedures are put into place to minimise environmental effects during construction.

5.3.71 A Final CEMP will be prepared by the Contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO. The Applicant will require that the EPC Contractor maintains the CEMP to appropriately control site activities to minimise impacts on the environment.

5.3.72 To manage and monitor waste generated on the Site during Proposed Development's construction, a Framework SWMP will be developed as part of the Framework CEMP which will allow for waste streams to be estimated and monitored. The Framework SWMP will require that the construction contractor segregates waste streams on-site, prior to them being taken to a waste facility for recycling or disposal. All waste removal from the Site will be undertaken by fully licensed waste carriers and taken to permitted waste facilities.

Construction Traffic Management Plan (CTMP)

5.3.73 A CTMP will be implemented to control the impact of HGVs on the local road network during construction. A Framework CTMP will be prepared and included with the ES.

Commissioning

5.3.74 Commissioning of the Proposed Development will include testing of the process equipment and pipework. A Commissioning Plan will be required to be agreed with the EA under the environmental permit, which will specify monitoring and control procedures to be used and set out a schedule of commissioning activities. Phase 1 commissioning is programmed for Q1 2028 whilst that for Phase 2 is programmed for Q4 2030 (as shown in Table 5-1).

5.4 References

- Department for Environment, Food and Rural Affairs (2009). *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/716510/pb13298-code-of-practice-090910.pdf.
- Environment Agency (2001). *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention.*

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6.0 NEED, ALTERNATIVES AND DESIGN EVOLUTION

6.1 Introduction

6.1.1 This chapter of the Preliminary Environmental Information (PEI) Report sets out a summary of the need case for the Proposed Development, and the alternatives that have been considered during the evolution of the design process as presented in Chapter 4: Proposed Development (PEI Report, Volume I) up to statutory consultation.

6.1.2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') state that an Environmental Statement (ES) (and, in following its structure, a PEI Report) should contain "*A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen, option, including a comparison of the environmental effects"* (Regulation 14(2)(e)). This chapter recognises and fulfils this requirement in respect of the Proposed Development.

6.1.3 Under the EIA Regulations there is no requirement to assess the alternatives, only a requirement to provide information regarding the alternatives that have been considered.

6.1.4 On the matter of alternatives, National Policy Statement (NPS) EN-1 (DECC, 2011) paragraph 4.4.1 states that "*This NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option''.* Paragraph 4.4.2 goes on to state "*However, applicants are obliged to include in their ES, as a matter of fact, information about the main alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility"*.

6.1.5 Similarly, paragraph 4.2.15 of draft revised EN-1 (refer to Chapter 7: Legislative Context and Planning Policy of this PEI Report (PEI Report, Volume I)) (Department for Energy Security and Net Zero (DESNZ, 2023)) states that '*Applicants are obliged to include in their ES, information about the reasonable alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility'*.

6.1.6 Paragraphs 4.2.18-4.2.28 of the draft revised NPS go on to set out the various considerations that the Secretary of State (SoS) should take into account in considering alternatives.

6.1.7 In this context, the consideration of alternatives and design evolution has been undertaken with the aim of avoiding and/or reducing adverse environmental effects (following the mitigation hierarchy of avoid, reduce and, if possible, remedy), while maintaining operational efficiency and cost-effectiveness, considering other relevant

matters such as available land and planning policy, and taking into account the alternatives considerations that apply under the Water Environment (Water Framework Directive (WFD)) (England and Wales) Regulations 2017 (2000/60/EC) (HM Government, 2017), the Conservation of Habitats and Species Regulations 2017 (Habitats Regulations) (HM Government, 2017), common law and compulsory acquisition regimes.

6.1.8 The design of the Proposed Development is at a sufficiently advanced stage to allow meaningful consultation. The design remains preliminary and will continue to evolve up to the point of the DCO Application submission in response to consultation feedback and with reference to any ongoing surveys and technical studies. Detailed design work will proceed once the project moves into the '*Front End Engineering Design*' (FEED) stage which is due to commence in 2024. The detailed FEED work will remain within the design parameters set out in the DCO Application and as assessed within the ES.

6.2 The Need for the Proposed Development

6.2.1 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), the Proposed Development comprises the construction, operation (including maintenance), and decommissioning of an approximately 1.2 GWth LHV (Phase 1, 600-megawatt thermal (MWth) LHV and Phase 2, 600 MWth LHV) Carbon, Capture and Storage (CCS) enabled Hydrogen Production Facility ('the Production Facility') located in the Teesside industrial cluster area. This includes hydrogen (H_2) distribution pipelines to supply H_2 to various offtakers on Teesside and within the surrounding area.

6.2.2 bp is aiming to be a net zero company by 2050 or sooner. In support of this, bp is determined to advance the H_2 industry across the UK, Europe, Australia and US. H_2 is set to provide a low carbon energy for activities and processes that are difficult to electrify – especially in industry: iron, steel and chemicals for high-temperature processes. It can also help to decarbonise long-distance transportation in marine, aviation and heavy-duty road transport.

6.2.3 'Blue hydrogen', or 'CCS-enabled hydrogen', is H_2 that is extracted from natural gas, but the vast majority of CO_2 produced during this process is captured and stored permanently. Blue hydrogen, integrated with carbon capture and storage, can provide the scale and reliability needed by industrial processes. It can play an essential role in decarbonising industries that are hard to electrify – for example cement and steel making, which depend on fuels that can create intense heat, and heavy transport, which need fuels capable of powering vehicles with heavy loads.

6.2.4 Low carbon H_2 can be used to decarbonise a range of carbon intensive sectors including industry (as a low carbon fuel and feedstock), power and steam generation, mobility and transport (heavy duty fleets, buses, rail, aviation and marine) and grid blending. H2Teesside H_2 demand will come from multiple end users, including to support fuel switching from natural gas to H_2 within process heat, steam raising and power generation applications, therefore reducing CO_2 emissions from these industries.

6.2.5 The Proposed Development would deliver low carbon H_2 production at scale, coupled with CCS. It is well placed to support large-scale industrial decarbonisation, being located in one of the UK's major industrial clusters, with the potential to supply H_2 to a number of industrial users/offtakers, while linking into the NEP infrastructure for the transportation and storage of the CO_2 generated during the H_2 production process.

6.2.6 Further information on the need for the Proposed Development will be provided in the Planning Statement which will be submitted in support of the DCO Application.

6.3 The Do Nothing Alternative

6.3.1 The 'Do Nothing' alternative would mean that the Proposed Development would not be developed, meaning that it would not produce nor distribute any low carbon H_2. There would not be opportunity for offtakers within the Teesside region to transition to this low-carbon alternative, generated at the Production Facility.

6.3.2 In addition, Carbon Capture and Storage (CCS) is recognised in Government policy as being essential to achieving the UK Government's commitments to achieving net-zero emissions by 2050. In particular, H_2 is identified as critical to the decarbonisation of industries that are hard to electrify. The Proposed Development is well placed to support large-scale industrial decarbonisation, as it is located in one of the UK's major industrial clusters, with the potential to supply H_2 to a number of industrial users/offtakers and linking into the Northern Endurance Partnership (NEP) infrastructure for the transportation and storage of the CO_2 generated during the H_2 production process.

6.3.3 If the Proposed Development was not progressed, then the opportunity that it presents in helping to achieve those targets would not exist.

6.3.4 For these reasons, the 'Do Nothing' alternative scenario is not considered appropriate. This scenario has implicitly been assessed as it represents the baseline conditions in the EIA.

6.4 Alternative Technologies

6.4.1 No alternatives to H_2 production have been considered given the need for the Proposed Development as outlined above. The consideration of alternative technologies has focused only on the means of delivering a H_2 production facility.

6.4.2 Blue hydrogen has been selected for H_2 production as it uses proven and widely used technology for H_2 production, combined with proven carbon capture technologies (thereby delivering low carbon H_2). The technology is readily available and can be deployed at a large scale to meet Government ambitions, such as those outlined in the UK Hydrogen Strategy (HM Government, 2021).

6.4.3 Different syngas technologies have been evaluated to identify the preferred option for delivering this CCS enabled blue H_2 production facility. Two potential technology options are being considered at this stage, as part of the Proposed Development. These are referred to as Case A (which involves ATR based reforming) and Case B (which utilises a proprietary Low Carbon Hydrogen technology). Only one of these

technologies will be selected, based on factors such as capacity, scalability, cost, technology readiness level, energy efficiency, associated emissions, safety considerations and capture rate. A summary of the key differences between Case A and Case B is provided in Chapter 4: Proposed Development (PEI Report, Volume I). Partial oxidation was also evaluated but is no longer considered a preferred option.

6.4.4 It is anticipated that one of these technologies will be selected as the EIA progresses and the justification for this will be clearly outlined in the ES.

6.4.5 These technologies would be combined with chemical solvents for carbon capture and the following technologies for H_2 purification:

- physical solvents;
- chemical solvents;
- cryogenics separation; and
- pressure swing adsorption.

6.5 Alternative Sites

6.5.1 Within Teesside, a number of sites were considered by the Applicant for the Production Facility. The analysis of potential sites focussed on identifying a site that supports the development of a viable blue H_2 project that facilitates industrial connectivity and the path to decarbonisation.

6.5.2 Various factors influenced the site selection process. The criteria that were considered as part of the site selection process include:

- process safety considerations;
- proximity to the east coast and NEP infrastructure, to enable high pressure CO_2 export to be quickly directed offshore, specifically to the Endurance storage facility;
- size – ensuring there is sufficient space for the Proposed Development, that it is safe to construction, and it has expansion potential;
- utilising brownfield land where possible;
- distance from residential areas (with remoteness from residential receptors being preferable);
- proximity to industrial offtakers that could connect into the H_2 network;
- proximity to necessary connections including a gas network, electricity transmission network, water supply and wastewater management options;
- minimising environmental/social effects or risks; and
- discussions with landowners.

6.5.3 The EIA Scoping Report presented within Appendix 1A (PEI Report, Volume III) provides details of two Main Site options, namely Main Site A (the Foundry) and Main Site B (RBT). Both site options provide proximity to existing and potential future users

of low carbon H_2 and access to the off-shore Endurance carbon store via NEP's nearby proposed infrastructure. Both locations (the Foundry and RBT) were considered sufficiently remote from any safety sensitive receptors, thereby minimising process safety risks. In addition, both Main Site options could be easily connected to the required infrastructure (including natural gas, water and electrical).

6.5.4 In June 2023, the Applicant decided to progress with Main Site A. Main Site A is directly adjacent to the NEP onshore facilities, thereby simplifying the connection corridor routing.

6.5.5 Main Site A is also large enough to allow for the potential expansion of the H2Teesside project, as well as possible co-location other proposed bp projects in Teesside (such as HyGreen, a green H_2 project which is proposed to be located adjacent to the Proposed Development Site), allowing synergies between the projects to be explored.

6.5.6 Main Site A also offers greater opportunity to manage process safety risk; its size means that potential process safety impacts on adjacent sites can be minimised.

6.5.7 As identified in the EIA Scoping Report included at Appendix 1A (PEI Report, Volume III), the environmental baseline conditions for both Main Site options are very similar. They are located in proximity to each other and as such, are in similar proximity to sensitive receptors; although, Main Site B is slightly closer to the River Tees and Teesmouth National Nature Reserve (NNR). Main Site A is slightly closer to the nearest residential receptor (Marsh House Farm), but both Main Sites are generally remote from residential receptors. Marsh House Farm is located approximately 1.3 km and 2.2 km to the east of Main Sites A and B respectively. Both Main Sites have similar industrial histories, and similar topographies.

6.6 Alternative Layouts within the Main Site

6.6.1 Alternative development layouts within the Main Site are being evaluated. Options will continue to be refined as the DCO Application progresses, including (but not limited to):

- the layout of the Proposed Development including the configuration of the structures and buildings within the Main Site; and
- the design of the Proposed Development, e.g. the solution chosen in terms of O_2 and N_2 supply (whether sourced locally or requiring an Air Separation Unit (ASU)).

6.6.2 The location and layout of proposed infrastructure within the Main Site has considered relevant development plans (outlined in Chapter 7: Legislation and Planning Policy (PEI Report, Volume I), ground conditions and proximity to sensitive receptors. At this stage, design and assessment work is still ongoing to determine the most appropriate layout for the Main Site. Some of the factors that are being considered during this process are:

- consideration of space available for the plant and construction laydown;
- process safety;

- proximity to the NEP infrastructure on the adjacent NZT site, thereby minimising the length of the high-pressure CO_2 export connection;
- distance from residential areas/population/sensitive ecological receptors;
- access to water supply;
- access to the proposed NZT effluent outfall to Tees Bay or the existing Bran Sands Wastewater Treatment Works (WwTW) outfall to Dabholm Gut ; and
- construction access including jetties that could be used for the delivery of Abnormal Indivisible Loads (AILs).

6.7 Connection Corridor Routing

6.7.1 At this stage, some options remain under consideration for the routing of the Connection Corridors required for the Proposed Development, as shown on Figures 4-2 to 4-8 (PEI Report, Volume II).

6.7.2 Options will be refined as the DCO Application progresses, including (but not limited to):

- the options and refinement of routes carried forward for connection to the natural gas, 'other gases' (O_2 and N_2) and electricity supply networks within the proposed connection corridors;
- the options and refinement of routes for the H_2 pipeline within the proposed Hydrogen Pipeline Corridor; and
- the options and refinement of routes for the water connection within the proposed Water Connections Corridor.

6.7.3 Various options have been considered for the routing of the Hydrogen Pipeline Corridor. Since the preparation of the EIA Scoping Report, the route options have been refined, informed by engineering feasibility work, the outcome of environmental studies and consultation with statutory consultees such as Natural England and the Environment Agency (EA). This includes the removal of a route option to the western extent of the Proposed Development Site. Only one route option is now being considered for the crossing of Greatham Creek, as shown by Figure 4-4: Hydrogen Pipeline Corridor (PEI Report, Volume II). Ultimately, a single route option to each offtaker will be selected.

6.7.4 The optionality in the routing of the Hydrogen Pipeline Corridor still includes several options for the crossing of the River Tees, as shown by Figure 4-4: Hydrogen Pipeline Corridor (PEI Report, Volume II). The choice of routing in this location depends upon the construction methodology selected (e.g. Horizontal Directional Drilling (HDD) or micro-tunnelling, as only trenchless methods are being considered for this particular crossing); further detail regarding this is provided in Section 6.8.

6.7.5 The options being considered in respect to the water management are outlined in Chapter 4: Proposed Development (PEI Report, Volume I). In summary:

- Raw water (for process and sanitary uses) will be supplied via the existing Northumbrian Water Limited (NWL) raw water supply to the Teesworks site, which is an existing licensed abstraction from the River Tees.
- Two options are under consideration in terms of process effluent management. The first option is based on Minimalised Liquid Discharge (MLD) from the Effluent Treatment Plant. In this scenario, treated wastewater from the Effluent Treatment Plant will be reused as makeup water in the Proposed Development's Water Treatment Plant. A low volume liquid waste stream containing salts and nutrients would be taken offsite for further treatment. The second option is an alternative to MLD and requires discharge of process effluent to the NZT project outfall at Tees Bay.
- Clean surface water runoff would be discharged to the Tees Estuary via Dabholm Gut or Tees Bay. The following options are being considered:
  - direct feed to Dabholm Gut (with any new pipework and outfall to be consented under a subsequent planning application);
  - discharge via the existing Brans Sands discharge pipeline (but not requiring treatment at Brans Sands WwTW as this is surface water runoff); or
  - discharge via the NZT outfall.

6.7.6 Final routings for all connections will take into consideration the location of sensitive environmental receptors including but not limited to statutory designated sites (such as Ramsar sites, Special Protection Areas (SPAs) and Sites of Special Scientific Interest (SSSIs)) within the area. Where possible, the selected route will seek to avoid environmentally sensitive areas and utilise existing established pipeline routes, and/or the least intrusive construction methodologies (e.g., trenchless methods, as opposed to open-cut trench). The final routings will be outlined in the ES.

6.8 Connection Corridor Construction Methodologies

6.8.1 The proposed construction methodologies for each of the connection corridors are outlined in Chapter 4: Proposed Development (PEI Report, Volume I). In summary, various options are being considered, including trenchless crossings (such as HDD), below ground open trench (buried), the installation of new or existing above ground support structures, and the repurposing and reuse of existing pipelines (where possible). This is subject to ongoing design work, discussions with landowners and statutory consultees, and is being informed by environmental sensitive receptors and constraints and surveys.

6.8.2 Since the preparation of the EIA Scoping Report, the construction methodologies for the Hydrogen Pipeline Corridor have been refined, informed by engineering feasibility work, the outcome of environmental studies and consultation with statutory consultees such as Natural England and the EA. This includes the decision to utilise trenchless methods for the crossing of the River Tees and Greatham Creek; no other methodologies are being considered in these locations.

6.8.3 The final construction methodologies selected will take into consideration the location of sensitive environmental receptors within the area. Where possible, existing established pipeline routes will be utilised, and/or the least intrusive construction methodologies (i.e. trenchless methods, as opposed to open-cut trench). The final design will be outlined in the ES.

6.9 Conclusions

6.9.1 As outlined at Section 6.4, no alternatives to H_2 production have been considered given the need for the Proposed Development. Blue hydrogen production has been selected as it uses proven, widely used and readily available technology that can be deployed at a large scale to deliver low carbon H_2 in line with Government ambitions.

6.9.2 Different syngas technologies have been evaluated; two options are being considered at this stage, referred to as Case A and Case B. Only one of these technologies will be selected, based on factors such as capacity, scalability, cost, technology readiness level, energy efficiency, associated emissions, safety considerations and capture rate.

6.9.3 As outlined at Section 6.5, the site selection process concluded that the Foundry Main Site is the most appropriate for the Production Facility, given its location on brownfield land suitable for redevelopment, its proximity to a number of existing industrial offtakers and to the proposed NEP infrastructure, and its remoteness from residential receptors. It is also sufficiently large to minimise process safety risks and to allow for potential synergies with other projects (such as HyGreen) to be explored.

6.9.4 As outlined in Sections 6.6 - 6.8, the layout of the Proposed Development (including the routeing of the connection corridors), and the proposed construction methodologies, are being developed taking into account the potential environmental effects, alongside other factors such as technical and commercial feasibility. The design of the Production Facility and the associated connection corridor routes and construction methodologies will continue to be refined following consultation, with the final Rochdale Envelope design being reported in the ES to be submitted as part of the DCO Application.

6.9.5 The ES will include a full summary of the alternatives considered throughout the design process, including the reasons for any changes.

6.10 References

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7.0 PLANNING AND ENERGY POLICY

7.1 Introduction

7.1.1 This chapter of the Preliminary Environmental Information (PEI) Report provides an overview of the planning and energy policies of relevance to the Proposed Development.

7.1.2 The DCO Application for the Proposed Development will include a Planning Statement that will detail the policies and supplementary planning guidance of relevance to the Proposed Development and include an assessment of how it complies with that policy and guidance.

7.1.3 Development consent is required for the Proposed Development as it falls within the definition and thresholds for a Nationally Significant Infrastructure Project (NSIP) under Sections 14(g) and 21 of the Planning Act (PA) 2008, associated development under Section 115(1)(b) and by direction under Sections 35(1) and 35ZA of the same Act. The following planning and energy policy is of relevance to the Proposed Development:

- National Policy Statements (NPSs) for Energy;
- Marine Policy Statements (MPSs) and Plans;
- Government Energy and Climate Change Policy;
- the National Planning Policy Framework (NPPF); and
- local planning policy.

7.1.4 These planning and energy policies are considered below. In addition, each technical chapter of the PEI Report refers to the policies that are relevant to the assessment of the environmental effects reported within that chapter and discusses how the Proposed Development interacts with those policies.

7.2 National Policy Statements for Energy

7.2.1 Under the PA 2008 regime, the policy framework for examining and determining applications for development consent is provided by NPSs. Section 5 of the PA 2008 allows the relevant Secretary of State (SoS) to designate NPSs setting out national policy in relation to the types of NSIPs listed at Section 14 of the Act. The NPSs are the primary policy used by the relevant SoS to examine and determine DCO applications for NSIPs.

7.2.2 Section 104 of the PA 2008 provides that where a NPS has effect, the SoS must determine the DCO application in accordance with the relevant NPSs and appropriate marine policy documents (if any) having regard to: any local impact report produced by the relevant Local Planning Authority (LPA); any matters prescribed in relation to development of the description to which the application relates; and any other matters which the SoS thinks are both '*important and relevant'* to their decision, unless this would:

- lead to the UK being in breach of its international obligations;

- be in breach of any statutory duty that applies to the SoS;
- be unlawful;
- result in the adverse impacts of the development outweighing the benefits; or
- be contrary to any condition prescribing how decisions regarding an NSIP application are to be taken.

7.2.3 Section 105 of the PA 2008 relates to the decision on applications where no NPS has effect, that is, where there is no NPS in place relating to the specific type of development. In such cases, Section 105 states that in deciding the application the SoS must have regard to any relevant local impact report produced by the relevant LPA; any matters prescribed in relation to development of the description to which the application relates; and any other matters which the SoS thinks are both important and relevant to their decision.

7.2.4 In light of recent case law[1], and until revised NPSs are designated which change the position (as they are anticipated to do given the clear text on this in the revised draft NPS), the Applicant recognises that those aspects of the Proposed Development which are automatically a NSIP will be determined under Section 104 and those aspects which are development for which consent is required pursuant to the Section 35 Direction will be determined under Section 105.

Current NPSs

7.2.5 Several NPSs have been designated in relation to energy infrastructure. The current energy NPSs were published in July 2011 by the SoS for the Department for Energy and Climate Change (DECC). DECC became part of the Department for Business, Energy & Industrial Strategy (BEIS) in July 2016, which existed until 2023 when BEIS was split to form the Department for Business and Trade (DBT), the Department for Energy Security and Net Zero (DESNZ) and the Department for Science, Innovation and Technology (DSIT).

7.2.6 The designated NPSs include an overarching NPS setting out general policies and assessment principles for energy infrastructure and a number of technology specific NPSs. The NPSs considered to be of relevance to the Proposed Development are:

- the Overarching NPS for Energy (EN-1) (DECC, 2011a);
- the NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (DECC, 2011b); and
- the NPS for Electricity Networks Infrastructure (EN-5) (DECC, 2011c).

7.2.7 Part 3 of EN-1 *"The need for new nationally significant energy infrastructure projects"* defines and sets out the need for nationally significant energy infrastructure. Paragraph 3.1.1 states that the UK needs all types of energy infrastructure covered by the NPS to achieve energy security at the same time as dramatically reducing greenhouse gas (GHG) emissions. Paragraph 3.1.2 goes on to state that it is for

[1] Including High Court judgement 'EFW Group Limited v Secretary of State for Business, Energy and Industrial Strategy [2021] EWHC 2697 (Admin)' (England and Wales High Court, 2021).

industry to propose the type of energy infrastructure and that the Government does not consider it appropriate for planning policy to set targets for, or limits on, different technologies.

7.2.8 While the current NPSs for energy infrastructure do not include policy specifically relating to hydrogen (H_2) infrastructure, they do include policy that is of relevance to the Proposed Development.

7.2.9 Part 4 of EN-1 sets out several 'assessment principles' that must be taken into account by applicants and the SoS in preparing and determining applications for nationally significant energy infrastructure. General points include (paragraph 4.1.2) the requirement for the SoS, given the level and urgency of need for the infrastructure covered by the energy NPSs, to start with a presumption in favour of granting consent for applications for energy NSIPs. This presumption applies unless any more specific and relevant policies set out in the relevant NPS clearly indicate that consent should be refused or any of the considerations referred to in Section 104 of the PA 2008 (noted above) apply.

7.2.10 Other assessment principles include the matters to be covered within any Environmental Statement (ES); the Habitats and Species Regulations; the consideration of alternatives; criteria for good design; grid connection; consideration of Carbon Capture and Storage (CCS); climate change adaptation; pollution control and environmental regulatory regimes; safety; hazardous substances; health; common law and statutory nuisance and security, amongst others.

7.2.11 Part 5 of EN-1 deals with the "*Generic Impacts*" of energy infrastructure. These include impacts that occur in relation to all or most types of energy infrastructure, in addition to others that may only be relevant to certain technologies. Paragraph 5.1.2 stresses that the list of impacts is not exhaustive and that applicants should identify the impacts of their projects in the ES in terms of both those covered by the NPSs and others that may be relevant. Generic impacts include land use; socio economics; air quality and emissions; noise and vibration; dust, odour, artificial light, steam and smoke; traffic and transport; civil and military aviation; biodiversity and geological conservation; historic environment; landscape and visual; water quality and resources; flood risk and waste, amongst others. In relation to each of the generic impacts listed within Part 5, guidance is provided on how an applicant should assess these within their application and the considerations that the SoS should consider in decision-making.

7.2.12 In addition to the assessment principles and generic impacts covered by EN-1, NPSs EN-4 and EN-5 set out the factors (e.g. those influencing site selection) and *'assessment and technology specific'* considerations to be considered in the preparation and assessment of applications for gas pipelines and electricity network infrastructure, including relevant environmental matters.

Draft Revised NPSs

7.2.13 In December 2020 the Government launched a review of the energy NPSs to ensure that they reflected the legally binding commitment (through the Climate Change Act 2008 (2050 Target Amendment) Order 2019) to achieve net zero in terms of GHG

emissions by 2050 and the Government's energy priorities as set out in the Ten-Point Plan and Energy White Paper. As part of the review, the Government consulted on draft revised NPSs for energy in September 2021.

7.2.14 Since the September 2021 consultation, the Government has published two further documents setting out relevant energy policy. These include the Net Zero Strategy: Build Back Greener (October 2021) and the British Energy Security Strategy (April; 2022), the latter setting out several commitments related to energy, planning reform and the energy NPSs. The Government has made some material updates to the draft revised energy NPSs following the British Energy Security Strategy and launched a further consultation in March 2023 on those material changes in policy. The consultation closed on 23rd June 2023.

7.2.15 No date has currently been set for the designation of the revised energy NPSs and it has been confirmed by the Government that for any application for development consent submitted before they are designated, the current 2011 suite of NPSs should have effect in accordance with the terms of those NPSs. While the current suite of NPSs for energy remain relevant policy and have effect for NSIP applications for the purposes of the PA 2008, the Government has also clarified that the draft revised NPSs are potentially capable of being important and relevant considerations in the decision-making process.

7.2.16 Paragraph 1.3.5 of draft revised EN-1 states that where the need for a particular type of energy infrastructure set out in paragraph 1.3.2 is established by the NPS, but that type of infrastructure is outside the scope of one of the technology specific NPSs, EN-1 alone will have effect and be the primary basis for SoS decision making. It goes onto state:

"This will be the case for, but is not limited to, unconventional hydrocarbon extraction sites, hydrogen pipeline and storage infrastructure, Carbon Capture Storage (CCS) pipeline infrastructure and other infrastructure not included in EN-2 or EN-3."

7.2.17 As outlined in Chapter 1: Introduction (PEI Report, Volume I), although works to construct the Proposed Development, including the Production Facility, do not fall under the definition of a NSIP, the Applicant sought a direction under Section 35 of the PA 2008 from the SoS to give a direction for all the elements of the Proposed Development to be treated as development for which development consent is required.

7.2.18 On the 22nd December 2022, the SoS issued a Direction under Sections 35(1) and 35ZA that the Proposed Development is to be treated as development for which consent is required, including the Production Facility and any aspect of the hydrogen pipelines that are not automatically a NSIP. Paragraph 1.3.10 of draft EN-1 states that EN-1, in conjunction with any relevant technology specific NPS, will be the primary policy for SoS decision making on projects in the field of energy for which a direction has been given under Section 35.

7.2.19 Paragraph 2.3.3 of draft EN-1 sets out the Government's objectives for the energy system. These are to ensure our supply of energy always remains secure, reliable, affordable and consistent with meeting the UK's target to cut GHG emissions to net

zero by 2050. Paragraph 2.3.4 goes onto state that meeting these objectives necessitates a significant amount of energy infrastructure, both large and small-scale. This includes the infrastructure needed to convert primary sources of energy (e.g. wind) into energy carriers (e.g. electricity or hydrogen), and to store and transport these energy carriers into and around the country. It also includes the infrastructure needed to capture, transport and store carbon dioxide (CO_2). The requirement for new energy infrastructure will present opportunities for the UK and contributes towards our ambition to support jobs in the UK's clean energy industry and local supply chains.

7.2.20 Part 3 of draft EN-1 deals with the need for new nationally significant energy infrastructure projects. It explains why the Government sees a need for significant amounts of new large-scale energy infrastructure to meet its energy objectives and why it considers the need for such infrastructure is urgent. However, it notes (paragraph 3.1.2) that it will not be possible to develop the necessary amounts of such infrastructure without some significant residual adverse impacts.

7.2.21 Paragraph 3.2.2 confirms that we need a range of different types of energy infrastructure and (paragraph 3.2.4) that it is for industry to propose new infrastructure within the strategic framework set by Government. It also states that it is not appropriate for planning policy to set limits on different technologies. Furthermore, paragraphs 3.2.5 to 3.2.7 state that the SoS should assess all applications for development consent for the types of infrastructure covered by EN-1 on the basis that the Government has demonstrated that there is a need for those types of infrastructure which is urgent; that substantial weight should be given to that need; and that the SoS is not required to consider separately the specific contribution of any individual project to satisfying that need.

7.2.22 Paragraphs 3.2.10 and 3.2.11 together state that where an energy infrastructure project is not covered by Sections 15 to 21 of the PA 2008, but is considered to be nationally significant and is subject to a direction under Section 35, then the application for development consent would need to be considered in accordance with EN-1:

"In particular: …

Where the application is for hydrogen infrastructure not covered by sections 15-21 of the Planning Act, the Secretary of State should give substantial weight to the need established at paragraphs 3.4.12 to 3.4.21 of this NPS …"

7.2.23 As confirmed above, the need for low carbon hydrogen infrastructure is set out at paragraphs 3.4.12 to 3.4.21 of draft EN-1. Paragraph 3.4.12 specifically states that there "*… is an urgent need for all types of low carbon hydrogen infrastructure to allow hydrogen to play its role in the transition to net zero*." Paragraph 3.4.13 goes onto state:

"… the government is committed to developing low carbon hydrogen, which will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050, with the potential to help decarbonise vital UK industry sectors and provide flexible deployment across heat, power and transport."

7.2.24 Paragraph 3.4.21 states that in considering applications for low carbon hydrogen infrastructure, the SoS will expect applicants to consider foreseeable future demand when considering the size and route of their investments. Applicants may propose pipelines with a greater capacity than demand might suggest at the time of consenting.

7.2.25 Draft EN-1 in relation to CCS states at paragraph 3.5.1 that "*There is an urgent need for new carbon capture and storage (CCS) infrastructure to support the transition to a net zero economy.*" Paragraph 3.5.2 refers to the Committee on Climate Change's statement that CCS infrastructure will be needed to capture and store carbon dioxide from hydrogen production.

7.3 Marine Policy Statements & Plans

7.3.1 Section 104 of the PA 2008 requires the SoS to have regard to '*the appropriate marine policy documents'* relevant to NSIPs. It is considered that such documents would also be important and relevant considerations under Section 105. A number of elements of the Proposed Development involve works within the UK Marine Area, under the tidal River Tees. The marine policy documents that are relevant to the Proposed Development are the UK MPS (HM Government, 2011a) and the North East Inshore and North East Offshore Marine Plan (HM Government, 2011b) – these documents are considered in the following sections.

UK Marine Policy Statement (March 2011)

7.3.2 The UK MPS, adopted in March 2011, provides the policy framework for preparing marine plans and taking decisions affecting the marine environment. It has been prepared and adopted for the purposes of Section 44 of the Marine and Coastal Access Act 2009 and is intended to sit alongside terrestrial consenting regimes, including the PA 2008 regime. The MPS was subject to updates in September 2020 relating to how references to European Union (EU) law should be interpreted from 1 January 2021 following the UK's withdrawal from the EU.

7.3.3 Chapter 3 sets out the policy objectives for key activities that take place in the marine environment. Section 3.3 deals specifically with '*Energy production and infrastructure development*'. Paragraph 3.3.1 notes that a secure, sustainable and affordable supply of energy is of central importance to the economic and social well-being of the UK. Paragraph 3.3.4 sets out issues that decision makers should consider when examining and determining applications for energy infrastructure. Those of relevance to the Proposed Development, which will connect to a Carbon Capture, Usage and Storage (CCUS) cluster in Teesside, that should be taken into account include:

- the national level of need for new energy infrastructure, as set out in the Overarching NPS for Energy (EN-1);
- the positive wider environmental, societal and economic benefits of CCS as key technologies for reducing CO_2 emissions;

- that the physical resources and features that form oil and gas fields or suitable sites for CO_2 storage occur in relatively few locations and need first of all to be explored for and can then only be exploited where they are found;
- the UK's programme to support the development and deployment of CCS clusters and in particular the need for suitable locations that provide for the permanent storage of CO_2.

North East Inshore and North East Offshore Marine Plan (June 2021)

7.3.4 Marine plans are intended to set out detailed policy and spatial guidance for a particular area. The UK is divided into several marine planning regions with associated plan authorities that are responsible for preparing marine plans. In England the Marine Management Organisation (MMO) is the plan authority. Marine plans are a material consideration.

7.3.5 The Proposed Development Site lies within the 'North East Inshore Marine Area', which stretches from Flamborough Head in Yorkshire to the Scottish Border. The Plan Area has three main tidal rivers, including the River Tees.

7.3.6 The North East Marine Plan is intended to provide a strategic approach to decision-making, considering future use and providing a clear approach to managing resources, activities and interactions within the area.

7.3.7 Policy NE-CCUS-3 is of relevance to the Proposed Development as it supports proposals associated with the deployment of low carbon infrastructure for industrial clusters such as that being proposed on Teesside as part of the East Coast Cluster being advanced by the Northern Endurance Partnership (NEP). The policy states:

"The government identified potential regional clusters which can be utilised for low carbon development in the Delivering clean growth: CCUS Cost Challenge Taskforce report and the subsequent plan, The UK carbon capture, usage and storage (CCUS) deployment pathway: an action plan. NE-CCUS-3 supports the development of low carbon industrial clusters where low carbon infrastructure, including carbon capture, usage and storage technologies could be deployed. Encouraging developments associated with industrial clusters aims to reduce the capital costs of deploying carbon capture, usage and storage, maximising the economies of scale."

7.4 Energy and Climate Change Policy

7.4.1 Other matters that the SoS may consider important and relevant include recent UK energy and climate change policy.

7.4.2 The Proposed Development will support the overarching objective of the Government to continue transitioning the UK to a low carbon economy and meeting the legally binding target of net zero GHG emissions by 2050. The important role that H_2, coupled with CCS/CCUS must play in achieving this transition is confirmed by recent Government energy and climate change policy, including:

- The Ten Point Plan for a Green Industrial Revolution (HM Government, 2020a);
- The Energy White Paper (HM Government, 2020b);

- Industrial Decarbonisation Strategy (HM Government, 2021a);
- North Sea Transition Deal (HM Government, 2021b);
- UK Hydrogen Strategy (HM Government, 2021c);
- Net Zero Strategy: Build Back Greener (HM Government, 2021d);
- British Energy Security Strategy (BESS) (HM Government, 2022); and
- Powering up Britain (HM Government, 2023a).

7.4.3 These policy documents are considered below.

The Ten Point Plan for a Green Industrial Revolution (November 2020)

7.4.4 '*The Ten Point Plan for a Green Industrial Revolution – Building back better, supporting green jobs, and accelerating our path to net zero*', was published on 18 November 2020 and is aimed at delivering a '*Green Industrial Revolution*' in the UK. The plan has a foreword by the Prime Minister stating that the plan will aim to mobilise £12 billion of Government investment and potentially three times as much from the private sector, to create and support up to 250,000 green jobs.

7.4.5 The Introduction to the Ten Point Plan (page 6) states:

"We will generate new clean power with offshore wind farms, nuclear plants and by investing up to half a billion pounds in new hydrogen technologies. We will use this energy to carry on living our lives, running our cars, buses, trucks and trains, ships and planes, and heating our homes while keeping bills low. And to the extent that we still emit carbon, we will pioneer a new British industry dedicated to its capture and return to under the North Sea. Together these measures will reinvigorate our industrial heartlands, creating jobs and growth, and pioneering world-leading SuperPlaces that unite clean industry with transport and power …

The cumulative effect of this plan will be to reduce the UK emissions by 180 million tonnes of carbon dioxide equivalent (Mt CO_2 e) between 2023 and 2032, equal to taking all of today's cars off the road for around two years…."

7.4.6 The 'Ten Points' of the plan are summarised at page 7. Point 2 '*Driving the Growth of Low Carbon Hydrogen'* is covered at pages 10 to 11 and states (page 10):

"Working with industry the UK is aiming for 5GW of low carbon hydrogen production capacity by 2030. Hubs where renewable energy, CCUS and hydrogen congregate will put our industrial 'SuperPlaces' at the forefront of technological development."

7.4.7 It highlights how 5 gigawatt (GW) of low carbon hydrogen production by 2030 could see the UK benefit from around 8,000 jobs across its industrial heartlands. This will be supported by a range of measures, including a £240 million Net Zero Hydrogen Fund. It goes on (page 10) to state:

"Producing low carbon hydrogen at scale will be made possible by carbon capture and storage infrastructure, and we plan to grow both of these new British industries side by side so our industrial 'SuperPlaces' are envied around the world."

7.4.8 Point 8 *'Investing in Carbon Capture, Usage and Storage'* (pages 22 and 23) identifies the ambition to capture 10 Mt of CO_2 a year by 2030 and the Government's commitment to invest up to £1 billion to support the establishment of CCUS in four industrial clusters in areas such as the North East. It goes onto state how CCUS will be developed alongside hydrogen production in these locations.

The Energy White Paper (December 2020)

7.4.9 The Energy White Paper '*Powering our Net Zero Future*' (EWP) was presented to Parliament in December 2020 and builds on the Ten Point Plan. At the core of the EWP is the commitment to tackle climate change and achieve net zero. The EWP seeks to put in place a strategy for the wider energy system that transforms energy, supports a green recovery, and creates a fair deal for consumers (page 4). As with the Ten Point Plan, the EWP confirms the Government's support for new hydrogen technologies and CCUS drawing upon the resources provided by the North Sea.

7.4.10 The Government estimates (page 15) that the measures in the EWP could reduce emissions across power, industry, and buildings by up to 230 Mt CO_2 in the period to 2032 and enable further savings in other sectors such as transport. In doing so, these measures could support up to 220,000 jobs per year by 2030. These figures include the energy measures from the Ten Point Plan as well as additional measures set out in the EWP. However, the EWP recognises that more will need to be done to meet key milestones on the journey to net zero.

7.4.11 The EWP (pages 16 to 17) provides an overview of the Government's key commitments to put the UK on a course to net zero. These are grouped under several headings and include:

"SUPPORT A GREEN RECOVERY FROM COVID-19 …

Increasing the ambition in our Industrial Clusters Mission four-fold, aiming to deliver four low-carbon clusters by 2030 and at least one fully net zero cluster by 2040.

Investing £1 billion up to 2025 to facilitate the deployment of CCUS in two industrial clusters by the mid-2020s, and a further two clusters by 2030, supporting our ambition to capture 10 Mt per year by the end of the decade.

Working with industry, aiming to develop 5GW of low-carbon hydrogen production capacity by 2030." Chapter 2 'Power' of the EWP sets out how it is proposed to decarbonise the power sector. This includes a commitment to consult on steps to ensure that new thermal plants can convert to low carbon technologies either through the retrofit of carbon capture plant or 'conversion to firing clean hydrogen' (page 48)."

7.4.12 Chapter 5 *'Industrial Energy'* sets out the goal for emissions from industry to fall by around 90% from today's levels by 2050. To achieve this (page 118) the Government:

"…will:

Create a sustainable future for UK manufacturing industry through improved energy efficiency and the adoption of clean energy technologies.

Establish the UK as a world leader in the deployment of CCUS and clean hydrogen, supporting up to 60,000 jobs by 2030." The EWP confirms that manufacturing and refineries, which form the bulk of industrial emissions, still account for around 1% of the UK's GHG emissions. About half of those emissions are concentrated in the UK's six major industrial clusters. This includes Teesside (Figure 8.1, page 121) which accounts for 3.9 Mt CO_{2e} of emissions (2018 figures)."

7.4.13 To transform industrial energy, the EWP (page 122) states that we cannot rely on energy efficiency alone to reduce emissions in line with the Government's 2050 goal. Manufacturing industry will also need to capture its carbon for onward transport and storage and switch from using fossil fuels to low-carbon alternatives, such as hydrogen.

7.4.14 To bring about change in industrial energy, the EWP includes a commitment (page 124) to increase the *'Industrial Clusters Mission'* to support the delivery of four low-carbon industrial clusters by 2030 and at least one fully net zero cluster by 2040. The EWP states that the Government will focus on the UK's industrial clusters:

"... centres where related industries have congregated and can benefit from utilising shared clean energy infrastructure, such as CCUS and low-carbon hydrogen production and distribution. Decarbonisation in clusters will enable economies of scale, reducing the unit cost for each tonne of carbon abated, while clusters provide high quality jobs which tend to pay above the UK average wage."

7.4.15 The EWP notes (page 124) that many clusters are in regions in need of economic revitalisation and that decarbonising those clusters can act as a driver of prosperity for the surrounding areas. Furthermore, that investments in key technologies like CCUS and hydrogen will be crucial to enhancing local economic growth and creating jobs together with prosperity.

7.4.16 Chapter 5 of the EWP includes a section on 'Clean Hydrogen' (pages 127 to 128). It identifies that hydrogen will be critical in reducing emissions from heavy industry, as well as in power, heat and transport. Clean hydrogen includes using natural gas and capturing the CO_2 by-product with CCUS or using renewable electricity to split water into hydrogen (H_2) and oxygen (O_2). It includes commitments to:

- work with industry to develop 5 GW of low-carbon hydrogen production capacity by 2030; and
- create a Net Zero Hydrogen Fund to support low-carbon hydrogen production, providing £240 million of capital co-investment out to 2024/25.

7.4.17 The EWP underlines (page 128) that a variety of hydrogen production technologies will be required to satisfy the level of anticipated demand for clean hydrogen by 2050, and that the Government hopes to see 1GW of hydrogen production capacity by 2025 on route to its 2030 goal.

<u>Industrial Decarbonisation Strategy (March 2021)</u>

7.4.18 The Industrial Decarbonisation Strategy is the first strategy published by a major economy, which sets out how industry can be decarbonised in line with net zero, while remaining competitive and without pushing emissions abroad. It builds on the

Ten Point Plan and sets out the Government's vision for a prosperous, low carbon UK industrial sector by 2050, and aims to provide industry with the long-term certainty it needs to invest in decarbonisation.

7.4.19 The Ministerial Foreword (page 6) emphasises that the 2020s will be crucial to industrial decarbonisation, with the UK needing to deploy key technologies such as CCUS while beginning the journey of switching from fossil fuel combustion to low carbon alternatives such as hydrogen.

7.4.20 Chapter 1 *'Why we need a strategy and our approach'* sets out the Government's ambition for decarbonising industry in line with net zero. The expectation is that emissions will need to reduce by at least two-thirds by 2035 and by at least 90% by 2050, with 3 Mt CO_2 per annum captured through CCUS and a significant switching to low carbon fuels such as hydrogen by 2030. Significantly, the strategy (page 18) recognises that government should play a key role in the delivery of large infrastructure projects for key technologies such as hydrogen networks where there is a sharing of benefits, and the risk or cost is too great for the private sector.

7.4.21 Chapter 2 *'Getting investors to choose low carbon'* confirms the Government's commitment (Action 2.2) to put in place funding mechanisms to support the deployment and use of CCUS and low carbon hydrogen infrastructure. It states that (pages 29-30):

"CCUS will be crucial to reaching net zero, and low carbon hydrogen has the potential to play a key role in enabling the economic transformation of the UK's industrial regions. With both technologies at early stages of development, government will need to play an active role in overcoming market failures; sharing the risk and costs of scaling up deployment of both CCUS and low carbon hydrogen.

…. We have already committed to a £1 billion CCS Infrastructure Fund to provide industry with certainty to deploy CCUS at pace and scale, alongside a £240 million Net Zero Hydrogen Fund. Later in 2021 will bring forward further details of the revenue mechanism to support business models for both industrial carbon capture and low carbon hydrogen projects."

7.4.22 With regard to fuel switching (Action 4.2, pages 51 and 52), Chapter 4 of the strategy confirms that the Government is committed to developing a low carbon hydrogen economy in the UK. The Government sees it as critical to demonstrate fuel switching to hydrogen in industrial sites in parallel to ramping up low carbon hydrogen production.

North Sea Transition Deal (March 2021)

7.4.23 The North Sea Deal is a transformational sector deal for the offshore oil and gas sector in recognition of the key role that it can play in helping the UK meet its net zero commitments. The document recognises (Foreword, page 6) that with declining output of hydrocarbons from the UK Continental Shelf (UKCS) and a projected decline in domestic demand, there is a clear need for determined action to be taken to build on the proven capabilities and skills within the existing sector to support the transition to net zero. It continues:

"The UK already has the capability and skills within the existing sector to lead in new and emerging energy technologies such as Carbon Capture, Usage and Storage (CCUS) and the hydrogen economy as well as to support the growth of new sectors such as offshore wind.

... Delivering large-scale decarbonisation solutions will strengthen the position of the existing UK energy sector supply chain in a net zero world, securing new high-value jobs in the UK, supporting the development of regional economies and competing in clean energy export markets."

7.4.24 The Executive Summary (page 8) states that the North Sea Deal is aimed at delivering on the commitments set out in the oil and gas chapter of the EWP and is closely aligned with the Prime Minister's Ten Point Plan. It seeks to do this through the implementation of several commitments and measures, including supporting up to 40,000 direct and indirect supply chain jobs in decarbonising UKCS production and the CCUS and hydrogen sectors.

7.4.25 The North Sea Deal is built on five key outcomes – supply decarbonisation; CCUS; hydrogen; supply chain transformation; and people and skills. These are seen as being closely interlinked, meaning that they must be delivered as an integrated whole for the Deal to achieve its full potential. With regard to hydrogen, the Deal notes that:

"Hydrogen is essential to meeting our net zero commitment in the UK. It could provide a clean source of energy across the economy, from industrial and domestic heat, to heavy transport, and flexible power and energy storage. The UK already has world-leading offshore wind potential and electrolyser capability, alongside unparalleled CCS sites that the UK can maximise to scale up low carbon hydrogen production.

The hydrogen commitment in the North Sea Transition Deal focuses on creating the economic environment in which low carbon hydrogen production can flourish. This will help unlock billions of pounds of investment from the sector. The oil and gas sector is positioned to enable the production of low-carbon hydrogen at scale as part of a long-term competitive market, supporting the UK's ambition to deliver 5 GW of low carbon hydrogen production capacity by 2030."

<u>UK Hydrogen Strategy (August 2021)</u>

7.4.26 The UK Hydrogen Strategy sets out the Government's approach to developing a thriving low carbon hydrogen sector in the UK to meet its ambition for up to 5 GW of low carbon hydrogen production capacity by 2030.

7.4.27 Chapter 1 '*The case for low carbon hydrogen'* confirms that low carbon hydrogen will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050 and Carbon Budget Six in the mid-2030s. Hydrogen can support the deep decarbonisation of the UK economy, particularly in the "hard to electrify" UK industrial sectors, and can provide greener, flexible energy across power, heat and transport (page 7). It goes on (page 8) to state:

"Today most hydrogen produced and used in the UK and globally is high carbon, coming from fossil fuels with no carbon capture; only a small fraction can be called

low carbon. For hydrogen to play a part in our journey to net zero, all current and future production will need to be low carbon."

7.4.28 Section 1.3 of Chapter 1 *'The UK's hydrogen opportunity'* sets out the Government's *'twin track'* approach to hydrogen production, which seeks to capitalise on the UK's potential to produce large quantities of both electrolytic 'green' and CCUS enabled 'blue' hydrogen. It states that the UK has the technology, know-how and storage potential to scale up CCUS across the country, unlocking new routes to CCUS-enabled hydrogen production (page 10). It goes on (Page 10) to state:

"Early deployment of CCUS technology and infrastructure will likely be located in industrial clusters. Many of these are in coastal locations, with important links to CO_2 storage sites such as disused oil and gas fields. Government aims to establish CCUS in four industrial clusters by 2030 at the latest, supporting our ambition to capture 10 Mt/ CO_2 per annum.

In turn, industrial clusters and wider industry are significant potential demand centres for low carbon hydrogen. Today, numerous industrial sectors from chemicals to food and drink are exploring the role that hydrogen can play in their journey to net zero. UK Research and Innovation's (UKRI's) Industrial Decarbonisation Challenge provides up to £170 million – matched by £261 million from industry – to invest in developing industrial decarbonisation infrastructure including CCUS and low carbon hydrogen." Figure 1.3 at Chapter 1 of the strategy identifies Teesside as a location for both green and blue (CCUS-enabled) hydrogen production (page 11)."

7.4.29 The strategy (page 33) highlights the potential of CCUS-enabled blue hydrogen production, stating:

"Our Hydrogen Production Cost 2021 report suggests that, under central fuel price assumptions, CCUS-enabled methane reformation is currently the lowest cost low carbon hydrogen production technology. Given the potential production capacity of CCUS-enabled hydrogen plants, we would expect this route to be able to deliver a greater scale of hydrogen production as we look to establish a UK hydrogen economy during the 2020s."

7.4.30 The strategy considers the *'Use of hydrogen in industry'* (pages 52 and 53) stating:

"It is clear that UK industrial sectors will play a vital role in developing a hydrogen economy over the next decade. Industry produced 16 per cent of UK emissions in 2018, and hydrogen will be critical to decarbonise industrial processes that would be hard to abate with CCUS or electrification. The Industrial Decarbonisation Strategy published earlier this year sets out the policy and technology principles to decarbonise industry by 2050, including the installation of deep decarbonisation infrastructure such as hydrogen and CCUS networks in the 2020s.

Our industrial heartlands will likely lead the way for large scale low carbon hydrogen supply, and industrial users are expected to provide the most significant new demand for hydrogen by 2030 through industrial fuel switching. Today's hydrogen economy will need to scale up from its current base in the oil refining and chemical sectors, to enter other parts of industry and the wider energy system. We will develop policy to

support and deliver this change, and to drive the decarbonisation of existing industrial hydrogen use."

7.4.31 Since the UK Hydrogen Strategy was published, the British Energy Security Strategy (April 2022) has doubled the UK's hydrogen production ambition from 5 GW to 10 GW by 2030. This is reflected in the latest '*Hydrogen Strategy update to the market*' issued to BEIS in December 2022. The Hydrogen Strategy update to the market also includes the announcement on shortlisted hydrogen projects in the BEIS Phase 2 Cluster Sequencing Process (Cluster sequencing Phase-2: shortlisted projects (power CCUS, hydrogen and ICC), August 2022)), which identifies 'bpH2Teesside' as one of the shortlisted projects in the East Coast Cluster, to have moved to the due diligence stage of the process.

Net Zero Strategy: Build Back Greener (October 2021)

7.4.32 The '*Net Zero Strategy: Build Back Greener'* expands on key commitments in the Ten Point Plan. The EWP and sets out the next steps the Government proposes to take to cut emissions, seize green economic opportunities and leverage further private investment in net zero. The strategy sets an indicative delivery pathway for emission reductions to 2037 by sector. It is intended to put the UK on the path for Carbon Budget 6 and ultimately on course for net zero by 2050.

7.4.33 Regarding power, the strategy states that the UK will fully decarbonise its power system by 2035 subject to security of supply. It states that the power system will consist of abundant, cheap renewables, cutting edge new nuclear power stations, underpinned by flexibility including storage, gas with CCUS and hydrogen (page 19).

7.4.34 For industry, the Net Zero Strategy states (page 21) that it will deliver four CCUS clusters, capturing 20-30 Mt CO_2 across the economy, including 6 Mt CO_2 of industrial emissions, per year by 2030. This will be done by supporting industry to switch to cleaner fuels, such as low carbon hydrogen alongside renewable energy and CCUS. These clusters, including the East Coast Cluster, which includes Teesside, could have the opportunity to access support under the Government's CCUS programme (£1 billion). The strategy also states that the Government has set up the Industrial Decarbonisation and Hydrogen Revenue Support Scheme, providing up to £140 million to fund new hydrogen and industrial carbon capture business models. This is in addition to £240 million Net Zero Hydrogen Fund.

7.4.35 Whilst the Net Zero Strategy was the subject of a successful Judicial Review in 2022, the Court's decision did not quash the strategy, but instead ordered the Government to provide an update to that strategy by the end of March 2023 to add further explanation as to how the Government's aims set out in the strategy would be met.

British Energy Security Strategy (BESS) (April 2022)

7.4.36 The BESS was published largely in response to soaring energy prices as a result of a sudden surge in demand following the Coronavirus (COVID-19) pandemic, compounded by the Russian invasion of Ukraine. Much of the focus of the strategy is upon providing financial assistance to families and businesses struggling with higher energy bills. It also looks at improved energy efficiency, reducing the amount of

energy we need and addressing the underlying vulnerability to international oil and gas prices by reducing the UK's dependence on imported oil and gas.

7.4.37 Notably, the BESS identifies the importance of low carbon hydrogen, with an increased commitment to achieve up to 10 GW of hydrogen production by 2030, including CCUS-enabled blue hydrogen.

Powering Up Britain (March 2023)

7.4.38 On 30 March 2023 the Government published three documents comprising 'Powering Up Britain,' the 'Energy Security Plan' and 'Net Zero Growth Plan' following the judicial review of the Net Zero Strategy. All three documents provide details of the Government's measures to increase domestic energy production, resilience in the energy supply and achieve net zero.

7.4.39 Regarding hydrogen, the Energy Security Plan sets out the measures to support the development of business models and finance for hydrogen projects, including the launch of Strands 1 and 2 of the Net Zero Hydrogen Fund. It also the shortlisted projects for the first electrolytic hydrogen allocation round. In addition to this, the Government is entering into bilateral negotiations with two CCUS-enabled hydrogen projects.

7.4.40 The Energy Security Plan signals continued support towards the CCUS industry most notably the announcement of eight Track-1 projects across the hydrogen, power, industry, and waste sectors which are progressing towards negotiations. This includes H2Teesside as a hydrogen CCUS project in the East Coast Cluster. The Energy Security Plan also sets out the proposed reforms to the planning system, including publication of the revised draft NPS.

7.4.41 The Net Zero Growth Plan sets out the actions by the Government to support the delivery of the hydrogen sector, consolidating measures set out in previous strategy documents such as the ambition to deliver 2GW of low carbon hydrogen by 2025 and 10GW by 2030. The plan also reiterates the measures outlined in the Energy Security Plan.

7.5 National Planning Policy Framework (NPPF)

7.5.1 The NPPF (MHCLG, 2021) introduced in March 2012 (last updated July 2021) sets out the Government's planning policies for England. It is a material consideration in planning decisions. Although paragraph 5 of the NPPF confirms that NSIPs are to be determined in accordance with the decision-making framework of the PA 2008 and relevant NPSs, decisions on NSIPs should also take account of any other matters that are '*relevant'*, which may include the NPPF. The NPPF is supported by the Planning Practice Guidance (PPG), which provides more detailed guidance on various aspects of planning.

7.5.2 Section 2 *'Achieving sustainable development'* confirms (paragraph 7) that the purpose of the planning system is to contribute to the achievement of sustainable development, summarised as '*meeting the needs of the present without compromising the ability of future generations to meet their own needs'*. Paragraph 8 goes on to identify three overarching objectives to the achievement of sustainable

development, which are interdependent and need to be pursued in mutually supportive ways. These are:

- an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
- an environmental objective – to protect and enhance our natural, built and historic environment, including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

7.5.3 Central to the NPPF is '*The presumption in favour of sustainable development'*. This is set out at Paragraph 11. For decision-making, this means approving applications that accord with the development plan without delay.

7.5.4 The NPPF is supportive of infrastructure projects. One of the methods of fulfilling the objective of sustainable development listed at paragraph 8 under *'a) an economic objective'* is through the "*provision of infrastructure"*.

7.5.5 Paragraph 152 in Section 14 *'Meeting the challenge of climate change, flooding and coastal change*' states:

"The planning system should support the transition to a low carbon future in a changing climate … it should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure".

7.5.6 Paragraph 158 states that when determining an application for renewable and low carbon development, there should be no requirement for applicants to demonstrate the overall need for renewable or low carbon energy and that applications for renewable or low carbon development should be approved if their impacts are (or can be made) acceptable.

7.5.7 NPPF policies of particular relevance include:

- building a strong, competitive economy (Chapter 6);
- making effective use of land (Chapter 11);
- meeting the challenge of climate change, flooding and coastal change (Chapter 14); and

- conserving and enhancing the natural environment (Chapter 15).

7.5.8 A summary of these policies is provided in Table 7-1.

Table 7-1: Relevant National Planning Policy Framework Policies

POLICY	POLICY SUMMARY
Chapter 6 – Building a strong, competitive economy	Confirms that the Government is committed to securing economic growth and productivity and allowing each area to build on its strengths, counter any weaknesses and address the challenges of the future. Paragraphs 81 and 82 make it clear that the planning system should do all it can to support sustainable economic growth though, amongst other measures, planning proactively and removing barriers to investment such as a lack of infrastructure.
Chapter 11 – Making effective use of land	Aimed at promoting the effective use of land, including by (paragraph 120c) giving substantial weight to the use of suitable brownfield land.
Chapter 14 – Meeting the challenge of climate change, flooding and coastal change	Focuses upon adapting to and mitigating the effects of climate change. Paragraph 152 highlights that planning plays a key role in helping shape places to secure radical reductions in GHG emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy. Paragraph 159 warns that inappropriate development in areas at risk of flooding should be avoided but where it is necessary the development should be made safe for its lifetime without increasing flood risk elsewhere. If it is not possible for development to be in zones with a lower risk of flooding the exception test may have to be applied.
Chapter 15 – Conserving and enhancing the natural environment	Aimed at protecting and enhancing value landscapes, recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital, minimising impacts on and providing net gains for biodiversity and preventing new and existing development from contributing to, being put at unacceptable risk from or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

7.5.9 The above NPPF policies will be considered in detail within the Planning Statement, which will be submitted with the DCO Application for the Proposed Development.

7.5.10 The Government consulted on proposed reforms to the NPPF between December 2022 and March 2023 and is now considering the responses to the consultation. The

Planning Statement will consider any policy changes within the revised NPPF of relevance to the Proposed Development, should it be published in advance of the DCO Application being submitted.

7.6 Local Planning Policy

Development Plan Documents

7.6.1 The Main Site is located within the administrative boundary of Redcar and Cleveland Borough Council (RCBC).

7.6.2 The hydrogen pipelines and other connections involve crossings of the River Tees and encompass land within the administrative boundaries of RCBC, Stockton on Tees Borough Council (STBC) and Hartlepool Borough Council (HBC).

7.6.3 The relevant Development Plan Documents (DPDs) for the Proposed Development are as follows:

- the Redcar and Cleveland Local Plan and Policies Map (adopted May 2018; RCBC, 2018a);
- Stockton-on-Tees Borough Council Local Plan (adopted January 2019; STBC, 2019);
- Hartlepool Local Plan (adopted May 2018; HBC, 2018); and
- The Tees Valley Joint Minerals and Waste DPDs (adopted September 2011; Darlington Borough Council *et al*., 2011).

7.6.4 The Tees Valley Joint Minerals and Waste DPDs comprise a Minerals and Waste Core Strategy DPD and a Minerals and Waste Policies and Sites DPD. The Joint Minerals and Waste DPDs were prepared together by RCBC, STBC, HBC and Darlington and Middlesbrough Councils. The Joint Minerals and Waste DPD is of limited relevance to the Proposed Development.

Supplementary Planning Documents

7.6.5 Parts of the Proposed Development Site lie within the boundary of the South Tees Development Corporation (STDC) area, which is now known as 'Teesworks'. STDC is a Mayoral Development Corporation, established to further the economic development of the South Tees Area through physical, social and environmental regeneration. However, RCBC retains planning powers for the area and continues to act as the LPA in respect of planning policy and development management and the processing and determination of planning applications.

7.6.6 STDC has produced a Master Plan (the '*South Tees Regeneration Master Plan*') to provide a flexible framework for the regeneration of the Teesworks/South Tees Area. The Master Plan was prepared throughout 2017 (later revised in 2019 as STDC (2019)) as a supporting vision and development strategy document to inform the preparation of a Supplementary Planning Document (SPD) by RCBC for the South Tees Area. Following consultation, the Master Plan was launched alongside the South Tees Area SPD, which was formally adopted by RCBC in May 2018 (RCBC, 2018b).

Planning Allocations/Designations

7.6.7 The key planning allocations/designation and related development plan policies (based upon the relevant policies maps) and relevant SPD designations and policies that apply to the Proposed Development Site within the administrative areas of RCBC, STBC and HBC are listed below.

7.6.8 The key planning allocations/designations and related development plan policies that apply to the Proposed Development Site within the RCBC area are:

- Development Limits – Policy SD3;
- Protected Employment Area – Policy ED6;
- South Tees Development Corporation Area – Policy LS4;
- 30 km wind farm safeguarding area for Durham Tees Valley Airport – Policy SD6;
- Sensitive Landscape Areas – Policy N1;
- Restoration Landscape Areas – Policy N1;
- Strategic Landscape Areas – Policy N2;
- Green Wedge – Policy N2;
- Primary Open Spaces – Policy N3;
- Special Protection Areas (SPAs) – Policy N4;
- Sites of Special Scientific Interest (SSSIs) – Policy N4;
- 6 km Special Protection Area (SPA) Buffer Zone – Policy N4;
- Local Wildlife Sites – Policy N4;
- Marine Dredged Sand and Gravel – Policies MWC4 and MWC5;
- General Location for Large Waste Management Facilities – Policy MWC8;
- South Tees Eco Park – Policies MWP8 and MWP10(b); and
- Safeguarded Wharves – Policy MWC11.

7.6.9 Figure 2 of the South Tees Area SPD shows indicative clusters for key industries and processes within the South Tees Area. The Main Site is identified primarily as part of clusters for 'manufacturing' and 'manufacturing and energy' and 'port-related uses' , while within its vicinity clusters are shown for 'port-related uses', 'Redcar Bulk Terminal', 'other processing, advanced manufacturing and training, testing and research'.

7.6.10 The SPD divides the South Tees Area into five main development zones (as shown by Figure 6 of the SPD). These are the North Industrial Zone; North East Industrial Zone; Central Industrial Zone; South Industrial Zone; and Coastal Community Zone. The North Industrial Zone, which encompasses the Main Site is identified for development proposals relating to port related industry, major space users/large

scale manufacturing, energy innovation, power generation and storage, bulk materials and mineral processing.

7.6.11 The SPD sets out several '*Development Principles*' to guide the development of the Teesworks/South Tees Area. Those of particular relevance to the Proposed Development include:

- Development Principle STDC6: Energy Innovation;
- Development Principle STCD7: Natural Environmental Protection and Enhancement;
- Development Principle STDC10: Utilities; and
- Development Principle STDC11: North Industrial Zone.

7.6.12 Development Principle STDC6 *'Energy Innovation'* (pages 33 to 34) supports new energy generation within the area, including the promotion of renewable energy and innovative energy projects. STDC11 *'North Industrial Zone'* states that STDC will encourage development proposals relating to port related industry, major space users/large scale manufacturing, energy innovation, power generation and storage and bulk materials and processing within this area.

7.6.13 Key planning allocations/designations and related development plan policies for the STBC administrative area are:

- Development Limits – Policies SD2, SD3, SD4 and SD5;
- General Employment Allocation/Locations – Policies SD4 and EG1;
- Employment Areas/Specialist Use Locations – Policies SD4 and EG4;
- Reserve Housing Land – Polices H1 and H2;
- Durham Tees Valley Airport Safeguarding Area – Policy EG5;
- Internationally Designated Sites (SPAs and Ramsar sites) – Polices SD5 and ENV5;
- Nationally Designated Sites (SSSIs) – Policies SD5 and ENV5;
- Locally Designated Sites (Local Nature Reserves) – Policies SD5 and ENV5;
- Locally Designated Sites (Local Wildlife Sites) – Policies SD5, ENV5; and
- Open Space – Policies SD5 and ENV5.

7.6.14 Key planning allocations/designations and related development plan policies for the HBC administrative area are:

- Development Limits – Policies LS1 and RUR2;
- Strategic Gaps – Policy LS1;
- Underground Storage – Policy EMP6;
- Safeguarded Land for Future Road Schemes – Policy INF2;
- Internationally Designated Sites – Policy NE1a; and

- Local Wildlife Sites – Policy NE1c.

7.6.15 The above policies and development principles, and how the Proposed Development complies with them, will be considered in detail within the Planning Statement that will form part of the DCO Application.

7.7 Summary

7.7.1 The current NPSs confirm the need that exists for new energy infrastructure and are the key bases for decision-making by the SoS on DCO applications.

7.7.2 Although the current NPSs do not contain policies that specifically relate to hydrogen infrastructure, they do contain policy that is relevant to the Proposed Development. The draft revised NPSs include new policy in relation to hydrogen infrastructure, which confirms (paragraphs 3.4.12 to 3.4.13):

"There is an urgent need for all types of low carbon hydrogen infrastructure to allow hydrogen to play its role in the transition to net zero' and that 'the government is committed to developing low carbon hydrogen, which will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050, with the potential to help decarbonise vital UK industry sectors and provide flexible deployment across heat, power and transport."

7.7.3 While the NPSs are the key basis for decisions by the SoS on the DCO for the Proposed Development, the SoS can take account of any other matters that are both important and relevant to their decision. It is considered that such matters include recent Government energy and climate policy.

7.7.4 The energy and climate change policy considered in this chapter underlines the important role that hydrogen, coupled with CCUS, must play in achieving the UK's transition to a low carbon economy and the Government's legally binding target of net zero GHG emissions by 2050. In particular, hydrogen is identified as being critical to the decarbonisation of industries that are hard to electrify.

7.7.5 Other important and relevant matters that the SoS can take into account when examining and determining the DCO Application for the Proposed Development can include the NPPF and local planning policy and guidance.

7.7.6 The DCO Application for the Proposed Development will include a Planning Statement that will set out in detail the policy and guidance of relevance to the Proposed Development and include an assessment of how it complies with those documents.

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8.0 AIR QUALITY

8.1 Introduction

8.1.1 This chapter of the Preliminary Environmental Information (PEI) Report identifies the potential impacts and effects of the Proposed Development on air quality. The air quality assessment has considered a realistic worst case for both Phases 1 and 2 and Cases A and B; for further detail regarding the phasing of the Proposed Development, and the different technologies being considered (i.e., Case A and Case B), please refer to Chapter 4: Proposed Development (PEI Report, Volume I).

8.1.2 The focus of the air quality assessment is on the following:

- construction emissions from vehicles;
- construction dust; and
- operational emissions from the production facility.

8.1.3 Emissions from Non-Road Mobile Machinery (NRMM) and operational emissions from vehicles are also discussed within the air quality assessment.

8.1.4 The preliminary assessment has been undertaken in accordance with best practice guidance from the Department for Environment, Food and Rural Affairs (Defra), the Environment Agency (EA) and the Institute of Air Quality Management (IAQM).

8.1.5 This chapter is supported by the following figures (PEI Report, Volume II) and technical appendices (PEI Report, Volume III):

- Figure 8-1: Air Quality Study Area – Human Health Receptors and Monitoring;
- Figure 8-2: Air Quality Study Area – Ecological Receptors;
- Figure 8-3: Air Quality Study Area – Construction Road Traffic Locations;
- Figure 8-4: Air Quality Study Area – Operational Model Inputs Phase 1;
- Figure 8-5: Air Quality Study Area – Operational Model Inputs Phase 2;
- Figure 8-6: Annual Mean NO_2 Process Contribution for the Proposed Development during Normal Operations for Phase 1 and 2 Combined – Case B, for the Worst Affected Meteorological Year of 2022;
- Figure 8-7: 99.79th Percentile 1h NO_2 Process Contribution for the Proposed Development during Normal Operations for Phase 1 and 2 Combined – Case B, for the Worst Affected Meteorological Year of 2022;
- Figure 8-8: 99.79th Percentile 1h NO_2 Process Contribution for the Proposed Development during Start Up for Phase 1 and 2 Combined – Case A, for the Worst Affected Meteorological Year of 2021;
- Figure 8-9: 99.79th Percentile 1h NO_2 Process Contribution for the Proposed Development during Emergency Operations for Phase 1 and 2 Combined – Case B, for the Worst Affected Meteorological Year of 2022;
- Appendix 8A: Air Quality – Construction Assessment; and

- Appendix 8B: Air Quality – Operational Phase.

8.2 Legislation and Planning Policy Context

8.2.1 This section identifies and describes legislation, planning policy and guidance of relevance to the assessment of the potential air quality impacts.

Legislative Background

The Air Quality Directive 2008

8.2.2 European Union (EU) air quality legislation is provided within the Ambient Air Quality and Cleaner Air for Europe Directive 2008/50/EC (The Air Quality Directive) (Council for European Communities, 2008), which is transcribed into United Kingdom (UK) legislation by The Air Quality Standards Regulations 2010 (The Stationery Office Limited, 2010) as amended by the Air Quality Standards (Amendment) Regulations 2016 (The Stationery Office Limited, 2016). These limit values are legally binding on the UK and have been set with the aim of avoiding, preventing, or reducing harmful effects on human health and on the environment.

8.2.3 EU legislation which applied directly or indirectly to the UK before 11.00 p.m. on 31 December 2020 has been retained in UK law as a form of domestic legislation known as 'retained EU legislation'. This is set out in sections 2 and 3 of the EU (Withdrawal) Act 2018 (c. 16) (The Stationery Office Limited, 2018). Section 4 of the 2018 Act ensures that any remaining EU rights and obligations, including directly effective rights within EU treaties, continue to be recognised and available in domestic law after the UK's exit from the EU.

The Air Quality Standards Regulations 2010

8.2.4 The 2010 Regulations (The Stationery Office Limited, 2010) set air quality limits for a number of major air pollutants that have the potential to impact public health, such as nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO) and particulate matter (PM) in the form of PM_{10} (PM of 10 micrometres (µm) diameter or less). The 2010 Regulations also include an exposure reduction objective for $PM_{2.5}$ (PM of 2.5 µm diameter or less) in urban areas and a national target value for $PM_{2.5}$.

The Environment Act 1995

8.2.5 The Environment Act 1995 (H.M Government, 1995a) requires the UK Government to produce a national Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland containing standards, objectives and measures for improving ambient air quality and to keep the policies identified under review.

8.2.6 Four versions of the national AQS have been published to date (2000 to 2019) with a further 2023 version having recently been subject to consultation. The current version is called the Clean Air Strategy 2019 (Defra, 2019). The national AQS requires that local authorities undertake a tiered assessment of air quality within their jurisdiction to determine whether (or not) the objectives established in the AQS are being achieved. Where the objectives are likely to be exceeded, the local authority must designate an Air Quality Management Area (AQMA) and establish an Air Quality Action Plan (AQAP), which outlines measures to achieve the objectives. These

objectives apply to outdoor locations where people are regularly present and do not apply to occupational, indoor or in-vehicle exposure. The human health objectives that are applicable to this assessment are set out in Table 8-1. Defra has responsibility for coordinating assessments and AQAPs for the UK as a whole.

Table 8-1: National Air Quality Strategy Objectives (NAQS) - Protection of Human Health

POLLUTANT	SOURCE	CONCENTRATION ($\mu G/M^3$)	MEASURED AS
NO_2	National Air Quality Objective Value	40	Annual mean
		200	1-hour mean, not to be exceeded more than 18 times per year
PM_{10}	National Air Quality Objective Value	40	Annual mean
		50	24-hour mean, not to be exceeded more than 35 times a year
$PM_{2.5}$	National Air Quality Objective Value	20	Annual mean
CO	National Air Quality Objective Value	10,000	Maximum daily running 8 hour mean
SO_2	National Air Quality Objective Value	266	15-minute mean, not to be exceeded more than 35 times a year
		350	1-hour mean, not to be exceeded more than 24 times a year
		125	24-hour mean, not to be exceeded more than 3 times a year

8.2.7 No AQMAs have been declared for the Proposed Development Site or the surrounding area. The nearest AQMA to the Proposed Development Site is located outside of the defined air quality Study Area (refer to Section 8.3), in Staithes, approximately 20 km to the south-east of the Proposed Development Site. This AQMA is designated for the exceedance of the 24-hour PM_{10} limit value. Based on Defra forecast models and local authority monitoring data, no exceedances of the EU standards have been identified in the vicinity of the Proposed Development Site.

The Environment Act 2021

8.2.8 The Environment Act 2021 (HM Government, 2021) amends the Environment Act 1995 (HM Government, 1995). It includes provisions to establish a post-Brexit set of statutory environmental principles and ensure environmental governance through an environmental watchdog, the Office for Environmental Protection (OEP). Part IV of the Environment Act (2021) requires the government to produce a new national AQS which contains standards, objectives and measures for improving ambient air quality. The AQS proposes for the Secretary of State (SoS) to publish a report reviewing the AQS every five years (as a minimum and with yearly updates to Parliament). The Act also included a proposal that the Government set two targets by October 2022: the first on the amount of $PM_{2.5}$ pollutant in the ambient air and a second long-term target set at least 15 years ahead to encourage stakeholder investment.

8.2.9 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (The Stationery Office Limited, 2022) introduced the two targets described above with a target level for annual mean concentrations of $PM_{2.5}$ to be achieved at relevant monitoring stations by 31st December 2040 and an exposure reduction target for the Secretary of State (SoS) to report on by 15th July 2041. For the purposes of these regulations, relevant monitoring locations are fixed monitoring stations within the national monitoring network. There are no such monitoring locations within the air quality Study Area for the Proposed Development.

Critical Levels and Loads

8.2.10 In addition to the ambient thresholds described above for human health critical levels for the protection of vegetation have also been set out in legislation (The Air Quality Standards Regulations 2010) and Environment Agency air emissions risk assessment guidance (Environment Agency, 2023b). The impact of emissions from the Proposed Development on sensitive ecological receptors can be quantified in two ways:

- as direct impacts arising due to increases in atmospheric pollutant concentrations, assessed against defined 'critical levels'; and
- as indirect impacts arising through deposition of acids and nutrient nitrogen to the ground surface, assessed against defined 'critical loads.'

8.2.11 The critical levels for the protection of vegetation and ecosystems are set out in Table 8-2 and apply regardless of the habitat type or species present at the habitat receptor. In the case of ammonia (NH_3), the greater sensitivity of lichens and bryophytes to these pollutants is reflected in the application of two critical levels, with a stricter critical level applied to locations where such species are present.

Table 8-2: Critical Levels (CL) – Protection of Vegetation and Ecosystems

POLLUTANT	SOURCE	CONCENTRATION ($\mu G/M^3$)	MEASURED AS
Oxides of nitrogen (NO_x)	UK objective value	30	Annual mean
	UK target value	75	Daily Mean
SO_2	UK target value for lichen and bryophytes	10	Annual mean
	UK objective value	20	Annual mean
Ammonia (NH_3)	UK target value for lichen and bryophytes	1	Annual mean
	UK target value	3	Annual mean

8.2.12 Critical load criteria for the deposition of nutrient nitrogen and acidifying species are dependent on the habitat type and species present, and therefore are specific to the sensitive receptors considered within the assessment. The relevant critical loads for the ecological receptors considered in this assessment are defined on the Air Pollution Information System website (Centre for Ecology and Hydrology and APIS, 2017).

8.2.13 Throughout the remainder of this chapter and the associated technical appendices, NAQS objectives, UK target values (i.e., Environmental Assessment Levels) and critical levels are collectively referred to as Air Quality Assessment Levels (AQALs).

Industrial Emissions Directive 2010 and Environmental Permitting Regulations (2016

8.2.14 The EU's Industrial Emissions Directive (IED) (European Commission, 2010) provides operational limits and controls to which regulated plant must comply, including Emission Limit Values (ELVs) for pollutant releases into the air. The operator of a plant covered by the IED is required to employ Best Available Techniques (BAT) for the prevention or minimisation of emissions to the environment, to ensure a high level of protection of the environment as a whole. European BAT reference documents (BRefs) are published for each industrial sector regulated under the IED, and they include BAT-Associated Emission Levels (BAT-AELs) which are expected to be met through the application of BAT. These levels may be the same as the ELVs published in the IED, or they may be more stringent.

8.2.15 However, as an emerging technology, there is currently no finalised BRef or BAT guidance document available for a Production Facility with associated Carbon Capture, and therefore no BAT-AELs have been defined for the activity to date. However, guidance on Emerging techniques for hydrogen production with carbon

capture has been released (EA, 2023) and this will form the basis for discussions with the EA to agree appropriate BAT and AELs. This will be done as the environmental permit required for the operation of the Proposed Development is developed. The permit application is being made generally in parallel with this DCO submission.

Sensitive Ecosystems

8.2.16 The UK is bound by the terms of the European Birds (European Commission, 2009) and Habitats Directives (European Commission, 1992) and the Ramsar Convention (Ramsar, 1971). The Conservation of Habitats and Species Regulations 2017 (H.M Government, 2017) (the 2017 Regulations) provide for the protection of European Sites created under these i.e., Special Areas of Conservation (SACs) designated pursuant to the Habitats Directive, Special Protection Areas (SPAs) and provisional SPAs (pSPAs) classified under the Birds Directive. Specific provisions of the European Directives are also applied to SACs and candidate SACs (cSACs) which requires these sites to be given special consideration, and for further assessment to be undertaken for any development which is likely to lead to a significant effect upon them. Consideration has also been given to Ramsar sites, designated as wetlands of international importance.

Planning Policy Context

National Planning Policy

National Policy Statement EN-1

8.2.17 National Policy Statements (NPSs) are, where in place, the primary basis for the assessment and determination of applications for Nationally Significant Infrastructure Projects (NSIPs) such as the Proposed Development.

8.2.18 The Overarching National Policy Statement for Energy (EN-1) (Department of Energy and Climate Change, 2011) requires the consideration of significant air emissions, their mitigation and any residual effects, the predicted absolute emission levels after application of mitigation, the relative change in air quality from existing concentrations and any potential eutrophication impacts as a result of a proposed development's project stages, including contributions from additional road traffic. All the above is covered in the within the air quality assessment for the Proposed Development. Where a project could result in deterioration in air quality in an area where national air quality limits are not being met or may lead to a new area breaching national air quality limits, or where substantial changes in air quality concentrations are predicted, such effects would be expected to be given substantial weight in consideration of the acceptability of the proposal. Where a project is likely to lead to a breach of statutory air quality limits, the developer should work with the relevant authorities to secure appropriate mitigation measures to allow the proposal to proceed.

8.2.19 The UK Government is currently reviewing and updating the energy NPSs. It is doing this to reflect its policies and strategic approach for the energy system that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions. As part of the NPS review process, the

government published a suite of revised draft NPSs for new energy infrastructure on 6 September 2021. A further update was published in March 2023 by the Department for Energy Security & Net Zero (DESNZ, 2023). The 2023 Draft EN-1 states at paragraph 4.11.2 that:

"The planning and pollution control systems are separate but complementary. The planning system controls the development and use of land in the public interest… Pollution control is concerned with preventing pollution through the use of measures to prohibit or limit the releases of substances to the environment from different sources to the lowest practicable level. It also ensures that ambient air and water quality meet standards that guard against impacts to the environment or human health".

8.2.20 Paragraph 4.11.9 and 4.11.10 state:

"*In considering an application for development consent the Secretary of State should focus on whether the development itself is an acceptable use of the land or sea, and the impact of that use, rather than the control of processes, emissions or discharges themselves".*

"The Secretary of State should work on the assumption that the relevant pollution control regime and other environmental regulatory regimes…will be properly applied and enforced by the relevant regulator".

National Policy Statement EN-4

8.2.21 NPS EN-4 sets out planning policy specific to gas supply infrastructure and gas an oil pipeline (DECC, 2011b). The NPS states that the effect of gas emissions and specific effects on flaring and venting gas should be assessed and makes particular reference to EN-1 in regard to assessing the potential effects. EN-4 does not introduce any additional requirements for air quality assessments, and relevant emissions from the Proposed Development are included within this assessment.

8.2.22 As for EN-1, an updated draft of EN-4 was release for consultation in 2023 (DESZT, 2023b). As for the extant EN-4, the update does not introduce any additional requirements for assessment of emissions to air that are not included within EN-1.

National Policy Statement EN-5

8.2.23 NPS EN-5 sets out planning policy specific to gas supply infrastructure and gas an oil pipeline (DECC, 2011c). The NPS does not include any policies specific to emission to air. The updated draft (DESNZ, 2023c) also does not include any policies specific to emissions to air.

The National Planning Policy Framework (NPPF) (2023)

8.2.24 The NPPF (Ministry of Housing, Communities and Local Government, 2023) concisely sets out national policies and principles on land use planning. Paragraph 174 of the NPPF states that:

"*Planning policies and decisions should contribute to and enhance the natural and local environment by… e) preventing new and existing development from contributing*

to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability…"

8.2.25 The effect of the Proposed Development on the achievement of such policies and plans are matters that may be a material consideration by planning authorities when making decisions for individual planning applications. Paragraph 186 of the NPPF states that:

"*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas… Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.*"

Planning Practice Guidance (PPG) for Air Quality (2021)

8.2.26 The National Planning Practice Guidance (NPPG) (Department for Communities and Local Government, 2021) was first launched on 6th March 2014. It was last updated on 24th June 2021 and provides a web-based guidance resource in support of the NPPF. It provides a summary of the air quality issues set out in the NPPF and goes on to note that assessments of the impact of a proposed development on air quality should include the following information:

- the existing air quality in the study area (existing baseline);
- the future air quality without the development in place (future baseline); and
- the future air quality with the development in place (with mitigation).

8.2.27 The PPG then advises that a planning application should proceed to decision with appropriate planning conditions or planning obligations, if the proposals (including mitigation) would not lead to an unacceptable risk from air pollution and prevent sustained compliance with EU limit values.

Local Planning Policy

8.2.28 Local air quality planning policy may be something which the SoS considers is both important and relevant to the determination of the application for the Proposed Development. Local air quality planning policy has been presented for those authorities within which the Proposed Development is located and authorities which are included within the air quality study area.

Redcar and Cleveland Borough Council Local Plan (2018)

8.2.29 Redcar and Cleveland Borough Council (RCBC) adopted its Local Plan in May 2018 (RCBC, 2018), which includes Policy SD 4: General Development Principles, which states that:

"All development must be designed to a high standard. Development proposals will be expected to…:

n. minimise pollution including light and noise and vibration levels to meet or exceed acceptable limits…"

8.2.30 Policy LS 4: South Tees Spatial Strategy, states that:

"The Council and its partners will aim to….:

l. encourage clean and more efficient industry in the South Tees area to help reduce carbon dioxide emissions and risk of environmental pollution…"

Stockton-on-Tees Borough Council Local Plan (2019)

8.2.31 Stockton-on-Tees Borough Council (STBC) adopted its Local Plan in January 2019 (STBC, 2019), which includes Policy SD5: Natural, Built and Historic Environment, which states that:

"To ensure the conservation and enhancement of the environment alongside meeting the challenge of climate change the Council will:

1. Conserve and enhance the natural, built and historic environment through a variety of methods including:…

l. Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of ground, air, water, light or noise pollution or land instability. Wherever possible proposals should seek to improve ground, air and water quality."

8.2.32 Policy ENV7: Ground, Air, Water, Noise and Light Pollution states that:

"1. All development proposals that may cause groundwater, surface water, air (including odour), noise or light pollution either individually or cumulatively will be required to incorporate measures as appropriate to prevent or reduce their pollution so as not to cause unacceptable impacts on the living conditions of all existing and potential future occupants of land and buildings, the character and appearance of the surrounding area and the environment.

2. Development that may be sensitive to existing or potentially polluting sources will not be sited in proximity to such sources. Potentially polluting development will not be sited near to sensitive developments or areas unless satisfactory mitigation measures can be demonstrated.

3. Where development has the potential to lead to significant pollution either individually or cumulatively, proposals should be accompanied by a full and detailed assessment of the likely impacts. Development will not be permitted when it is considered that unacceptable effects will be imposed on human health, or the environment, taking into account the cumulative effects of other proposed or existing sources of pollution in the vicinity. Development will only be approved where suitable mitigation can be achieved that would bring pollution within acceptable levels."

Hartlepool Borough Council Local Plan (2018)

8.2.33 Hartlepool Borough Council (HBC) adopted its Local Plan in May 2018 (HBC, 2018), which includes Paragraph 9.49, which states that:

"Residents and visitors should not suffer from pollution (noise, dust, fumes or odour) or poor air and water quality. The location and design of development should have

due regard to minimising the impacts of pollution both on existing land uses and the future proposed land use."

8.3 Assessment Methodology and Significance Criteria

Study Area

8.3.1 The air quality Study Areas for the preliminary assessments carried out have been defined according to the appropriate guidance for the type of assessment being undertaken (i.e., construction dust, construction traffic and the operational Proposed Development), and therefore these vary for the various types of air quality assessments.

8.3.2 The Study Area for the construction dust and NRMM emissions has been applied in line with IAQM guidance (IAQM, 2014), extending:

- up to 350 m beyond the Proposed Development Site and 50 m from the construction traffic routes (up to 500 m from the Proposed Development Site entrances), for human health receptors; and
- up to 50 m from the Proposed Development Site and construction traffic routes (up to 500 m from the Proposed Development Site entrances) for ecological receptors.

8.3.3 The Study Area for the traffic assessment is defined in the screening criterion set out in the Design Manual for Roads and Bridges (DMRB) LA 105 Air Quality (Highways England, 2019) and the IAQM/Environmental Protection UK (EPUK) guidance (EPUK/IAQM, 2017), which states that only properties and habitat sites within 200 m of affected roads (roads that experience a change in traffic flow above a certain criteria) should be considered in road traffic emissions assessments.

8.3.4 The Study Area for the operational Proposed Development point source emissions extends up to 10 km from the emission sources to assess the potential impacts on ecological receptors, in line with the EA risk assessment methodology (Defra and Environment Agency, 2016) and considers:

- SPAs, SACs, Ramsar sites and Sites of Special Scientific Interest (SSSIs) within 10 km of the Proposed Development Site; and
- Local Nature Sites (including ancient woodlands, Local Wildlife Sites (LWSs) and National and Local Nature Reserves (NNRs and LNRs)) within 2 km of the Proposed Development Site.

8.3.5 In terms of human health receptors, impacts from the operational Proposed Development become negligible well within 2 km and therefore sensitive receptors for the human health impacts only are concentrated within a 2 km Study Area.

Impact Assessment Methodology

8.3.6 The potential emissions to air from construction and operation of the Proposed Development have been determined or estimated, and key local receptors have been identified, together with the current local ambient air quality.

8.3.7 Impacts arising from the construction and operational phases of the Proposed Development have been predicted, which has enabled the preliminary assessment of the impacts associated with the Proposed Development on the existing local ambient air quality and particularly on the identified sensitive receptors.

8.3.8 The assessment methodology for construction phase emissions is outlined below, with further details provided in the accompanying technical appendix (Appendix 8A: Air Quality – Construction Assessment (PEI Report, Volume III)).

8.3.9 The process and traffic emissions assessments refer to the relevant AQALs as defined in Tables 8-1 to 8-2.

Construction Phase – Construction Dust Assessment

8.3.10 The movement and handling of soils and spoil during construction activities for the Proposed Development is anticipated to lead to the generation of some short-term airborne dust. The occurrence and significance of dust generated by earth moving operations is difficult to estimate and depends heavily upon the meteorological and ground conditions at the actual time and location of the work, and the nature of the activity being carried out.

8.3.11 At present, there are no statutory UK or EU standards relating to the assessment or control of dust. The emphasis of the regulation and control of construction dust, therefore, is through the adoption of Best Practicable Means (BPM) when working on-site to mitigate any potential impacts. It is intended that significant adverse environmental effects are avoided at the design stage and through embedded mitigation where possible, including the use of good working practices to minimise dust formation – refer to Section 8.5.

8.3.12 The IAQM provides guidance for good practice and for qualitative assessment of risk of dust emissions from construction and demolition activities (IAQM, 2014). The guidance considers the risk of dust emissions from unmitigated activities to cause human health impacts (associated with PM_{10}), dust soiling impacts, and ecological impacts (such as physical smothering and chemical impacts, for example from the deposition of alkaline materials). The appraisal of risk is based on the scale and nature of activities and on the sensitivity of receptors, and the outcome of the appraisal is used to determine the level of good practice mitigation required for adequate control of dust.

8.3.13 The preliminary assessment undertaken for the Proposed Development is consistent with the overarching approach to the assessment of the impacts of construction, and the application of example descriptors of impact and risk set out in IAQM guidance. It considers the significance of potential effects with no mitigation and recommends mitigation measures appropriate to the identified risks to receptors. The steps in the assessment are to:

- identify receptors within the appropriate Study Area from the Proposed Development Site;
- identify the magnitude of impact through consideration of the scale, duration and location of activities being carried out (including demolition, earthworks,

construction and trackout, where construction vehicles could carry mud onto the public highway);

- establish the sensitivity of the area through determination of the sensitivity of receptors and their distance from construction activities;
- determine the risk of significant effects on receptors occurring as a result of the magnitude of impact and the sensitivity of the receptors;
- determine the level of mitigation required based on the level of risk, to reduce potential effects at receptors to levels that are insignificant or negligible; and
- summarise the potential residual effects of the mitigated works.

8.3.14 The criteria for the assessment of impact magnitude, receptor sensitivity and risk are summarised in Appendix 8A: Air Quality – Construction Assessment (PEI Report, Volume III).

Construction Phase - Construction Site Plant Non-Road Mobile Machinery Assessment

8.3.15 Construction of Phase 1 is likely to last approximately two years. Phase 2 works will commence thereafter (approximately late 2027/early 2028) and last a further two to three years, with construction expected to be completed by late 2029 or early 2030.

8.3.16 The duration of the Phase 2 construction might be extended when compared to Phase 1 due to potential overlaps in Phase 1 commencement of operation and construction activities for Phase 2, requiring management of simultaneous operations and minimisation of risks and impacts.

8.3.17 There are likely to be emissions to air during construction activities arising from on-site construction plant or NRMM. The IAQM guidance (IAQM, 2014) states:

"Experience of assessing the exhaust emissions from on-site plant … and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. For site plant and on-site traffic, consideration should be given to the number of plant/ vehicles and their operating hours and locations to assess whether a significant effect is likely to occur."

8.3.18 Emissions from NRMM associated with the Proposed Development will be temporary and localised and will be controlled via the application of appropriate emissions standards and through best-practice mitigation measures – refer to Section 8.5. For that reason, effects associated with construction phase NRMM emissions are highly unlikely to be significant and, therefore, have been scoped out of this assessment. This approach is in line with Appendix 1B: Scoping Opinion (PEI Report, Volume III) for the Proposed Development.

Construction and Operational Phase - Road Traffic Assessment

8.3.19 The incomplete combustion of fuel in vehicle engines results in the presence of combustion products of CO, PM_{10}, and $PM_{2.5}$ in exhaust emissions as well as hydrocarbons (HC) such as benzene and 1,3-butadiene. Similarly, but to a lesser

extent, any sulphur in the fuel can be converted to SO_2 that is then released to the atmosphere. In addition, at the high temperatures and pressures found within vehicle engines, some of the nitrogen in the air and the fuel is oxidised to form NO_x, mainly in the form of nitric oxide (NO), which is then converted to NO_2 in the atmosphere. Better emission control technology and fuel specifications are expected to reduce emissions per vehicle across the UK vehicle fleet in the long term.

8.3.20 Although SO_2, CO, benzene, and 1,3-butadiene are present in motor vehicle exhaust emissions, detailed consideration of the associated impacts on local air quality is not considered relevant in the context of the Proposed Development. This is because the released concentrations of these pollutants are low enough to not give rise to significant effects due to the numbers of anticipated vehicles associated with either the construction or operation of the Proposed Development. In addition, no areas within the administrative boundaries of the relevant councils are considered at risk of exceeding the relevant objectives for these pollutants, and therefore the risks to the attainment of the relevant air quality objectives in the vicinity of the Proposed Development Site are considered to be negligible. Emissions of SO_2, CO, benzene and 1,3-butadiene from road traffic are, therefore, not considered further within this preliminary assessment.

8.3.21 The exhaust emissions from road vehicles that do have the potential to affect ambient concentrations of pollutants are NO_2, PM_{10} and $PM_{2.5}$. Therefore, the preliminary assessment of the significance of road traffic air quality effects only considers these pollutants.

8.3.22 DMRB LA105 (Highways England, 2019) sets out criteria to establish the need for an air quality assessment from road traffic. The standard considers the following changes in anticipated traffic as a result of a development in order to identify the need for further evaluation:

- Annual Average Daily Traffic (AADT) flows of more than 1,000 vehicles;
- 200 Heavy Duty Vehicles (HDVs - all vehicles greater than 3.5 tonnes gross weight, including buses);
- a change in the speed band; or
- a change in carriageway alignment by >5 m.

8.3.23 Guidance published by the IAQM proposes a lower threshold in AADT flow to warrant a detailed air quality assessment, namely:

- a change of 500 Light Duty Vehicles (LDV, all vehicles less than 3.5 tonnes gross weight) or 100 HDV when outside of an AQMA.

8.3.24 For changes in traffic below these criteria, significant changes in air quality are not expected.

8.3.25 Considering that the Proposed Development does not include any modifications to road carriageways and that there is no indication that there will be any change in average traffic speed due to the Proposed Development, the appropriate metric to

determine if a detailed air quality assessment is necessary in this instance is the AADT and HDV flow criteria.

8.3.26 In order to conduct a worst-case assessment of the air quality impacts of construction traffic, the lower IAQM screening criteria has been applied for this assessment. The AADT associated with the construction phase of the Proposed Development, therefore, requires detailed air quality modelling.

8.3.27 This assessment has used the latest version of dispersion model software 'ADMS-Roads' (v5.0.0.1) to quantify baseline pollution levels at selected receptors due to road traffic emissions. ADMS-Roads is a modern dispersion model that has an extensive published track record of use in the UK for the assessment of local air quality impacts, including model validation and verification studies.

8.3.28 The details of the preliminary assessment of construction and operational traffic are presented in Chapter 15: Traffic and Transport (PEI Report, Volume I).

8.3.29 The traffic data used in this preliminary assessment includes the following scenarios:

- 2019 Baseline Scenario (for model verification process) (Base);
- 2025 Future Construction Year Base (Future Baseline); and
- 2025 Future Construction Year Base + Peak Construction Scenario (month 17 of construction) (Future Year with Proposed Development).

8.3.30 The future decommissioning baseline scenario is not included, as it is considered that the effects would be comparable to or lower than construction impacts, particularly given the expected improvements in vehicle fleet emissions over that time.

8.3.31 Data in the form of traffic flows, composition (percentage Heavy Goods Vehicles (HGVs)) and speed has been used in modelling of emissions from road traffic during the construction phase.

Operational Phase – Operational Traffic Assessment

8.3.32 No detailed assessment of operational traffic emissions has been made as the numbers of additional vehicles associated with the operational phase of the Proposed Development are predicted to be below the DMRB and IAQM screening criteria for requiring assessment. Significant air quality effects are, therefore, not expected to be associated with the Proposed Development's operational traffic flows. This is in line with the Planning Inspectorate's ('the Inspectorate's') EIA Scoping Opinion at ID 3.1.1 (The Inspectorate, 2023).

Operational Phase – Process Emissions from the Operational Plant

8.3.33 Emissions from the Proposed Development, assumed to be operational in 2028 (Phase 1) and 2030 (Phase 2) have been assessed using the Environment Agency's Risk Assessment methodology (Defra and Environment Agency, 2016) to identify where proposed emissions can be screened out as being unlikely to cause significant air quality effects. In line with EA Guidance (EA, 2023) detailed dispersion modelling using the atmospheric dispersion model ADMS (currently ADMS 5.2.2) has been used to calculate the concentrations of pollutants at identified receptors. The pollutants

assessed from operational combustion sources include NO_x (ecosystems only), nitrogen deposition (ecosystems only) and acid deposition (ecosystems only), NO_2, CO, SO_2 (ecosystems and human health), PM_{10} and $PM_{2.5}$. These concentrations will be compared with the defined AQALs for each pollutant species as summarised in Table 8-1 and Table 8-2. There will be no emissions to air of amines and amine degradation products during normal operation, as the carbon dioxide capture process is a closed loop system.

8.3.34 Dispersion modelling calculates the predicted concentrations arising from the emissions to atmosphere, based on Gaussian approximation techniques. The model to be employed has been developed for UK regulatory use. Further details of the operational air quality modelling can be found in Appendix 8B: Air Quality – Operational Assessment (PEI Report, Volume III).

8.3.35 Modelling will be undertaken assuming that the Proposed Development is operated continuously as this is considered to represent the worst-case scenario in terms of the annual average operational emissions. The worst result from five years of meteorological data, assuming phases 1 and 2 are operational, from either Case A or Case B have been presented and evaluated within this chapter.

8.3.36 It is recognised that during start-up and shut down there may be short periods where emission concentrations are higher than those assessed for the annual average. At this stage in the design process there is limited data on the duration and release concentration of these emissions. Whilst the emission concentration may be higher, the gas flow rate will be lower than that to be modelled, therefore resulting in mass emissions that are likely to be reasonably comparable with steady state operation. Furthermore, the peak emission concentrations will be limited to the transient period, during which the flue gas is introduced into the absorber and not for the full duration of a start-up condition. It is therefore considered that this will have a minimal impact on the short-term impacts from the Proposed Development. It is anticipated that detail on start-up emissions will become available during the Front End Engineering Design (FEED) process and confirmed during commissioning, the impact of short-term emissions of this type will therefore be addressed in detail as part of the Environmental Permit application process. Additionally, an initial assessment has been provided within this PEIR with the information currently available for both start up and emergency conditions are presented in Appendix 8B.

8.3.37 The first year of full operation (referred to as ‘opening’) of the Proposed Development, including Phase 1 and Phase 2, is assumed to be 2030 for the purpose of this preliminary assessment.

8.3.38 The assessment of worst-case long-term (annual mean) and short-term (daily and hourly mean) emissions resulting from the operation of the Proposed Development has been undertaken by comparison of the maximum predicted process contributions at identified sensitive receptors with the annual mean and hourly mean AQALs, taking into consideration the baseline air quality, in accordance with the EA’s Risk Assessment methodology (Defra and Environment Agency, 2016).

8.3.39 An assessment of nutrient nitrogen enrichment has been undertaken by applying published deposition velocities to the predicted annual average NO_2 concentrations at ecological sites (selected in conjunction with biodiversity specialists), determined through dispersion modelling, to calculate nitrogen deposition rates (expressed as kilograms per hectare per year, Kg/ha/yr). These deposition rates have then been compared to the Critical Loads for nitrogen published by UK Air Pollution Information System (APIS) (Centre for Ecology and Hydrology and APIS, 2016), taking into consideration the baseline air quality.

8.3.40 Potential increases in acidity on designated ecological receptors from depositional contributions of NO_2 have also be considered. Acid deposition is derived from nitrogen deposition modelling values using standard conversion factors and expressed as kilograms of nitrogen equivalent per hectare per year (KqNeq/ha/yr). The process contribution acid deposition rates and baseline deposition rates have been used within the APIS Critical Load Function Tool (Centre for Ecology and Hydrology and APIS, 2016) to determine whether the contribution will result in exceedance of the defined acidity Critical Loads for the most sensitive features.

8.3.41 Several non-statutory habitat sites have been assessed for both nutrient nitrogen and acid deposition, due to the proximity of these sites to the Proposed Development Site. These include LWSs and LNRs. For these sites, there is no data available on APIS with regards to habitat types present and therefore the relevant critical loads class to be applied, and therefore process contributions will be considered against an appropriate critical load determined for the appropriate habitat type as informed by Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I).

8.3.42 An assessment of cumulative impacts with other proposed developments that could interact with the operational impacts and effects of the Proposed Development will be carried out – this will be reported in the Environmental Statement (ES) in the cumulative and combined effects assessment. This may change the total concentration of pollutants in the ES relative to those reported herein.

Significance Criteria

Evaluation of Significance – Construction Phase Dust Assessment

8.3.43 For potential amenity effects, such as those related to dust deposition, the aim is to bring forward a Proposed Development that includes mitigation measures as necessary, that minimises the potential for amenity, human health and ecological impacts as a result of the construction works.

8.3.44 The IAQM guidance (IAQM, 2014) does not provide a method for the evaluation of impacts on receptors from construction dust, rather a means to determine the level of mitigation required to avoid significant effects on receptors. The guidance indicates that application of appropriate mitigation (refer to Section 8.5) should ensure that residual effects will normally be Not Significant.

Evaluation of Significance – Traffic and Operational Emissions Assessment

8.3.45 The evaluation of the significance of air quality effects from the traffic and operational point sources is based on the criteria referenced in IAQM/EPUK guidance

(IAQM, 2017), and in the EA Risk Assessments for Your Environmental Permit guidance (Defra and Environment Agency, 2016). The predicted changes in pollutant concentrations can be compared to AQALs to determine the magnitude of change.

8.3.46 For a change of a given magnitude, the IAQM publication Land-Use Planning & Development Control: Planning for Air Quality (IAQM, 2017) has published recommendations for describing the magnitude of long-term impacts at individual receptors and describing the significance (refer to Table 8-3) of such impacts. This terminology has been changed where appropriate to maintain consistency with the rest of this PEI Report – where the IAQM uses 'substantial' this has been changed to 'Major', whilst 'slight' has been changed to 'Minor'.

Table 8-3: Air Quality Impact Descriptors for Long Term Changes in Ambient Concentrations

LONG TERM AVERAGING CONCENTRATION AT RECEPTOR	PERCENTAGE CHANGE IN ANNUAL MEAN CONCENTRATIONS (%)				
	UP TO 0.5% IMPERCEPTIBLE	0.5 – 1% VERY LOW	2-5% LOW	6-10% MEDIUM	>10% HIGH
75% or less of AQAL	Negligible	Negligible	Negligible	Minor	Moderate
76-94% of AQAL	Negligible	Negligible	Minor	Moderate	Moderate
95-102% of AQAL	Negligible	Minor	Moderate	Moderate	Major
103-109% of AQAL	Negligible	Moderate	Moderate	Major	Major
110% or more of AQAL	Negligible	Moderate	Major	Major	Major
AQAL = Air Quality Assessment Level (NAQS objective or EU Limit Value or Environmental Assessment Level)					

8.3.47 The IAQM guidance (IAQM, 2017) is not explicit in the identification of whether any of the above impact descriptors should be considered 'Significant' or 'Not Significant' effects, rather it indicates that the descriptors should be applied to individual receptors and a 'Moderate' adverse impact at one receptor may not mean that the overall impact has a 'Significant' effect; other factors need to be considered. However, the guidance does indicate that 'Negligible' impacts are likely to lead to effects that are 'Not Significant' and that 'Major' impacts describe the potential for 'Significant' effects. The judgment of significance of effects adopted within this assessment is discussed below.

8.3.48 The EA EPR Risk Assessment screening criteria for comparison of Process Contributions (PCs) with AQAL states that an emission may be considered insignificant (or negligible) where:

- short term PC <=10% of the AQAL; and
- long term PC <=1% of the AQAL.

8.3.49 Where an emission cannot be screened out as insignificant, the second stage of screening considers the PCs in the context of the existing background pollutant concentrations; the predicted environmental concentration (PEC) is considered acceptable where:

- short term PC <20% of the short-term AQALs minus twice the long-term background concentration; and
- long term PEC (PC + background concentration) <70% of the AQALs.

8.3.50 Where the PEC is not predicted to exceed the AQAL, and the proposed emissions comply with the BAT associated emission levels (or equivalent requirements), the emissions are considered acceptable by the EA.

8.3.51 The IAQM guidance indicates that the EA threshold criterion of 10% of the short term AQAL is sufficiently small in magnitude to be regarded as having an 'insignificant' effect. The IAQM guidance deviates from the EA guidance (discussed below) with respect to the background contribution; the IAQM guidance indicates that severity of peak short-term concentrations can be described without the need to reference background concentrations as the PC is used to measure the impact, not the overall concentration at a receptor. The peak short-term PC from an elevated source is described as follows:

- PC <=10% of the AQAL represents an 'insignificant' (Negligible) impact;
- PC 11-20% of the AQAL is small in magnitude representing a 'slight' (Minor) impact;
- PC 21-50% of the AQAL is medium in magnitude representing a Moderate impact; and
- PC >51% of the AQAL is large in magnitude representing a 'substantial' (Major) impact.

8.3.52 The impact of point source emissions on ecological receptors, through deposition of nutrient nitrogen or acidity, can be evaluated using the EA and Natural England insignificance criterion of 1% of the long-term objective, as above.

8.3.53 Where emissions are not screened as insignificant (Negligible), the descriptive terms for the air quality effect outlined in Table 8-4 above can be applied. Additionally, where air quality effects cannot be screened as insignificant at designated ecosystem sites then further evaluation is required by biodiversity specialists. It is understood that this will be provided within Chapter 12: Ecology and Nature Conservation of the ES.

Evaluation of Significance – Proposed Development as a Whole

8.3.54 Following the assessment of each individual air quality effect (construction dust, traffic and operational plant (Phases 1 and 2, Cases A and B)), the significance of all the reported effects can then be considered for the Proposed Development in overall terms, recognising that construction dust and traffic will occur in the same time period, but operational effects would occur at a later date. The potential for the Proposed Development to contribute to or interfere with the successful implementation of policies and strategies for the management of local air quality will be considered if relevant, but the principal focus will be any change to the likelihood of future achievement of the air quality standards (which also relate to compliance with local authority goals for local air quality management and objectives are set for the protection of human health).

8.3.55 In terms of the significance of the effects (consequences) of any adverse impacts, an effect will be reported as being either 'Not Significant' or 'Significant'. If the overall effect of the development on local air quality or on amenity at sensitive sites (e.g., residential location) is found to be 'Moderate' or 'Major' this will be deemed to be 'Significant' for EIA purposes. Effects found to be 'Minor' or 'Negligible' will be considered to be 'Not Significant'.

Sources of Information/Data

8.3.56 The physical parameters for the modelling of emissions from the Proposed Development's point sources have been sourced from the concept design data.

8.3.57 The dispersion modelling of point source emissions takes into consideration the sensitivity of predicted results to model input variables, and to ultimately identify the realistic worst-case results for inclusion in the assessment. These variables include:

- meteorological data, for which five years' recent data (2018-2022) from a representative meteorological station (Durham Teesside Airport) will be used; and
- inclusion of buildings, structures and local topography that could affect dispersion from the source into the modelling scenarios.

Consultation

8.3.58 An EIA Scoping Opinion was requested from the Planning Inspectorate (the Inspectorate) in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to air quality is provided in Table 8-4.

Table 8-4: Responses to Scoping Comments

CONSULTEE	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	It is agreed that operational traffic can be scoped out of the air quality assessment providing that supporting evidence of low traffic generation can be provided.	Noted. As outlined in Chapter 15: Traffic and Transportation (PEI Report, Volume I), traffic generation will be low for the operational phase. This will be confirmed within the ES.
The Inspectorate	It is agreed that NRMM emissions can be scoped out and that best practice mitigation measures will be utilised to control these emissions. It is also noted that this mitigation should be secured in the draft DCO (dDCO).	It is agreed that suitable mitigation will be secured in the dDCO. This will be confirmed within the ES.
The Inspectorate	It is not yet agreed that operational emissions of water vapour, N_2, O_2, H_2, CH_4 and CO_2 can be scoped out of the ES.	Further information on the volumes of these pollutants will be provided in the ES, to support the scoping out approach proposed for the air quality assessment.
The Inspectorate	It is agreed that emissions from the connection corridors can be scoped out of the ES.	Noted.
The Inspectorate	Public and private amenity areas should be considered	Public and private amenity areas have been considered in the construction dust assessment in Appendix 8A (PEI Report, Volume III).
The Inspectorate	The assessment of road traffic emissions from the construction phase should utilise Natural England guidance (NEA001).	This guidance will be considered in the ES.

Use of the Rochdale Envelope

8.3.59 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with the Inspectorate's Advice Note 9 (The Planning Inspectorate, 2018). This involves assessing the

maximum (or where relevant, minimum)/worst case parameters for the elements where flexibility needs to be retained (for example, building dimensions or operational modes).

8.3.60 For the operational assessment, the plant will be subject to further detailed design. Worst case emissions leading to the worst case predicted impacts will be used in the assessment to be reported in the ES to ensure that it comprises a conservative assessment.

8.3.61 The operational Proposed Development will be assumed to be running 24 hours a day for 8,760 hours per year. Assuming continuous operation throughout the year is considered to lead to worst-case annual average air quality impacts.

8.3.62 The building dimensions included within the assessment are based on available information within the concept design for the Proposed Development, including Phase 1 and 2 buildings.

8.4 Baseline Conditions

Existing Baseline

Sensitive Receptors

8.4.1 Based on IAQM guidance (IAQM, 2014), receptors potentially affected by dust soiling and short-term concentrations of PM_{10} generated during construction activities are limited to those located within 350 m of the nearest construction activity, and/or within 50 m of a public road used by construction traffic that is within 500 m of the construction site entrances. Ecological receptors are limited to those located within 50 m of the nearest construction activity and/or within 50 m of a public road used by construction traffic that is within 500 m of the construction site entrances.

8.4.2 Receptors potentially affected by the exhaust emissions associated with construction phase vehicle movements are those located within 200 m of a public road used by construction traffic to access the Proposed Development Site.

8.4.3 Receptors potentially affected by operational emissions from the Proposed Development including local residential and amenity receptors that have been identified through site knowledge, desk study of local mapping and consultation. Through the dispersion modelling, gridded outputs of pollutant concentrations have been examined to identify the receptors that will receive the highest point source contributions so that the assessment of impacts can be made at these receptors.

8.4.4 Ecological receptors potentially affected by operational emissions have been identified through a desk study of Defra Magic mapping (Defra, n.d.) and consultation (see Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I)). Statutory designated sites including SACs, SPAs, Ramsar sites and SSSIs up to 10 km from the Proposed Development Site have been considered. Several non-statutory designated sites including LNRs and LWSs within 2 km have also been considered. Further details of these sites and reasons for their designations are provided in Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I).

8.4.5 Identified receptors are detailed in Table 8-5, for construction (Road Traffic Receptor 'R') and operational phases (Operational Receptor 'O') and these are shown in Figures 8-1: Air Quality Study Area – Human Health Receptors, Monitoring, 8-2: Air Quality Study Area – Ecological Receptors and 8-3: Air Quality Study Area – Construction (PEI Report, Volume II). The distances to the receptors from the Proposed Development Site as associated with the construction phase are provided in Appendix 8A: Air Quality – Construction Assessment (PEI Report, Volume III).

Table 8-5: Selected Receptors

ID	RECEPTOR NAME	RECEPTOR TYPE	GRID REFERENCE (BRITISH NATIONAL GRID)	
			X	Y
R_001	Saltview Terrace, Stockton-on-Tees	Residential	450068	521631
R_002			450049	521620
R_003	High Clarence Primary School. Port Clarence Road	School	449463	521974
R_004	2 Fieldview Close, Stockton-on-Tees	Residential	449092	522334
R_005	87 Broadway, Middlesbrough	Residential	455429	520571
R_006	51 Eversham Road, Middlesbrough	Residential	455434	520610
R_007	Grangetown Primary School, St Georges Rd W, Middlesbrough	School	455189	520409
R_008	139 Bolckow Road, Grangetown,	Residential	455306	520890
R_009	8 St Nicholas Close, Grangetown,	Residential	454846	520708
R_010	2 Kirkleatham Lane, Redcar	Residential	459216	524569
R_011	4 Corporation Road, Redcar	Residential	459262	524598
R_012	2 Keepersgate, Eston,	Residential	456153	518576
R_013	19 Moorgate, Middlesbrough,	Residential	456240	519019
R_014	19 Gaisdale Close, Middlesbrough	Residential	456043	518989
R_015	239 Wychgate, Middlesbrough	Residential	456119	518963
R_016	23 High Street, Middlesbrough,	Residential	456477	519134

ID	RECEPTOR NAME	RECEPTOR TYPE	GRID REFERENCE (BRITISH NATIONAL GRID)	
			X	Y
R_017	North Lodge, Wilton, Lazenby, Redcar	Residential	458240	520240
R_018	Wilton Primary School, 12 High Street, Lazenby	School	457463	519859
R_019	2 Grange Estate, Middlesbrough	Residential	457559	519861
R_020	Brookfield Care Home, High Street, Lazenby	Care Home	457455	519763
R_021	10 Chestnut Close, Middlesbrough	Residential	457311	519649
R_022	Police House, Eston Road, Lazenby	Residential	457016	519403
O1	Marsh Farm House, Warrenby Road, Redcar	Residential	457950	525045
O2	Cleveland Golf Links, Redcar	Recreational	458090	525550
O3	South Gare Fishermans Association, Redcar	Recreational	455680	527395
O4	Marine Club, Redcar	Recreational	455550	527345
O5	Tingdene Beach Caravan Park, Redcar	Recreational	458675	525415
O6	120 Broadway W, Dormanstown, Redcar	Residential	457895	523735
O7	68 York Rd, Coatham, Redcar	Residential	458900	525060
O8	Dormanstown Primary Academy, Redcar	School	458250	523585
O9	Coatham Church of England School, Redcar	School	459195	524980
RE001	Teesmouth and Cleveland Coast SSSI and SPA	Ecological	450640	523527
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coatham Marsh LWS	Ecological	458966	524537
RE003	Teesmouth and Cleveland Coast SSSI	Ecological	457334	525348
RE004	Charlton's Pond LNR	Ecological	446972	523081

ID	RECEPTOR NAME	RECEPTOR TYPE	GRID REFERENCE (BRITISH NATIONAL GRID)	
			X	Y
RE005	Teesmouth and Cleveland Coast SSSI and SPA	Ecological	450050	521413
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	Ecological	450744	522993
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	Ecological	450758	522995
RE008	Teesmouth and Cleveland Coast SSSI and SPA	Ecological	450997	523670
RE009	Teesmouth and Cleveland Coast SSSI and SPA	Ecological	450050	521413
RE010	Wilton Woods Complex LWS	Ecological	456441	518679
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA and SSSI	Ecological	457283	526000
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA and SSSI	Ecological	456579	526306
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA and SSSI	Ecological	456127	526339
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA and SSSI	Ecological	455726	526273
OE2a	Teesmouth and Cleveland Coast SPA and SSSI	Ecological	456300	526098
OE2b	Teesmouth and Cleveland Coast SPA and SSSI	Ecological	456849	525878
OE2c	Teesmouth and Cleveland Coast SPA and SSSI	Ecological	455587	524856
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA and SSSI	Ecological	457860	524991
OE4	Eston Pumping Station LWS	Ecological	456474	523797
OE5a	Teesmouth NNR	Ecological	454525	527129
OE5b	Teesmouth NNR	Ecological	453980	526143
OE6	Teesmouth and Cleveland Coast SSSI	Ecological	455835	526155

Baseline Air Quality

8.4.6 Existing air quality conditions in the vicinity of the Proposed Development Site have been evaluated through a review of local authority air quality management reports, Defra published data and other sources. The key pollutants of concern resulting from construction and operation of the Proposed Development are NO_x, NO_2, CO, SO_2, and PM (PM_{10} and $PM_{2.5}$), and therefore the assessment of baseline conditions only considers these pollutants. Data on NH_3 is not presented as this is associated with the start-up process only and as this is a short term event that is not considered to have a significant long term effect on designated ecosystem sites described in paragraph 8.3.36.

8.4.7 There are no AQMAs designated within the administrative boundary of RCBC or the adjoining local authority areas of HBC and STBC. As the closest AQMA is 20 km to the south-east of the Proposed Development Site (in Staithes), it is considered that the Proposed Development will not impact upon the air quality within any AQMA.

8.4.8 RCBC has one continuous monitoring station at Dormanstown focusing on emissions from the industrial complexes located along the River Tees. The monitor is located in the grounds of Dormanstown Primary School, in an area of relevant public exposure, and is regarded as a key site within the Tees Valley for industrial pollution monitoring.

8.4.9 The annual means for NO_2 and NO_x for 2019 at the Dormanstown monitor were 9 $\mu g/m^3$ and 13 $\mu g/m^3$ respectively, indicating that background concentrations are well within the annual average AQAL. The annual mean for PM_{10} was 14 $\mu g/m^3$.

8.4.10 In addition, RCBC undertook NO_2 diffusion tube monitoring at 16 sites during 2019, including a number of co-located tubes at the Dormanstown continuous monitor. Apart from the Dormanstown site tubes, which are classified as suburban, the remaining 15 sites are located at roadside locations. The results of the diffusion tube monitoring indicate that air quality in the borough is of a good quality, and well below the annual AQAL.

8.4.11 A number of NO_2 diffusion tubes were deployed in the air quality Study Area in order to supplement the available data and to aid traffic air quality model verification. The diffusion tube survey commenced in July 2022 and ceased in October 2022. A further period of three months data collection has also recently been undertaken and the results of this will be included in the ES.

8.4.12 The locations of all the monitoring sites (diffusion tubes) used in the assessment are shown in Figure 8-1: Air Quality Study Area – Human Health Receptors and Monitoring (PEI Report, Volume II). Data from the diffusion tube survey are presented in Table 8-6.

Table 8-6: Air Quality Monitoring Survey Data

SITE ID	SITE TYPE	GRID REFERENCE (BRITISH NATIONAL GRID)		2019* ANNUAL MEAN CONCENTRATION (µG/M^3)
		X	Y	
DT1	Roadside	457401	523654	29.7
DT2	Roadside	457667	523958	**44.3**
DT3	Urban Background	459008	524872	18.2
DT4	Roadside	455455	520616	20.9
DT5	Roadside	455431	520975	21.8
DT6	Roadside	455949	521326	**49.7**
DT7	Roadside	457131	519556	29.7
DT8	Roadside	456466	519123	21.8
DT9	Urban Background	455100	517473	16.2
DT10	Urban Background	453905	517394	12.2
DT11	Urban Background	455488	519463	14.5
DT12	Urban Background	457237	519877	11.4
DT13	Co-location	458147	523551	19.3
DT14	Ecological	453310	528182	15.1
DT15	Ecological	457341	525680	20.7
DT16	Ecological	456650	525953	18.8
DT17	Ecological	456323	526112	19.9
DT18	Roadside	449399	522028	25.3
DT19	Urban Background	449091	522434	16.5
DT20	Ecological	450821	525066	19.2
DT21	Roadside	449943	521663	25.3

Note: Bold denotes an exceedance of an air quality objective value. *Concentrations are provided for 2019 to match the year of the baseline traffic assessment, the annualisation process is detailed in Appendix 8A.

8.4.13 Annual mean NO_2 concentrations when annualised back to 2019 resulted in two exceedances of the annual mean NO_2 objective of 40 µg/m^3, recorded at DT2 and DT6, with concentrations of 44.3 µg/m^3 and 49.7 µg/m^3, respectively. Both locations

are near industrial areas, therefore high concentrations are expected due to the increased vehicle movements of HGVs which are associated with greater NO_2 emissions compared to other vehicles. There are no relevant human exposure receptors at these locations.

8.4.14 In addition to specific air quality monitoring data in the air quality study area for some pollutants further background data is also available for NO_x, NO_2, CO SO_2, and PM (PM_{10} and $PM_{2.5}$) from Defra. Further details of this data are presented in Appendix 8B: Air Quality – Operational Phase (PEI Report, Volume III). Local concentrations of NO_2 are discussed in detail above, baseline concentrations of the other pollutants within the study area are well within their respective AQALs.

Future Baseline

8.4.15 Background concentrations of pollutants are expected to decrease in the future due to changes in technology and the types of emission sources. However, to provide a conservative prediction of pollutant concentrations in the future, the current baseline background concentrations will be used for the future operational assessment scenarios, assuming no decrease in background concentrations. Similarly, for the assessment of the construction phase, current background concentrations have been used.

8.5 Proposed Development Design and Impact Avoidance

8.5.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development (also known as 'embedded measures').

8.5.2 The following impact avoidance measures have either been incorporated into the design or are standard construction or operational practices. These measures have, therefore, been taken into account during the impact assessment and will be secured through the draft DCO.

Construction

8.5.3 A Framework Construction Environmental Management Plan (CEMP) will be included alongside the ES which will accompany the DCO Application which will set out the key measures to be employed during the Proposed Development's construction phase, to control and minimise the impacts on the environment – including the minimisation of air quality impacts. A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

8.5.4 Emissions of dust and particulates from the construction phase of the Proposed Development will be controlled in accordance with industry best practice, through incorporation of appropriate control measures according to the risks posed by the activities undertaken, as determined through this assessment process. The management of dust and particulates and application of adequate mitigation measures will be enforced through the CEMP.

8.5.5 Based on an initial assessment of the area, of its sensitivity to dust impacts and the likely risk of impacts arising from each of the key construction activities (earthworks, construction and 'trackout' of material onto roads (see Appendix 8A: Air Quality – Construction Assessment (PEI Report, Volume III)), appropriate embedded measures to be implemented during construction (good site techniques drawn from the 'high risk' site schedule in IAQM guidance) that have been identified are:

- avoid mechanical roughening or grinding of concrete surfaces, where appropriate;
- store sand and aggregates in bunded areas and store cement powder and fine materials in silos, where appropriate;
- use water suppression and regular cleaning to minimise mud on roads, and control dust during earth moving activities;
- cover vehicles leaving the construction site that are carrying waste materials or spoil;
- employ wheel wash systems at site exits;
- restrict where practicable the use of unmade road accesses;
- minimising duration of storage of topsoil or spoil during pipeline construction; and
- prohibit open fires on-site.

8.5.6 Good practice will also be employed for the siting and operation of NRMM to control associated emissions, including:

- minimise vehicle and plant idling; and
- where possible, locating static plant away from sensitive boundaries or receptors.

Operation

IED/ BAT-AEL Emission Limit Value (ELV) Compliance

8.5.7 The Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. In addition, the Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

8.5.8 The Proposed Development will be designed such that process emissions to air comply with the ELV requirements as agreed in the environmental permit, as per the emerging techniques for hydrogen production with carbon capture guidance. This will be agreed as part of the Environmental Permit Application with the EA. The EA will then regulate the operation of the Proposed Development.

Stack Heights

8.5.9 The fired heater, auxiliary boiler and flare stack heights for the Proposed Development have been assessed as a worst case, with consideration given to minimisation of ground-level air quality impacts and the visual impacts of taller stacks based on the current potential layout of the main structures of the Proposed Development.

8.5.10 Dispersion modelling has been undertaken to determine the optimum stack heights at the current stage of design, through comparison of the maximum impacts at human health and ecological receptors, to ensure that the impacts at sensitive receptors will be considered to be acceptable.

8.5.11 Details of the stack height determination results are presented in Appendix 8B: Air Quality – Operational Phase (PEI Report, Volume III).

Decommissioning

8.5.12 At the end of its design life decommissioning of the Proposed Development will see the removal of all above ground equipment down to ground level and the ground remediated to enable future re-use. It is assumed that all underground infrastructure will remain in-situ; however, all connection and access points will be sealed or grouted to ensure disconnection.

8.5.13 A Decommissioning Environmental Management Plan (DEMP) will be produced and agreed with the EA pursuant to a DCO Requirement at the appropriate time. The DEMP will consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed.

8.5.14 The predicted air quality effects of decommissioning of the Proposed Development are considered to be comparable to, or less than, those assessed for construction activities.

8.6 Likely Impacts and Effects

Construction

Assessment of Construction Dust

8.6.1 The impact on local air quality from Proposed Development construction and demolition activities has used a sensitivity assessment methodology to assess the likelihood and scale of dust impact on sensitive receptors located in the vicinity of the Proposed Development Site (including consideration of nearby amenity areas). Further details of the assessment can be found in Appendix 8A: Air Quality – Construction Assessment (PEI Report, Volume III). Demolition and site clearance of the Main Site will be undertaken prior to the main works, and these do not form part of this assessment.

8.6.2 The evaluation of expected dust arisings from the proposed construction and demolition works has shown that without mitigation there could be a short-term Low to Medium impact of dust emissions associated with the construction phase on human health and a potential High impact on ecological receptors, resulting in a

potential Significant effect. However, appropriate mitigation measures for managing these risks will be set out in the Framework CEMP in accordance with the IAQM guidance. Such measures will be formalised in the Final CEMP to be prepared by the construction contractor and then implemented for the duration of the construction phase. Through the implementation of these measures, dust effects on sensitive receptors are considered to be Not Significant.

Assessment of Construction Traffic

8.6.3 Appendix 8A: Air Quality – Construction Assessment, Tables 8-18 to 8-20 (PEI Report, Volume III) shows the predicted annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ at sensitive receptors along routes anticipated to be utilised by construction traffic. Please see Table 8-5 and Figures 8-1 and 8-3 for further details of the receptors modelled and Chapter 15: Traffic and Transportation (PEI Report, Volume I) for further details of construction traffic movements.

8.6.4 The construction traffic air quality assessment is based on Peak Construction Scenario (month 17 of construction) indicates that the impact at all human receptors can be considered Negligible. This is as both the change between the with and without the Proposed Development scenarios for all receptors is less than 1% of the AQAL and all receptors are below 75% of the AQAL.

8.6.5 Despite there being some sensitive human receptors along roads where construction traffic will be present, the largest change in AADT flow occurs on the unnamed road that connects the Proposed Development Site with the road network where there are no adjacent human receptors.

8.6.6 The effect of construction traffic on air quality is therefore Negligible and Not Significant.

Operation

8.6.7 The impact of point source emissions at human health receptors has been determined from model outputs at discrete receptor locations.

8.6.8 The maximum hourly, daily and annual mean predicted concentrations at human health receptors have been compared with the relevant AQALs, as summarised in Table 8-7: Results of Operational Impact Assessment for Human Health Impacts

8.6.9 The results have been initially presented as the maximum concentration that occurs at sensitive receptors. The predicted concentrations at locations within the Study Area have been reported in Appendix 8B: Air Quality – Operational Phase Tables 8B-13 to 8B-15 (PEI Report, Volume III), as well as the detailed concentrations at all identified receptor locations for each year modelled.

8.6.10 The impacts of all species released from the operational Proposed Development are predicted to result in negligible adverse effects at all human health receptors within the study area, and these are considered to be not significant.

Table 8-7: Results of Operational Impact Assessment for Human Health Impacts

SPECIES	AQAL ($\mu G/M^3$)	PC ($\mu G/M^3$)	PC/AQAL (%)	MAGNITUDE OF IMPACT	BC ($\mu G/M^3$)	PEC ($\mu G/M^3$)	PEC/AQAL (%)	SIGNIFICANCE OF EFFECT
Maximum NO_2 hourly mean (as the 99.79th percentile) – Normal Operation	200	11.7	5.9	Insignificant	26.6	38.4	19.2	Insignificant
Maximum NO_2 annual mean	40	1.7	4.4	Low	13.3	15.1	37.6	Insignificant
Maximum PM_{10} 24 Hour Mean (as the 90.41th percentile) – Normal Operation	50	0.8	1.6	Insignificant	19.2	20.0	40.0	Insignificant
Maximum PM_{10} Annual Mean	40	0.3	0.7	Imperceptible	9.6	9.9	24.6	Insignificant
Maximum $PM_{2.5}$ Annual Mean	20	0.3	1.3	Very Low	6.3	6.6	32.7	Insignificant
Maximum CO 8-hour rolling average – Normal Operation	10,000	14.2	0.1	Insignificant	110.9	125.1	1.3	Insignificant
Maximum SO_2 24-hour mean (as the 99.18th percentile) – Normal Operation	125	2.6	2.0	Insignificant	4.0	6.6	5.3	Insignificant

SPECIES	AQAL ($\mu G/M^3$)	PC ($\mu G/M^3$)	PC/AQAL (%)	MAGNITUDE OF IMPACT	BC ($\mu G/M^3$)	PEC ($\mu G/M^3$)	PEC/AQAL (%)	SIGNIFICANCE OF EFFECT
Maximum SO_2 1-hour mean (as the 99.73th percentile) – Normal Operation	350	5.0	1.4	Insignificant	4.0	9.1	2.6	Insignificant
Maximum SO_2 15-minute mean (as the 99.9th percentile) – Normal Operation	260	8.2	3.2	Insignificant	4.0	12.3	3.5	Insignificant
PC = Process Contribution, AQAL = Air Quality Assessment Level, BC = Background Concentration, PEC = Predicted Environmental Concentration								

Table 8-8: Results of Operational Impact Assessment for Designated Habitats

SPECIES	AQAL (µG/M3)	PC (µG/M3)	PC/AQAL (%)	BC (µG/M3)	PEC (µG/M3)	PEC/AQAL (%)	SIGNIFICANCE OF EFFECT
Worst case receptor NO_x daily mean (as the 100th percentile)	75	16.6	22.1	35.4	51.9	69.2	Cannot be screened out as Not Significant at this stage
Worst case receptor NO_x annual mean	30	2.49	8.3	17.7	20.2	67.3	Not Significant

8.6.11 Operational air quality results for the worst affected ecological receptor (Teesmouth and Cleveland Coast SPA, SSSI and Ramsar site, located adjacent to the Main Site) are presented in Table 8-8.

8.6.12 The annual average impacts of NO_x can be considered insignificant, given that the PEC remains below 70% of the relevant critical levels.

8.6.13 The daily NO_x concentration cannot be considered insignificant, given that the PC is greater than the 10% screening criteria, and is greater than 20% of the relevant critical level. The depositional impacts of nutrient-nitrogen and acid are provided in Table 8B-19 and 8B-20.

8.6.14 The significance of the effects for daily NO_x, nutrient nitrogen and acid deposition will be discussed in further detail in Chapter 12: Terrestrial Ecology and Nature Conservation of the ES.

Decommissioning

8.6.15 The predicted air quality effects during decommissioning of the Proposed Development are considered to be comparable to, or less than, those assessed associated with construction activities. As such, air quality effects at sensitive receptors are anticipated to be Not Significant.

8.7 Mitigation and Enhancement Measures

Construction

8.7.1 The management of construction phase emissions, including dust and particulates, and the application of adequate mitigation measures will be enforced through the Final CEMP – refer to Section 8.5.

8.7.2 As the environmental effects from Proposed Development construction have been identified as being Not Significant, no specific additional mitigation measures have currently been identified as being necessary.

Operation

8.7.3 The air quality assessment of operational impacts assumes that the ELVs will be met for the operational plant as required under the IED and in accordance with use of BAT under the environmental permitting regime. Details regarding operational phase air quality mitigation measures will be further investigated and reported in the ES.

Decommissioning

8.7.4 No specific additional mitigation measures (other than those identified in Section 8.5) have been identified as being necessary during Proposed Development decommissioning.

8.8 Limitations and Difficulties

Construction

8.8.1 The preliminary construction phase air quality assessment is based on the information available at the time of the assessment. Further details regarding

construction methods will become available as the Proposed Development design further develops. As such, the results from this preliminary assessment will be updated and reported in the ES.

15.1.1 In addition, at this preliminary stage, the assessment does not include a cumulative assessment of the Net Zero Teesside (NZT) development or any other specific developments for either point sources or traffic. Traffic data that accounts for committed developments will be available for the assessment to be included in the ES, which will be inherently cumulative. Regardless, as any traffic associated with such committed developments will be included with both the with and without construction scenarios, the inclusion of traffic from committed developments is not currently anticipated to alter the assessment findings.

Operation

8.8.2 Information regarding the Production Facility is still in development and thus it is not currently possible to undertake air quality modelling of emissions from the Proposed Development. Such information is in development and will become available such that a full assessment of human health and ecological effects will be reported in the ES.

Decommissioning

8.8.3 There are no significant limitations associated with the decommissioning phase air quality assessment.

8.9 Residual Effects and Conclusions

Construction

8.9.1 The preliminary air quality assessment of construction impacts assumes that the measures outlined within Section 8.5 will be fully implemented via the Final CEMP. For this reason, effects associated with construction dust are anticipated to be Not Significant.

8.9.2 Despite there being some sensitive human receptors along roads where construction traffic will be present, effects of construction traffic on air quality are predicted to be Not Significant.

Operation

8.9.3 Operational phase traffic flows are below applicable screening criteria, and therefore, significant air quality effects are not anticipated.

8.9.4 The design of the Production Facility is still in development and will be refined for the EIA. However, it has been possible to undertake a preliminary operational assessment using available concept design information. This has predicted that air quality effects on human health receptors are Not Significant. Additionally, guidance on Emerging techniques for hydrogen production with carbon capture has been released (EA, 2023). This will form the basis for discussions with the EA to agree appropriate BAT and AELs. This will be done as the environmental permit required for the operation of the Proposed Development is developed. The permit application is being made

generally in parallel with this DCO submission. This will manage air quality emissions from the Proposed Development. Air quality modelling of air quality effects during Proposed Development operation will be re-confirmed in the ES.

8.9.5 Air quality effects during Proposed Development operation on nearby ecological receptors have also been predicted. This has shown that daily NO_x concentrations, nitrogen deposition and acid deposition require further evaluation in the ES. The significance of the effects for daily NO_x, nutrient nitrogen and acid deposition will be discussed in Chapter 12: Ecology and Nature Conservation of the ES.

Decommissioning

8.9.6 It is assumed that relevant best practice mitigation measures will be in place during Proposed Development decommissioning works via the DEMP. With the implementation of such mitigation measures, the predicted air quality effects during decommissioning are considered to be comparable to, or less than, those assessed associated with construction activities, and thus Not Significant.

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9.0 SURFACE WATER, FLOOD RISK AND WATER RESOURCES

9.1 Introduction

9.1.1 This chapter of the Preliminary Environmental Information (PEI) Report identifies the potential impacts and effects of the Proposed Development on surface water environment (including inland, transitional, and coastal surface waters), flood risk and water resources. The scope of the assessment includes water quality, water resources, hydro-morphology, flood risk and drainage.

9.1.2 This preliminary assessment has been undertaken in accordance with the following stages (as also described in Chapter 2: Assessment Methodology (PEI Report, Volume I)):

- reviewing the planning and legislative context;
- establishing the baseline;
- appraisal of potential impacts and determining the classification and significance of effects;
- identification of potential mitigation and enhancement measures; and
- identification of likely remaining residual effects.

9.1.3 Environmental effects have been assessed for the construction, operational and decommissioning phases of the Proposed Development. The residual effects reported at the end of this chapter take account of embedded mitigation and the implementation of additional mitigation measures as described in this chapter.

9.1.4 The chapter is supported by information presented in the following Figures (PEI Report, Volume II) and Appendices (PEI Report, Volume III):

- Figure 9-1: Surface Water Features and their Attributes;
- Figure 9-2: Groundwater Features and their Attributes;
- Figure 9-3: Fluvial Flood Risk;
- Figure 9-4: Surface Water Flood Risk;
- Appendix 9A: Preliminary Flood Risk Assessment (FRA); and
- Appendix 9B: Nutrient Neutrality Screening Assessment.

9.2 Legislation and Planning Policy Context

9.2.1 This section identifies and describes legislation, planning policy and guidance of relevance to the assessment of the potential impacts on flood risk, water quality and water resources. Legislation, policy and other relevant guidance has been considered on a national and local level.

National Legislation

9.2.2 The following UK legislation is of relevance to the water environment assessment:

- Environment Act 2021 (UK Government, 2021);

- Water Act 2014 (as amended) (UK Government, 2014);
- Floods and Water Management Act 2010 (as amended) (UK Government, 2010);
- Marine and Coastal Access Act 2009 (UK Government, 2009a);
- Land Drainage Act 1991 (UK Government, 1991a);
- Water Resources Act 1991 (UK Government, 1991b);
- Water Industry Act 1991 (UK Government, 1991c);
- Environment Protection Act 1990 (as amended) (UK Government, 1990);
- Salmon and Freshwater Fisheries Act 1975 (as amended) (UK Government, 1975);
- The Water Environment (Water Framework Directive) (England Wales) Regulations 2017 (UK Government, 2017a);
- Environmental Permitting (England and Wales) Regulations 2016 (UK Government, 2016);
- Control of Major Accident Hazards (COMAH) Regulations 2015 (UK Government, 2015a);
- Environmental Damage (Prevention and Remediation) Regulations 2015 (UK Government, 2015b);
- Bathing Water (Amendment) (England) Regulations 2018 (UK Government, 2018);
- Eels (England and Wales) Regulations 2009 (UK Government, 2009b);
- Groundwater (England and Wales) Regulations 2009 (UK Government, 2009c);
- Control of Pollution (Oil Storage) (England) Regulations 2001 (UK Government, 2001);
- Control of Substances Hazardous to Human Health (COSHH) Regulations 2002 (UK Government, 2002);
- Anti-Pollution Works Regulations 1999 (UK Government, 1999); and
- Water Framework Directive Standards and Classifications Directions 2015 (as amended) (UK Government, 2015c).

9.2.3 The Levelling-up and Regeneration Bill (UK Government , 2023)is progressing through the House of Lords at the time of writing (August 2023) and includes provisions for reducing water pollution, including a requirement for water companies to upgrade wastewater treatment works in nutrient neutrality impacted areas.

National Policy Guidance

National Policy Statements

The National Policy Statement for Energy (EN-1) (2011)

9.2.4 The Overarching National Policy Statement (NPS) for Energy (EN-1) (Department of Energy and Climate Change, 2011a) is relevant to this assessment with the main sections being:

- Section 4.10: Pollution control and other environment regulatory regimes;
- Section 5.7 Flood Risk, Paragraph 5.7.6 states that "*Applications for energy projects of 1 hectare or greater in Flood Zone 1 in England or Zone A in Wales and all proposals for energy projects located in Flood Zones 2 and 3 in England or Zones B and C in Wales should be accompanied by a flood risk assessment (FRA)"*. The minimum requirements for an FRA are listed in Paragraph 5.7.5
- Section 5.15: Water Quality and Resources states that "*Where the project is likely to have effects on the water environment, the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment, as part of the ES or equivalent.*" (Paragraph 5.15.2); and
- Paragraph 5.15.3 provides advice on what an Environmental Statement (ES) should describe including:
  - *"the existing quality of waters affected by the proposed project and the impacts of the proposed project on water quality, noting any relevant existing discharges, proposed new discharges and proposed changes to discharges;*
  - *existing water resources affected by the proposed project and the impacts of the proposed project on water resources, noting any relevant existing abstraction rates, proposed new abstraction rates and proposed changes to abstraction rates (including any impact on or use of mains supplies and reference to Catchment Abstraction Management Strategies);*
  - *existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project and any impact of physical modifications to these characteristics; and*
  - *any impacts of the proposed project on water bodies or protected areas under the Water Framework Directive and source protection zones (SPZs) around potable groundwater abstractions".*

The National Policy Statement for Energy (EN-4) (2011)

9.2.5 The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Department of Energy and Climate Change, 2011b) is also relevant in that it describes the need for assessment of the water environment, particularly with regard to effects on water resources and water quality, and potential mitigation measures.

The National Policy Statement for Energy (EN-5) (2011)

9.2.6 The NPS for Electricity Networks Infrastructure (EN-5) (Department of Energy and Climate Change, 2011c) makes reference to EN-1 with regard to the policies for mitigating climate change. It indicates that there is a need to determine vulnerability of a proposed development to flooding and to ensure sufficient resilience to the potential effects of flooding within the design of the development.

Revised Draft National Policy Statements

9.2.7 The UK Government is currently reviewing and updating the energy NPSs. It is doing this to reflect its policies and strategic approach for the energy system that is set out in the Energy White Paper (Department for Business, Energy and Industrial Strategy, 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions. As part of the NPS review process, the government published a suite of revised draft NPSs for new energy infrastructure on 6 September 2021. A further update was published in March 2023 by the Department for Energy Security & Net Zero (DESNZ). Draft NPSs of relevance include:

- Draft Overarching National Policy Statement for Energy (EN-1) (DESNZ, 2023a),
- Draft NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (DESNZ, 2023b); and
- Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (DESNZ, 2023c).

9.2.8 The details of these provisions are, however, subject to consultation and thereafter implementation. The timetable for adoption of the updated NPSs is not known, however it is expected that these will be finalised and shall replace the current NPSs by the time the DCO Application for the Proposed Development is submitted.

9.2.9 Given the importance of these NPSs, the EIA approach takes account of these new emerging documents, whilst any subsequent formal adoption of new NSPs for energy infrastructure will be considered where relevant during the production of the ES. The following summary indicates where the relevant Draft NPS contain requirements that differ from the requirements of the existing NPSs:

- Identifying and securing opportunities to reduce the causes and impacts of flooding overall during the construction period should be included as a minimum requirement for FRA as stated in EN-1 Draft 2023 Section 5.8 Flood Risk, Paragraph 5.8.15;
- Inclusion of changes to the assessment of the existing status due to the impact of climate change on rainfall patterns and consequently water availability across the water environment in EN-1 Draft 2023 Section 5.16 Water Quality and Resources, Paragraph 5.16.13;
- Increased emphasis on early engagement with regulators and consideration of climate change and cumulative effects in EN-1 Draft 2023 Section 5.16 Water Quality and Resources Paragraph 5.16.14;

- EN-2 2021 Section 2.8 Water quality and resources Paragraph 2.8.4: statement regarding the decision making of the Secretary of State specific to water quality and resources as described in EN-1 was not included in the EN-2 Draft 2023 Section 2.6.

UK Marine Policy Statement

9.2.10 The Marine Policy Statement (MPS) (Department for Environment, Food & Rural Affairs (DEFRA), 2011a) is the framework for preparing Marine Plans and taking decisions affecting the marine environment. It establishes a vision for the marine environment, which is for clean, healthy, safe, productive, and biologically diverse oceans and seas. The MPS underpins the process of marine planning, which establishes a framework of economic, social and environmental considerations that will deliver these high-level objectives and ensure the sustainable development of the UK marine area.

9.2.11 The North East Inshore Plan and North East Offshore Marine Plan (DEFRA, 2021a) establishes the plan led system for the marine area in which the riverine parts of the Proposed Development are located. It provides a framework that will shape and inform decisions over how the areas' waters are developed, protected and improved over the next 20 years.

9.2.12 Of particular note is Policy NE-CCUS-2 which indicates that carbon capture, usage and storage proposals incorporating the re-use of existing oil and gas infrastructure will be supported; and Policy NE-WQ-1 which states that proposals that protect, enhance and restore water quality will be supported, and that proposals that cause deterioration of water quality must demonstrate that they will i) avoid, ii) minimise or iii) mitigate (in that order) deterioration of water quality in the marine environment.

The National Planning Policy Framework (2021)

9.2.13 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2012a) was updated in July 2021, superseding previously published versions. The NPPF has three overarching objectives to contribute to the achievement of sustainable development, one of which is the 'environmental objective'. This objective includes the requirement of "*improving biodiversity, using natural resources prudently, and minimising waste and pollution*" (Paragraph 8c). The NPPF also contains a number of statements which are relevant to water quality and flood risk - these include:

- strategic policies should set out an overall strategy for the pattern, scale, and quality of development, and make provision for conservation and enhancement of the natural, built, and historic environment. This includes landscapes and green infrastructure, and planning measures to address climate change mitigation and adaptation (paragraph 20d);
- plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating

from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure (paragraph 153);

- new development should be planned for in ways that: (a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure (paragraph 154);
- inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere (paragraph 159);
- strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards (paragraph 160);
- all plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property (paragraph 161); and
- planning policies should contribute and enhance the natural environment by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as water quality, taking into account relevant information such as river basin management plans (paragraph 174).

National Planning Practice Guidance (2021)

9.2.14 The Planning Practice Guidance (PPG) Water Supply, Wastewater, and Water Quality (last updated June 2021), provides guidance for local planning authorities on assessing the significance of water environment effects of proposed developments. The guidance highlights that adequate water and wastewater infrastructure is needed to support sustainable development.

9.2.15 The NPPF (MHCLG, 2021) and the Flood Risk and Coastal Change NPPG (Department for Communities and Local Government, 2022) recommends that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and should develop

policies to manage flood risk from all sources taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as Lead Local Flood Authorities (LLFAs) and Internal Drainage Boards. Local Plans should apply a sequential, risk-based approach to the location of development to avoid, where possible, flood risk to public and property and manage any residual risk, taking account of the impacts of climate change.

The UK Government's Environmental Improvement Plan 2023

9.2.16 UK Government's Environmental Improvement Plan (EIP23) has been published by Defra as a revision of the 25YEP (see below) and to report on the progress made since 25YEP. One of their goals is to upgrade 160 wastewater treatment works by 2027 and increased advice and incentives to support a shift to sustainable agricultural techniques to mitigate nutrient pollution. They have also set out a goal to restore 400 miles of river through the first round of Landscape Recovery projects and establish 3,000 hectares (ha) of new woodlands along England's rivers. The Tees catchment was not included in the first round of Landscape Recovery Schemes (Burford, 2022). A second round of Landscape Recovery opened in spring 2023 and so details of which river catchments will be part of the scheme is yet to be published (Burford, 2023). Water efficiency labelling will also be rolled out across appliances, and it will be ensured that water companies deliver a 50% reduction in leakages by 2050 (DEFRA, 2023a).

Defra's 25 Year Environment Plan (2018)

9.2.17 In 2018, Defra published the 25 Year Environment Plan (Defra, 2018) (25YEP) setting out the UK Governments goals for improving the environment within a generation and leaving it in a better state than we found it. The plan covers the provision of clean air and water; protection and enhancement of habitats, wildlife, and biosecurity; reducing the risk from environmental hazards and mitigating and adapting to climate change; using resources more sustainable and efficiently, minimizing waste and managing exposure to chemicals; enhancing beauty, heritage and engagement with the natural environment.

9.2.18 The plan includes specific goals to achieve good environmental status in our seas, reduce the environmental impact of water abstraction, meet the objectives of River Basin Management Plans under the WFD, reduce leakage from water mains, improve the quality of bathing waters, restore protected freshwater sites to a favourable condition, and do more to protect communities and businesses from the impact of flooding, coastal erosion and drought. At the heart of the Plan's delivery is the natural capital approach with the aspiring goal of a net gain in biodiversity from new development.

The UK Government's Plan for Water: Our Integrated Plan for Delivering Clean and Plentiful Water (2023)

9.2.19 In the plan (DEFRA, 2023b), more investments, tighter regulation and effective enforcement are being made to transform and integrate the water system, address sources of pollution and boost water supply. A few of the key actions include giving the Environment Agency the power to issue bigger penalties for when water

companies pollute, and authorising Ofwat under the new powers in the Environment Act 2021 to link the dividends of water company to their environmental performance.

9.2.20 Besides setting new legally binding targets to significantly reduce pollution from farming, wastewater, and abandoned metal mines, the UK Government have also initiated a significant investment in water infrastructure improvements. Monitoring of storm overflows has also been substantially increased from only 10% in 2015 to over 90% today (DEFRA, 2023b). Further actions are listed within the plan to address multiple sources of pollution impacting water bodies.

9.2.21 With almost £500 million of additional investment in new large-scale water infrastructure, water companies are required to develop plans to meet water demands in a changing climate. Key actions to reduce drought impacts on water reliant business and farmers has also been addressed.

Future Water, The Government's Water Strategy for England (2011)

9.2.22 The Government's Future Water Strategy (Defra, 2011b) sets out the government's long-term vision for water and the framework for water management in England. It aims to enable sustainable and secure water supplies, whilst ensuring an improved and protected water environment. Future Water brings together the issues of water demand, supply and water quality in the natural environment, as well as surface water drainage and river/coastal flooding into a single coherent long-term strategy, in the context of the need to reduce greenhouse gas (GHG) emissions.

9.2.23 The strategy also considers the issue of charging for water. The water environment and water quality have great economic, biodiversity, amenity and recreational value, playing an important role in many aspects of modern-day society, and thus the functions provided must be sustainably managed to ensure they remain available to future generations without compromising environmental quality.

Sustainable Drainage Systems Guidance

9.2.24 Overall, national and local planning policy currently encourages developers to include sustainable drainage systems (SuDS) in their proposals where practicable. SuDS provide a way to attenuate runoff from a site to the rate agreed with the Environment Agency to avoid increasing flood risk, but they are also important in reducing the quantities and concentration of diffuse urban pollutants found in the runoff.

9.2.25 Defra published guidance on the use, design and construction of SuDS in 'Non-statutory Technical Standards for SuDS (Defra, 2015).

9.2.26 A review of Schedule 3 of the Flood and Water Management Act 2010 was published by the UK Government in January 2023 and recommended that implementation of Schedule 3 in England. Schedule 3 requires developers to seek approval from a SuDS Approval Body (SAB), who must determine whether the application meets the National Standards. Defra is currently carrying out further work to draft these standards which each SAB will refer to, and these are expected to be published in 2024.

9.2.27 Industry good practice guidance on the planning for and design of SuDS is provided by a range of publications, notably:

- C753 The SuDS Manual (CIRIA, 2015a);
- Design Manual for Roads and Bridges (DMRB) CD532 Vegetated Drainage Systems for Highways Runoff (Highways England, 2020); and
- DMRB CG 501 Design of Highway Drainage Systems (Highways England, 2020).

River Basin Management Plan

9.2.28 River Basin Management Plans (RBMPs) are prepared by the Environment Agency for six-year cycles and set out how organisations, stakeholders and communities will work together to improve the water environment. The most recent plans were published in 2022 (the third cycle) and will remain in place until reviewed and updated by 2027. The waterbodies within the water environment Study Area fall under the Tees Management Catchment within the Northumbrian RBMP (Defra, 2022).

Flood Risk Management Plan

9.2.29 Flood Risk Management Plans (FRMPs) are prepared by the Environment Agency for six-year cycles and set out how organisations, stakeholders and communities will work together to achieve the objectives and measures (actions) needed to manage flood risk at a national and local level. The most recent plans were published in 2022 and will remain in place until after 2027. The water environment Study Area is located within the Northumbria River Basin District Flood Risk Management Plan (Environment Agency, 2022).

Local Policy Guidance

Redcar and Cleveland Local Plan (2018)

9.2.30 The Proposed Development Site is located predominantly within the administrative boundary of Redcar and Cleveland Borough Council (RCBC). RCBC has published a Local Plan (RCBC, 2018) which was adopted in 2018 and which outlines the council's strategy up to the year 2032. The following policies of the local plan are of relevance to the water environment:

- Policy SD4 – General Development Principles – Development will not be permitted where it results in an unacceptable loss or significant adverse impact on important open spaces, or environmental, built or heritage assets which are considered important to the quality of the local environment; and development will not be permitted where it results in an increase in flood risk either on site or downstream of the development.
- SD7 – Flood and Water Management – Flood risk will be taken into account at all stages in the planning process to avoid inappropriate development in areas at current or future risk. All development proposals will be expected to be designed to mitigate and adapt to climate change, taking account of flood risk by ensuring opportunities to contribute to the mitigation of flooding elsewhere are taken; prioritising use of SuDS; ensuring full separation of foul and surface water flows; and ensuring development is in accordance with the Redcar and Cleveland Strategic FRA. Further detail is provided regarding requirements for site specific

flood risk assessments, discharge of surface water, and runoff rates. Drainage plans must be submitted incorporating SuDS unless it is demonstrated that they would be inappropriate. The drainage system should not adversely impact water quality of receiving water bodies, both during construction and operation, and should seek to improve water quality where possible, as well as maintaining and enhancing biodiversity and habitat of watercourses.

- Policy N4 – Biodiversity and Geological Conservation – The Local Plan will protect and enhance biodiversity and geological resources. These factors should be considered at an early stage in the development process, with appropriate protection and enhancement measures incorporated into the design of the development proposals, recognising wider ecosystem services, and providing net gains wherever possible. Priority will be given to protecting internationally important sites, including the Teesmouth and Cleveland Coast Special Protection Area/Ramsar and European Marine Site. Development which is likely to have a significant effect on any internationally designated site will be subject to an appropriate assessment. Requirements relating to nationally important and locally important sites are also discussed.

Stockton-on-Tees Borough Council Local Plan (2019)

9.2.31 The elements of the Proposed Development to the north of the Tees Estuary (i.e. the Natural Gas Connection and CO_2 Gathering Network) are located within the Stockton-on-Tees Borough Council (STBC) administrative area. STBC published a Local Plan in 2019 (STBC, 2019) which outlines the council's strategy up to the year 2032. The following policies of the local plan are of relevance to the water environment:

- Policy EG4 – Seal Sands, North Tees, and Billingham – Development proposals in the North Tees and Seal Sands are required, as appropriate, to be supported by a site-specific FRA which considers, amongst other matters, emergency access/egress in the event of tidal flooding.
- Policy ENV4 – Reducing and Mitigating Flood Risk – All new development to be directed towards areas of lowest flood risk, with any such risk mitigated through design and implementing SuDS principles. Development on Flood Zones 2 or 3 will only be permitted following successful completion of the Sequential and Exception Tests and a site-specific FRA. All development proposals should seek to minimise flood risk elsewhere, separate foul and surface water flows and prioritise use of SuDS. Surface water run-off should be managed at source and disposed of following the hierarchy of infiltration, discharge to a watercourse (open or closed), or sewer as a last resort. For developments which were previously developed, the peak run-off rate from the development to any drain, sewer, or surface water body for the 1-in-100 year rainfall event should be as close as practicable to the greenfield run-off rate from the development for the same rainfall event but should never exceed the rate of discharge from the development prior to redevelopment for that event.
- Policy ENV7 – Ground, Air, Water, Noise and Light Pollution – All development that may cause groundwater or surface water pollution individually or

cumulatively will be required to incorporate measures as appropriate to prevent or reduce their pollution so as not to cause unacceptable impacts on living conditions of all existing and potential future occupants of land and buildings, the character and appearance of the surrounding area and environment. Where contamination may present a risk to the water environment, proposals must demonstrate appropriate mitigation measures and that there would not be unacceptable risks to human health or the environment or cause the surrounding environment to become contaminated. Groundwater and surface water quality will be improved in line with the requirements of the WFD and Northumbrian River Basin Management Plan. The Council will support ecological improvements along riparian corridors; avoid net loss of sensitive inter-tidal or sub-tidal habitats and support creation of new habitats; protect natural water bodies from modification; and support improvement and naturalisation of heavily modified waterbodies (including deculverting and removing barriers to fish migration).

Tees Valley Authorities – Local Standards for Sustainable Drainage

9.2.32 The Tees Valley Authorities (i.e., the local authorities of Hartlepool, Middlesbrough, Redcar and Cleveland, Stockton-on-Tees, and Darlington Borough Councils) produced a supplementary planning guidance (SPG) document entitled 'Sustainable Drainage Systems (SuDS) Guidance: Design Guide and Local Standards' in 2019 (The Tees Valley Authorities, 2019). Volume 1 provides an overview into SuDS techniques and policy requirements. Volume 2 highlights the Tees Valley specific local standards intended to provide clarity to the national standards.

9.2.33 The document strongly promotes the use of SuDS to help manage increased surface water runoff from new developments and help mitigate flood risk. It outlines the minimum standards to ensure a satisfactory scheme is constructed but are not intended to preclude any requirement for a higher standard that may be deemed necessary.

9.2.34 It is stated that when designing and using SuDS, consideration should be given to ensuring that they reduce damage from flooding, improve water quality, protect and improve the environment, protect health and safety and ensure stability and durability of drainage.

9.3 Assessment Methodology and Significance Criteria

9.3.1 This section presents the following:

- the basis of the assessment and the application of the Rochdale Envelope in accordance with the Planning Inspectorate's ('the Inspectorate') Advice Note 9 (The Planning Inspectorate, 2018);
- identification of the information sources that have been used for the assessment;
- summary of consultations;
- assessment methodology;

- an explanation as to how the identification and assessment of water resources and flooding effects has been determined; and
- the significance criteria and terminology for assessment of the residual effects to water resources and flooding.

Basis of Assessment

9.3.2 The following sources of information that define the Proposed Development have been reviewed and form the basis of this assessment:

- Chapter 4: Proposed Development (PEI Report, Volume I);
- Chapter 5: Construction and Programme Management (PEI Report, Volume I);
- Figure 1-1: Proposed Development Site Location Plan (PEI Report, Volume II);
- Appendix 9A: Preliminary Flood Risk Assessment (PEI Report, Volume III).

Study Area

9.3.3 For the purposes of the water quality assessment, a Study Area of approximately 1 km around the Proposed Development Site has been considered to identify surface water bodies that could reasonably be affected by the Proposed Development. However, since watercourse flow and water quality impacts may propagate downstream, where relevant, the assessment also considers a wider study area based on professional judgement. The Tees Coastal waterbody is considered the furthest downstream waterbody that could conceivably be impacted.

9.3.4 As flood risk impact can also impact upstream and downstream, the FRA considers a wider study area, where relevant. Professional judgement has been applied to identify the extent to which such features are considered. Additional indirect effects may also occur to other water environment receptors distant from the Study Area through increased demand on potable water supplies and foul water treatment (if the adjacent Brans Sands Wastewater Treatment Works (WwTW) does not have capacity).

Consultation

9.3.5 The Environment Agency have been contacted for pre-application planning advice, and a response was received on 17th March 2023. A summary of the planning advice relevant to this discipline are outlined in Table 9-1, along with a summary of how the various points will be addressed by the water environment assessment.

9.3.6 An EIA Scoping Opinion was requested from the Inspectorate in April 2023. A response was received on 17th May 2023. The opinions received from the inspectorate, the Environment Agency and Natural England which are relevant to this chapter are summarised in Table 9-1.

9.3.7 A joint workshop with the Environment Agency and Natural England was held on 12th June 2023 within which details of the Proposed Development and the water environment baseline were described, mitigation as defined at this PEI stage was presented, and the approach to the WFD assessment and nutrient neutrality assessments outlined.

Table 9-1: Summary of Environment Agency Pre-application Advice and the Scoping Opinion

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
Environment Agency	Pre-Application Advice March 2023	Flood Risk: The red line boundary for the full development is located within Flood Zone 3, 2 and 1. The majority of the development site for the Main Site is situated within Flood zone 1. However, small portions of the Main Site are situated within Flood Zone 2 and 3. Parts of the Hydrogen Pipeline Corridor are also within Flood Zone 2 and 3.	Noted. Refer to Figure: 9-3 (PEI Report, Volume II) for fluvial flood risk mapping. The Main Site is wholly within Flood Zone 1. Parts of the Hydrogen Pipeline Corridor are also within Flood Zones 2 and 3.
Environment Agency	Pre-Application Advice March 2023	Flood Risk Vulnerability Classification: No information has been provided on the flood risk vulnerability classification within the provided information. Therefore, we are unable to advise on our policy position in relation to flood risk until the vulnerability of the development has been confirmed by the applicant and/or the local planning authority. It should be noted that 'highly vulnerable' uses, requiring a Hazardous Substance Consent, would not be appropriate within flood zones 3. In accordance with Table 2 of the flood risk and coastal change section of the Planning Practice Guidance (PPG), 'highly vulnerable' developments are not appropriate in flood zone 3 and should not be permitted.	Noted. Flood risk vulnerability is outlined in Appendix 9A: Flood Risk Assessment (PEI Report, Volume III). The Proposed Development comprises an approximately 1.2 GWth Carbon Capture Usage & Storage (CCUS) enabled Hydrogen Production Facility and supporting associated connections. According to NPPF Annex 3 Flood Risk Vulnerability Classification, the Proposed Development is classified as 'Essential Infrastructure'. Essential Infrastructure is defined as 'Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
			electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood'. The Main Site is wholly in Flood Zone 1.
Environment Agency	Pre-Application Advice March 2023	Sources of Flooding: The main source of potential flooding in the area is from the tidal stretch of the River Tees, but there could be other local sources of flooding such as groundwater and surface water. We have published a suite of interactive maps that indicate where possible flooding from different sources could occur Check the long term flood risk for an area in England - GOV.UK (www.gov.uk). Our maps are not suitable for a detailed Flood Risk Assessment (FRA), but they can indicate where further assessment may be needed.	Noted. These sources have been interrogated during the preparation of the Preliminary FRA (Appendix 9A, PEI Report, Volume III). Further flood risk data and information has also been requested from the Environment Agency and was received in May 2023.
Environment Agency	Pre-Application Advice March 2023	Flood Risk Assessment: We would expect a FRA to be submitted in support of your DCO application. The FRA must assess flood risk from all sources of flooding and recommend the mitigation measures that will be implemented to ensure a safe development in a 1 in 200-year (tidal) flood event, taking account of climate change. It must also demonstrate that flood risk will not be increased elsewhere. Flood risk mitigations will need to be included within the development to ensure it can remain safe for its' lifetime. This includes raising the finished floor levels to the 1 in 200 year plus climate change plus a freeboard of 600mm.	A Preliminary FRA is presented in Appendix 9A (PEI Report, Volume III). This will be updated during the EIA as more information becomes available from the Environment Agency to account for these requirements. Further consultation with the Environment Agency will also be sought as the Proposed Development design progresses.
Environment Agency	Pre-Application Advice March 2023	Flood Risk Information the Environment Agency (EA) holds: We have an outline for a 1 in 200-year level undefended model that can be requested. The modelling we have for this location does not include climate change allowances and therefore	Noted. A request for information was sent to the Environment Agency in March 2023 and a response was

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		this will need to be calculated in accordance with the 'Flood risk assessments: climate change allowances'. As the development location is at risk from tidal flooding, sea level allowances will need to be applied to the 1 in 200-year level for the lifetime of the development using both higher central and upper end allowances. This applies to both the temporary and permanent works. The extent, speed and depth of flooding shown in the assessment should be used to determine the flood level for flood risk mitigation measures. Where assessment shows flood risk increases steadily and to shallow depths, it is likely to be more appropriate to choose a flood level lower in the range. Where assessment shows flood risk increases sharply due to a 'cliff edge' effect caused by, for example, sudden changes in topography or defences failing or overtopping, it is likely to be more appropriate to choose a flood level higher in the range.	received in May 2023. This has been incorporated into this chapter and its appendices where relevant.
Environment Agency	Pre-Application Advice March 2023	Flood Alleviation Schemes: The Environment Agency are currently in the process of developing flood alleviation schemes which may have an interface with the proposed development. Attached to this letter is the scheme overview for the Greatham North East Flood Alleviation scheme.	Noted, and interfaces with the Greatham North East Flood Alleviation scheme have been considered during the design of the Hydrogen Pipeline Corridor for the Proposed Development.
Environment Agency	Pre-Application Advice March 2023	Flood Risk Consents and Permits: The River Tees is a designated ‘main river’ and under the Environmental Permitting Regulations certain works within 16m of a tidal main river, or within 16m of any flood defence structure on a tidal main river, require a Flood Risk Activity Permit from the Environment Agency. This includes works such as directional drilling under the River Tees. You can find more information on permit requirements using the following link: Flood risk activities: environmental permits - GOV.UK (www.gov.uk). If a permit is required, it must be obtained prior to beginning the works.	Noted. Permits and consents that are expected to be required by the Proposed Development are outlined in Section 9.5 of this Chapter of the PEI Report. The need for an MMO licence is not expected given that there is no requirement for physical works within

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		You may also need a Marine Management Organisation (MMO) license depending on if any works will be undertaken below the mean high water springs (MHWS).	the marine environment (i.e. below MHWST) with trenchless approaches to be used for crossings (e.g. of the Tees estuary and Greatham Creek). If Case 2A and 2B for the Proposed Development are taken forward. then process water effluent may be discharged to Tees Bay but using existing infrastructure and Environmental Permit associated with the NZT development. No new licences would therefore be required. Consultation with the MMO will be undertaken to confirm this during the preparation of the DCO application.
Environment Agency	Pre-Application Advice March 2023	Water Framework Directive (WFD) Assessment: Your development proposal should have regard to the objectives the Water Environment (Water Framework Directive) Regulations 2017, and the Northumbria River Basin Management Plan, which requires the restoration and enhancement of water bodies to prevent deterioration and promote recovery of water bodies. We would expect a WFD assessment to be submitted in support of your DCO application. Your WFD assessment should consider the impact of the proposed development on the WFD status of the receiving water body Tees estuary (GB510302509900) and ensure that there is no deterioration resulting from their activities. Information about the status of the waterbody is available at TEES | Catchment Data Explorer. As well as water quality impacts, your WFD assessment consider impacts to fisheries, ecology, and the marine environment, both from the proposed activity	A WFD Screening and Scoping Assessment will be undertaken and will be issued to the Environment Agency for consultation as to the scope of assessment to be presented in the final WFD Assessment, that will be appended to the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		once operational and during the construction phase. Any impacts identified need to be minimised and/or mitigated against. These mitigation measures should go above and beyond simply preventing deterioration and should work to create a better environment.	
Environment Agency	Pre-Application Advice March 2023	Construction Environmental Management Plan: A Construction Environmental Management Plan (CEMP) should be submitted in support of your DCO application. With respect to water quality, the CEMP should address the following points: • Treatment and removal of suspended solids from surface water run-off during construction works; • Management of fuel and chemical spills during construction and operation, including the process in place to ensure the environment is not detrimentally impacted in the event of a spill; and • Construction runoff could contain hazardous chemicals and elements due to the site's location. Contaminated land is likely to be present on site, and a scheme would be required to manage the associated risks, and minimise mobilisation of hydrocarbons, heavy metals, and any other hazardous pollutants into the water environment during construction and site operation.	A Framework CEMP will be included in the ES. This will outline mitigation measures based on best practice, to prevent pollution of surface water or groundwater. Further details are given in Section 9.5 of this chapter. The Framework CEMP will be submitted as part of the ES whilst a Final CEMP will be produced and implemented by the appointed contractor post-consent.
Environment Agency	Pre-Application Advice March 2023	Drainage Strategy: In order to determine the water quality impacts, the following information should be submitted as part of your drainage strategy: • How rainwater will be handled and discharged from the site; and • How foul water will be handled and discharged from the site. This should include if the site will be connecting to Northumbrian water's public sewer network.	Noted. Drainage principles for the Proposed Development are outlined in Section 9.5 of this chapter. Further drainage details will accompany the DCO Application, and suitability assessed during the EIA process and reported in the ES.
Environment Agency	Pre-Application Advice March 2023	Reclaimed Water Supply: The applicant seeks to utilise reclaimed water to supply water for the proposed development. However, limited information has been provided on this matter. We recognise that reusing water will provide a substitute	Water supply will be from the River Tees via a connection to the existing

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		for either a new abstraction or increase the utilisation of existing abstractions. This will limit the environmental impact of the proposal and protect the flow regime of sources of supply. We are unable to provide further comments on the opportunities or constraints that could be associated with effluent reuse, as it is assumed that these sources of water are regulated discharges and are therefore controlled under a separate regulatory regime.	Northumbrian Water Limited (NWL) raw water feed.
Environment Agency	Pre-Application Advice March 2023	Discharge of Trade Effluent Effluent discharged from any premises carrying on a trade or industry, and effluent generated by a commercial enterprise where the effluent is different to that which would arise from domestic activities in a normal home is considered to be trade effluent. If you are not able to discharge effluent, it will be classed as waste, and you must then comply with your duty of care responsibilities. Any effluent discharging into the Tees estuary or the adjacent coastal waterbody will need to be assessed as part of the DCO application. This may involve a standalone water quality assessment along with hydrodynamic modelling. Depending on the nature of the discharge, additional chemical or thermal plume modelling may be required. If proposing to discharge to non-mains: If you wish to discharge effluent, after appropriately treating it, to groundwater or surface water a permit under the Environmental Permit Regulations will be required. Full characterisation of the effluent will be required, and modelling may be required at the planning stage to determine the impact of the effluent on the receiving watercourse. A trade effluent consent or a trade effluent agreement with your water and sewerage company (in this case likely to be Northumbrian Water) must be obtained before you discharge trade effluent to a public foul sewer or a private sewer that connects to a public foul sewer.	A provisional and qualitative assessment of effluent discharge is included within this chapter. Further quantitative hydrodynamic dispersion modelling of the effluent discharge to Tees Bay (for Case 2A and Case 2B) is being undertaken and will be reported within the ES. The Environment Agency and Natural England will be consulted further to confirm the modelling scope and review outputs as the modelling work develops. The modelling and associated consultation will be reported within the ES, including a standalone appendix to describe the modelling process and outcomes (for Case 2A and Case 2B).

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Environment Agency	Pre-Application Advice March 2023	Discharge of Clean Water: Clean surface water (i.e., clean, uncontaminated rainwater from hard standing areas such as roads and car parks) can be discharged to a watercourse without a permit if the discharge passes through a maintained oil interceptor or Sustainable Urban Drainage System. If a water attenuation system is proposed it would be beneficial to see the details, methods, and maintenance of the system to ensure longevity and effectiveness.	Noted. Drainage principles for the Proposed Development are outlined in Section 9.5 of this chapter. Further drainage details will accompany the DCO Application, and suitability assessed during the EIA process and reported in the ES.
Environment Agency	Pre-Application Advice March 2023	Construction Dewatering (Discharge): Discharge from temporary excavations can occur if the discharge can meet all of the conditions of the Regulator Position Statement "Temporary dewatering from excavations to surface water". This is available at https://www.gov.uk/government/publications/temporary-dewatering-from-excavations-to-surface-water/temporary-dewatering-from-excavations-to-surface-water). If any discharge cannot meet all the conditions, a Bespoke Environmental Permit would be required, this would follow the same timeline as other water quality permits stated under the discharge of trade effluent section of this response.	Noted. Permits and consents that are expected to be required by the Proposed Development are outlined in Section 9.5 of this chapter.
Environment Agency	Pre-Application Advice March 2023	Water Resources (Abstraction and Impoundment): The proposals may require Water Resource Licences in respect of the construction activities required and the eventual operation of the site. Water Resource (Impoundment and Abstraction) Licences are issued by the Environment Agency under the terms of the Water Resources Act 1991, and the provisions of the Water Resources (Abstraction and Impounding) Regulations 2006. The current estimated time to receive a water resources licence permit is between 6 and 9 months. Therefore, applications should be made at the earliest opportunity.	Noted. Permits and consents that are expected to be required by the Proposed Development are outlined in Section 9.5 of this chapter.
Environment Agency	Pre-Application Advice March 2023	Impounding licence: If you intend to impound a watercourse then you are likely to need an impounding licence from the Environment Agency. An impoundment is any dam, weir or other structure that can raise the water level of a water body	Noted. Permits and consents that are expected to be required by the

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		above its natural level. 'On-line' impoundments hold back water in rivers, stream, wetlands and estuaries, and consequently affect downstream flows, sediment transport and migration of fish. Impoundments could be created through works to modify or change existing watercourses. An Impoundment Licence could also be required if you amend, modify or remove existing in channel structures.	Proposed Development are outlined in Section 9.5 of this chapter.
Environment Agency	Pre-Application Advice March 2023	Construction Dewatering (Abstraction): Dewatering is the removal/abstraction of water (predominantly, but not confined to, groundwater) in order to locally lower water levels near the excavation. This can allow operations to take place, such as mining, quarrying, building, engineering works or other operations, whether underground or on the surface. The dewatering activities on-site could have an impact upon local wells, water supplies and/or nearby watercourses and environmental interests. This activity was previously exempt from requiring an abstraction licence. Since 1 January 2018, most cases of new planned dewatering operations above 20 cubic metres a day will require a water abstraction licence from us prior to the commencement of dewatering activities at the site.	Noted. Permits and consents that are expected to be required by the Proposed Development are outlined in Section 9.5 of this chapter.
Environment Agency	Pre-Application Advice March 2023	Nutrient Neutrality: Nutrient Neutrality applies to developments and discharges in this area. Please ensure liaison with Natural England is undertaken as this issue may have implications on your WFD assessment and technical assessments.	Noted. A Nutrient Neutrality Screening Report is included in Appendix 9B (PEI Report, Volume III). Consultation is being undertaken with Natural England as the Proposed Development design is progressed to ensure that nutrient neutrality is suitably assessed.
The Inspectorate	Scoping Opinion May 2023	Flood Zones. The Scoping Report identifies Flood Zones across the Study Area however does not include sub-categories, such as an area of high probability (Flood Zone 3a) or functional floodplain (Flood Zone 3b). The ES should provide an	Noted. Refer to Figure 9-3: Evaluating Magnitude for Surface Water, Flood Risk and Water Resources, (PEI

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		accurate and consistent description of the baseline flood risk for each element of the Proposed Development and the description should clearly distinguish between Flood Zones, including Flood Zones 3a and 3b where relevant. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding Flood Zones; the Inspectorate notes that there is a discrepancy between information in the Scoping Report, which identifies that Main Site B is entirely within Flood Zone 1, and the EA's information, which states it is primarily within Flood Zone 1 but partially within Flood Zones 2 and 3. The Flood Zone should be confirmed within the ES and mitigation identified as required.	Report, Volume II) for fluvial flood risk mapping. A further description is provided in the Preliminary FRA (Appendix 9A, PEI Report, Volume III) and summarised in this chapter.
The Inspectorate	Scoping Opinion May 2023	Pollution of surface water courses during operation. The Scoping Report scopes in assessment for this matter during construction and decommissioning. Consideration of the potential for accidental spillages during operation is proposed to be assessed as part of Geology, Hydrogeology and Contaminated Land (paragraph 6.4.88 of the Scoping Report). Cross-reference should be made to the outcome of that assessment in the Surface Water Resources chapter of the ES.	Assessment of pollution to surface watercourses is addressed in this chapter. Refer to Section 9.5 for Development Design and Impact Avoidance and Section 9.6 Likely Impacts and Effects for the impact assessment. Cross-references are made to other chapters where appropriate.
The Inspectorate	Scoping Opinion May 2023	Additional assessments. The Inspectorate notes that a Flood Risk Assessment (FRA), Water Framework Directive (WFD) assessment and nutrient neutrality assessment will be prepared. Information from these assessments should be used to inform preparation of the ES. The Scoping Report describes surface water bodies and groundwater bodies designated under the WFD, which are located close to the Proposed Development. The ES should include an assessment of the likely significant effects to both types of WFD water body. The Applicant's attention is drawn to the EA's comments in regarding scope of the WFD and nutrient neutrality assessments.	Noted. A preliminary impact assessment is presented in this chapter taking into account Appendix 9A: Preliminary FRA, (PEI Report, Volume III) and Nutrient Neutrality Screening Appendix 9B (PEI Report, Volume III). The assessment will be updated as appropriate for the ES when further Proposed Development design details are available.

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The Inspectorate	Scoping Opinion May 2023	Scope of assessment – FRA. The FRA underpinning the ES assessment should additionally cover matters including the effect that temporary mounds of soil in the floodplain could have on flood risk, the volumes of water displacement involved and mitigation measures where necessary. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding scope of the FRA and climate change allowances.	Noted. Refer to the Appendix 9A: Preliminary FRA (PEI Report, Volume III).
The Inspectorate	Scoping Opinion May 2023	Impacts from frac-out. The ES should include an assessment of likely significant effects arising from frac-out i.e. fracking fluid breakout during HDD works, on aquatic environment receptors and water resource receptors, including consideration of any impacts arising from clean-up works.	Noted. Impacts from frac-out have been considered. Refer to Section 9.5 for Development Design and Impact Avoidance and Section 9.6 Likely Impacts and Effects for the impact assessment.
The Inspectorate	Scoping Opinion May 2023	Scope of assessment. The ES should assess the potential for an increase in offsite flood risk arising from any proposed ground raising within the development boundary, including the pipeline corridors. Effort should be made to agree the scope of the assessment, including the requirement for flood modelling, with the EA. The ES should identify any mitigation required to address likely significant effects.	Noted, refer to Appendix 9A: Preliminary FRA (PEI Report, Volume III). Flood risk effects (including offsite flood risk) are summarised in this chapter.
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Offsite Flood Risk. If ground raising is occurring within part of the development boundary, and the existing ground levels are below the design flood event, then an assessment will be required to confirm no increase in offsite flood risk. Given current topographical levels of the Main Site and if ground raising is significant which is below the design flood event, then flood modelling should be undertaken. If the pipeline is causing any ground raising or is above ground which could impact local flood mechanisms, an assessment will be required to understand any increase in offsite flood risk and provide mitigation measures, this assessment could include modelling.	Noted – refer to Appendix 9A: Preliminary FRA (PEI Report, Volume III). Flood risk effects (including offsite flood risk) are summarised in this chapter. Continued consultation with the Environment Agency will be maintained should modelling be required during the EIA.

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Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Hydrogen Pipeline Corridor. The proposed hydrogen pipeline corridor heading north towards the Venator Plant, could affect our flood defence assets along Greatham Creek and the EA's land holding at Marsh House Farm. In addition, all three routes (labelled R1, R2 and R3 on a document previously supplied to the EA ('All Utility Connection Corridor, Figure 1') could have a significant impact on Greatham Creek and its associated saltmarsh habitat – the last remaining natural area of the original Tees Estuary. In particular, R2 and R3 in particular are of significant concern to the EA. R2 runs along the line of one of our major flood defences at Cowpen Marsh. The defence lies between the Cowpen Bewley Landfill (to the West) and the Teesmouth and Cleveland Coast Special Protection Area (SPA) (to the East). As such, any work along this corridor could impact one the three current land uses. To the north of Greatham Creek, R2 then runs through Saltern Wetlands (an area of saltmarsh owned by the EA) and under the EA's flood embankment to the south of the ConocoPhillips tank farm. The EA has concerns that this route will have an impact on the wetland area, which lies within the SPA, and flood defences. R1 crosses the no. 4 brinefield (owned by Sabic and used for hydrocarbon storage), and under the flood embankment on the south bank of Greatham Creek (Sabic Embankment). It also lies under the flood embankment on the north bank of Greatham Creek, which is to be significantly repaired as part of EA's Greatham North East Flood Alleviation Scheme (FAS). This route also crosses the redundant no. 5 brinefield (owned by Inovyn Chlorvinyl Ltd) and the ConocoPhillips oil pipeline corridor and Seal Sands Emergency Access Road. R3 crosses our land at Marsh House Farm to be used for the extraction of clay in 2024-2026 for our Greatham NE FAS. The EA is also developing a scheme (Greatham North East FAS) to improve the defences to the south of the Venator Plant. We expect to submit an application for planning permission in Spring 2024 and hope to start construction of the scheme in summer 2024. We are currently	Noted, interfaces with the Greatham Creek flood alleviation scheme have been taken into account during determining the route of the Hydrogen Pipeline Corridor. Impacts on flood defences are considered in Appendix 9A: Preliminary FRA (PEI Report, Volume III). Continued consultation with the Environment Agency will be maintained to ensure there are no impacts to flood defence assets. Potential impacts and effects to habitats are considered in Chapter 12: Ecology and Nature Conservation (including Aquatic Ecology) (PEI Report, Volume I). Impacts on surface waterbodies and groundwater bodies related to the pipelines are considered in this chapter.

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		seeking contributions from beneficiaries of the scheme. As the proposed pipeline could benefit from our works, we would welcome discussions with the applicant on the potential for financial contributions from DCO, if R1 is chosen as the preferred route.	
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Pipelines. The EA would require the existing flood standard of protection, provided by the defences to be maintained both during the construction of the pipeline, and after completion of the scheme, whichever route is chosen. In order minimise the impact of the DCO on our flood defences, consideration should be given to the following comments: Pipeline Design • Where the pipeline crosses a flood defence structure below ground, designs for the pipeline must include a load case for the top water level. This may be different at each location. The pipeline must also be at a suitable depth to ensure the stability of the flood defence structure, this is to be demonstrated in submitted designs; • The scoping report states the pipeline will not cross our flood defence structure above ground. If this is to change, loading to our asset will need to be considered and the design must not impede access for routine maintenance and inspections of the flood defence structure; • If the pipeline crosses a watercourse above ground, it must be appropriately designed and positioned to prevent accumulation of debris and localised increases in water levels; • Where the pipeline is to utilise existing pipework that crosses watercourses, it is expected that modifications to the structure will be made where possible for improved conveyance and reduce debris accumulation; and	Noted. These considerations will be taken into account during Proposed Development design development. Full details regarding pipeline design are being developed, and so worst-case assumptions have been considered in this chapter.

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		• Where ground levels near a flood defence are to be disturbed on either a permanent or temporary basis, designs must not allow additional water to pond at the toe of the flood defence.	
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Pipeline Construction. • Open trench methodology is not permitted when crossing a flood defence. Excavations near the footprint of a flood defence must remain a safe distance away from the toe of the defence to ensure stability of the defence. This must be demonstrated in submitted designs; and • Directional drilling would be permitted when crossing a flood defence provided: - The drilling operation does not affect the stability of the flood defence structure by inducing a geotechnical failure, including when it is retaining flood water; and - The drilling or permanent works do not provide a conduit for water seepage underneath the flood defence structure, including when it is retaining flood water.	Noted. These considerations will be taken into account during ongoing Proposed Development design.
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Pipeline Maintenance. • Repairs or future improvement works will be subject to an Environmental Permit from the EA if taking place within 16 m of a flood defence; and • Routine maintenance activities on the pipeline should be detailed within the DCO application.	Noted. Information regarding maintenance activities pertaining to pipelines will be included during the EIA and reported in the ES.
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice	Flood Defence Maintenance. In order to maintain the standard of protection, the EA requires continued access to continue routine maintenance of the existing and planned defences. Any permissions or legal agreements to allow these works to go	Noted. Environment Agency access will be incorporated as necessary.

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
	responses outlined above)	ahead, must be agreed in advance of pipeline construction. It should be noted that the EA have statutory powers to carry out works on our assets.	
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Drinking Water Protected Areas. The scoping report states there are no drinking water protected areas within 1 km (or in Section 6.3.8, 15km) of the proposed development area. In terms of groundwater, all groundwater bodies in England are designated as drinking water protected areas. As such, the development area sits upon a groundwater drinking protected area.	Noted. Clarified within this chapter that this refers to drinking protected areas for surface water.
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Drainage. In terms of SUDs, we would recommend that there is no increase in infiltration within the development area. This is to avoid the risk of contaminant mobilisation given the industrial heritage of the area. This ties into section 6.4.88 where the scope of assessment includes 'disturbance of contaminated soils and perched groundwater, and the creation of new pathways to sensitive receptors (including construction workers and controlled waters) during construction.	Surface water drainage is proposed to be discharged to Tees Bay following treatment and so there would be no increase in infiltration. Drainage principles for the Proposed Development are outlined in Section 9.5 of this chapter. Further drainage details will accompany the DCO Application, and suitability assessed during the EIA and reported in the ES.
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	The Water Environment (Water Framework Directive) (WFD) Regulations. The applicant should provide an assessment of the impact of the proposal on water quality in respect to the following waterbodies: • Tees (GB510302509900) • Tees Coastal (GB650301500005) • Tees Estuary (South Bank) GB103025072320)	A WFD Assessment will be presented in the ES. This will include potential for impacts relating to pipeline corridors.

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		The WFD assessment will need to have regard to the Water Environment Regulations (WER) / WFD, and the Northumbria River Basin Management Plan (NRBMP). The applicant should ensure that: • The pipeline corridors do not add to the physical modification of the water environment unless equivalent appropriate mitigation measures are put in place; and • Pipeline corridor routes and excavations should as far as practicably minimise or avoid the crossing of watercourses, and not run proximate and parallel to watercourses. In particular, pipeline corridors should not be situated so as to jeopardise the potential for restoration of intertidal and riverine habitats that support the recovery of the Teesmouth and Cleveland Coast SPA. Preferably pipeline corridors should follow existing physical modifications such as road infrastructure or existing pipeline corridors.	
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Nutrient Neutrality. For clarification of the statement at 6.3.9, the Teesmouth and Cleveland Coast SPA is within the Tees catchment where future development must be nutrient neutral to ensure no deterioration in WER (WFD) Dissolved Inorganic Nitrogen (DIN) element status. Reductions below the current baseline are required to achieve the protected area objectives. Similarly, the undertaking at 6.3.36 to carry out a Nutrient Neutrality Screening Assessment to assess likely impact on achievement of the targets for the WFD DIN element is acknowledged and supported. This should include the potential impact from emissions to air.	Noted. A Nutrient Neutrality Screening Report is included in Appendix 9B (PEI Report, Volume III). Consultation will continue with Natural England as the Proposed Development design is progressed to ensure that nutrient neutrality is suitably assessed.
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-	Baseline conditions. The Scoping Report identifies in section 2.2 that large areas of the proposed development site was historically intertidal habitat within the Tees estuary. The progressive infilling of the estuary, port development and subsequent flood protection modifications have contributed to the Tees estuary waterbody	A freedom of information request has been sent to the Environment Agency to obtain additional information regarding WFD mitigation measures.

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
	application advice responses outlined above)	being designated as a Heavily Modified Waterbody (HMWB) under WFD. In order to achieve the overarching WFD objective of Good Ecological Potential (GEP) in HMWBs, mitigation measures must be taken to address the ongoing ecological impacts of such modifications and prevent deterioration on this baseline. A Mitigation Measures Assessment has been undertaken and various information on appropriate mitigation measures is available. However, the limitations of the Catchment Data Explorer portal are such that this information cannot currently be provided through that platform.	
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Future baseline. The Tees estuary is undergoing a period of ecological recovery after decades of industrial and sewage pollution. The future ecological baseline conditions are likely to be an improvement on the current conditions because of interventions already completed. Future baseline conditions will also be influenced by imminent legislation (Levelling Up Bill) and regulatory requirements (Water Company Price Review) that are likely to require significant reductions in the level of nutrients within the Tees estuary and within the timeframe of the proposed development. The area is also already subject to nutrient neutrality advice that aims to ensure no deterioration of current environmental conditions. The WFD assessment should therefore take account of such future baseline conditions.	The assessment presented in this chapter. A WFD Assessment will be provided in the ES.
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	Foul drainage. We would expect to see the following points to be addressed within the DCO application: • Confirmation of which sewage treatment works will receive the foul flows. • Confirmation that there is sufficient capacity in the receiving Northumbrian Water network to accept the flows without increasing storm overflow spills. • Confirmation that there is sufficient capacity at the receiving sewage treatment works (STW) to accept the flows while still operating within the permitted flow and quality limits.	Noted. Foul drainage will be discharged to Marske-by-the-Sea WwTW. Further engagement will be undertaken with NWL to confirm this arrangement and that there is sufficient capacity.

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		• The applicant will need to produce their own WFD assessment to demonstrate the impact of the proposed development on the receiving watercourse. • If there is insufficient capacity within the network or at the STW, details of an appropriate phasing approach for the development to enable the necessary upgrades to the sewage network before connecting the development should be provided.	
Environment Agency	Scoping Opinion May 2023 (only included where different or additional to the pre-application advice responses outlined above)	EA and Partner Projects. The EA and partners are bringing forward a programme of projects designed to mitigate the ongoing ecological impact of historical physical modifications on the Tees estuary and tributaries. The current Programme is scheduled to be completed by the commissioning date of the proposed development. The DCO should not jeopardise attainment of these WFD mitigation measures. Therefore, the developer may wish to support these projects so as to demonstrate appropriate mitigation of any impacts, or to secure betterment of the local environment: • The Tees Tidelands Programme is led by the EA and Stockton-on-Tees Borough Council, and consists of a number of projects that aim to restore intertidal habitats and ecologically reconnect the Tees estuary to tributaries. • The EA Seal Sands SSSI restoration project is initially focusing on building a Tees estuary baseline hydraulic model, but in the future also seeks to identify the prioritised physical interventions to manage excess growth of macroalgae. • The Tees Rivers Trust (TRT) are undertaking a Tees Estuary Edges project to install a suite of bio-engineered designs that enhance ecology in the highly modified Tees navigation channel. • TRT are also undertaking species (oyster, seagrass, mussel) reintroduction projects at locations within Tees Bay and the estuary. • The Canal and River Trust (CRT) are developing designs to secure enhanced fish passage across the Tees Barrage and so throughout the Tees catchment.	Noted. These projects are incorporated into the baseline presented in this chapter and any potential impacts on these considered where necessary in the assessment in this chapter.

CONSULTEE	DATE AND METHOD OF CONSULTATION	CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
Natural England	Scoping Opinion May 2023	Nutrient Neutrality. Natural England's Nutrient Neutrality advice is that new developments should not result in additional nitrogen entering the catchment of the River Tees upstream of the Teesmouth & Cleveland Coast SPA and Ramsar site (i.e. they are nutrient neutral). This advice applies primarily to development involving overnight accommodation i.e. it focuses on additional volumes of treated wastewater arising as a result of new house building. However in order to restore the SPA to favourable condition the wider effects of nutrient inputs into the Tees hydrological catchment are also relevant. As a result we note and welcome the applicant's recognition of the nutrient pollution theme (paragraphs 6.3.35-37). The Habitats Regulations Assessment (HRA) process provides the means to assess the proposal and we acknowledge paragraphs 6.6.27-31 accordingly. Natural England looks forward to continued dialogue with the applicant to progress this element of the proposal.	Noted. A Nutrient Neutrality Screening Report is included in Appendix 9B (PEI Report, Volume III). Consultation will continue with Natural England as the Proposed Development design is progressed to ensure that nutrient neutrality is suitably assessed.

9.3.8 A freedom of information request was issued to the Environment Agency in March 2023 to receive the latest baseline information relating to water resources, flood risk and WFD waterbodies. A response had not been received at the time of writing in May 2023. Any data subsequently received will be included in the baseline in the ES.

Impact Assessment Methodology

Desk Study

9.3.9 Desk based research has been undertaken to identify the waterbodies within and adjacent to the Proposed Development Site and defined Study Area, and to gather and critically evaluate relevant data and information on their condition and attributes. The Environment Agency's online Main Rivers and flood maps have also been reviewed.

9.3.10 In summary, the key background reports, websites and data used include the following (all web sources last accessed in January 2023):

- RCBC's Local Plan (2018) (RCBC, 2018);
- STBC's Local Plan (2019) (STBC, 2019);
- British Geological Survey Geological Mapping Viewer, 'GeoIndex' (British Geological Society (BGS), (British Geological Survey , 2023);
- Environment Agency Catchment Data Explorer (Environment Agency, 2023a);
- Environment Agency Flood Risk Maps (Environment Agency, 2023b);
- Environment Agency Bathing Water Quality website (Environment Agency, 2023c);
- Environment Agency Ecology and Fish Data Explorer (Environment Agency, 2021);
- Environment Agency Guidance on discharges to surface water and groundwater: environmental permits (Environment Agency, 2016);
- DEFRA Hydrology Data Explorer website (DEFRA, 2021b);
- Environment Agency Water Quality Archive website (Environment Agency, 2023d);
- Centre for Ecology and Hydrology (CEH)'s National River Flow Archive (CEH, 2021);
- Cranfield University 'Soilscapes' (Cranfield University, n.d.);
- Met Office Climate averages data (Met Office, n.d.);
- Defra Multi-Agency Geographic Information for the Countryside (MAGiC) website (Defra, 2023);
- Ordnance Survey (OS) maps and aerial photography (Bing, 2023);
- Data requested from the Environment Agency with regard to water quality of receptors in the Study Area, water resources (licensed abstractions and

discharge consents), pollution incidents, fisheries and aquatic ecology data and WFD information and data;

- Data requested from the Environment Agency with regard to fluvial and tidal flood risk, flood defences, flood water levels derived from hydraulic modelling studies and climate change allowances; and
- Information available in previous planning applications relating to Tees Estuary and Tees Bay – Net Zero Teesside (EN010103); Improvement of the Inter Terminals (MLA/2019/00151), Teesside Offshore Windfarm (32421/040319/14), Able Seaton Berth Dredging (MLA/2015/00334/4), York Potash Harbour Facilities Order (TR 030002).

Site Surveys

9.3.11 A walkover survey was undertaken on 15th February 2023 by a surface water quality specialist and hydromorphologist in cold, dry and fair conditions. The walkover focused on surface water features in the Study Area, observing their current character and condition, the presence of existing risks and any potential pathways for construction and operational impacts from the Proposed Development.

9.3.12 A programme of water quality monitoring was undertaken of a single pond (known as 'Pond 14' within Coatham Dunes) between January 2023 and March 2023, to provide an update to previous monitoring undertaken for the Net Zero Teeside (NZT) project, as previously outlined in the Scoping Report. Monitoring was required for this pond as this is the only permanently open water pond in the adjacent sand dunes and was previously identified as being potentially susceptible to adverse water quality impacts related to atmospheric nitrogen deposition. More detail is provided later in this chapter. The results of this monitoring are summarised in Section 9.4.

Source-Pathway-Receptor Approach

9.3.13 The impact assessment is based on a source-pathway-receptor approach. For an impact on the water environment to exist, the following is required:

- an impact source (such as the release of polluting chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or the loss or damage to all or part of a water feature);
- a receptor that is sensitive to that impact (i.e. water feature and the services they support); and
- a pathway or pathways by which the two are linked.

9.3.14 The first stage in applying the Source-Pathway-Receptor model is to identify the causes or 'sources' of potential impact from a development. The sources of impact have been identified through a review of the details of the Proposed Development as currently known, including the size and nature of the development, potential construction methodologies and timescales.

9.3.15 The next step in the model is to undertake a review of the potential receptors, that is, the water environment receptors in the Study Area that have the potential to be

affected. Water features including their attributes have been identified through desk study and site surveys.

9.3.16 The last stage of the model is, therefore, to determine if there is a viable exposure pathway or a 'mechanism' linking the source to the receptor. This has been undertaken in the context of local conditions relative to the water receptors within the Study Area, such as topography, geology, climatic conditions and the nature of the impact (e.g., the mobility of a liquid pollutant or the proximity to works that may physically impact a water body).

9.3.17 The assessment of the likely significant effects is qualitative, and considers construction, operational and decommissioning phases of the Proposed Development, as well as cumulative effects with other developments. This assessment considers the risk of pollution to surface water features directly and indirectly from construction, operational and decommissioning activities, particularly in relation to those water features which are within or close to the Proposed Development Site. The risk of pollution from urban runoff and the increased demand on water resources has also been considered so that appropriate measures (e.g. SuDS, proprietary treatment devices and water conservation measures) can be incorporated into the Proposed Development design, as applicable. Where other elements of the Proposed Development may be subject to consent under separate planning applications (e.g., any new pipework or outfalls that may be required for surface water discharge to Dabholm Gut), these would also be considered within the cumulative assessment.

9.3.18 Some specific assessments have been undertaken to support the impact assessment process. These are described in more detail in the following sections.

Assessment of Surface Water Runoff for the Operational Phase

9.3.19 Surface water runoff from development sites of this type may contain pollutants derived from urban surfaces (e.g., inert particulates, litter, hydrocarbons, metals, nutrients and de-icing salts). This mixture of pollutants is collectively known as 'urban diffuse pollutants,' and although each pollutant may itself not be present in harmful concentrations, the combined effects over the long term can cause chronic adverse impacts. There is not considered to be an appreciably greater risk of such pollution from the Proposed Development in comparison to the existing site, nonetheless, an assessment is needed to determine the potential risk to receiving watercourses and to inform the development of suitable treatment measures. There is an opportunity to provide betterment over the existing scenario using SuDS for water quality treatment.

9.3.20 The appropriateness of the surface water drainage measures in terms of providing adequate treatment of diffuse urban pollutants will be assessed with reference to the Simple Index Assessment method described in the SuDS Manual (CIRIA, 2015a). The Simple Index Approach follows three steps:

- Step 1 – Determine suitable pollution hazard indices for the land use(s);

- Step 2 – Select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index (for three key types of pollutants - total suspended solids, heavy metals, and hydrocarbons). Only 50% efficiency should be applied to second, third etc. treatment train components; and
- Step 3 – If the discharge is to a water body protected for drinking water, consider a more precautionary approach.

9.3.21 The SuDS Manual (CIRIA, 2015a) only provides a limited number of land use types and so those chosen will be land uses that best reflect the components of the Proposed Development. Where more than one pollution hazard category applies to a component of the Proposed Development, the worst pollution hazard has been selected. For areas where site specific industrial activities may take place or there is a greater risk of a chemical spillage, a process specific risk qualitative assessment will need to be undertaken.

9.3.22 At this stage, a Vent and Drain Philosophy and Surface Water Drainage Plan has been prepared for the Proposed Development and forms the basis of a high-level qualitative assessment for the purposes of the preliminary assessment. SuDS treatment trains remain under development and so the full runoff assessment that utilises the SuDS Manual Simple Index Approach will be included in the ES.

Water Framework Directive Screening and Scoping Assessment

9.3.23 Proposed developments having the potential to impact current or predicted WFD status are required to assess their compliance against the objectives defined for potentially affected water bodies. As part of its role, the Environment Agency must consider whether proposals for new developments have the potential to:

- cause a deterioration of a water body from its current status or potential; and/or
- prevent future attainment of Good status (or potential where not already achieved).

9.3.24 The following guidance on how to undertake WFD assessments has been used and will inform a Water Framework Directive Screening Assessment that will be included in the ES:

- Environment Agency Advice Note – Water Framework Directive Risk Assessment: How to Assess the Risk of Your Activity (Environment Agency, 2016);
- Environment Agency Guidance - Water Framework Directive Assessment: Estuarine and Coastal Waters (Clearing the Waters for All) (Environment Agency, 2017); and
- The Planning Inspectorate Advice Note 18: The Water Framework Directive (The Inspectorate, 2017).

9.3.25 WFD assessments should be undertaken in three stages. The first stage is ‘screening’, the aim of which is to identify the Proposed Development components that could affect WFD status and ‘screen out’ aspects of the project that do not require any further consideration. The second stage is ‘scoping’, whereby WFD receptors that are potentially at risk are identified and it is determined how the risk will be assessed.

Finally, and if required, the third stage involves a full impact assessment, including consideration of the criteria for derogation (if one is expected to be required) as outlined in Regulation 19 of The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

9.3.26 A WFD Screening and Scoping assessment for the Proposed Development will be undertaken and will be issued to the Environment Agency for consultation. Where required, further impact assessment stages will also be undertaken and included within the ES as appropriate.

Nutrient Neutrality Assessment

9.3.27 Natural England has identified the Teesmouth and Cleveland Coast SPA as a site that is impacted by excess nutrients. In particular, the Seal Sands area is known to be adversely impacted; excessive growth of algal mats is impacting feeding opportunities for the bird populations that the SPA is designated for. Any development in the catchment of the SPA that may lead to an increase in the nitrogen emissions into the designated site must be supported by a robust nutrient neutrality assessment.

9.3.28 A Nutrient Neutrality Screening Assessment is included in Appendix 9B (PEI Report, Volume III). The screening identifies all possible sources of nitrogen from the Proposed Development (including atmospheric deposition, changes in discharges from local WwTW and direct treated effluent discharges) and considers (1) whether this is a new source or fundamentally already part of the catchments nutrient baseline; and (2) whether there is a pathway to the SPA. Where there is scope to reduce nutrient emissions compared to baseline from the Proposed Development Site, this will also be considered. Natural England will be consulted on the outcome of the assessment during which the scope for further assessment will be agreed and included during the EIA and reported in the ES.

Discharge Modelling: Assessment of Process Water discharge

9.3.29 Case 2A and Case 2B of the Proposed Development (described further later in the chapter) would discharge treated process water effluent to Tees Bay. Hydrodynamic dispersal modelling of discharges to Tees Bay, will be undertaken during the EIA to assess potential impacts on the qualifying features of the Teesmouth and Cleveland Coast SPA/Ramsar and the potential for effluent to disperse into the Tees Estuary e.g., by tidal effects.

9.3.30 Due to the Teesmouth and Cleveland Coast SPA/Ramsar being affected by nutrient neutrality with regards to nitrogen, and the fact that Tees estuary is failing to achieve Good WFD status for dissolved inorganic nitrogen (DIN), there will be a particular focus on modelling dispersal of nitrogen (in all of its forms), and this will inform the nutrient neutrality and WFD assessments described above, as well as the Habitats Regulation Assessment.

9.3.31 Consultation on the scope of the water dispersion modelling with the Environment Agency and Natural England will continue during the EIA. The results of the modelling will be reported in the ES.

Flood Risk Assessment

9.3.32 A Site-wide Preliminary Flood Risk Assessment (FRA) is provided as Appendix 9A (PEI Report, Volume III), which, based on information received to date, assesses the current risk of flooding from all sources including fluvial, surface water, groundwater, tidal, artificial sources and drainage infrastructure. The Preliminary FRA includes a full description of the flood risk baseline, which is also summarised in Section 9.4. This will be reviewed and updated during the EIA once further data has been received from the Environment Agency.

Classification of Effects and Significance Criteria for EIA Assessment

9.3.33 There is no standard guidance in place for the assessment of the likely significant effects on the water environment from developments of this type. Based on professional judgement and experience of other similar schemes, a qualitative assessment of the likely significant effects on surface water quality and water resources has been undertaken.

9.3.34 The classification and significance of effects has been determined using the principles of the guidance and the criteria set out in DMRB LA 113 (Highways England, 2019) adapted to take account of hydromorphology. Although these assessment criteria were developed for road infrastructure projects, this method is suitable for use on any development project, and it provides a robust and well tested method for predicting the significance of effects.

9.3.35 Approaches to mitigating potential impacts during the construction, operational and decommissioning phases of the Proposed Development have been described with reference to good practice guidance and design.

9.3.36 Following the DMRB LA 113 (Highways England, 2019) guidance, the importance of the receptor (Table 9-2) and the magnitude of impact (Table 9-3) are determined independently and are then used to determine the overall classification and significance of effects (see Table 9-4). Where significant adverse effects are predicted, options for mitigation have been considered and proposed where possible. The residual effects of the Proposed Development with identified mitigation in place have also been assessed.

9.3.37 Whilst other disciplines may consider ‘receptor sensitivity’, ‘receptor importance’ is considered herein. This is because when considering the water environment, the availability of dilution means that there can be a difference in the sensitivity and importance of a water feature. For example, a small drainage ditch of low conservation value and biodiversity with limited other socio-economic attributes, is very sensitive to impacts, whereas an important regional scale watercourse, that may have conservation interest of international and national significance and support a wider range of important socio-economic uses, is less sensitive by virtue of its ability to assimilate discharges and physical effects. Irrespective of importance, all controlled waters in England are protected by law from being polluted.

Table 9-2: Evaluating the Importance for Surface Water, Flood Risk, and Water Resources[1]

IMPORTANCE	GENERAL CRITERIA	SURFACE WATER	GROUNDWATER	MORPHOLOGY[2]	FLOOD RISK
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.	Watercourse having a WFD classification shown in a RBMP and Q95≥1.0 m^3/s. Sites protected/designated under an EC or UK legislation (SAC, SPA, SSSI, Ramsar, salmonid water) / Species protected by EC legislation Ecology and Nature Conservation.	Source Protection Zone (SPZ) 1; Principal aquifer providing a regionally important resource and/or supporting a site protected under EC and UK legislation; Groundwater locally supports Groundwater Dependent Terrestrial Ecosystems (GWDTE); Water abstraction: >1,000 m^3/day	Unmodified, near to or pristine conditions, with well-developed and diverse geomorphic forms and processes characteristic of river type.	Essential Infrastructure or highly vulnerable development. Very high risk from non-fluvial/non-tidal flood sources.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.	Watercourse having a WFD classification shown in a RBMP and Q95<1.0 m^3/s. Species protected under EC or UK legislation Ecology and Nature Conservation.	Principal Aquifer providing locally important source supporting river ecosystem; SPZ2; Groundwater supports GWDTE; Water abstraction: 500–1,000 m^3/day.	Conforms closely to natural, unaltered state and would often exhibit well developed and diverse geomorphic forms and processes characteristic of river type, with abundant bank side vegetation. Deviates from natural conditions due to direct and/or indirect channel, floodplain, and/or catchment development pressures.	More vulnerable development. High risk from non-fluvial/non-tidal flood sources.

IMPORTANCE	GENERAL CRITERIA	SURFACE WATER	GROUNDWATER	MORPHOLOGY[2]	FLOOD RISK
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value or is of regional importance.	Watercourses not having a WFD classification shown in a RBMP and Q95 >0.001m^3/s.	Secondary Aquifer providing water for agricultural or industrial use with limited connection to surface water SPZ 3; Water abstraction: 50–499 m^3/day.	Shows signs of previous alteration and / or minor flow regulation but still retains some natural features or may be recovering towards conditions indicative of the higher category.	Less vulnerable development. Medium risk from non-fluvial/non-tidal flood sources.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.	Watercourses not having a WFD classification shown in a RBMP and Q95 ≤0.001m^3/s.	Generally Unproductive strata. Water abstraction: <50 m^3/day	Substantially modified by past land use, previous engineering works or flow regulation and likely to possess an artificial cross-section (e.g., trapezoidal) and would probably be deficient in bedforms and bankside vegetation. Could be realigned or channelised with hard bank protection, or culverted and enclosed. May be significantly impounded or abstracted for water resources use. Could be impacted by navigation, with associated high degree of flow regulation and bank	Water compatible development. Low risk from non-fluvial/non-tidal flood sources

IMPORTANCE	GENERAL CRITERIA	SURFACE WATER	GROUNDWATER	MORPHOLOGY[2]	FLOOD RISK
				protection, and probable strategic need for maintenance dredging. Artificial and minor drains and ditches would fall into this category.	

Note 1 Professional judgement is applied when assigning an importance category to all water features.
All controlled waters are protected from pollution under the Environmental Permitting (England and Wales) Regulations 2016 and the Water Resources Act 1991 (as amended), and future WFD targets also need to be considered.

Note 2 Based on the water body 'Reach Conservation Status' presently being adopted for another major infrastructure project (developed originally by Atkins) and developed from EA conservation status guidance (Environment Agency 1998a, Environment Agency, 1998b) as DMRB guidance does not currently provide any importance criteria for morphology.

9.3.38 The magnitude of impact has been determined based on the criteria in Table 9-3 considering the likelihood of the impact occurring. The likelihood of an impact occurring is based on a scale of certain, likely, or unlikely.

Table 9-3: Evaluating Magnitude for Surface Water, Flood Risk and Water Resources

IMPACT	CRITERIA	DESCRIPTION AND EXAMPLES
Major Adverse	Results in a loss of attribute and/or quality and integrity of the attribute	Surface Water: Loss or extensive change to a fishery. Loss of regionally important public water supply. Loss or extensive change to a designated Nature Conservation Site. Reduction in water body WFD classification Groundwater: Loss of, or extensive change to, an aquifer. Loss of regionally important water supply. Loss of, or extensive change to groundwater dependent terrestrial ecosystem (GWDTE) or baseflow contribution to protected surface water bodies. Reduction in water body WFD classification. Loss or significant damage to major structures through subsidence or similar effects. Flood Risk: Increase in peak flood level (>100mm). Change in flood risk to receptor from low or medium to high; Permanent adverse effect on local drainage system and subsequent capacity implications.
Moderate Adverse	Results in effect on integrity of attribute, or loss of part of attribute	Surface Water: Partial loss in productivity of a fishery. Degradation of regionally important public water supply or loss of major commercial/industrial/agricultural supplies. Contribution to reduction in water body WFD classification. Groundwater: Partial loss or change to an aquifer. Degradation or regionally important public water supply or loss of significant commercial/industrial/agricultural supplies. Partial loss of the integrity of GWDTE.

IMPACT	CRITERIA	DESCRIPTION AND EXAMPLES
		Contribution to reduction in water body WFD classification. Damage to major structures through subsidence or similar effects or loss of minor structures. Flood Risk: Increase in peak flood level (>50 mm). Change in flood risk to receptor from low to medium; Severe temporary adverse effect on local drainage system and subsequent capacity issues
Minor Adverse	Results in some measurable change in attribute's quality or vulnerability	Surface Water: Minor effects of water supplies. Groundwater: Minor effects on an aquifer, GWDTEs, abstractions and structures. Flood Risk: Increase in peak flood level (>10mm). Change in flood risk to receptor from no risk to low risk; Minor effect on local drainage system and subsequent capacity issues
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use or integrity	Surface Water / Groundwater: No risk identified to surface water quality or hydro-morphology. The proposed project is unlikely to affect the integrity of the water environment. Flood Risk: Negligible change in peak flood level (≤+/- 10 mm). No change in flood risk to the receptor; Negligible change on local drainage system
Minor Beneficial	Results in some beneficial impact on attribute or a reduced risk of negative effect occurring	Surface Water: Contribution to minor improvement in water quality, but insufficient to raise WFD classification.

IMPACT	CRITERIA	DESCRIPTION AND EXAMPLES
		Groundwater: Reduction of groundwater hazards to existing structures. Reductions in waterlogging and groundwater flooding. Flood Risk: Creation of flood storage and decrease in peak flood level (>10 mm) Change in flood risk to receptor from low risk to no risk; Minor reduction in surface water run-off and subsequently the impact on the local drainage system.
Moderate Beneficial	Results in moderate improvement of attribute quality	Surface Water: Contribution to improvement in waterbody WFD classification. Groundwater: Contribution to improvement in water body WFD classification. Improvement in water body catchment abstraction management strategy (CAMS) (or equivalent) classification. Support to significant improvements in damaged GWDTE. Flood Risk: Creation of flood storage and decrease in peak flood level (>50 mm) Change in flood risk to receptor from medium to low Moderate reduction in surface water run-off and subsequently the impact on the local drainage system.
Major Beneficial	Results in major improvement of attribute quality	Surface Water: Removal of existing polluting discharge or removing the likelihood of polluting discharges occurring to a watercourse. Improvement in water body WFD classification. Groundwater: Removal of existing polluting discharge to an aquifer or removing the likelihood of polluting discharges occurring. Recharge of an aquifer.

IMPACT	CRITERIA	DESCRIPTION AND EXAMPLES
		Improvement in water body WFD classification. Flood Risk: Creation of flood storage and decrease in peak flood level (>100 mm) Change in flood risk to receptor from high to medium or low Major reduction in surface water run-off and subsequently the impact on the local drainage system.

Classification and Significance of Effect

9.3.39 Once the magnitude of impact and the receptor importance have been defined, the classification and significance of the potential effect can be derived by combining both assessments in a simple matrix as shown in Table 9-4. Effects classed as moderate or greater are considered significant. Where there is a range of effects (e.g., large/very large) professional judgement has been used to determine the residual effect.

Table 9-4: Classification and Significance of Effect

MAGNITUDE OF IMPACT	IMPORTANCE OF ATTRIBUTES			
	LOW	MEDIUM	HIGH	VERY HIGH
No change	Neutral	Neutral	Neutral	Neutral
Negligible	Neutral / Slight	Neutral / Slight	Slight	Slight
Minor	Neutral / Slight	Slight	Slight / Moderate	Moderate / Large
Moderate	Slight	Moderate	Moderate / Large	Large / Very Large
Major	Slight / Moderate	Moderate / Large	Large / Very Large	Very Large

9.3.40 The following significance categories have been used for both potential and residual effects:

- Negligible: an imperceptible effect or no effect to a water resource receptor;
- Beneficial: a beneficial/positive effect on the quality of a water resource receptor; or
- Adverse: a detrimental/negative effect on the quality of a water resources receptor.

9.3.41 In the context of this assessment, an effect can be temporary or permanent, with effects quantified temporally as being short-term (0–5 years), medium-term (6–10 years) and long-term (>10 years).

9.3.42 At a spatial level, 'local' effects are those affecting the Proposed Development Site and neighbouring receptors, while effects upon receptors beyond the vicinity of the Proposed Development Site are considered to be at a 'regional' level. Effects which affect different parts of the country, or England as a whole, are considered being at a 'national' level.

Rochdale Envelope

9.3.43 In order to ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with The Planning Inspectorate's Advice Note 9 (The Planning Inspectorate, 2018). This involves assessing the maximum (or where relevant, minimum)/worst case parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example)

9.3.44 The following are the reasonable worst case scenario assumptions (maximum parameters) for the purposes of the water environment assessment:

- It is assumed that during Proposed Development construction the contractor will as a minimum conform to all permit/consent/licence requirements and best practice measures to avoid, reduce and minimise the risk of water pollution or unacceptable physical impacts (without mitigation) on water bodies. Details of this mitigation and best practice standards are described in Section 9.5.
- Water is to be supplied to the Proposed Development via the existing Northumbrian Water Limited's (NWL's) raw water pipeline feed from the River Tees. The abstraction flow rate would be 176 m^3/hr for Case 1A and 2A and 182 m^3/hr for Case 1B and 2B. Treatment is required to the supplied water to produce the desired water quality for utility water/cooling water make-up, firewater and for producing demineralised water.
- It is assumed for the purposes of the assessment, that Northumbrian Water's existing abstraction or discharge licences can be used to accommodate the Proposed Development. It is assumed that any alterations required to the consents would be assessed and applied for by Northumbrian Water as appropriate. However, this will be confirmed in the ES.
- Case 1A and 1B for the Proposed Development are based on Minimalised Liquid Discharge (MLD) from the Effluent Treatment Plant. In this scenario treated wastewater from the Effluent Treatment Plant will be reused as makeup water in the Water Treatment Plant. A liquid waste stream (concentrate sludge / waste) containing salts and nutrients would be taken offsite for further treatment at a rate of 5.2 m^3/hr for Case 1A and 3.3 m^3/hr for Case 1B. The offsite treatment location has yet to be confirmed but will be outside of the Teesmouth and

Cleveland Coast SPA/Ramsar site catchment and thus will avoid any implications in terms of nutrient neutrality.

- Case 2A and 2B would require discharge of treated process water effluent to Tees Bay via the neighbouring NZT project outfall. The process water discharge rate would be 104.6 m^3/hr for Case 2A and 65.1 m^3/hr for Case 2B. At the time of writing (August 2023) it has not been decided which option will be taken forward. However, discharge of process wastewater under Case 2A and Case 2B to Tees Bay via the NZT outfall is considered the worst case, given greater potential for impacts to the water environment than Case 1A and Case 1B.
- Should the option to discharge wastewater to the NZT outfall at Tees Bay be taken forward, then it is assumed that the wastewater discharge will meet the requirements of the Best Available Techniques (BAT) Reference Document (BREF) for Common Wastewater and Waste Gas Treatment/Management Systems in the Chemical Sector 2016 (EC JRC, 2016). The discharge would also be required to meet the standards outlined within the discharge permit. Consultation with the Environment Agency will be undertaken to discuss the scope of hydrodynamic dispersion modelling for the discharge to the Tees Bay outfall. Modelling results will be included in the ES.
- This assessment assumes that should the Tees Bay outfall associated with the NZT project be utilised by the Proposed Development, that it will be unchanged from the design assessed for NZT for which no significant morphological effects to the Tees Bay waterbody were identified (bp, 2021), and thus no assessment has been included herein regarding installation of the outfall.
- Amines will be appropriately bunded and accidental spills will be cleaned and go to a separate closed drainage system. From here, it would be recovered and recycled for use within the process, or otherwise taken off-site by tanker to a specialist treatment plant.
- The surface water drainage strategy for the Proposed Development remains under development at the time of writing (August 2023). However, surface water drainage will discharge to Tees Estuary via Dabholm Gut or Tees Bay. There are three options for this route: 1) direct feed to Dabholm Gut (with any new pipework and outfall to be consented under a subsequent planning application); 2) discharge via the existing Bran Sands discharge pipeline (but not requiring treatment at Brans Sands WwTW as this is surface water runoff); or 3) discharge via the NZT outfall. It is assumed that SuDS or bypass oil separators will be used (as a minimum) to provide treatment for surface water runoff prior to discharge from the Proposed Development Site. It is also assumed that penstocks will be provided to isolate any accidental spillages or fire water on the Proposed Development Site that enter the surface water drainage system or process water system, so that they can be disposed of accordingly.
- It is assumed that all liquid chemicals stored within the operational Proposed Development Site will be kept in bunded, controlled areas with a volume of 110% of storage capacity.

- It is assumed that water discharged from the Proposed Development Site will be limited to the greenfield runoff rate, and that water storage (e.g. within an attenuation pond) is appropriately sized to accommodate the 1% Annual Exceedance Probability (AEP) event with 40% allowance for climate change.
- Foul water will be treated at NWL's Marske-by-the-Sea WwTW. It is assumed given the relatively low volumes of foul effluent anticipated from the Proposed Development that NWL will treat this within their consent limits and in accordance with requirements to not cause deterioration or prevent improvement under the WFD.
- The Tees crossing (northern or southern option) and the crossing of Greatham Creek for the Hydrogen Pipeline Corridor will be constructed using trenchless technologies, and at a sufficient depth below the estuary bed to ensure that there is no risk of exposure. For the purposes of assessment this is assumed to be 10-15m below the bed. It is assumed that the maximum excavation dimensions for launch and reception pits will be 5 m width x 5 m length x 3 m depth. It is assumed that these pits will be at least 10 m from the watercourse edge, as measured from the top of bank. It is assumed that the drill fluids used within the drilling machine will be water based, such as naturally occurring bentonite clay.
- As a worst case, it has been assumed that open-cut methods will be required for the connection corridor crossings of all watercourses other than the Tees estuary and Greatham Creek. In such cases, it is assumed that flow will be temporarily over-pumped, diverted around or flumed through the working area and the watercourse fully reinstated as before.

Limitations and General Assumptions

9.3.45 The EIA process enables good decision-making based on the best possible available information about the environmental implications of a proposed development. However, there is often a degree of uncertainty as to the exact scale and nature of the environmental impacts, and in such cases the worst-case scenario has been considered under a Rochdale Envelope approach as outlined above.

9.3.46 The assessment has been undertaken using available data and Proposed Development design details at the time of writing. It is also based on understanding of flow pathways as observed during the site walkover. However, many of the watercourses in the Study Area are in culvert and underground for significant sections, and so assumptions have been made regarding flow pathways for these culverted sections, based on OS mapping. Understanding of flow pathways is described for each watercourse in the baseline (Section 9.4).

9.3.47 Assumptions and limitations relating to flood risk are outlined in the Preliminary FRA (Appendix 9A, PEI Report, Volume III).

9.3.48 A reasonable assumption has been made that all works will take place using best practice, as set out and secured in a Construction Environmental Management Plan (CEMP), pursuant to the Framework CEMP to be submitted with the ES.

9.3.49 Aside, from Pond 14 (the only open water pond remaining within the Teesmouth and Cleveland Cost Site of Special Scientific Interest (SSSI)), no water quality monitoring has been undertaken. Background water quality has been determined from the nearest Environment Agency monitoring stations. This is considered sufficiently robust for the characterisation of water body importance and the determination of impacts on the surface water environment. Water quality data was collected from Pond 14 to assess the potential risk of atmospheric depositions of nitrogen to this open water pond.

9.3.50 The understanding of drainage arrangements assessed herein is based on provisional information. The drainage strategy will be subject to further development in consultation with the Environment Agency and LLFA.

9.4 Baseline Conditions

9.4.1 This section describes the baseline physical characteristics and water features of the Study Area. Refer to Figure 9-1: Surface Water Features and their Attributes (PEI Report, Volume II) throughout.

Land Use, Topography and Rainfall

9.4.2 The Proposed Development Site is located on part of the former Redcar Steelworks site to the east of Redcar Bulk Terminal (referred to as 'the Foundry'). The site is coastal, being located immediately south-west of Teesmouth, at approximately 6 - 8 m above ordnance datum (AOD). Coatham Sands is immediately to the north and Bran Sands is located to the west (Figure 9-1: Surface Water Features and their Attributes). The Proposed Development Site is currently industrial, comprising former steelworks structures. Dormanstown is located south-east of the Proposed Development Site.

9.4.3 The Proposed Development Site extends west across the Tees Estuary at the southern extent of Bran Sands also further south close to Teesport (Figure 9-1: Surface Water Features and their Attributes, PEI Report, Volume II). These crossings of the Tees Estuary are included to incorporate the Hydrogen Pipeline Corridor infrastructure required by the Proposed Development.

9.4.4 South of the Tees Estuary, the Proposed Development Site extends south to Grangetown to accommodate the Electrical Connection Corridor, Water Connection Corridor, Natural Gas Connection Corridor, Other Gases Connection Corridor and the Hydrogen Pipeline Corridor.

9.4.5 The Proposed Development Site to the north of the Tees Estuary partly follows existing pipeline routes on reclaimed land to the south of the Seal Sands inter-tidal mudflats. The Hydrogen Pipeline Corridor extends west as far as Cowpen Bewley Woodland Country Park, and south into the industrial area at the eastern edge of Billingham. This whole section of the Proposed Development Site is very flat, being between 0 and 10 m AOD. The immediate surroundings include heavy industry on the banks of the Tees, mudflats to the north, marshland at Saltholme and Cowpen Marsh and the Tees Estuary itself. There are numerous large standing bodies of water

in the marshland areas, as well as small watercourses draining towards Seal Sands (which are included within local SSSI and Special Protection Area (SPA) designations).

9.4.6 The nearest weather station on the Met Office website (Met Office, n.d.) with historical data is located at Stockton-on-Tees, approximately 5.0 km south-west of the eastern extent of the Proposed Development Site, at NGR NZ 43846 19831. Based on the average climate data (for the period 1981 to 2010 (as the most recent data available)) for this weather station, it is estimated that the Study Area experiences an average of 574 mm of rainfall per year, with it raining more than 1 mm on around 112 days per year. This is a relatively low level of rainfall for England.

9.4.7 Plate 9-1 illustrates how the average rainfall varies throughout the year, with the wettest period being in the late summer to autumn, and driest in late winter to early spring. Average monthly rainfall is generally less than 60 mm throughout the year, except in August and November when it is between 60 and 65 mm. February is the driest month with an average of approximately 33 mm rainfall between 1981 and 2010.

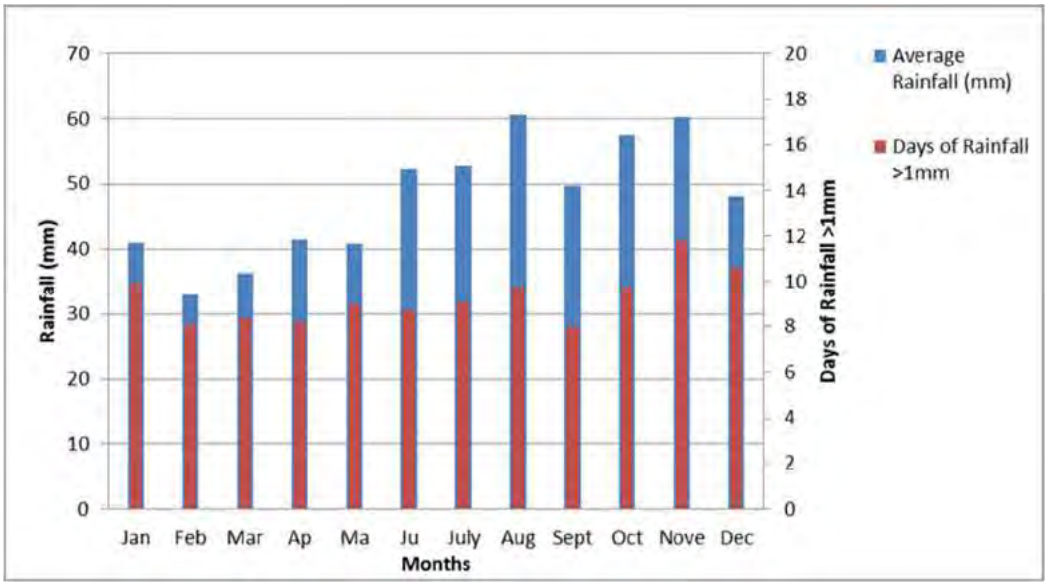

Plate 9-1: Stockton-on-Tees Weather Station – Average Rainfall per Month (1981-2010) and Average Days per Month with >1 mm of Rainfall (1981-2010)

Water Features

9.4.8 A site walkover was undertaken on 15th February 2023 in cold, dry but overcast conditions. Using observations taken on this visit, data from OS mapping and the Environment Agency Catchment Data Explorer website, a summary list of the surface waterbodies and where relevant to the assessment, groundwater water features listed in Table 9-5 were identified within the Study Area and are presented in Figure 9-1: Surface Water Features and their Attributes and 9-2: Groundwater Features and their Attributes (PEI Report, Volume II). Further details on these are presented in Table 9-6 to Table 9-7.

9.4.9 The Environment Agency's Catchment Data Explorer website (Environment Agency, 2023) confirms that the estuarine and coastal waterbodies in the Study Area are

contained within the Northumbrian River Basin District, the Northumbrian Transitional and Coastal (TraC) Management Catchment, and the Tees Lower and Estuary TraC Operational Catchment. The fluvial waterbodies are contained within the Northumbrian River Basin District, Tees Management Catchment and Tees Lower and Estuary Operational Catchment.

9.4.10 There are five WFD designated surface water bodies within the Study Area - these are described briefly in Table 9-6 (see also Figure 9-1: Surface Water Features and their Attributes, PEI Report, Volume II). Although these are the WFD reporting reaches, WFD principles and objectives apply to all tributaries of these watercourses. The WFD waterbodies include one coastal waterbody (Tees Coastal Water), one estuarine waterbody (Tees transitional waterbody) and three rivers (The Fleet - designated as Tees Estuary (S Bank), Cowbridge Beck, and North Burn from Source to Claxton Beck.

9.4.11 Within the catchments of the WFD waterbodies outlined in Table 9-6, there are also a number of named watercourses shown on OS mapping (Bing, 2023) - these are described in Table 9-7 (also refer to Figure 9-1: Surface Water Features and their Attributes (PEI Report, Volume II)).

9.4.12 In addition to the watercourses described in Table 9-6 and Table 9-7, there are numerous drains and ditches in the Study Area. These are predominantly related to drainage infrastructure in the industrial areas, and many are culverted beneath ground for part of their course and so their exact path is unclear. These ditches are not included within any nature conservation designations and due to largely being in culvert have minimal biodiversity value. In places, the drainage channels are visible above ground and are typically of the order of 0.5 - 1 m in width, intermittent or ephemeral (i.e. flowing for only part of the year or only after storms), have artificial engineered and sometimes concrete channels, and thus generally do not support functional flows (i.e. flows with the ability to erode, transport and deposit sediment resulting in the formation of geomorphic bedforms that result in habitat diversity).

Table 9-5: Surface and Groundwater Water Features Identified within the Study Area

WATERBODY	WATERBODY TYPE	WFD DESIGNATION OR ASSOCIATED WFD WATERBODY (WHERE APPLICABLE)
Tees Bay	Coastal	Tees Coastal Water (GB650301500005)
Tees Estuary	Watercourse (Main River)	TEES Transitional Waterbody (GB510302509900)
Cowbridge Beck	Watercourse (Main River)	Cowbridge Beck from Source to North Burn (GB103025072380)
North Burn	Watercourse (Main River)	North Burn from Source to Claxton Beck (GB103025072540)
Greatham Creek	Watercourse (Main River)	Designated under the Tees Transitional WFD Waterbody (GB510302509900), and so is considered further in the context of the WFD waterbody
The Fleet	Watercourse (Ordinary)	Tees Estuary (S Bank) (GB1030250723320)
Main's Dike	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Mill Race	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Dabholm Gut	Watercourse (Ordinary)	Designated under the TEES Transitional Waterbody (GB510302509900)
Dabholm Beck	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Kettle Beck	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Kinkerdale Beck	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Knitting Wife Beck	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Castle Gill	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Ash Gill	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Holme Fleet	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Belasis Beck	Watercourse (Ordinary)	Tributary of Holme Fleet and therefore associated with the Tees Transitional WFD Waterbody
Cross Beck	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody

WATERBODY	WATERBODY TYPE	WFD DESIGNATION OR ASSOCIATED WFD WATERBODY (WHERE APPLICABLE)
Mucky Fleet	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Swallow Fleet	Watercourse (Ordinary)	Tributary of the Tees Transitional WFD Waterbody
Saltholme Nature Reservoir Ponds, Brine Reservoirs, Brine Field, and refinery ponds	Stillwaters and watercourses	Catchment of Tees Transitional WFD Waterbody
Cowpen Marsh ponds located adjacent to landfill site off Landfill Rd, Brine Field, small ponds	Stillwaters and watercourses	Catchment of Tees Transitional WFD Waterbody
Lake at Charlton's Pond Nature Reserve	Stillwater	Catchment of Tees Transitional WFD Waterbody
Ponds at Billingham Technology Park	Stillwater	Catchment of Tees Transitional WFD Waterbody
Ponds within Coatham Dunes and Bran Sands	Stillwater	Catchment of Tees Transitional WFD Waterbody
Ponds at Coatham Marsh	Stillwater	Catchment of Tees Transitional WFD Waterbody
Numerous industrial ponds and artificial waterbodies across the area including Lazenby Reservoirs, Salthouse Brine Reservoirs and the Venator reservoirs	Stillwater	Catchment of Tees Transitional WFD Waterbody
Tees Sherwood Sandstone	Groundwater	WFD designation (GB40301G702000)
Tees Mercia Mudstone & Redcar Mudstone	Groundwater	WFD designation (GB40302G701300)

Table 9-6: WFD Surface Waterbodies in the Study Area

WATERBODY	ECOLOGICAL STATUS / POTENTIAL	CHEMICAL STATUS	OVERALL TARGET OBJECTIVE	HYDROMORPHOLOGICAL DESIGNATION	DESIGNATED REACH
Tees Coastal Water (GB650301500005)	Moderate Ecological Potential	Fail	Good (2027)	Heavily Modified	The Tees Coastal waterbody stretches from approximately 20 km south-east of Redcar at Boulby, to approximately 13 km north-west of Redcar at Crimdon. It includes a total area of 88.442 km^2.
Site observations: The Tees Coastal waterbody was observed from Coatham Sands between Redcar and Teesmouth. The waterbody is backed by a wide sandy beach and sand dunes and is popular for recreation. Coatham Sands has, in places along its length, been strongly influenced by historical deposition of slag from local ironworks. This means that large parts of the dunes are a mix of slag deposits and natural marine-deposited and subsequently wind-blown sand. Within the sand dune complex are a number of ponds and wetland areas. Discharge infrastructure was not apparent and is presumably buried or only observable at very low tide. One pipe was noted across the beach emanating from the direction of Cleveland Links golf course and the area of Warrenby Industrial Estate and is likely to be for discharges to the Tees. The Teesside Offshore Wind Farm was observed approximately 1.5 km off the coast from Redcar.					
Tees Transitional Waterbody (GB510302509900)	Moderate Ecological Potential	Fail	Moderate (2015)	Heavily Modified	The Tees Transitional Waterbody extends from the Tees Barrage to the east of Stockton-on-Tees, to Teesmouth. This is a distance of approximately 16 km. It includes a total area of 11.41 km^2. The designation includes the mud and sand flats at Seal Sands, Tees Dock, Greatham Creek, Dabholm Gut and the lower reaches of Billingham Beck. Greatham Creek is the estuarine section of Greatham Beck, which flows from the north of Elwick (NZ 45077 33468) to Seal Sands (NZ 51667 25568) and into

WATERBODY	ECOLOGICAL STATUS / POTENTIAL	CHEMICAL STATUS	OVERALL TARGET OBJECTIVE	HYDROMORPHOLOGICAL DESIGNATION	DESIGNATED REACH
					the Seaton on Tees Channel. Dabholm Gut is a kilometre-long tidal channel on the east bank of the Tees, left when the land on both sides was reclaimed from the Tees estuary.
Site observations: The Tees waterbody was observed from near the Dabholm Gut on the south bank. At this point the estuary is approximately 455 m wide. The estuary is also a busy route for navigation with docks and jetties on both banks. Land either side of the waterbody is flat, having been largely reclaimed in this area and is currently occupied by various heavy industries. Further details regarding hydrodynamics, tides and sediments are provided later in the baseline. The Dabholm Gut is an artificial channel of around 1 km length left following historical land reclamation. Upstream is Dabholm Beck which is formed from the coalescence of numerous small watercourses and drains through an area of freshwater marshland to the northwest of the Wilton International Site (upstream of the tidal limit). Dabholm Beck has a single stem channel is around 3 – 4 m wide, incised and straight, and lacking bedform features of interest, being indicative of extensive past modification. Reeds surround the channel on both banks and there are several large outfalls that discharge into the channel. At the tidal limit where it becomes Dabholm Gut, the channel widens to approximately 30 m and numerous other active outfalls were observed with relatively high rates of discharge, with some visible foaming suggesting potential presence of agitated chemicals. There are numerous consented discharges here from the adjacent industry, and consents are shown in Figure 9-1: Surface Water Features and Their Attributes (PEI Report, Volume II) and Table 9-14 (Water Activity Permits). The channel width remains constant up to the confluence with the Tees. At low tide, fine sediments are exposed in the channel and are dark in colour suggesting potential presence of pollutants. During especially high tides anecdotal evidence suggests the channel has been known to overtop onto the adjacent access road. The site is popular with birdlife and is included in the Teesmouth and Cleveland Coast SSSI. This WFD waterbody also includes Greatham Creek up to the National Tidal Limit (NTL). Greatham Creek was observed during the site visit at Greatham Creek Bridge (A178 road crossing). Here, historic modifications are evident, particularly downstream of the road crossing, with raised stone banks and embankments containing this tidal river maintaining a straightened length through to the Tees Estuary. There are three existing structures downstream of the A178 road crossing, comprising two other bridge crossings and a series of in-channel piers that formed part of a redundant crossing. The watercourse is sinuous upstream of the A178 and forms part of a dynamic system of intertidal channels and marsh. Bed and bank sediment comprised					

WATERBODY	ECOLOGICAL STATUS / POTENTIAL	CHEMICAL STATUS	OVERALL TARGET OBJECTIVE	HYDROMORPHOLOGICAL DESIGNATION	DESIGNATED REACH
fine material which is likely reworked with each tide. The watercourse has an approximate Mean High Water width of 60 m, although width varies considerably through the more natural length upstream of the road crossing.					
Tees Estuary (South Bank) (GB1030250723320)	Moderate Ecological Potential	Fail	Good (2027)	Heavily Modified	This watercourse is known on local mapping as The Fleet and is designated from adjacent to Longbeck Lane in Saltburn (NGR NZ 60988 20908). It continues north to the west of Redcar, and then flows west through the industrial works to discharge into Dabholm Gut at NGR NZ 56131 24038.
Site observations: The watercourse was observed in Coatham Marsh Nature Reserve, where the channel has been artificially widened to flow through a pond/wetland area that reduces the rate of flow and likely alters the character of water quality. The channel is culverted beneath a bridge within the nature reserve through an overly constrained arch of around 2 m width, which leads to backing up of flow upstream. The channel is also choked by submerged and emergent macrophytes, the extent of which suggests some enrichment by nutrients. Upstream of the bridge the channel is approximately 8 - 9 m wide but increases to approximately 25 - 30 m wide immediately downstream where the channel looks like it may have been artificially constructed for access. There is good connectivity with the floodplain upstream of the culvert but less so downstream. Flows upstream of the culvert may on occasion spill onto the surrounding marsh. Various service crossing was noted over the watercourse near this location. Flow is sluggish as a result of the widespread macrophytes, culverted crossing and overwide nature of the channel. The watercourse flows into Dabholm Gut approximately 2 km downstream of this observation point in the Nature Reserve, although there are expected to be controlling structures before the confluence with Dabholm Gut. A tributary of The Fleet was also observed as it crosses Limerick Road in Dormanstown. This was an artificial, perfectly straight channel of around 5 m width. The bed was smothered in fine sediment and pollution pressures were notable with an oil sheen on the water. There were very few macrophytes and the channel has incised banks, rising steeply 1 - 2 m abruptly from the channel bed.					
Cowbridge Beck from Source to North Burn (GB103025072380)	Moderate Ecological Status	Fail	Good (2027)	Not designated artificial or heavily modified	The watercourse is designated from the junction of Thames Road and Wolviston Road in Wolviston (NGR NZ 45225 24805) and flows in

WATERBODY	ECOLOGICAL STATUS / POTENTIAL	CHEMICAL STATUS	OVERALL TARGET OBJECTIVE	HYDROMORPHOLOGICAL DESIGNATION	DESIGNATED REACH
					an easterly direction to its confluence with North Burn at Cowpen Bewley Country Park where it is then designated as the Tees transitional waterbody (NGR NZ 48477 25835). It is 4.64 km in length and has a catchment of 13.4 km^2.
Site observations: This watercourse was not observed during the initial site visit as it is upstream of any direct works required for the Proposed Development.					
North Burn from Source to Claxton Beck (GB103025072540)	Bad Ecological Status	Fail	Good (2027)	Not designated artificial or heavily modified	The WFD designated watercourse consists of three tributaries that rise close to Hurworth Burn. These flow generally south to converge at Embleton (NGR NZ 42148 29919), before flowing south-east as a single stem to Cowpen Bewley Country Park where it is then designated as the Tees transitional waterbody (NGR NZ 48384 25916). The designated watercourse has an overall length of 25.7 km and catchment areas of 30.1 km^2.
Site observations: This watercourse was not observed during the initial site visit as it is upstream of any direct works required for the Proposed Development.					

Table 9-7: Other Named Watercourses in the Study Area that are not Defined WFD Water Bodies

NAME	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
Belasis Beck	Holme Fleet (Within Tees Transitional WFD Waterbody catchment)	Belasis Beck appears to rise from ponds in Belasis Hall Technology Park (NZ 47373 23267) and flows east for 2 km before its confluence with Holme Fleet within Saltholme Nature Reserve at NZ 49071 23577.	Belasis Beck was observed in the pastoral fields adjacent to Cowpen Bewley Road, where the main channel appeared to be shallow and wide (~6-7 m). Water levels were high during the site visit and overtopping slightly onto the floodplain. Here the channel flows roughly parallel with an adjacent pipeline, which cuts through the fields either side of the road. Flow was sluggish as a result of the shallow gradient and probable tidal locking. This creates a depositional environment, encouraging the growth of submerged and emergent macrophytes. Although these will take up nutrients during their growth, if they are not removed these are released back into the water column resulting in permanent recycling of nutrients and enriched conditions that support further growth of invasive macrophytes. Sediments are fine with little evidence of any transportation. They are also likely to be contaminated due to the past and current industry in this location. The road crossing appeared largely buried at this location, and flows appeared to be backing up upstream of the road leading to the spillage onto the floodplain. A brown surface scum was observed and was thought to be indicative of organics.
Dabholm Beck	Tees Transitional Waterbody	Dabholm Beck is a drainage channel marked on mapping as flowing northeast above ground for 700 m between NZ 56161 23102 and NZ 56710 23730. It then flows northwest into the tidal Dabholm Gut.	Refer to the Dabholm Gut description under the Tees Transitional Waterbody description above.

NAME	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
Kettle Beck	Tees Transitional Waterbody	Kettle Beck rises at Lazenby Bank and flows approximately 4 km generally north along the edge of the Wilton International Site, beneath the A1085, beneath the Teesside Works (Lackenby), and beyond the A1053 before discharging to the Tees. The exact course of the watercourse is no clear from online mapping north of the A1085 as the watercourse is culverted.	Kettle Beck was observed at the western edge of the Wilton International Site. Here the channel was between 2 and 3 m wide, with an artificial, straightened character. The bed was dominated by fine sediment with some isolated very fine gravel accumulations. Submerged macrophytes were abundant and some sections of the channel were shaded by overhanging vegetation and thick riparian vegetation. Flow was impeded by a road culvert at the observation site, which consisted of 6 small diameter (~0.5 m) pipes. The banks rose steeply from the channel bed and were incised meaning the channel is likely disconnected from the floodplain.
Holme Fleet	Tees Transitional Waterbody	Holme Fleet is a marshland channel that meanders between Cowpen Marsh (NZ 50596 24732) and Port Clarence (NZ 50703 21620). It is around 5.6 km in length, and a large number of marshland channels join the Fleet, which also flows through several marshland open waterbodies and reedbeds.	This watercourse was not observed during the initial site visit as it would not be directly impacted by the Proposed Development (does not cross into the Proposed Development Site).
Kinkerdale Beck	Tees Transitional Waterbody	This watercourse is mapped as a surface waterbody for 320 m at the north-western extent of the Wilton International Site (NZ 56071 20996) and is then in culvert. As such, the source and exact course of the watercourse is not known, although it is known to outfall to the Lackenby Channel.	Kinkerdale Beck is a 2 - 3 m wide ditch which appears to be fed from an overflow connection from Kettle Beck. It was observed just downstream of Kettle Beck where it has an artificial, straightened character with steep banks. The bed was dominated by fine sediment. Submerged macrophytes were abundant and some sections of the channel were shaded by overhanging vegetation. Water in this section of the channel was largely ponded.

NAME	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
			Further downstream the watercourse is largely culverted beneath the Wilton International Site.
Castle Gill	Tees Transitional Waterbody	Castle Gill is a short watercourse, which flows for approximately 1.5 km in a south-westerly direction within the southern extent of the Wilton International Site, from NZ 57760 20577 to NZ 56121 20500,	This watercourse was not observed during the initial site visit as it would not be expected to be directly impacted by the Proposed Development. Based on aerial photography, it is partly in culvert, is straightened and heavily modified with a width of approximately 2 - 3 m.
Knitting Wife Beck	Tees Transitional Waterbody	This watercourse rises just north of the A66 in Grangetown (NZ 55172 20910), before flowing north for approximately 300 m towards the Lackenby Steelworks. The watercourse is then culverted and so the course alignment is unclear but is known to outfall at the Lackenby Channel.	The watercourse was visited as it emerges from an approximately 1 m wide box culvert to the north of the A66. The channel was approximately 1 - 1.5 m wide, and artificial in nature being straight with steep incised banks rising 2 - 3 m from the channel bed. Fine sediment accumulations were abundant; the channel was largely overgrown; and this section of the channel largely shaded by overhanging deciduous vegetation. Pollution was evident with red staining on all the vegetation immediately downstream of the culvert.
Lackenby Channel	Tees Transitional Waterbody	The Lackenby Channel is a drainage cut between the Lackenby steelworks (NZ 55305 22207) and the eastern bank of the Tees estuary (NZ 54145 23341). It is approximately 1.6 km in length and conveys flows from Knitting Wife Beck, Kinkerdale Beck and Kettle Beck to the Tees.	Lackenby Channel was not visited during the site visit, but aerial photography available online indicates that it is an artificial, straight channel varying between 10 and 15 m in width. It is likely to be very similar to Dabholm Gut with limited hydromorphological interest.
Main's Dike	The Fleet - Tees Estuary (S Bank	Main's Dike watercourse rises from a spring in Wilton Wood to the south-east of the Site	Main's Dike was observed along the eastern edge of the Wilton International Site where it was very straight, around 1 m in width

NAME	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
	WFD Waterbody)	at NZ 59328 19741. The watercourse then flows north along the eastern boundary of the Wilton International Site, and into the Mill Race at NZ 57893 22824.	and with steep incised banks rising around 4 m from the channel. The watercourse was heavily shaded, and no macrophytes were observed in the channel at this location although marginal vegetation was dense. The bed was dominated by fine sediment, with some isolated fine gravel patches (e.g., 2 - 3 cm diameter). Significant sediment accumulations were observed downstream of the Mains Dike Bridge culvert. There was also evidence of some lateral erosion of the banks and the formation of small, alternating fine gravel lateral bars, although the gradient was still shallow and the channel stable.
Ash Gill	The Fleet - Tees Estuary (S Bank WFD Waterbody)	Ash Gill flows parallel to Main's Dike to the north of the Proposed Development Site. It rises in Kirkleatham and flows northwest through arable agricultural land and the outskirts of Dormanstown before meeting the Fleet at NGR NZ 57587 24388	This watercourse was not observed during the initial site visit as it is upstream of any direct works required for the Proposed Development. However, aerial imagery indicates that the watercourse is straightened with a modified character and is approximately 2 - 3m wide. It is culverted beneath Dormanstown and road crossings of the A108 and railway line.
Mill Race	The Fleet - Tees Estuary (S Bank WFD Waterbody)	The course of the Mill Race is unclear as it is largely culverted but appears to emanate from coalescence of ditches and watercourses at NZ 57893 22824, then flows north of the Wilton International Site beneath the A1085. It remerges at NZ 57102 24152 and flows west into The Fleet.	The Mill Race was observed within the Wilton International Site to the south of the A1085. Here the watercourse was overly wide (around 3.5 - 4 m wide) leading up to a circular culvert of around 2 m diameter, with artificial concrete banks in places. Banks were step and incised. The bed was dominated by fine sediment. There are numerous service crossings of the watercourse at this location. The Mill Race was also observed downstream of the A1085 adjacent to the Trunk Road roundabout where it was 2 - 3 m wide,

NAME	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
			very straight, with a bed dominated by fine sediment. Road runoff appears to discharge into the channel.
Mucky Fleet/ Swallow Fleet	Tees Transitional Waterbody	Mucky Fleet and Swallow Fleet are meandering channels draining Cowpen Marsh. A large number of marshland channels intersect these channels, which ultimately drain to the Tees Transitional Waterbody.	Swallow Fleet was observed from the viewing platform on the A178. The watercourse was approximately 30 m wide at its widest point, although this varied. A network of interconnected marshland channels join Swallow fleet, along with several linear, artificial drainage channels. Fine sediment dominates in this intertidal habitat and is likely reworked with each tide.

9.4.13 There is also a network of small watercourse channels throughout the saltmarsh and wetland area to the south and south-west of Seal Sands. Some of these channels were observed on site from the Saltholme RSPB Reserve, and they are small (1 - 2 m wide) low gradient, single thread, meandering waterbodies that are closely connected to their floodplains.

9.4.14 Other water features shown in Figure 9-1: Surface Water Features and their Attributes (PEI Report, Volume II) outside of the 1 km Study Area are not included in this assessment where they are upstream of any proposed works and so will not have any pathways through which to be impacted. This includes Greatham Beck, Skelton Beck, Cross Beck, Spencer Beck, Normanby Beck, Ormesby Beck, Middle Beck, Marton West Beck, Lustrum Beck and Old River Tees.

9.4.15 There are a large number of still water features across the Proposed Development Site, most of which are small ponds or artificial standing waterbodies. The majority of these on the south-east bank of the Tees are small artificial waterbodies and ponds related to the surrounding industrial land use. To the north-east of the Tees there are further artificial and industrial waterbodies, such as the large brine reservoirs immediately north of the Proposed Development Site at Saltholme. The surrounding wetlands here also include several large, interconnecting waterbodies which attract a great deal of biodiversity interest, especially birdlife. The ponds within the Proposed Development Site itself are predominantly very small and generally artificial, with the exception being several waterbodies within the South Gare and Coatham Dunes.

9.4.16 The ponds within Coatham Dunes have been surveyed and appear to have formed in depressions in the relatively impermeable historic slag deposits that lie between the Proposed Development Site and the more natural sand dunes that have evolved adjacent to the Tees Bay shoreline. Based on site visits between December 2022 and February 2023 (as well as previous visits undertaken in connection with the NZT Project), these ponds appear to be predominantly rainwater fed with little influence from tidal variation and groundwater. Except ‘Pond 14’ (as previously described for the NZT Project , and for which the nomenclature is maintained here for consistency), all ponds across the dunes have succeeded to become fully vegetated wetlands covered by *Phragmites australis*. Therefore, only Pond 14 will be considered in this assessment.

Tees Estuary

9.4.17 Land reclamation, canalisation, and channel deepening carried out in the mid-19th century result in the present-day Tees Estuary's largely anthropogenic character. The estuary was originally surrounded by extensive wetlands and tidal ingress extended for approximately 44 km upstream from the mouth. Historical maps indicate a channel width of up to 300 m between Stockton and Middlesbrough prior to 1900, which has reduced to a modern-day width varying between 100 and 200 m. This relatively narrow estuarine channel has marginal intertidal areas, especially where the mouth widens, spanning around 300 ha. This includes an approximately 140 hectare (ha) area known as Seal Sands, on the north bank, which is separated from other intertidal areas by Seaton Channel (Royal Haskoning, 2016a). The Tees Barrage

that was built in the mid-1990s comprised of river barrage together with a road bridge and a footbridge. Navigation for boats is maintained by a barge lock, whilst there is also a fish pass. Water is held upstream of the barrage at the level of a typical high tide and the water used to supply a white-water course. The barrage has reduced the tidal stretch of the Tees to approximately 14 km from the mouth and reduced tidal volume upstream of South Gare by around 7% (ABPmer, 2002).

9.4.18 The Tees Estuary is not designated as a Bathing Water or Shellfishery. Northumbrian Water's Brans Sands WwTW discharges to the estuary close to Teesmouth.

9.4.19 The mouth of the Tees Estuary has a breakwater to either side; North Gare and South Gare. The South Gare breakwater is the larger and longer structure (approximately 2 km in length compared to around 850 m for the North Gare breakwater). The South Gare breakwater runs parallel to the main approach channel of the Tees and is built over areas of deposited slag. Within the mouth of the Tees, to the south, is Bran Sands Bay, while Coatham Sands is to the east of the breakwater. North Gare Sands is to the south of the North Gare breakwater, with Seaton Sands to the north.

9.4.20 PD Teesport report that the Tees Approach Channel has a charted depth of 15.4 m, which progressively reduces to 4.1 m east of Billingham Beck, which is 8 nautical miles upstream from the entrance to the estuary (Royal Haskoning, 2016c).

9.4.21 The tide curve at Teesmouth is near sinusoidal in shape with a mean spring range of 4.6 m and a mean neap tide range of 2.3 m (UK Hydrographic Office (UKHO), 2006). Other tidal statistics are given in Table 9-8.

Table 9-8: Tidal Statistics for the Tees Estuary (ABPmer, 2002)

TIDAL STATISTIC	LEVEL (M CHART DATUM)
Lowest astronomical tide	0.00
Mean low water spring tide	+0.90
Mean low water neap tide	+2.00
Mean sea level	+3.20
Mean high water neap tide	+4.30
Mean high water spring tide	+5.50
Highest astronomical tide	+6.10

9.4.22 Freshwater input to the estuary is measured at a gauging station at Low Moor (NGR: NZ364105). According to the National River Flow Archive (CEH, 2021) for the period 1969-2021, the Tees at this point has a mean flow of 20.823 m^3/s, with a 10% exceedance (Q10) of 47.3 m^3/s, and a 95% exceedance (Q95) of 3.1 m^3/s.

9.4.23 The Tees Barrage controls freshwater flow into the Tees Estuary and allows partial mixing with saline water. However, the combination of reduced tidal volume, partial mixing and longitudinal salinity gradient drive a density driven gravitational circulation. Ebb flows are strongest at the surface, while flood tide flows are more evenly spread through depth. As such, the tidally average currents tend to be

seawards in the surface waters and landwards closer to the estuary bed (Royal Haskoning, 2016a). This effect leads to a net sediment supply into the estuary from offshore areas.

9.4.24 A combination of locally created wind waves and offshore swell generates the waves in the Tees Estuary. The majority of offshore swell is from a northerly direction. The most common wind direction at South Gare observed between 1999 to 2005 is from the south-west (210-217°N), although frequent large wind events which are normally over 40 m/s tend to occur from the north (HR Wallingford, 2006).

9.4.25 Extreme wave heights for defined return periods, as previously reported for the waverider buoy north of the Tees North Buoy, are presented in Table 9-9. Due to North and South Gare breakwaters, only the remaining swell waves energy and short-period local wind waves (including winds from south-west) penetrates into the Tees Estuary (Royal Haskoning, 2016a).

Table 9-9: Calculated Extreme Wave Heights at Waverider Bouy North of Tees North Buoy (HR Wallingford, 2006)

RETURN PERIOD IN YEARS	SIGNIFICANT WAVE HEIGHT (Hs (M))
0.1	3.87
1	6.03
10	8.63
50	10.69

9.4.26 Suspended sediment concentrations are generally low in Tees Bay and in the Tees Estuary when compared to some UK estuaries, with values typically below 50 mg/l based on historical (pre-Tees Barrage) measurements held by the Environment Agency. Highest concentrations tend to coincide with spring tides, and inputs tend to be derived from marine influences downstream, freshwater inputs from further up the catchment and industrial inputs. The marine input is washed in with the flood tide, and often causes resuspension of fine bed sediments.

9.4.27 The DCO application relating to York Potash Harbour Facilities in 2016 (Royal Haskoning, 2016a) demonstrates that historical bed sampling in the vicinity of the Proposed Development has bed sediments comprising 65 - 70% silt, with some clay (around 20%) and the reminder sand and gravel. Coarser sands tend to settle in the lower estuary, with finer material transported further up the estuary by the tides. It is also estimated that the total fine material input to the estuary is 280,000 m^3 to 330,000 m^3 per annum with the assumptions that the fine silty sand content is between 15% - 35% (Royal Haskoning, 2016d).

9.4.28 There are some notable enhancement schemes relating to the Tees Estuary. Firstly, Tees Estuary Edges Enhancement Study (2018) (University of Hull) - this study aimed to identify a framework of habitat enhancement opportunities to improve biodiversity provision and habitat connectivity within the Tees. There is considered potential for functional provision to be improved for species associated with the

existing and proposed SPA designation (e.g. increased foraging potential for waders using intertidal mudflat habitat and breeding birds such as tern species through improvements to essential fish habitats and associated populations). The study focused on areas along the Tees estuary (from barrage to mouth) where estuary edges improvement techniques could be applied. Identified techniques included re-profiling foreshore levels, vegetated floating pontoons, fish habitat creation and extending intertidal areas (Boyes, Cutts and Thomson, 2018).

9.4.29 The Tees Tideland project is currently assessing the potential for implementing measures to restore habitats in the Holme Fleet/Belasis Beck catchment that would formerly naturally have formed part of the Tees Estuary intertidal area, and to restore ecological connectivity with the Tees Estuary.

Tees Bay

9.4.30 Tees Bay includes Bathing Waters designated under the Bathing Waters Directive, with 'Redcar Coatham' being located immediately north of the Proposed Development Site, and 'Seaton Carew North Gare' being situated immediately north of the Study Area. There are no designated shellfisheries within Tees Bay.

9.4.31 The North Sea tidal wave, which originates in the north and travels south, drives tidal patterns in Tees Bay. The semi-diurnal tide occurs every 12.5 - 13 hours, with a macro-tidal range of 4.6 m for a mean spring tide and meso-tidal range of 2.3 m for a mean neap tide. Tidal velocities are generally low, reaching up to 0.25 m/s to 0.3 m/s. In addition, the flood tide direction in the Bay is south-east and the ebb direction is north-west (EDF Energy, n.d.).

9.4.32 The sediment regime in the area includes surface seabed sediments, suspended sediments and a variety of sources and sinks. Silts and muds are readily transported as suspended sediment load and can remain in suspension for extended periods through the tidal cycle, while coarser sands and gravels are mobilised as bedload during periods of peak hydrodynamic forcing carried. A suspended sediment concentration of between 1,500 to 4,000 mg/l has been measured at exposed locations during peak wave events (EDF Energy, n.d.).

9.4.33 Coatham Sands are protected at the western end by nearshore slag banks exposed at low water and known as the German Charlies. The Redcar seafront then extends as a defended headland for around 1.5 km. The headland results from the outcropping rocks of Coatham Rocks and Redcar Rocks (Royal Haskoning, 2014).

9.4.34 Located approximately 1.5 km north of Coatham Sands is the cable landfall for the Teesside Offshore Wind Farm, which has been operating since 2013, and consists of 27 turbines with a 62 MW capacity. Off Coatham Sands but still within Tees Bay is also the discharge point from the former Steelworks site. It is also proposed that a new outfall from the NZT development will be installed off Coatham Sands.

Navigation

9.4.35 The Tees Estuary and adjacent Tees Bay are subject to significant commercial vessel traffic. Table 9-10 provides a summary of vessel movements for 2013 as part of the York Potash Harbour developments (Royal Haskoning, 2016c). According to the data

from 2013, there were on average 878 vessel movements per month, with the highest number in May (1009) and the lowest in December (714).

Table 9-10: Vessel Tracking System for 2013 at Tees Estuary (Royal Haskoning, 2016c)

MONTH	NO. OF MOVEMENTS
January	824
February	808
March	981
April	922
May	1009
June	871
July	899
August	867
September	869
October	890
November	886
December	714

9.4.36 In addition to the above, commercial fishing vessels launch from Redcar and Marske-by-the-Sea generate further traffic in Tees Bay. Fisheries in this area primarily involve potting for crab and lobster, as well as trawling for cod, haddock, sole, whiting, plaice and turbot (EDF Energy, n.d.).

9.4.37 The nearest HM Coastguard moorings (Maritime and Coastguard Agency, n.d.) are to the north of the Study Area at Hartlepool Marina. There is also a RNLI Lifeboat station at Redcar Seafront.

Surface Water Quality

9.4.38 The Tees Coastal WFD waterbody is currently failing to meet Good Chemical Status based on WFD Cycle 3 2019 data, due to failures for polybrominated diphenyl ethers (PBDE) and mercury as well as its compound. The status of all other priority substances, priority hazardous substances, specific pollutants and other pollutants are either good, higher, or have not been assessed.

9.4.39 The Tees Transitional WFD waterbody is currently failing to meet Good Chemical Status based on WFD Cycle 3 2019 data, due to failed status for PBDEs, benzo(g-h-i)perylene, tributyltin compounds, and cypermethrin (Priority substances). The failure for tributyltin compounds are attributed to diffuse pollution from contaminated waterbody bed sediments.

9.4.40 The Tees Estuary (South Bank) waterbody is currently failing to meet Good Chemical Status based on WFD Cycle 3 2019 data, due to failures for PBDEs and mercury as

well as its compounds (Environment Agency, 2023d). Priority substances were all at Good Status and Other Pollutants did not require assessment.

9.4.41 Despite being in the Study Area, North Burn and Cowbridge Beck are both upstream of the Proposed Development Site and so they are not considered further in this section.

9.4.42 Water quality data has been obtained from the Environment Agency's Water Quality Archive (Environment Agency, 2023d) for the Tees Estuary. Annual average values for the period 2009 - 2022 are summarised in Table 9-11 for a sampling point close to the mouth of the Tees at the Gares, and at Smiths Dock, Redcar Jetty, Teesport and the confluence with Dabholm Gut moving upstream (these monitoring locations are shown on Figure 9-1 (PEI Report, Volume II)). The parameter values presented in Table 9-11 are compared against WFD standards where they apply to transitional waters.

Table 9-11: Summary of Mean Average Tees Estuary Water Quality Data Based on Monitoring at Multiple Sites Between 2009 - 2022 (Environment Agency, 2023)

PARAMETER	WFD THRESHOLD (FOR GOOD)	TEES MOUTH NGR NZ 55200 28400	DABHOLM GUT CONFLUENCE, NGR NZ 54822 24858	TEESPORT, NGR NZ 54400 23700	REDCAR JETTY, NGR NZ 54500 25700	SMITHS DOCK, NGR NZ 52800 22100
Temperature of Water (ºC)	-	10.42	10.79	9.640	10.58	10.33
Ammoniacal Nitrogen, Filtered as N (mg/l)	21	0.114	0.688	0.480	0.277	0.380
Nitrate, Filtered as N (mg/l)	-	0.396	2.841	1.490	1.111	1.088
Nitrite, Filtered as N (mg/l)	-	0.009	0.117	0.014	0.016	0.014
Orthophosphate, Filtered as P (mg/l)	-	0.049	0.335	0.099	0.097	0.106
Oxygen, Dissolved, % Saturation	-	100.22	93.41	93.29	95.95	94.40
Arsenic, Dissolved (ug/l)	25	1.417	1.650	1.367	1.450	1.200
Chromium, Dissolved (ug/l)	-	0.500	2.073	0.433	0.500	0.518
Copper, Dissolved (ug/l)	3.76*	0.566	1.170	0.805	0.828	0.878
Lead, Dissolved (ug/l)	1.3	0.149	0.520	0.436	0.265	0.465
Nickel, Dissolved (ug/l)	8.6	0.575	1.463	0.765	0.867	0.835
Zinc, Dissolved (ug/l)	6.8**	2.167	6.120	4.320	3.188	3.492
Tributyl tin as Cation (ug/l)	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002
Lindane	-	-	-	-	0.000	-

PARAMETER	WFD THRESHOLD (FOR GOOD)	TEES MOUTH NGR NZ 55200 28400	DABHOLM GUT CONFLUENCE, NGR NZ 54822 24858	TEESPORT, NGR NZ 54400 23700	REDCAR JETTY, NGR NZ 54500 25700	SMITHS DOCK, NGR NZ 52800 22100
para-DDT	0.01	-	-	-	0.001	-
Chloroform:-{Trichloromethane}	-	-	0.626	0.105	-	-
Hexachlorobenzene	0.05	-	-	-	0.000	-
Hexachlorobutadiene	0.6	-	-	-	0.000	-

*Where DOC is less than or equal to 1 mg **dissolved plus Ambient Background Concentration (µg/l)

9.4.43 These data indicate only one failure against WFD Environmental Quality Standards (EQS) for transitional waters, which was for tributyltin in Dabholm Gut, although there is some evidence of slightly elevated metal concentrations across the monitoring sites, which is expected given the industrial and urban nature of the area surrounding the estuary mouth and the immediate upstream reaches of the river Tees. Raised tributyltin concentrations are consistent with the WFD 'Fail' classification for this waterbody.

9.4.44 The Water Quality Archive website (Environment Agency, 2023d) also provides water quality for other waterbodies and sites in proximity to the Proposed Development Site, spanning the period 2019 - 2023 inclusive. A summary is provided in Table 9-12 indicating parameters that were measured and a brief overview of water quality implications.

Table 9-12: Summary of Water Quality Data Waterbodies within the Study Area Based on Monitoring Between the Range of 2000-2023 (Environment Agency, 2023d)

MONITORING STATION	DURATION OF SAMPLING	TYPE OF WATER SAMPLED	PARAMETERS TESTED	GENERAL QUALITY COMMENTS
Coastal/Estuarine				
Wilton Complex Main Effluent Composite NGR: NZ 56100 24100	2019-2022	Effluent	Sanitary pollutants (e.g., Biochemical Oxygen Demand (BOD)), metals and organics (e.g., chloroform).	Numerous pollutants are present in this effluent. An extremely high BOD indicates that sanitary wastewater contains high concentration of organic material. As for copper and zinc, they exceed the EQS set forth by the WFD. While chloroform exceeds the EQS in the Dangerous Substance Directive.
Brans Sands NGR: NZ 55700 26600	2000-2019	Estuarine water	Physico-chemical parameters (e.g., pH, temp, dissolved oxygen); Nutrients and sanitary products (e.g. nitrate, ammoniacal nitrogen, orthophosphate).	Slightly alkaline and well oxygenated. Concentration of nitrates was relatively low, although orthophosphate elevated. Copper and zinc were not measured at this site. Escherichia coli and Intestinal enterococci have been measured once (2014) and were below limits of detection.
Dabholm Gut 100 m upstream from the Tees confluence NGR:NZ 55500 24500	2019-2023	Estuarine water	Trace metals (copper and zinc).	Average concentrations of zinc and cooper are below the WFD Standards for estuarine water. It should be noted that only ten samples were taken at this site.
Greatham Creek 100 m from outfall	2009-2019	Estuarine water	Physico-chemical parameters (e.g. pH, temp, dissolved oxygen); Nutrients	Slightly alkaline and well oxygenated. Concentration of nitrates and phosphate were low. Numerous metals were

MONITORING STATION	DURATION OF SAMPLING	TYPE OF WATER SAMPLED	PARAMETERS TESTED	GENERAL QUALITY COMMENTS
(adjacent to Able UK) NGR: NZ 52490 26490			and sanitary products (e.g. nitrate, ammoniacal nitrogen, orthophosphate)*; Trace metals.	measured at this site, all falling below EQS (as outlined in Table 9-11).
Billingham Beck 50 m upstream of River Tees confluence NGR: NZ 47470 20507	2019-2021	Estuarine Water	Physico-chemical parameters (e.g., pH, temp, dissolved oxygen); Nutrients and sanitary products (e.g. nitrate, ammoniacal nitrogen orthophosphate); Trace metals.	Circum-neutral and well oxygenated. Concentration of nitrates and phosphate are slightly elevated. Dissolved copper concentrations are below but close to the WFD Standard of 3.76 µg/l. However, the standard applies to bioavailable copper, and there is insufficient data to determine bioavailability. The mean concentration of zinc is just below the WFD Standard of 6.8 µg/l (plus ambient)
Freshwater				
Billingham Beck at Billingham Bottoms NGR: NZ 45495 22393	2019-2023	River	Physico-chemical parameters (e.g. pH, temp, dissolved oxygen); Nutrients and sanitary products (e.g. nitrate, Ammoniacal nitrogen, Orthophosphate)	Circum-neutral and well oxygenated. Concentration of nitrates and phosphate are considerably lower than the downstream sampling site close to the Tees confluence.

9.4.45 The data summary presented in Table 9-12 indicates that there remains substantial pollution pressure on the Tees Estuary from existing effluent and pollution discharges (e.g. several failures against EQS in the Wilton Complex effluent), although as noted above the Tees has a large capacity to absorb these pollutants with concentrations of most pollutants being below EQS in the monitored data from the Teesmouth area.

9.4.46 The freshwater streams in the Study Area draining to the River Tees are generally not routinely monitored by the Environment Agency. There is data for Billingham Beck, for both the downstream reach of the watercourse below the NTL (which is located at the south-western extent of the Study Area and is part of the Tees transitional WFD waterbody), and for a location upstream of the NTL at Billingham Bottoms. The freshwater reach of the watercourse is likely to exhibit similar water quality traits to those other freshwater rivers and streams in the Study Area given the similar surrounding urban land with heavy industry, low gradients and tide locking effect of the Tees Estuary. The data for this watercourse indicates that certain dissolved metals exceed WFD standards, while nitrates and phosphates are also slightly elevated.

9.4.47 Further water quality data for the Study Area is available for Bathing Water areas as designated under the Bathing Waters Directive. In the north-east of the Study Area, Coatham Sands is a designated bathing water (as 'Redcar Coatham'). Water quality at designated bathing water sites in England is assessed by the Environment Agency. From May to September each year, weekly assessments measure current water quality and at a number of sites daily pollution risk forecasts are issued. Annual ratings classify each site as excellent, good, sufficient or poor based on measurements of intestinal enterococci and Escherichia coli taken over a period of up to four years. Redcar Coatham had a 2022 classification of Excellent (Environment Agency, 2023d).

9.4.48 The Environment Agency's Bathing Water Quality website (Environment Agency, 2023c) notes that the Redcar Coatham bathing water is subject to short term pollution caused when heavy rainfall or high tides wash faecal material to the sea from livestock, sewage and urban drainage via rivers and streams, with water quality typically returning to normal after a few days.

9.4.49 The southern extent of the Seaton Carew North Gare Bathing Water is also within the 2 km of the Proposed Development Site and has a classification of Good for 2022 (Environment Agency, 2023d).

9.4.50 The only open water pond within the Coatham Dunes (Pond 14 within the Teesmouth and Cleveland Coast SSSI) has been monitored as part of the assessment to determine the potential for impacts from atmospheric deposition of pollutants from the Proposed Development. Pond 14 was monitored on three occasions between December 2022 and February 2023, to supplement previous monitoring undertaken as part of the NZT development between October 2020 and January 2021. In summary, the latest monitoring data indicated that the water is circum-neutral (mean pH 7.82), and well oxygenated with mean dissolved oxygen (DO) values of 97.2% saturated and 11.94 mg/l.

9.4.51 Mean electrical conductivity was 3,111 µS/cm suggesting brackish water. Average ammoniacal nitrogen was recorded at marginally above the laboratory limit of detection (LoD) at 0.05 mg/l. Furthermore, average nitrate values were low (0.4 mg/l) and nitrite was below the LoD. Total nitrogen had a mean average of 0.5 mg/l.

9.4.52 Certain metals including boron and molybdenum were elevated with recorded mean dissolved values of 750.67 µg/l and 200.00 µg/l respectively, and total values of 717.33 µg/l and 212.67 µg/l respectively. Total iron was also found to be elevated with an average value of 259 µg/l; however dissolved iron was far lower at 59.67 µg/l.

9.4.53 Previous sampling (2020 - 2021) of polycyclic aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (TPHs) all fell below LoDs. One sample of polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs) and phenols was taken, all of which fell below the LoDs. Further results and analysis from the Pond 14 sampling will be presented in an appendix with the ES.

Sediment Quality

9.4.54 Numerous investigations of sediment quality have recently been undertaken to support various recent dredging proposals and developments around the Tees Estuary, with samples compared to Cefas Action Levels for the disposal of dredged material. These give an indication of sediment quality in the Tees Estuary and Teesmouth areas. In general, contaminant levels in dredged material below Action Level 1 are of no concern and are unlikely to influence marine licensing decisions and the dredged material is suitable for sea disposal. However, dredged material with contaminant levels above Action Level 2 is generally considered unsuitable for sea disposal.

9.4.55 Samples were collected in 2017 and 2018 to support dredging at Seaton Port (Able UK, 2018), adjacent to the Seaton Port Dry Dock facility on the north bank of the River Tees, centred approximately on NGR NZ 52416 26658. This is approximately 2.4 km west of the abstraction point from the Proposed Development. Sampling consisted of four surface samples in the vicinity of the dry dock in 2017 and a further five in 2018. A summary of results is presented against Cefas Action Levels in Table 9-13 which shows that several metals are present in concentrations over Action Level 1, which triggered additional sampling, but none were found to exceed Action Level 2.

Table 9-13: Assessment of Sediment Samples Against Cefas Action Levels for Samples Collected in 2017/18 from Seaton Port (Adapted From Able UK (2018))

PARAMETER	ACTION LEVEL 1	ACTION LEVEL 2	MAXIMUM 2017 RESULT	MAXIMUM 2018 RESULT	COMMENT
Arsenic	20	100	36.28	26.2	Above Level 1; Significantly below Level 2.

PARAMETER	ACTION LEVEL 1	ACTION LEVEL 2	MAXIMUM 2017 RESULT	MAXIMUM 2018 RESULT	COMMENT
Mercury	0.3	3	0.72	0.35	Above Level 1; Significantly below Level 2.
Cadmium	0.4	5	0.47	Below AL1	2017 result above Level 1; Significantly below Level 2
Chromium	40	400	105.84	92.8	Above Level 1; Significantly below Level 2.
Copper	40	400	66.4	40	Above/equal to Level 1; Significantly below Level 2.
Nickel	20	200	42.88	40.2	Above Level 1; Significantly below Level 2.
Lead	50	500	151.32	108	Above Level 1; Significantly below Level 2.
Zinc	130	800	244.5	199	Above Level 1; Significantly below Level 2.

Note: all values as mg/kg Dry weight (ppm)

9.4.56 The DCO application relating to York Potash Harbour Facilities in 2016 (Royal Haskoning, 2016a) also included sediment sampling in the main Tees Estuary downstream of Dabholm Gut. The sampling was undertaken in 2014 and full results are available in the York Potash Harbour Facilities ES (Royal Haskoning, 2016b).

9.4.57 Surface sediment samples were collected as well as sediment from a range of depths down to 4.87 m below the surface. In summary, the sediments contained relatively high levels of contamination, including elevated metals and PAH concentrations. Metals and PAHs exceeded Cefas Action Level 1 at most of sampling stations and depths. In some cases, Cefas Action Level 2 was also exceeded, notably for chromium, copper and mercury. As such these sediments were not considered suitable for disposal at sea. The concentration of metals in dredged samples from the Tees Approach Channel were generally less than those sampled closer to the east bank, with no exceedances of Cefas Action Level 1 in the samples from the approach channel. On the whole, there were fewer exceedances of PCBs against the Cefas

Action Levels than metals and PAHs, although there were instances of exceedances against both Action Level 1 and 2. Concentrations of contaminants are greater at depth than in surface samples, reflecting the historical impact of heavy industry in this area around the waterbody, which in the past received a large amount of waste discharge.

9.4.58 Two earlier impact assessments of sediment quality were undertaken to support the EIAs of the Northern Gateway Container Terminal (NGCT) and QE II Berth Redevelopment project.

9.4.59 The QE II Berth sediment assessment consisted of two samples immediately west of Tees Dock, taken in 2008. Two vibrocores were used for sampling sediment to a depth of 4 m below ordnance datum. Results indicated that all metals exceeded Cefas Action Level 1 levels of contamination. Concentrations of dibutyl tin and organotins were present below Action Level 1. Concentrations of cadmium, chromium, copper, lead, mercury and zinc also exceeded Cefas Action Level 2 (Royal Haskoning, 2016a) and were not considered suitable for disposal at sea.

9.4.60 The NGCT sediment samples were collected in 2006 from several locations throughout the Tees Estuary, including the main channel between Tees Dock and Dabholm Gut, Seal Sands, Bran Sands and the Tees Approach Channel. In summary, there was some level of contamination recorded in the samples, particularly heavy metals. However, levels were not deemed high enough to prevent material being disposed of at sea (Royal Haskoning, 2016a).

9.4.61 These past sampling campaigns indicate significant historical contamination in the Tees Estuary, which is more concentrated at the margins of the channel and at depth than in surface sediments. In some locations, concentrations of contaminants exceeded Cefas Action Level 2 and so disposal at sea was not considered suitable in these cases.

Marine Ecology Overview

9.4.62 In terms of fisheries, the Tees Transitional WFD waterbody is an important water body for diadromous fish species which make seasonal migrations between the sea and riverine environment. Salmon (*Salmo salar*), sea trout (*Salmo trutta*), European eel (*Anguilla anguilla*), river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*) are all known to be present and have been identified as Local Priority Species within the Tees Valley Biodiversity Action Plan (BAP). Salmon, river lamprey and sea lamprey are also protected species under Annex II of the Habitats Directive. The River Tees is designated as one of the 64 main salmon rivers in England and Wales.

9.4.63 Estuarine and marine fish communities within the vicinity of the Proposed Development Site represent a mixed demersal and pelagic fish assemblage typical of the central North Sea. Data on the Environment Agency (Environment Agency, 2019) indicates that the total number of the monthly combined upstream counts for salmon and sea trout at the Environment Agency fish counter at the Tees Barrage on the Lower Tees has generally declined in recent years, but with a notable increase in

2020, with total fish counted being 498 (2016), 297 (2017), 217 (2018), 204 (2019), 328 (2020), 305 (2021), 266 (2022) (Environment Agency, 2021).

9.4.64 Common shellfish species within inshore waters include edible crab *(Cancer pagurus*), European lobster (*Homarus gammarus*) and velvet swimming crab (*Necora puber*). There are no designated shellfish waters within the vicinity of the Proposed Development Site.

9.4.65 The North Sea and coastal waters around the Proposed Development Site are known to be important for harbour porpoise (*Phocoena phocoena),* which is an Annex II species under the Habitats Directive.

9.4.66 No protected phytoplankton species or invasive non-native species (INNS) were identified during the Environment Agency surveys in the Tees Estuary. However, there is evidence of some forms of taxa being present that cause harmful algal blooms in UK coastal waters. These included: *Alexandrium* spp., *Karenia mikimotoi*, *Dinophysis acuminata*, *Dinophysis acuta*, and *Pseudonitzschia* spp. which are all known to cause shellfish poisoning (Defra, 2008). In addition, several taxa known to cause mortality in fish due to physical damage were also recorded; these included *Gymnodinium* spp., *Dictyocha speculum, Chaetoceros* spp. and *K. mikimotoi* (Defra, 2008).

9.4.67 No formal monitoring of harmful algal blooms is carried out within the lower Tees Estuary or coastal water bodies although the Tees WFD waterbody which covers the lower reaches of the estuary is classified as having 'Good' phytoplankton status despite Seal Sands being recognised as a sensitive eutrophic area.

9.4.68 With regard to zooplankton, several INNS are known to have been introduced to the North Sea due to human activities and have responded to favourable conditions, but no protected species have been identified.

9.4.69 The most recent Phase I and Phase II intertidal benthic survey was undertaken in October 2019 as part of the NZT project surveys (NZT ES, Appendix 14A: Intertidal Benthic Ecology Survey Report). Overall, benthic communities were characterised by relatively low abundance, biomass, species richness and diversity. No protected species were identified during the intertidal survey. However, two biotopes (EUNIS A5.233 and A5.242 (EEA, 2012)) were identified in the subtidal sampling which qualify as habitats of principal importance being listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and belong to the UK BAP priority habitat type, 'subtidal sands and gravels'. The only INNS recorded during the benthic surveys was the seaweed wakame (*Undaria pinnatifida*), found in the intertidal zone.

9.4.70 There have been incidents of mass mortality reported in crabs and lobsters along the coastline between Hartlepool and Whitby in recent years, notably between October and December 2021, and continuing periodically through 2022. Some crustaceans were observed displaying unusual twitching behaviour. The exact cause of death has been highly disputed. However, several explanations have been proposed, including disease, harmful algal blooms, chemical toxicity resulting from historical industrial activity in Teesside, and dredging in the Tees area, including Tees Estuary. The most likely cause of death is a novel pathogen. However, the mortality event is still largely

unexplained (Defra, 2023c), suggesting similar events could continue to occur into the future without an identifiable cause and therefore focused mitigation..

9.4.71 Details regarding marine ecology within the Study Area are provided in Chapter 14: Marine Ecology (PEI Report, Volume I).

Freshwater Ecology Overview

9.4.72 Full details regarding freshwater ecology within the Study Area are provided in Chapter 12: Ecology and Nature Conservation (including Aquatic Ecology) (PEI Report, Volume I). A summary is provided below.

9.4.73 There is only one riverine WFD waterbody within the boundary of the Proposed Development Site that is considered to be potentially impacted - this is the Tees Estuary South Bank (Water Body ID: GB103025072320). Routine WFD monitoring is limited in the area and there is limited availability of aquatic datasets. Those that are available were requested from the Environmental Records and Information Centre (ERIC). Given the limited data availability, further aquatic baseline surveys have been undertaken to gather more robust data to inform the assessment.

9.4.74 Several notable fish species were recorded within 2 km of the Proposed Development Site using Environment Agency data, NBN Atlas data, survey results for other developments in the area. Site surveys have shown European eel *Anguilla* in Dabholm Gut and Pond 3 (see Chapter 12: Ecology and Nature Conservation, PEI Report, Volume I).

9.4.75 There were no specific records of protected macroinvertebrate species identified in the aquatic ecology desk study data. However, some notable taxa were identified, including the beetle (*Helochares obscurus*) (Vulnerable), the beetle (*Ilybius subaeneus*) (nationally scarce), the beetle (*Noterus crassicornis*) (nationally scarce) and the caddisfly *Oxyethira simplex* (nationally scarce). These were found in and around the Swallow and Mucky Fleet area, which is outside the Proposed Development Site, but within the Study Area.

9.4.76 Previous surveys for other developments within the Study Area found pygmy backswimmer (*Plea minutissima*) and the beetle (*Haliplus obliquus*), to be present in The Mill Race. The pygmy backswimmer was also present in samples collected from The Fleet. Both species have a Conservation Score 4 and are considered 'Occasional' under the CCI index (see Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I) for classification details). Pond 14 from an NZT project survey contained a beetle *Hydroglyphus geminus* which is classified as "Local" or locally important under the CCI index. However, none of the species identified are listed under statutory or non-statutory designations.

9.4.77 The autumn 2022 aquatic macroinvertebrate survey for the Proposed Development recorded the locally notable bladder snail *Aplexa hypnorum* in Holme Fleet (NZ 49387 23931) and the locally notable Dytiscidae beetle (*Hygrotus confluens*) in a ditch at NZ 49735 24400.

9.4.78 There were no records of the white-clawed crayfish (*Austropotamobius pallipes*) within 2 km of the Proposed Development Site within the last ten years, nor within

10 km of the Study Area, and there is no mention of presence within the Tees Valley BAP. However, there are recent records of American signal crayfish (*Pacifastacus leniusculus*) in the Study Area, which being an invasive species, reduces the likelihood of native white-clawed being present. White-clawed crayfish is therefore considered absent from the Study Area.

9.4.79 The WFD macroinvertebrate monitoring data provided by the Environment Agency from 2016 for Dabholm Gut (part of the 'Tees Estuary South Bank' WFD waterbody) at NZ 56570 23772 indicates that the waterbody has very poor quality (Whalley Hawkes Paisley Trigg score of 17.6 to 19.5, Average Score Per Taxa of 3.3 to 3.5, very low diversity) and no species of conservation interest were recorded.

9.4.80 Based on available data, there are no notable or protected macrophyte species recorded within the Study Area. However, Pond 14 had five uncommon species recorded including sea club-rush (*Bolboschoenus maritimus*), spiked water milfoil (*Myriophyllum spicatum*) and horned pondweed (*Zannichellia palustris*).

9.4.81 Several INNS species were identified in the desk study, from Environment Agency data and data from previous NZT project surveys. Species identified on the Wildlife and Countryside Act 1981 (Schedule 9) include Floating Pennywort (*Hydrocotyle ranunculoides*), Giant Hogweed (*Heracleum mantegazzianum*), New Zealand pigmyweed (*Crassula helmsii*), Parrot feather (*Myriophyllum aquaticum*), Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*). There are statutory constraints to limit their potential spread, and therefore mitigation will be required during Proposed Development construction to prevent their spread and where possible locally eradicate these species within the construction boundary. Nuttall's waterweed (*Elodea nuttallii*) was also recorded, which is no longer listed in Schedule 9 of the Wildlife and Countryside Act 1981 but is listed in the Invasive Alien Species (Enforcement and Permitting) Order 2019.

Sites of Ecological Importance

9.4.82 Designations within and in proximity to the Study Area are shown on Figure 10-10: Ecological Designations (PEI Report, Volume II). The Hydrogen Pipeline Corridor (where it crosses the Tees Estuary) crosses the Teesmouth and Cleveland Coast SSSI. The Teesmouth and Cleveland Coast SSSI is notified under Section 28C of the Wildlife and Countryside Act 1981 and is of special interest for many nationally important features that occur within and are supported by the wider mosaic of coastal and freshwater habitats. Habitats in the SSSI include sand dunes, saltmarshes, mudflats, rocky and sandy shores, saline lagoons, grazing marshes, reedbeds and freshwater wetlands. The site stretches from Crimdon Dene Mouth in the north, to Marske-by-the Sea in the south, and inland to Billingham including the entire Tees Estuary upstream to the Tees Barrage.

9.4.83 The coast either side of Teesmouth is also designated as being of international importance as the Teesmouth and Cleveland Coast SPA which is designated under the Conservation of Habitats and Species Regulations (2017) (UK Government, 2017b), and the Teesmouth and Cleveland Coast Ramsar site, which is a wetland designated as being of international importance under the Ramsar Convention. The designation

is for its important bird populations, and the SPA is a complex of discrete coastal and wetland habitats. These include sandflats, mudflats, rocky foreshore, saltmarsh, sand dunes, wet grassland and freshwater lagoons. The SPA is classified for its breeding Little Tern, passage Sandwich Tern and Redshank, wintering Red Knot and an assemblage of over 20,000 wintering birds. The SPA and Ramsar site both fall cross the Proposed Development Site at its northern extent for the water discharge corridor.

9.4.84 Seaton Dunes and Common Local Nature Reserve (LNR) (part of the Teesmouth and Cleveland Coast SSSI) is located approximately 1.8 km from the Proposed Development. The area is of considerable importance for its invertebrate fauna, flora and bird life. The range of habitats include sandy, muddy, and rocky foreshore, dunes, dune slacks and dune grassland, as well as relict saltmarsh, grazed freshwater marsh with dykes, pools and swells (Natural England, n.d.).

9.4.85 Cowpen Bewley Woodland Country Park LNR is located partly within the Proposed Development Site at its western extent, with Cowbridge Beck running through it (with the watercourse being north of the Proposed Development Site). Reclaimed from former brickworks, landfill, and ex-agricultural land there are now large variety of habitats and wildlife including woodlands, grassland, a lake, and a series of ponds.

9.4.86 Charlton's Pond LNR is located approximately 0.5 km west of the Proposed Development Site. This is an 8 ha site, consisting of wetlands, amenity grassland and woodland. The site is upslope and upstream of the Proposed Development Site and so is scoped out of further assessment.

9.4.87 There are no other statutory, local non-statutory or other non-statutory designated sites whose reason for designation is due to aquatic habitats, species, or their assemblage up to 1 km from the Proposed Development Site.

Groundwater and Geological Features

9.4.88 Full details of geology and groundwater are provided in Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I). In summary, the BGS Geoindex viewer (BGS, n.d.) indicates that the solid geology beneath the Proposed Development Site consists of strata of Triassic and Jurassic age.

9.4.89 Immediately around the River Tees and to the south of Teesmouth the bedrock is Triassic Mercia Mudstone including the northern section of the Proposed Development Site which is also underlain by the Triassic Penarth Group. The southern half of the Proposed Development Site is underlain by Jurassic Redcar Mudstone, which also stretches south to beyond the Wilton International Site and underlies most of the town of Redcar.

9.4.90 To the north of the Tees Estuary, Mercia Mudstone underlies the Seal Sands Industrial Estate, which overlies the Triassic Sherwood Sandstone Group, which is present beneath Seal Sands, Cowpen Marsh, Saltholme and the town of Billingham.

9.4.91 Bedrock is overlain by superficial deposits consisting of Tidal Flat Deposits (sand, silt and clay). These are found beneath the Tees Estuary, Teesmouth, Seal Sands, Cowpen Marsh and Saltholme. To the north-east of the Proposed Development Site in the

coastal area adjacent to Coatham Sands there are deposits of Beach and Tidal Flat Deposits and Blown Sand. The Lackenby Steelworks, Grangetown and Lazenby are underlain by glaciolacustrine deposits, Redcar and the southern extent of the Wilton International Site are underlain by Devensian Till (diamicton). The north-west of the Study Area towards Cowpen Bewley is underlain by glaciolacustrine deposits. Finally, there are marine beach deposits on the coastline north of Teesmouth.

9.4.92 Defra's MAGiC website (Defra, n.d.) indicates that the Sherwood Sandstone to the north of the Tees is classified a Principal Aquifer. Principal aquifers have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

9.4.93 The Mercia Mudstone bedrock deposits surrounding the Tees are classified as a Secondary B aquifer. Secondary B aquifers are lower permeability strata which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons, and weathering. The Redcar Mudstone to the south of this is Secondary (undifferentiated) aquifer. This has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

9.4.94 The superficial deposits beneath the Proposed Development Site are predominantly classified as a Secondary (undifferentiated) aquifer, and in some cases unproductive (i.e., drift deposits with low permeability that have negligible significance for water supply or river base flow). However, there is an area of Secondary A superficial aquifer beneath the Proposed Development Site and immediately south towards the A1085 and Dormanstown. Secondary A aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

9.4.95 The Study Area to the east and south of the Tees estuary is within the Tees Mercia Mudstone & Redcar Mudstone WFD groundwater body (GB40302G701300) (Environment Agency, 2023a). The waterbody is at Poor Overall Status, with Good Quantitative Status but Poor Chemical Status. The latter is a consequence of Poor Chemical Dependent Surface Water Body Status, due to point source pollution from mining and quarrying sources. The waterbody has an area of 494.57 km^2.

9.4.96 The Study Area to the west and north of the Tees Estuary is mainly within the Tees Sherwood Sandstone WFD groundwater body (GB40301G702000), except an isolated point around Port Clarence, which remains in the Tees Mercia Mudstone & Redcar Mudstone WFD groundwater body. The Tees Sherwood Sandstone groundwater body is at Good Overall Status, with Good Quantitative and Chemical Elements. The waterbody has an area of 293.01 km^2.

9.4.97 There are no Groundwater Dependent Terrestrial Ecosystems (GWDTE) which are likely to be affected by activities related to the Proposed Development.

9.4.98 Cranfield University's Soilscapes website (Cranfield University, n.d.) indicates that the majority of the Study Area either side of the Tees Estuary is underlain by loamy and clayey soils of coastal flats with naturally high groundwater. Beyond this, the Lackenby Steelworks is underlain by slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soil. The latter is also found in the northern extent of the Study Area north of Haverton Hill and toward Billingham. However, due to past development soil type and structure is likely to have been altered and large areas of Made Ground exist. Finally, sand dune soils are found along the coastal areas to the north of the Study Area.

Water Resources

9.4.99 The Study Area is not within a Nitrate Vulnerable Zone, Drinking Water Protected Area (Surface Water), Drinking Water Safeguard Zone or near any Source Protected Zones (SPZs).

9.4.100 This section contains information on water activity permits (e.g. discharges), water abstractions, and past water pollution incidents. The following details are derived from the ES for the proposed NZT development (AECOM, 2021). A request has been made to the Environment Agency to update this information specifically for the Proposed Development, and any additional information will be included in the ES.

Water Activity Permits

9.4.101 There are known to be 45 water activity permits (i.e., formerly discharge consents) within 250 m of the NZT development. Locations are shown in Figure 9-1: Surface Water Features and their Attributes (PEI Report, Volume I). This will be refined to include those relevant to the Proposed Development Site for the ES.

9.4.102 The majority of the consented discharges come from treated/untreated sewage effluent from storm tanks, pumping stations and combined sewer overflows (both private and public water company). There are also a substantial number of discharges coming from trade effluent, process/chemical, and cooling water in the Study Area, reflecting the presence of industrial land use. Furthermore, there are two active discharges for raised mine/groundwater where past activity continues to impact present-day water quality.

Abstractions

9.4.103 Data provided by the Environment Agency for the NZT development indicates that there are 18 licensed water abstractions within 2 km of that site. Locations shown in Figure 9-1: Surface Water Features and their Attributes (PEI Report, Volume II).

9.4.104 Twelve of these abstractions are for groundwater from the underlying Triassic Sherwood Sandstone to the north and west of the Tees Estuary. They are predominantly for industrial, commercial, and public service use. There are also groundwater abstractions for water supply.

9.4.105 There are six surface water abstractions, from both the Tees and Holme Fleet. Again, the predominant use is the industrial, commercial, and public service sector, with one abstraction also for power generation.

9.4.106 Details on private water supplies (PWS) have been requested from the local authorities. RCBC have confirmed that there is one PWS located at NZ 56914 20433. This is for Barnaby Side Farm and is for 2m^3 per day and is south of the Proposed Development Site. STBC have confirmed that there are no private water supplies in the Study Area in their respective administrative areas.

Water Pollution Incidents

9.4.107 Four water pollution incidents of Category 3 (minor) or worse were identified within 250 m of the NZT development within the last 10 years. Details are given in Table 9-14 and locations are shown in Figure 9-1: Surface Water Features and Their Attributes (PEI Report, Volume II).

Table 9-14: Pollution Incidents to Controlled Waters within 250 m of the Proposed Development Site

FIG 9.1 REF.	NOTIFICATION ID & DATE	CATEGORY	NATIONAL GRID REFERENCE	POLLUTANT	PORBABLE RECEIVING WATER
P1	969033 10/03/2012	3 (Minor)	NZ 49573 21710	Atmospheric pollutants and - smoke	Tees Estuary effects
P2	1187178 25/12/2013	3 (Minor)	NZ 49573 21710	Contaminated Water – firefighting runoff	Tees Estuary
P3	1256199 15//07/2014	2 (Significant)	NZ 56608 23878	Crude sewage	Dabholm Gut
P4	1405228 22/01/2016	2 (Significant)	NZ 57917 23982	Oils – Diesel (including agricultural)	Tributary of the Fleet

9.4.108 The recorded pollution incidents have impacted the Tees Estuary, Dabholm Gut and a tributary of the Fleet. They have been related to pollution from oils, crude sewage and contaminated water associated with firefighting runoff.

Flood Risk

9.4.109 This section provides a summary of the baseline flood risk data available for the Proposed Development Site. Refer to Appendix 9A: Preliminary FRA (PEI Report, Volume III) for a more detailed description of the baseline environment in relation to flood risk.

9.4.110 The Environment Agency's 'Flood Map for Planning' (Environment Agency, 2023b) identifies areas subject to fluvial/tidal flood risk for the present day but does not include the benefits or impacts of any existing flood defences. Flood zones are illustrated on Figure 9-3: Fluvial Flood Risk (PEI Report, Volume II) and should be referred to throughout.

9.4.111 The flood zone definitions for the flood zones used on the Flood Map for Planning, are defined in Table 9-15.

Table 9-15: Flood Zone Definitions (source Table 1 of the PPG; Department of Communities and Local Government, 2022)

FLOOD ZONE	DEFINITION	PROBABILITY OF FLOODING
Flood Zone 1	Land that has a low probability of flooding (less than 1 in 1,000 annual probabilities of river or sea flooding (<0.1%)).	Low
Flood Zone 2	Land that has a medium probability of flooding (between 1 in 100 and 1 in 1,000 annual probability of river flooding (0.1-1%), or between 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.1-0.5%).	Medium
Flood Zone 3a	Land that has a high probability of flooding (1 in 100 year or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%).	High
Flood Zone 3b (Functional Floodplain)	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map).	Very High

Tidal Sources

9.4.112 The River Tees is classified as a Main River and is tidal as it passes through the Study Area, with the normal tidal limit approximately 14 km upstream (at the Tees Barrage).

9.4.113 Greatham Creek, a Main River, is a tidal watercourse which flows in an easterly direction, following the STBC boundary, and discharges into the Tees at Seal Sands. Its tidal limit extends to a weir, which is approximately 300 m upstream of the confluence with Cowbridge Beck, outside of Stockton Borough. Greatham Creek is crossed by bridges which carry the A178 trunk road and the emergency access road to Seal Sands. There is a history of tidal flooding and breach of the defences at Greatham Creek.

9.4.114 The online Flood Map for Planning (Environment Agency, 2023b) illustrates that the Main Site is located entirely in Flood Zone 1 and a significant amount of the Hydrogen Pipeline Corridor is located within Flood Zones 2 and 3. Small areas of the Electrical Connection Corridor and the Water Connections Corridor are also located within Flood Zones 2 and 3.

9.4.115 The Hydrogen Pipeline Corridor crosses Flood Zones 2 and 3 at the delta of Greatham Creek flowing into the Seaton on Tees Channel, between Holme Fleet and Swallow Fleet in the south-west of the Proposed Development Site and around the Dabholm Gut and Knitting Wife Beck in the north-east of the Proposed Development Site. Refer to Figure 9-3: Fluvial Flood Risk (PEI Report, Volume II) for the spatial extent of these Flood Zones.

9.4.116 Flood risk is extensive to the north of the River Tees including large areas of the very low-lying Seal Sands, Cowpen Marsh, Saltholme and Port Clarence, with flooding predominantly associated with the River Tees and Greatham Creek. The connection corridor that extends out towards Billingham crossing land between the two tidal watercourses is located across Flood Zone 1 (low risk), Flood Zone 2 (medium risk) and Flood Zone 3a (high risk) with the main area at risk located to the north of Port Clarence. There is no land within the Proposed Development Site within Flood Zone 3b (Functional Floodplain).

9.4.117 The Environment Agency own and maintain a number of flood defence assets along the River Tees near the Proposed Development Site. This includes a series of embankments and walls upstream and downstream of the Transporter Bridge and defences around the Greatham Creek delta flowing into Seaton on Tees Channel. There are also demountable defences (that when erected create a wall with the same standard of protection as the surrounding defences). These are privately owned and maintained by Wilton International Site.

9.4.118 The tidal defences in proximity to the Proposed Development Site consist of a combination of high ground and raised defences, including floodwalls and flood banks. According to information provided by the Environment Agency they are in ‘very good to good’ condition and reduce the risk of flooding up to a 0.5% AEP (1 in 200 chance in any year) event. The Environment Agency inspects these defences routinely to ensure potential defects are identified.

9.4.119 The Environment Agency provided modelled tidal peak water levels for the tidal Tees area for the NZT development for the 0.5% AEP (1 in 200 year), 0.1% AEP (1 in 1,000 year) and 0.1% AEP with climate change scenario flood events, and this has been used to inform the Preliminary FRA (Appendix 9A, PEI Report, Volume III). The model demonstrated that during a 0.1% AEP (1 in 1000 chance) event based upon the existing (2019) scenario, tidal levels in the Tees Estuary could rise up to 4.33 m AOD at the mouth of the estuary and up to 4.40 m AOD where the A19 crosses the Tees near Portrack.

9.4.120 The Main Site is considered to be at 'low risk' of flooding from tidal sources, together with the connection corridors located within Flood Zone 1 on the south bank of the River Tees (CO_2 Export Corridor and Electrical Connection Corridor). The section of the Hydrogen Pipeline Corridor crossing the River Tees and the section to the east of Billingham (located in Flood Zone 3a on the left bank of the River Tees) is at 'high' risk of tidal flooding. On the right bank of the River Tees and east of the Main Site, sections of the Water Connection Corridor and Electrical Connection Corridor are at 'high risk' of tidal flooding.

Fluvial Sources

9.4.121 The nearest fluvial watercourses to the Main Site are The Fleet (otherwise known under the WFD as 'Tees Estuary (S Bank)'), located approximately 0.8 km east of the Main Site (but crossing through the Water Connections Corridor and Electrical Connection Corridor); Dabholm Gut, located approximately 0.7 km south of the Main Site and within the Hydrogen Pipeline Corridor; and the Mill Race, located approximately 0.9 km south-east of the Main Site.

9.4.122 Numerous other Ordinary Watercourses intersect the connection corridor routes including Mains Dike, The Mill Race, Lackenby Channel, Holme Fleet, Kinkerdale Beck, Kettle Beck and Knitting Wife Beck to the south of the River Tees and Belasis Beck, Mucky Fleet and Swallow Fleet to the north of the River Tees near Billingham. The position and direction of flow of these watercourses has been described earlier in Table 9-7. These watercourses all pose a potential risk of fluvial flooding to the connection corridors.

9.4.123 The Environment Agency's online Flood Map for Planning (Environment Agency, 2023b) illustrates that the entirety of the Main Site is within Flood Zone 1, while about half of the Hydrogen Pipeline Corridor is located in Flood Zones 2 and 3 in areas around the Tees. The majority of the Electrical Connection Corridor and the Water Connections Corridor is located within Flood Zone 1, except a small part of the Electrical Connection Corridor, between the Teesport Estate and the Trunk Road Industrial Estate, which falls within Flood Zones 2 and 3.

9.4.124 Although tidal flood risk is the greatest risk to the north of the Tees Estuary, there are Ordinary Watercourses, such as the Mucky Fleet, Swallow Fleet, and Belasis Beck that could pose a fluvial flood risk to small sections of the Hydrogen Pipeline Corridor, predominantly where the connection corridor crosses a watercourse/drain.

9.4.125 It is considered that for the baseline flood risk scenario that the Proposed Development Site and the majority of the connection corridors to the north and

south of the River Tees are at 'low' risk of flooding from fluvial sources. There are areas of higher risk where the connection corridors cross watercourses.

Groundwater Flood Risk

9.4.126 Groundwater flooding can occur when groundwater levels rise above ground surface levels. The underlying geology has a major influence on where this type of flooding takes place; it is most likely to occur in low-lying areas underlain by permeable rocks (aquifers), i.e. to the north of the Tees.

9.4.127 The Environment Agency have no groundwater level monitoring sites within 2 km of the Study Area (the closest groundwater level data held is from a site approximately 8.2 km north-north-west of the Main Site). However, the bedrock groundwater level is expected to be around the ordnance datum given the proximity to the coast and the prevailing flat, low gradient topography of the Study Area.

9.4.128 The Tees Catchment Flood Management Plan (CFMP) (Environment Agency, 2009) states "*there is little documented evidence of groundwater flooding in the Tees catchment and groundwater flooding is not known to be a major problem due to the geology of the catchment*". This is particularly true for STBC area as the main geology is of sandstone and mudstone. There are no sources of groundwater flooding as the aquifers within these sandstones are not artesian even in very wet conditions.

9.4.129 The Environment Agency's Areas Susceptible to Groundwater Flooding map is illustrated in the RCBC and STBC Preliminary Flood Risk Assessment (PFRA) report (STBC, 2011). The Areas Susceptible to Groundwater Flooding map is divided into 1 km^2 grid-squares in which a percentage is given for what proportion of the 1 km^2 is considered to be susceptible to groundwater emergence. Within both the RCBC and STBC areas the map shows the Proposed Development Site lies predominantly in an area where 75% or more of the area is considered to be potentially at risk of groundwater emergence.

9.4.130 The groundwater vulnerability map identifies the Proposed Development Site as Medium-High risk; this means that there are some areas that offer groundwater protection from pollution, whereas other areas may allow pollution to be transmitted to groundwater.

9.4.131 Based on this information the risk of flooding from groundwater sources is considered to be a medium risk for those parts of the Proposed Development Site to the north of the Tees.

Surface Water Runoff to the Site

Overland Flow of Rainfall Runoff

9.4.132 Overland flow results from rainfall that fails to infiltrate the surface and travels over the ground surface; this is exacerbated where the permeability of the ground is low due to the type of soil and geology (such as clayey soils) or urban development with more impermeable surfaces.

9.4.133 Surface water flooding is the main source of flood risk in the RCBC area with regular flooding occurring in Eston, Redcar and Guisborough. This flooding is due to

insufficient capacity within surface water drainage systems, combined sewer and culverted watercourses to convey the rainfall away. The RCBC PFRA (RCBC, 2011) states "*In general, this local flooding occurs regularly, but it is not particularly hazardous and individual incidents do not affect a large number of properties*".

9.4.134 The Environment Agency's online Risk of Flooding from Surface Water maps (Environment Agency, 2023b) indicate areas at risk from surface water flooding, when rainwater does not drain away through the normal drainage systems or soak into the ground, but instead lies on or flows over the ground. This is illustrated on Figure 9-4: Flood Risk from Surface Water (PEI Report, Volume II). Environment Agency mapping indicates that the Proposed Development Site and the associated connection corridors are generally at very low risk (<0.1% AEP event) of flooding from surface water. The risk of surface water flooding within the Proposed Development Site from elsewhere is considered to be low to very low.

9.4.135 There are, however, small, isolated areas of high, medium and low flood risk where water is seen to pond during more significant rainfall events. These areas are constrained to topographical low spots within the Proposed Development Site. The main locations of identified surface water flooding are:

- in the north-east part of the Proposed Development Site where water is seen to flood around the A1085/Broadway East roundabout junction. Land in this area is at low to high risk of surface water flooding in the area of the Hydrogen Pipeline Corridor, Water Connections Corridor and Electrical Connection Corridor; and
- land located to the west between the A1185 and Cowpen Bewley Road, approximately 8 km to the west of the Proposed Development Site. Land in this area is at low to medium risk of surface water flooding.

9.4.136 Based on the above information, the risk of surface water runoff to the Proposed Development Site is considered to be low.

Existing Drainage Infrastructure

9.4.137 No information was available regarding the private drainage falling within the Proposed Development Site at the time of preparing the PEI Report. It is assumed the existing surface water drainage system collects runoff from the buildings, hardstanding areas and gullies, which then discharge into the surrounding sewer network and/or watercourses.

9.4.138 Northumbrian Water's Bran Sands WwTW is located immediately to the south of the Proposed Development Site and discharges into the Dabholm Gut.

9.4.139 According to the local SFRA (RCBC, 2016) there has been in total 234 records of historical sewer flooding incidents in the RCBC area. Information provided in their SFRA indicates that no historical sewer flooding has occurred in close proximity to the Proposed Development Site and connection corridors to the south of the River Tees. Flooding from drainage infrastructure within the RCBC area tends to occur in predominantly residential areas, with Eston (located to the south-west of the Proposed Development Site), identified as a Critical Drainage Area (CDA).

9.4.140 Based on the available records and information, the Proposed Development Site is considered to be at low to medium risk of flooding from drainage infrastructure.

Artificial Waterbodies

9.4.141 Artificial flood sources include raised channels such as canals or storage features such as ponds and reservoirs.

9.4.142 A review of online OS mapping indicates that there are no canals located in close proximity to the Proposed Development Site.

9.4.143 The Reservoir Act 1975 defines a large reservoir as one that holds over 25,000 m^3 of water, although this was expected to be reduced to 10,000 m^3 under a review into the safety legislation and regulation of reservoirs and is expected to be phased in by the Environment Agency once this comes into effect under the Flood and Water Management Act 2010. However, the plans to reduce the threshold appear to be on hold at this time.

9.4.144 The risk of flooding associated with reservoirs is residual and is associated with failure of reservoir outfalls or dam breaching. This risk is reduced through regular maintenance by the operating authority. Reservoirs in the UK have an extremely good safety record with no incidents resulting in the loss of life since 1925.

9.4.145 The Environment Agency is the enforcement authority for the Reservoirs Act 1975 in England. All large reservoirs must be regularly inspected and supervised by reservoir panel engineers. In addition, local authorities are responsible for coordinating emergency plans for reservoir flooding and ensuring communities are well prepared.

9.4.146 Environment Agency Long-Term Flood Risk Mapping (Environment Agency, 2023b) shows that a significant portion of the area is at risk of flooding in the unlikely event of a breach or failure of reservoirs. The mapping shows the largest area that might be flooded if a reservoir were to fail and release the water it holds but does not give any information about the depth or speed of the flood waters. The Environment Agency mapping shows two scenarios, dry-day and wet-day scenario, where the wet-day scenario includes additional extreme fluvial flooding conditions. The reservoir flood extents largely follow the fluvial/tidal floodplains in the area. Even in the wet-day scenario, the Main Site is not shown to be affected, but the proposed pipeline corridors would cross the reservoir flood extents. Environment Agency mapping shows that the risk is associated with several reservoirs including: Hury Subsidiary, Balderhead, Blackton, Cow Green, Crookfoot, Grassholme and Selset. These are owned by NWL with the exception of Crookfoot which is privately owned.

9.4.147 Based on the information above, the current residual risk of flooding from artificial sources is considered to be low.

Future Baseline

Construction (2025-2029); Operation 2030

9.4.148 As outlined in Chapter 5: Construction Programme and Management (PEI Report, Volume I), the construction of the Proposed Development is expected to commence with early enabling works for Phase 1 in 2025, and so this year has been adopted as

the future baseline for construction as a worst-case scenario. Full operation is scheduled to commence in 2030.

9.4.149 The future baseline has been determined qualitatively by considering the possibility of changes in the attributes that are considered when deciding the importance of water bodies in the Study Area.

Surface Water

9.4.150 All WFD surface waterbodies identified within the Study Area (Tees Coastal, Tees Estuary (South Bank), Cowbridge Beck and North Burn) have a target of Good by 2027, with the exception of Tees Transitional which has a target of maintaining the existing Moderate Potential (i.e. no deterioration from the present condition). However, these WFD classifications are subject to change during RBMP Cycle 3.

9.4.151 It is likely that through the action of new legislative requirements and ever more stringent planning policy and regulation, that the health of the water environment will continue to improve post-2027. The Environment Act 2021, the proposed Levelling-Up and Regeneration Bill and regulatory requirements (Water Company Price Review) include measures to tackle storm sewage discharges and set new requirements on phosphate removal from sewage treatment works. There are, however, significant challenges such as adapting to a changing climate and pressures of population growth that could have a retarding impact. It is also difficult to forecast these changes with any certainty.

9.4.152 The Tees Estuary is considered to be undergoing a period of ecological recovery after several decades of industrial and sewage pollution. As such, there is likely to be an improvement over current conditions due to interventions that are being implemented or have already been implemented. This includes the introduction of nutrient neutrality requirements that aim to ensure no deterioration with regard to nutrient status.

9.4.153 The current receptor importance criteria presented in Table 9-16 is largely based on the presence or not of various attributes (e.g. water body size, designated nature conservation site, WFD designation, or presence of a Bathing Water). For most of these attributes, it is unlikely that they will change in the future. The application of these criteria is therefore not sensitive to more subtle changes or improvements in water quality as may be experienced over time. Thus, no significant changes to current baseline conditions are predicted for the future baseline in the absence of the Proposed Development, as the principal reasons for differences in water body importance are unlikely to change. For this reason, the impact assessment within this chapter is undertaken against existing baseline conditions.

9.4.154 It is also noteworthy that the wider area around the Proposed Development Site is allocated in the local plan for industrial development, and if the Proposed Development was not progressed, then another form of development would likely take its place or it is assumed that the Proposed Development Site would be left in its current state.

Groundwater

9.4.155 The Tees Mercia Mudstone & Redcar Mudstone WFD groundwater body is at its objective of Poor Status (2015), while the Tees Sherwood Sandstone WFD groundwater body WFD waterbody is at its objective of Good Status by 2015. However, these WFD classifications are subject to change during RBMP Cycle 3.

9.4.156 No significant changes to current baseline conditions are predicted for the future baseline for the same reasons as outlined above for surface water. The impact assessment within this chapter is therefore undertaken against existing baseline conditions.

Flood Risk

9.4.157 Climate change is predicted to alter both future tidal and fluvial flood risk and this has been taken into account by the Preliminary FRA (Appendix 9A, PEI Report, Volume III). Climate change resilience is accounted for, accommodating current government climate change projections, including peak river flow allowances, sea level allowances and peak rainfall intensity allowances.

9.4.158 Where the risk of flooding from fluvial sources is currently assessed as high, the risk category of flooding to the site is not likely to increase due to climate change, although flooding is likely to be more frequent and to a greater extent. If a flood event did occur, the impact of climate change would result in an increase in the depth and extent of floodwater across the areas of the site affected by flooding from this source during a 1% (1 in 100 chance) event.

9.4.159 The Environment Agency climate change guidance was recently updated with revised sea level allowances up to the year 2125. Applying these sea level allowances to the existing (2019) scenario indicates water levels along the estuary could increase by 1.32 m. This would result in a rise up to 5.40 m AOD and 5.65 m AOD for the 0.5% AEP and 0.1% AEP respectively at the mouth of the estuary and up to 5.48 m AOD and 5.72 m AOD near Portrack. For details of different modelled scenarios refer to the Preliminary FRA (Appendix 9A, PEI Report, Volume III), as water levels do vary depending on the time horizons used in the analysis. In reality, given the expected lifetime of the Proposed Development, climate change flood water levels will be significantly less than those shown in Table 9A-17 with a decrease of 0.5 m for the Higher Central allowance water levels and a 0.68 m decrease for the Upper End allowance water levels.

9.4.160 The Phase 1 and Phase 2 production facilities will have a design life of 25 years. However, the operational life could be longer subject to market conditions and plant condition. At the end of its operational life, the most likely scenario would be that the Proposed Development would be closed, with all above ground structures on the Main Site removed, and the ground remediated as required by the Environmental Permit to facilitate future re-use.

9.4.161 The PEI Report has assumed that the Proposed Development could operate for longer than a 25 year design life. As such for flood risk the lifetime of the development is assumed to be 75 years for the purpose of the preliminary FRA, which

is in line with the lifetime of non-residential uses in the NPPF and Flood Risk and Coastal Change PPG.

9.4.162 The Environment Agency Long Term Flood Risk map (Environment Agency 2022b), which includes the Risk of Flooding from Surface Water (RoFSW), shows that the Main Site is generally at very low risk (less than 0.1% AEP). There are isolated pockets of low risk (between 0.1% and 1% AEP) throughout which appear to be associated with topographic low points. There are no pluvial flood flow routes crossing the Main Site as per Environment Agency mapping. Environment Agency mapping shows surface water flow routes and areas of ponding associated with watercourses and bodies of water across the Hydrogen Pipeline Corridor - refer to Figure 9-4: Risk of Flooding from Surface Water (PEI Report, Volume III).

9.4.163 The new updated climate change allowances published by the Environment Agency have been used for guidance in the Preliminary FRA (Appendix 9A, PEI Report, Volume III). This includes the tidal sea level allowance (Table 9A-8) and maximum scenario (Table 9A-9), the fluvial climate change allowance (Table 9A-10), the peak river flow allowance (Table 9A-11), the peak rainfall intensity allowance for 3.3% annual exceedance rainfall event (Table 9A-12) and the 1% annual exceedance rainfall event (Table 9A-13).

Decommissioning

9.4.164 It is considered that continued environmental improvements, tighter regulation at both national, regional and local scales, and environmental enhancements will lead to a gradual improvement over current baseline conditions in terms of water quality.

9.4.165 Climate change has the potential to significantly impact on drainage and flood risk, for example through increased storm intensity and changes in future rainfall patterns. However, the design of the Proposed Development will incorporate the climate change projections required by the Environment Agency to ensure that potentially increased surface water flows are accounted for and managed across the lifetime of the Proposed Development. Therefore, it is assumed that there will be no significant adverse changes to current baseline conditions within the next 28 years (assumed Proposed Development decommissioning date), and so the impact assessment within this chapter is undertaken against existing baseline conditions.

Importance of Receptors

9.4.166 The importance of the local water resource receptors within the Study Area is described in Table 9-16. Importance is based on the criteria outlined above in Table 9-2.

Table 9-16: Importance of Water Resource Receptors

WATER FEATURE	IMPORTANCE DESCRIPTIONS
Tees Bay	Water Quality: The Tees Coastal waterbody is considered a Very High importance receptor on the basis of being WFD designated and including sites protected/designated under EU (e.g. Teesmouth and Cleveland Coast Special Protection

WATER FEATURE	IMPORTANCE DESCRIPTIONS
	Area, bathing waters) and UK legislation (Teesmouth and Cleveland Coast SSSI). Morphology: Low importance as a WFD Heavily Modified Waterbody, dominated in this area by breakwaters.
Tees Estuary	Water Quality: The Tees Estuary is considered a Very High importance receptor for water quality on the basis of its scale, being WFD designated and supporting and range of internationally, nationally and locally protected nature conservation sites (Teesmouth and Cleveland Coast SSSI). This is despite significant modifications to the channel and flow regime, and the presence of contamination within fine sediments. It is also important for the dilution and dispersion of treated/untreated sewerage/trade/process wastewater, which at the same time influence water quality and present a risk of chemical spillages. Water is also abstracted from the estuary for industrial use (e.g. cooling water supply). The channel is also important for navigation and commercial activities (which also require maintenance dredging). Morphology: The Tees Estuary is considered of Medium importance for the assessment, taking into account interventions that are underway in the catchment. Its current status is of lower importance but due to significant modifications of the channel, particularly along the banks, and flow and tidal conditions being influenced by the Tees Barrage and breakwaters. Nonetheless, the Environment Agency and partners are delivering a number of projects (e.g. Tees Tideland Programme) designed to mitigate the ongoing ecological impact of historical physical modifications on the Tees estuary and tributaries. The current Programme is scheduled to be completed by the commissioning date of the proposed development, and thus it is considered to raise the importance classification to medium to reflect the ongoing improvements within the catchment.
The Fleet (Tees Estuary (S Bank) WFD waterbody)	Water Quality: The Fleet (freshwater reach) is considered a High importance receptor for water quality on the basis of being WFD designated (as Tees Estuary S Bank), and having an estimated Q95 <1.0 m^3/s. Although the upper reaches flow through the Teesmouth and Cleveland Coast SPA/SSSI sites, these are upstream of the Proposed Development. It is also possible that fine sediments are contaminated and that these may be leaching into the water depending on the prevailing conditions. Morphology: The Fleet is considered a Low importance receptor for morphology on the basis of being substantially

WATER FEATURE	IMPORTANCE DESCRIPTIONS
	modified by past land use, having an artificial cross section and being culverting over significant lengths.
Main's Dike	Water Quality: Main's Dike is considered a Medium importance receptor for water quality on the basis of not being designated under the WFD in its own right, its size and scale, and with estimated Q95 >0.001 m^3/s. It is also possible that fine sediments are contaminated and that these may be leaching into the water depending on the prevailing conditions. Morphology: It is considered a Low importance receptor for morphology on the basis of being largely artificial in character as a straightened channel and deficient in bedforms.
Mill Race	Water Quality: The Mill Race is considered a Medium importance receptor for water quality on the basis of its relatively small size and scale, not being designated under the WFD as its own waterbody and having an estimated It is also possible that fine sediments are contaminated and that these may be leaching into the water depending on the prevailing conditions. Q95 >0.001 m^3/s. Morphology: The Mill Race is considered a Low importance receptor for morphology on the basis of being largely artificial in character with deficiency of bedforms, with significant stretches of culvert.
Dabholm Gut	Water Quality: Dabholm Gut is connected to and designated as part of the Tees transitional waterbody. As such, it is considered a Very High importance receptor for water quality as per the Tees Estuary above. Morphology: Low importance due to being an artificial channelised watercourse, over-widened in places and with artificial banks.
Lackenby Channel	Water Quality: Lackenby Channel is considered a Medium importance receptor for water quality on the basis of not being designated under the WFD as its own waterbody, its relatively small size and scale, and an estimated Q95 >0.001 m^3/s. Unlike Dabholm Gut, its final reach is believed to be culverted beneath PD Teesport and thus it does not have an open connection to the Tees Estuary. Morphology: Low importance due to being an artificial, straight, channelised watercourse with artificial banks.
Kettle Beck	Water Quality: Kettle Beck is considered a Medium importance receptor for water quality on the basis of not having a WFD classification, but is estimated to have a Q95 >0.001 m^3/s. It is also possible that fine sediments are contaminated and that these may be leaching into the water depending on the prevailing conditions.

WATER FEATURE	IMPORTANCE DESCRIPTIONS
	Morphology: Low importance receptor on the basis of being largely artificial in character (i.e. straight ditch course with steep banks) with deficiency of bedforms, and significant stretches of culvert.
Kinkerdale Beck	Water Quality: Kinkerdale Beck is considered a Medium importance receptor for water quality on the basis of not having a WFD classification but is estimated to have a Q95 >0.001 m^3/s. It is also possible that fine sediments are contaminated and that these may be leaching into the water depending on the prevailing conditions. Morphology: Low importance on the basis of being largely artificial in character (i.e. straight ditch course with steep banks) with deficiency of bedforms, and significant stretches of culvert.
Knitting Wife Beck	Water Quality: Knitting Wife Beck is considered a Medium importance receptor for water quality on the basis of not having a WFD classification but is estimated to have a Q95 >0.001 m^3/s. It is also possible that fine sediments are contaminated and that these may be leaching into the water depending on the prevailing conditions. Morphology: Low importance receptor on the basis of being largely artificial in character (i.e. ditch course with steep banks) with deficiency of bedforms and significant stretches of culvert.
Ash Gill	Water Quality: Ash Gill is considered a Medium importance receptor for water quality on the basis of not having a WFD classification, but is estimated to have a Q95 >0.001 m^3/s. It is also possible that fine sediments are contaminated and that these may be leaching into the water depending on the prevailing conditions. Morphology: Low importance receptor on the basis of being largely artificial in character (i.e. ditch course with steep banks) with deficiency of bedforms, and significant stretches of culvert.
Castle Gill	Water Quality: Castle Gill is considered a Medium importance receptor for water quality on the basis of not having a WFD classification, but is estimated to have a Q95 >0.001 m^3/s. It is also possible that fine sediments are contaminated and that these may be leaching into the water depending on the prevailing conditions. Morphology: Low importance receptor for morphology on the basis of being largely artificial in character (i.e. ditch course with steep banks) with deficiency of bedforms, and stretches of culvert.

WATER FEATURE	IMPORTANCE DESCRIPTIONS
Holme Fleet	Water Quality: Holme Fleet is considered a High importance for water quality on the basis of flowing through the Teesmouth and Cleveland Coast SSSI, although it does not have a specific WFD classification. Morphology: Whilst not visited on site, aerial imagery suggests that morphologically Holme Fleet is a High importance receptor as it exhibits diverse geomorphic forms and bank side vegetation, but deviates from natural conditions due to various floodplain and catchment pressures.
Belasis Beck	Water Quality: Belasis Beck is considered a High importance for water quality on the basis of flowing through the Teesmouth and Cleveland Coast SSSI, although it does not have a specific WFD classification. Morphology: High importance receptor as it exhibits a variety geomorphic forms and bank side vegetation, but deviates from natural conditions due to various floodplain and catchment pressures.
Greatham Creek	Water Quality: The tidal lower reaches of Greatham Creek are designated under the Tees transitional waterbody. As such, it is considered a Very High importance receptor for water quality as per the Tees Estuary above. Morphology: Greatham Creek is considered a High importance receptor, since it displays a natural form upstream of the A178 road crossing, although modifications to the channel and adjacent land are evident downstream of the road crossing.
Mucky Fleet/ Swallow Fleet	Water Quality: Mucky Fleet and Swallow Fleet within Cowpen Marsh are considered Very High importance for water quality on the basis of flowing through the Teesmouth and Cleveland Coast SSSI, although they do not have specific WFD classifications. Morphology: High importance since they display a natural form, although historic modifications to connected drainage channels are likely to have altered the function of these watercourses.
Lake at Charlton's Pond Nature Reserve	Water Quality: The pond is considered High Importance for water quality due to having a local designation as a nature reserve. Morphology: The pond is considered to be of Low importance for morphology as an artificial waterbody originally constructed for clay extraction for the adjoining brickworks.

WATER FEATURE	IMPORTANCE DESCRIPTIONS
Waterbodies within Coatham Marsh, Saltholme Nature Reserve and Bran Sands	Water Quality: These are considered Very High importance receptors for water quality as they are within the Teesmouth and Cleveland Coast SSSI and several fall under the Teesmouth and Cleveland Coast SPA designation, thereby supporting bird populations. Morphology: Waterbodies at Coatham Marsh, Saltholme Nature Reserve and Bran Sands are considered High Importance for morphology as they have a natural form and bank side vegetation but deviate from natural conditions due to various floodplain and catchment pressures.
Pond 14 (open water pond) within Coatham Dunes – all other ponds in Coatham Dunes identified by mapping have now succeeded to fully vegetated wetlands and are not open water ponds requiring assessment.	Water Quality: Pond 14 is considered a Very High importance receptor for water quality as it is within the Teesmouth and Cleveland Coast SSSI and the Teesmouth and Cleveland Coast SPA designations. The Coatham Sands waterbodies and dune slacks provide habitat for bird populations, particularly redshank (*Tringa totanus*), who move inland to open water at high tide. Site survey has indicated that Pond 14 is the only waterbody remaining in the Coatham Sands dunes complex that has not succeeded to a fully vegetated wetland state, and therefore has particular importance as the sole area of open water habitat within the dunes. Morphology: Pond 14 is considered of Low Importance for morphology due to its artificial nature, having been formed from slag deposits from the adjacent former steelworks. All other waterbodies within Coatham Sands are fully vegetated wetlands and so are not considered to be ponds requiring assessment.
Numerous industrial ponds and artificial waterbodies across the area including Lazenby Reservoirs, Salthouse Brine Reservoirs and Ponds at Billingham Technology Park	As industrial, artificial waterbodies lacking any protected species (as far as is currently known) or designations, these are considered Low Importance waterbodies for water quality and morphology.
Mercia Mudstone Group/ Redcar Mudstone Group	This is considered a Medium importance receptor. It is present beneath the Main Site, Water Connection Corridor, Electrical Corridor and parts of the Hydrogen Pipeline Corridor. Mercia Mudstone is a Secondary B aquifer and supports several abstractions for industry. Redcar Mudstone Group is Secondary (undifferentiated) aquifer. The bedrock is overlain by tidal flat deposits, blown sand, glaciolacustrine deposits, marine deposits and till (superficial deposits are

WATER FEATURE	IMPORTANCE DESCRIPTIONS
	secondary A aquifer in the case of blown sand and otherwise Secondary (undifferentiated) aquifer).
Sherwood Sandstone Group	This is considered a Very High importance receptor. It is present beneath the Hydrogen Pipeline Corridor to the west of the Study Area, and is Principal Aquifer, supporting numerous abstractions. It is overlain in the Study Area by tidal flat deposits, glaciolacustrine deposits, and till which are generally Secondary (undifferentiated) aquifer.

Floodplain Sensitivity for Impact Assessment

9.4.167 For the construction assessment, the key receptor in terms of all forms of flood risk are the construction workers present on Proposed Development Site who are considered to be of Very High sensitivity. It is considered that the risk to surrounding residential, commercial and ecological receptors is no greater than in the baseline scenario for the construction phase.

9.4.168 For the operational assessment, the importance is based on understanding of the receptors present within areas at risk of flooding (i.e. the Proposed Development and other infrastructure) and the existing risk of flooding from all sources. The floodplain around the Tees in the Study Area and within the majority of the Proposed Development Site is predominantly in Flood Zone 1, where sensitivity of the floodplain for impact assessment purposes is considered Low. The entirety of the Main Site is within Flood Zone 1, but there are notable areas of Flood Zone 2 and 3a associated with the connection corridors, and which relate to tidal and fluvial flooding. To the south of the Tees these areas are notably around Dabholm Gut, Lackenby Channel, the Mill Race and The Fleet. To the north of the Tees, there are similarly areas of Flood Zone 2 and 3a to the south of Seal Sands, around Haverton Hill and from Port Clarence north through Saltholme and Cowpen Marsh. Overall, it has been assessed that the Main Site and the majority of the connection corridors are at a 'low' risk of flooding from tidal sources. However, the section of the Hydrogen Pipeline Corridor crossing the River Tees and around Seal Sands and Cowpen Marsh are at 'high' risk of tidal and fluvial flooding. In EIA terms these areas are of Very High sensitivity to tidal and fluvial flooding due to proximity of essential infrastructure (see Table 9-2).

9.4.169 The criteria described in Table 9-2 do not provide examples of sensitivity for other forms of flood risk and so the sensitivity is based on the existing baseline risk described earlier in this chapter. For the purpose of this impact assessment the sensitivity of non-fluvial forms of flood risk is as follows:

- flooding from surface water – mainly Low sensitivity, with localised areas of Medium to Very High sensitivity, mainly associated with watercourses and ponds, and mainly in connection with the Hydrogen Pipeline Corridor and Electrical Connection (refer to Figure 9-4: Surface Water Flood Risk (PEI Report, Volume II));

- flooding from artificial sources – Low sensitivity;
- flooding from groundwater – Medium sensitivity; and
- flooding from existing drainage infrastructure – Low to Medium sensitivity.

9.5 Development Design and Impact Avoidance

9.5.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development (also known as 'embedded measures').

9.5.2 The following impact avoidance measures have either been incorporated into the design or are standard construction or operational practices. These measures have, therefore, been taken into account during the impact assessment and will be secured through the draft DCO.

Construction

9.5.3 A Framework CEMP will be included within the ES which will accompany the DCO Application which will set out the key measures to be employed during the Proposed Development construction phase in order to control and minimise the impacts on the environment – including the minimisation of water environment effects. A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

Surface Water

9.5.4 During Proposed Development construction, water pollution may occur directly from spillages of polluting chemical substances into water features, or indirectly by being conveyed in runoff washed off from hard standing, other sealed surfaces or from construction machinery. Site clearance and remedial works on the Main Site and where construction compounds and laydown areas are required (e.g. at the Teesworks site) may require the dismantling and removal of existing drainage infrastructure, removal of compounds and targeted removal of underground obstructions, all of which may contain or interact with liquid chemicals and wastewater. This will be managed by the remediation contractor with contaminated water either treated onsite or removed from site for disposal in accordance with a suitable Remediation Strategy (refer to Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report Volume I) for further detail).

9.5.5 Fine sediment may be disturbed in water features directly, wash off working areas and hard standing (including approach roads) into water features indirectly via existing drainage systems or overland or be generated by the need to dewater excavations. Due to past industrial activity, this sediment may not be inert and may potentially contain chemical contaminants that could cause water quality to deteriorate and be harmful to the aquatic environment. However, potential impacts to the water environment during the construction phase will tend to be temporary and short term.

9.5.6 As detailed above, prior to the construction of the Proposed Development beginning, a Final CEMP will be prepared by the construction contractor. The Final CEMP will describe the principles for the protection of the water environment during construction. Within the Final CEMP as a technical appendix will be a Water Management Plan (WMP) which will outline the mitigation measures necessary to avoid, prevent and reduce adverse effects where possible upon the local surface water (and groundwater) environment during construction.

9.5.7 More specifically, the WMP will include an outline of responsibilities with regard to water management, required water quality monitoring, pollution prevention measures, training requirements for construction workers with regard to the water environment, an outline of likely relevant permissions and consents required, and a Pollution Incident and Response Plan.

9.5.8 The Framework CEMP that will form part of the ES will need to be reviewed, revised and updated as the project progresses towards construction to ensure all potential impacts and residual effects are considered and addressed as far as practicable, in keeping with available good practice. The principles of the mitigation measures set out below are the minimum standards that the contractor will implement. However, it is acknowledged that for some issues, there are multiple ways in which they may be addressed. In addition, the methods of dealing with pollutant risk will need to be continually reviewed and adapted as construction works progress in response to different types of work, weather conditions and locations of work.

9.5.9 Finally, where not disapplied through the DCO, there may be the need for a number of secondary permissions for temporary and potentially some permanent works affecting watercourses or groundwater (e.g. flood risk activity permits, water activity permits, land drainage consents, and abstraction/impoundment licences). At this stage it is reasonable to assume that all temporary works will be carried out under the necessary consents/permits and that the contractor will comply with any conditions imposed by any relevant permission, or otherwise the matters covered by these secondary consents will be covered by the provisions of the DCO.

Good Practice Guidance

9.5.10 The following relevant Guidance for Pollution Prevention (GPPs) have been released to date on the NetRegs website (NetRegs, n.d.) and are listed below. While these are not regulatory guidance in England where the UK government website outlines regulatory requirements, it remains a useful resource for best practice. The best practice approaches will be secured through the CEMP:

- GPP 1: Understanding your environmental responsibilities – good environmental practices;
- GPP 2: Above ground oil storage;
- GPP 3: Use and design of oil separators in surface water drainage systems;
- GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer;

- GPP 5: Works and maintenance in or near water;
- GPP 8: Safe storage and disposal of used oils;
- GPP 13: Vehicle washing and cleaning;
- GPP 19: Vehicles: Service and Repair;
- GPP 20: Dewatering underground ducts and chambers;
- GPP 21: Pollution Incident Response Plans;
- GPP22: Dealing with spills;
- GPP26: Safe storage – drums and intermediate bulk containers; and
- GPP 27: Installation, decommissioning and removal of underground storage tanks.

9.5.11 Where new GPPs are yet to be published, previous Environment Agency Pollution Prevention Guidance (PPGs) still provide useful advice on the management of construction to avoid, minimise and reduce environmental impacts, although they should not be relied upon to provide accurate details of the current legal and regulatory requirements and processes. Construction phase operations will be carried out in accordance with guidance contained within the following PPG:

- PPG6: Working at construction and demolition sites (Environment Agency, 2012);
- PPG7: Safe storage – the safe operation of refuelling facilities (Environment Agency, 2011); and
- PPG18: Managing fire water and major spillages (Environment Agency, 2000).

9.5.12 Additional good practice guidance for mitigation to protect the water environment can be found in the following key CIRIA documents and British Standards Institute documents:

- British Standards Institute (2009) BS6031:2009 Code of Practice for Earth Works (British Standards Institute, 2009).
- British Standards Institute (2013) BS8582 Code of Practice for Surface Water Management of Development Sites (British Standards Institute, 2013a).
- C753 (2015) The SuDS Manual (second edition) (CIRIA, 2015a);
- C744 (2015) Coastal and marine environmental site guide (second edition) (CIRIA, 2015b);
- C741 (2015) Environmental good practice on site guide (fourth edition) (CIRIA, 2015c);
- C648 (2006) Control of water pollution from linear construction projects, technical guidance (CIRIA, 2006);
- C609 (2004) Sustainable Drainage Systems, hydraulic, structural and water quality advice (CIRIA, 2004);

- C532 (2001) Control of water pollution from construction sites – Guidance for consultants and contractors (CIRIA, 2001); and
- C736F Containment systems for prevention of pollution (CIRIA, 2014).

Management of Construction Site Run-off

9.5.13 Measures to manage fine sediment in surface water runoff as a result of construction activities will be included in the Framework CEMP and will be developed with further detail in the WMP (to be included in the Final CEMP). There are a wide range of measures that can be adopted by the contractor to reduce the risk of excessive fine sediment in runoff (e.g. the timing of works, minimising earthworks and seeding or covering them), to intercept runoff to prevent uncontrolled runoff from the Proposed Development Site (e.g. by using cut off drains, fabric silt fences and matts (in channel), bunds and straw bales (that may be placed in small channels), designated areas for cleaning plant and equipment, wheel washes and road sweepers), and to treat runoff to remove excessive levels of fine sediment (e.g. settlement lagoons, sumps, spraying on to land or proprietary measures such as lamella clarifiers, flocculation etc.). It will be for the contractor to continually monitor the need for measures depending on the nature of the works being undertaken, the weather conditions, and the performance of sustainable drainage systems installed.

Management of Construction Chemical Spillage Risk

9.5.14 Measures will be implemented to manage the risk of accidental spillages on the Proposed Development Site and potential conveyance to nearby water features via surface runoff or land drains. These measures relating to the control of spillages and leaks will be summarised in the Framework CEMP submitted with the ES and will be included in the WMP in the Final CEMP and adopted during the construction works. Measures will be in accordance with prevailing pollution prevention legislation and following best practice guidance summarised earlier. They will include details of how fuel and other chemicals (including cementitious products) will be stored, used on site, and equipment and plant cleaned, as well as how leaks and spillages will be prevented or remediated if needed. This will also include the implementation of a Pollution Prevention Plan and an Emergency Response Plan, which would both be technical appendices to the Final CEMP (and hence secured in the DCO). In addition, any site welfare facilities will be appropriately managed, and all foul waste disposed of by a licensed contractor to a suitably permitted facility.

Management of Construction Dewatering

9.5.15 To minimise the impact of the dewatering on groundwater and surface water receptors where pipeline construction or deep excavations are required, a Construction Dewatering Strategy will be prepared by the construction contractor in accordance with a Groundwater Risk Assessment to be developed post consent. The purpose of the Construction Dewatering Strategy will be to:

- review ground investigation data and estimate volume of water that may need to be dewatered and the likely quality of that water;

- consider how phasing/sequencing of excavations will influence the amount of water that may need to be managed at any given time;
- undertake a feasibility assessment of options to remove water, including undertaking appropriate ecological and hydromorphological surveys, and hydraulic modelling (if necessary). Disposal options may include, but are not limited to:
  - re-use of water on-site (e.g. for dust suppression);
  - discharge to local watercourses;
  - spraying to nearby fields.

9.5.16 At this stage the preferred option is to discharge any groundwater abstracted from dewatering activities to a watercourse (where it may compensate for any reduction that might occur from localised lowering of the groundwater table temporarily).

9.5.17 When discharging water to a nearby watercourse the rate of discharge will need to be agreed with the Environment Agency to ensure that there is no unacceptable increase in flood risk or risk of scour. Where the required rate of discharge to keep the excavations dry exceeds what may be allowed to a single watercourse, additional locations for discharging the water will need to be provided or storage provided. Any discharge will need to be undertaken with the agreement of the relevant statutory regulator and will need to comply with the pollution prevention requirements set out in the Final CEMP.

9.5.18 If groundwater contains high concentrations of suspended fine sediment, this will be filtered by using storage basins and in combination with other proprietary measures (for example lamella clarifiers).

Construction of Hydrogen Pipeline Corridor – Trenchless Crossings

9.5.19 A gaseous phase hydrogen pipeline network is required to connect various potential industrial off-takers across the Tees Valley to the Production Facility at the Main Site. This will require crossings of numerous watercourses.

9.5.20 The Hydrogen Pipeline is expected to be 24 inches (i.e., 60.96 cm) in diameter and while being primarily above ground, it would cross the Tees Estuary and Greatham Creek (and adjacent water features at Seal Sands) using trenchless technologies (Horizontal Direction Drilling (HDD) or Micro Bored Tunnelling (MBT). The Hydrogen Pipeline Corridor is shown in Figure 4-4: Hydrogen Pipeline Corridor (PEI Report, Volume II).

9.5.21 The use of trenchless technologies avoid any direct impact to the estuary bed, associated sediment mobilisation and scour. The drilling will be approximately 10-15m below the bed to ensure that there is no risk of exposure, and this buffer distance will be agreed with the Marine Management Organisation (MMO).

9.5.22 In addition to the control and management measures for site runoff and spillage risk noted above, the methodology of the drilling, or other trenchless techniques, will include measures to minimise the risk to the environment. There are risks associated

with the use of drilling muds and plant close to the channel. For example, although rare, without due care there is a risk that drilling muds can 'break out' into watercourses leading to pollution (known as 'hydraulic fracture' or 'frac-out' event).

9.5.23 A site-specific Hydraulic Fracture Risk Assessment will be developed prior to construction following further investigation of specific ground conditions at the crossing locations, and appropriate mitigation developed in line with best construction practice. The drilling fluid that returns to the drilling rig is recycled within that drilling rig. Any wastewater/drilling products that are not recycled will be stored and removed by a suitable waste management contractor and disposed of at a licensed wastewater facility.

9.5.24 The sections of the Hydrogen Pipeline Corridor that will be installed via trenchless techniques will require launch, reception and jointing pits to be installed. It is assumed for the purposes of the assessment that the pit excavations for drilling/boring will be located at least 10 m from the watercourse, as measured from the top of bank, under which they will be directional drilled.

9.5.25 The exact dimensions of the launch and receive pits will be determined by site and ground conditions but will be kept to a safe minimum in terms of length, width and depth. Such pits are typically 5 m long x 5 m wide x 3 m deep. Maximum parameters for the pit dimensions will be confirmed for the ES. A shoring system appropriate to the ground conditions will be used as appropriate to minimise water ingress into the pits. This may be timbers, sheet piling, or a modular system and will be chosen based on suitability for the site conditions. The ingress of any groundwater will be carefully managed through design of the launch or reception pit, shoring method, and a pumping and treatment system. Excessive ingress of water will make the pit unsafe and thus it is important that ingress is minimised and that a suitable system of managing that water is implemented.

9.5.26 Once the Hydrogen Pipeline is installed beneath the watercourse, the pits and any trenches will be backfilled to the original ground level and seeded to reduce the risk of runoff and fine sediments entering watercourses. The drill fluids used within the drilling machine will be water based, such as naturally occurring bentonite clay. The fluid component of the drilling mud will be mains water, obtained from a nearby supply and tankered to site when required. There will be some recycling of drilling muds by the drilling plant used.

9.5.27 The bentonite within the drilling fluid is a naturally occurring mineral and enables the fluid to have sufficient viscosity to carry the cutting chips back to the surface machine whilst lubricating and keeping cool the drilling bit. Directional drilling, or other trenchless techniques, will be undertaken by a specialist contractor and the water column above the drill path will be continuously monitored during drilling. It is noted that drill fluid leakage into a watercourse is not a common problem, particularly given the proposed depths. However, where there is an increased perceived risk (i.e. lack of drilling mud returns), the drilling/boring operation will be suspended, remediation action implemented, and subsequently the methodology for that crossing re-evaluated. Measures to avoid Frac-out will be set out in the ES to accompany the DCO application.

Construction of Hydrogen Pipeline Corridor – Above Ground and Open-Cut Crossings

9.5.28 Various route options and construction methodologies are being considered for the remainder of the Hydrogen Pipeline Corridor (aside from the trenchless crossings discussed above). These include an option for below ground open trench (buried), installation on existing above ground pipe racks, and repurposing and reuse of existing pipelines (where possible). However, this is subject to ongoing design work, discussions with landowners and statutory consultees as well as being informed by environmental surveys.

9.5.29 For the majority of the Hydrogen Pipeline Corridor south of the River Tees, it is proposed to route along existing established pipeline corridors (generally above ground) where possible. There may be a need to cross the following watercourses:

- The Mill Race (approximate NGR NZ 57329 23682);
- Mains Dike (approximate NGR NZ 58121 22905 and NZ 57448 23552); and
- The Fleet (Tees Estuary S Bank WFD waterbody) (approximate NGR NZ 56765 23730).

9.5.30 These are all assumed to be above ground crossings utilising existing pipe bridges. Belasis Beck (approximate NGR NZ 48313 23194) to the north of the Tees off Cowpen Bewley Road will also be constructed above ground (NZ 48313 23194).

9.5.31 The following watercourse pipeline crossings to the north of the Tees Estuary are assumed to require open cut methods for installation:

- Belasis Beck (at approximate NGR NZ 49397 23941); and
- Unnamed watercourses at NZ 51111 24826, NZ 49147 24367 and NZ 51221 26296.

9.5.32 The exact number of watercourse crossings and their methodology will be fully assessed during the EIA and reported in the ES. Where open-cut installation of pipelines is required, the following mitigation will be implemented.

9.5.33 A pre-works morphology survey of the channel of each watercourse to be crossed will be undertaken prior to construction. The pre-works survey is to ensure that there is a formal record of the condition of each watercourse prior to commencement of works to install cables beneath the channel. The survey is a precautionary measure so that should there be any unforeseen adverse impacts there is a record against which any remedial action can be determined.

9.5.34 At this stage it is assumed that where open-cut crossings are required that water flow will be maintained by damming and over pumping or fluming. Works will be carried out in the drier months where possible as this will reduce the risk of pollution propagating downstream, particularly in the case of ephemeral watercourses. Once the watercourses are reinstated, silt fences, geotextile matting or straw bales will be used initially to capture mobilised sediments until the watercourse has returned to a settled state. It will be a requirement that the watercourses are reinstated as found and water quality monitoring will be undertaken prior to, during, and following on

from the construction activity. Regular observations of the watercourses will also be required post-works during vegetation re-establishment of the banks, especially following wet weather, to ensure that no adverse impacts have occurred. These requirements will be secured in the WMP, that will form a technical appendix of the Final CEMP.

Construction of Water Connection Corridor

9.5.35 Raw water will be supplied via the existing NWL raw water supply to the Teesworks site. There would also be a connection to NZT for use of the discharge outfall (for Case 2A and Case 2B) and a potential route for a Demineralised Water connection between the Main Site and Wilton International. At this stage in the design development, the water connections may be entirely above or below ground or a combination of the two. Agreements with NWL and the NZT project will be sought through the ongoing DCO process where required.

9.5.36 Applying the Rochdale Envelope approach, the land required for the water connection options currently proposed for the Main Site has been depicted as a broad corridor. There is potential for watercourse crossings within the corridor depending on the final arrangement of infrastructure. The locations are not known at this stage, but affected watercourses may include the Fleet (Tees Estuary S Bank), Mains Dike and Dabholm Beck. At this stage, and applying a precautionary worst-case scenario, it is assumed that all of these watercourses will be crossed using open-cut techniques, following the mitigation outlined above with regard to the Hydrogen Pipeline Corridor.

Construction of Gas Connections

9.5.37 Gas connection pipelines may be required for the transportation of compressed O_2 and N_2 for use at the Production Facility (this is referred to as the 'Other Gases Connection Corridor', shown by Figure 4-8: Other Gases Connection Corridor (O_2 and N_2) (PEI Report, Volume I)). At this stage in the design process, the connections for other gases may be entirely above or below ground or a combination of the two. There is potential for watercourse crossings relating to the Fleet (Tees Estuary S Bank), Mains Dike and Dabholm Beck. At this stage, and applying a precautionary worst-case scenario, it is assumed that all of these watercourses will be crossed using open-cut techniques, following the mitigation outlined above with regard to the Hydrogen Pipeline Corridor.

9.5.38 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), CO_2 captured and compressed after metering will be exported from H2Teesside to the NEP CO2 gathering network on the adjacent NZT site via a CO_2 export connection pipeline. No watercourse crossings are known to be required to facilitate installation of this connection at this stage, but this will be confirmed for the ES.

9.5.39 Similarly, natural gas will need to be imported to the Production Facility for use in the reforming process. At this stage, it is anticipated that a pipeline will be constructed which will connect the Production Facility at the Main Site to an existing pipeline. Again no watercourse crossings are known to be required to facilitate installation of this connection at this stage, but this will be confirmed for the ES.

Construction of Electrical Connection Corridor

9.5.40 There is existing electrical infrastructure in the area which comprises a combination of overhead and lower voltage underground cables that serve the local area and other industrial users located in proximity to the Proposed Development Site. The final decision on substation choice will be subject to design development and further work based on constructability and electrical network resilience and capacity.

9.5.41 At this stage in the design development, the electrical connection may be entirely above or below ground or a combination of the two. The Electrical Connection Corridor is currently depicted as broad corridors.

9.5.42 There is potential for watercourse crossings within these corridors depending on the final arrangement of infrastructure. The locations are not known at this stage, but affected watercourses may include:

- The Fleet (Tees Estuary S Bank);
- Mains Dike;
- Dabholm Beck;
- Kinkerdale Beck;
- The Mill Race;
- Cross Beck; and
- Knitting Wife Beck.

9.5.43 At this stage, and applying a precautionary worst-case scenario, it is assumed that all of these watercourses will be crossed using open-cut techniques, following the mitigation outlined above with regard to the Hydrogen Pipeline Corridor.

9.5.44 Where there is a need for transformers and switchgear, these will be bunded given that they may contain hydraulic oils.

Water Quality Monitoring

9.5.45 During construction of the Proposed Development, it is proposed to undertake a water quality monitoring programme to ensure that mitigation measures are operating as planned and preventing pollution. This is standard practice for construction works of this type, and full details will be outlined in the WMP accompanying the Final CEMP. The purpose of the monitoring programme will also be to ensure that should pollution occur it is identified as quickly as possible and appropriate action is taken in line with the Pollution Prevention Plan.

9.5.46 The water quality monitoring programme will be developed by the contractor in consultation with the Environment Agency and MMO and will also reflect any requirements of secondary environmental permits/licences for works affecting, or for temporary discharges to, watercourses within the Proposed Development Site.

Management of Flood Risk

9.5.47 All construction materials and temporary compounds associated with the construction of the Proposed Development will be located in Flood Zone 1 where

possible. During the construction phase, the contractor will monitor weather forecasts and plan works accordingly. In addition, the contractor will sign up to Environment Agency flood warning alerts and describe in the Emergency Response Plan the actions it will take in the event of a possible flood event. These actions will be hierarchal meaning that as the risk increases the contractor will implement more stringent protection measures. This is important to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding during the construction phase.

9.5.48 If water is encountered during below ground construction, suitable de-watering methods will be used with reference to a Construction Dewatering Strategy (see below). Any significant groundwater dewatering that is required (i.e., more than 20 m^3 per day) will be undertaken in line with the requirements of the Environment Agency (under Water Resources Act 1991 as amended) and Environmental Permitting Regulations (2016).

9.5.49 Safe egress and exits are to be always maintained when working in excavations. When working in excavations a banksman is to be always present. Refer to the Appendix 9A: Preliminary FRA (PEI Report, Volume III) for further details of flood resistance and resilience measures.

Operation

8.1.1 The Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. In addition, the Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

9.5.50 The source of water to supply the Proposed Development will be the existing raw water pipeline feed, which is an existing licensed abstraction from the River Tees formerly used to supply Redcar Steelworks.

9.5.51 The effluent streams from the Proposed Development will include process water (e.g. process condensate from the reforming process, cooling tower blowdown water and demineralisation plant rejects), surface water runoff and foul effluent. Plates 9-2a to 9-2d below show flow diagrams summarising the Proposed Development's water balance for both Case A and Case B of the Proposed Development (for process and foul water, but not including surface water runoff which is described further below). As set out in Chapter 4; Proposed Development (PEI Report, Volume I), the two 'cases' reflect different technology options for blue hydrogen production, autothermal reforming technology (ATR) and low carbon hydrogen (LCH) technology, respectively. Each of the approaches have different water demands and produce different qualities of process returns.

9.5.52 In addition, two further 'cases' are under consideration in terms of process effluent management. Case 1 is based on Minimalised Liquid Discharge (MLD) from the

Proposed Development's Effluent Treatment Plant. In this scenario treated wastewater from the Effluent Treatment Plant will be reused as makeup water in the Proposed Development's Water Treatment Plant. A low-volume liquid waste stream containing salts and nutrients would be taken offsite for disposal (outside of the Teesmouth and Cleveland Coast SPA catchment). Case 2 is an alternative to MLD and requires discharge of process effluent to the NZT project outfall at Tees Bay.

9.5.53 Surface water runoff from the Proposed Development will be partially used to feed the process but will have an alternative disposal route to Dabholm Gut or Tees Bay. This is described further below.

9.5.54 The various 'cases' for the Proposed Development are summarised in Table 9-17. Note that this does not include management of surface water runoff which is discussed further below.

Table 9-17 Summary of the Four Cases Being Considered for the Proposed Development

	CASE 1A	CASE 1B	CASE 2A	CASE 2B
Technology	Autothermal reforming technology	Low carbon hydrogen - Gas Heated Reformer - ATR combination process	Autothermal reforming technology	Low carbon hydrogen - Gas Heated Reformer - ATR combination process
Process Wastewater Disposal	Minimalised Liquid Discharge – treated wastewater from the Effluent Treatment Plant will be reused as makeup water in the Proposed Development's Water Treatment Plant. A low-volume liquid waste stream containing salts and nutrients would be taken offsite for disposal (at a facility outside of the Teesmouth and Cleveland Coast SPA catchment)	Minimalised Liquid Discharge – treated wastewater from the Effluent Treatment Plant will be reused as makeup water in the Proposed Development's Water Treatment Plant. A low-volume liquid waste stream containing salts and nutrients would be taken offsite for disposal (at a facility outside of the Teesmouth and Cleveland Coast SPA catchment)	NZT Outfall to Tees Bay	NZT Outfall to Tees Bay

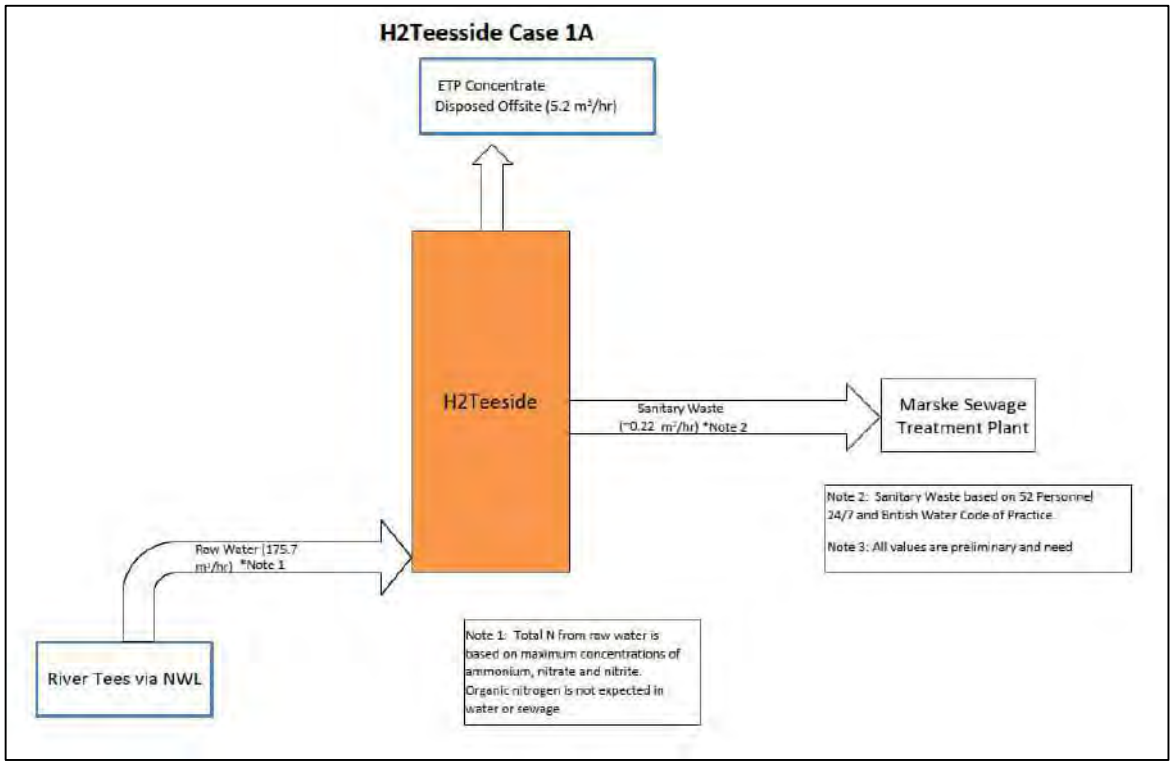

Plate 9-2a: Flow Diagram to Summarise the Water Cycle for the Proposed Development for Case 1A[1]

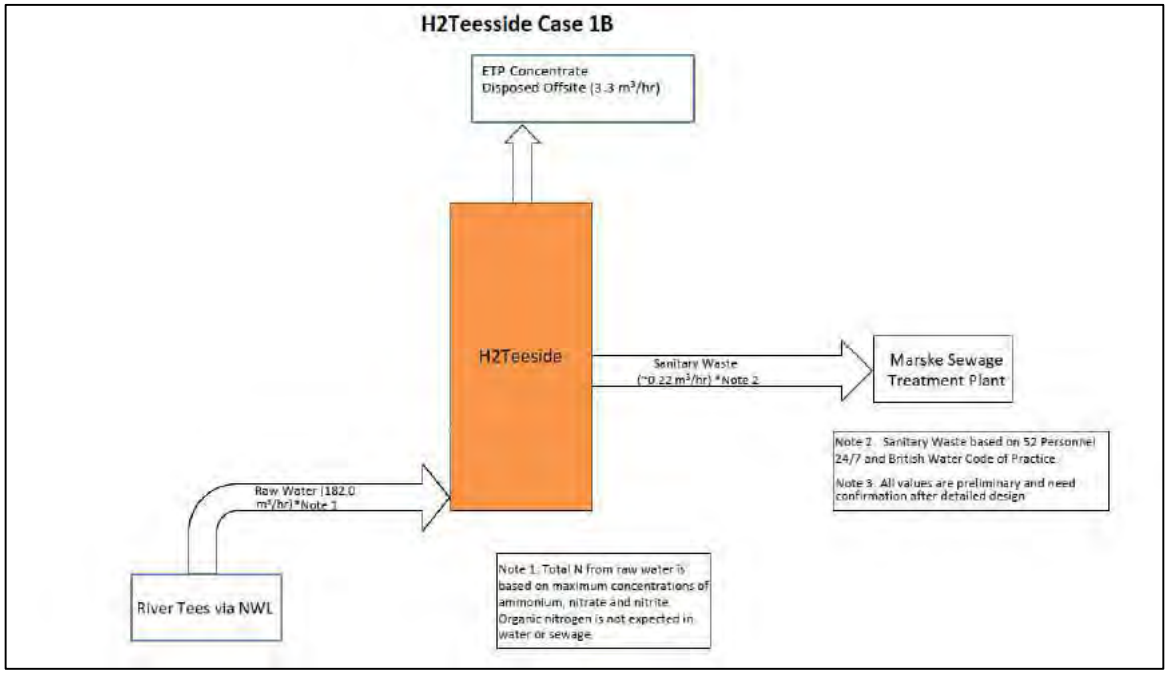

Plate 9-2b: Flow Diagram to Summarise the Water Cycle for the Proposed Development for Case 1B

[1] Sanitary wastewater volume presented in Plate 9-2a to 9-2d is based on a 52 personnel peak during weekday shifts. However, it should be noted that operations staffing will be on a shift basis to be spread over a 24-hour period and so personnel numbers will vary.

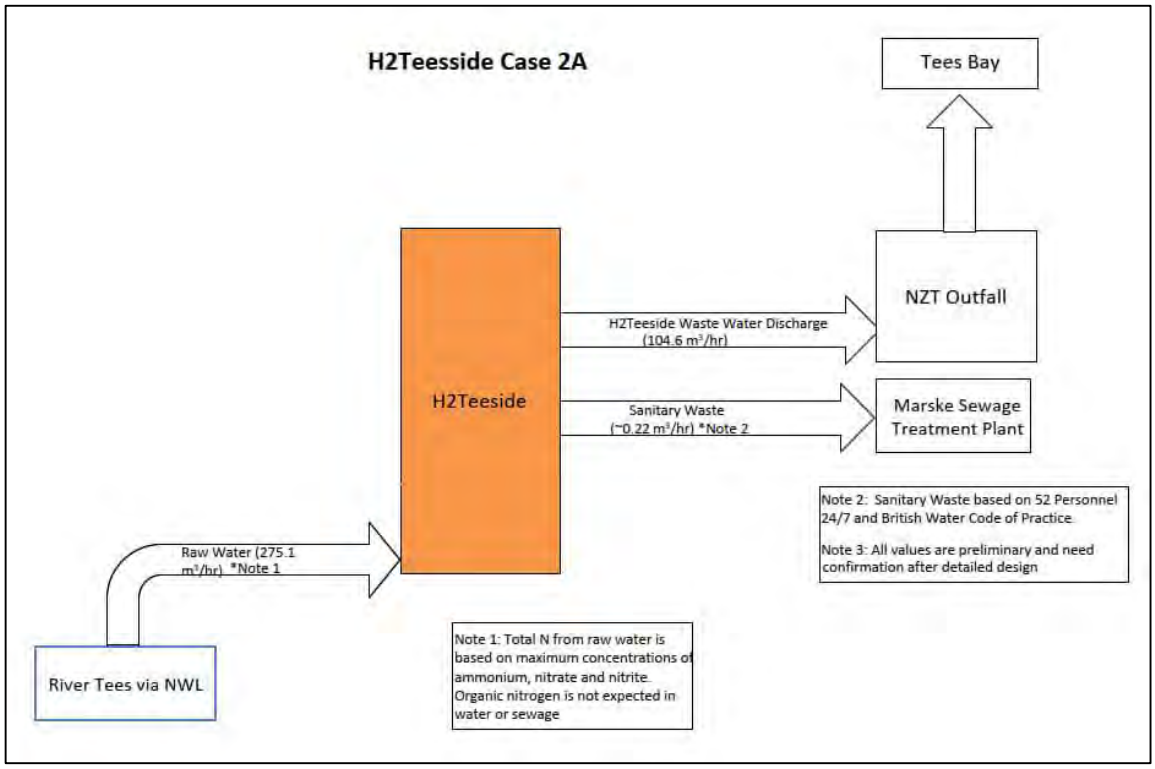

Plate 9-2c: Flow Diagram to Summarise the Water Cycle for the Proposed Development for Case 2A

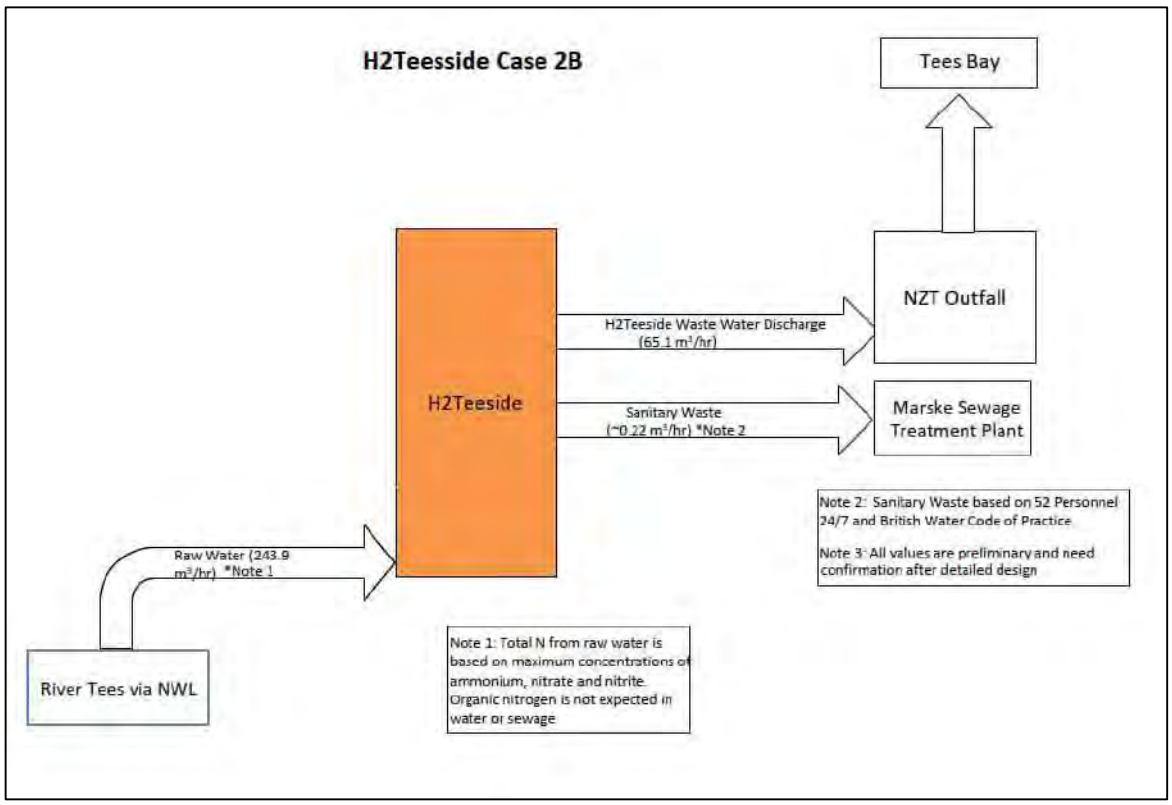

Plate 9-2d: Flow Diagram to Summarise the Water Cycle for the Proposed Development for Case 2B

9.5.55 Further details regarding water demand, surface water drainage, process wastewater and foul wastewater are described below. A number of mitigation features will be incorporated into the Proposed Development design in order to avoid, minimise and reduce potential adverse impacts on water features, water resource and flood risk - these are also described in the following sections where relevant.

Water Demand

9.5.56 There is a significant clean water requirement for the Proposed Development comprising the elements listed in Table 9-18.

Table 9-17 Clean Water Requirement for the Proposed Development[2]

WATER REQUIREMENT	CASE 1A & 2A (M^3/HR) (PHASE 1&2)	CASE 1B & 2B (M^3/HR) (PHASE 1&2)
Cooling water make-up	144	114
Utility water	10	10
Firewater make up	Normally no flow	
Demineralised water for boiler feed water make-up, chemicals, CO2 absorber and HCl scrubber	220	104

9.5.57 Water is to be supplied via the existing NWL's raw water pipeline feed from the River Tees. However, at the time of writing (August 2023), consultation is ongoing with NWL to confirm this arrangement. Treatment is required to the supplied water to produce the desired water quality for utility water/cooling water make-up, firewater and for producing demineralised water.

Surface Water Drainage

9.5.58 A new surface water drainage network and management system will be provided for the Main Site that will provide adequate interception, conveyance, and treatment of surface water runoff from buildings and hard standing. This will be separate to foul systems for welfare facilities and process wastewater generated by the operation of the Proposed Development Site. The connection corridors will not require additional drainage as they will be using existing pipe racks, pipe bridges, culverts or otherwise installed underground.

9.5.59 Surface water drainage will discharge to Tees Estuary via Dabholm Gut or Tees Bay. There are three options for this route: 1) direct feed to Dabholm Gut (with any new pipework and outfall to be consented under a subsequent planning application); 2) discharge via the existing Brans Sands discharge pipeline (but not requiring treatment at Brans Sands WwTW as this is surface water runoff); or 3) discharge via the NZT outfall.

[2] See Table 9-16 for definition of Cases

9.5.60 Due to the nature of the Proposed Development, it is likely that a range of different diffuse pollutant types may be present in surface water runoff, with concentrations varying depending on many factors. However, this risk will be offset by the fact that the Proposed Development Site is a brownfield site that is currently not operating (i.e. surface water from the Proposed Development Site may already contain diffuse chemical pollutants).

9.5.61 A Surface Water Drainage Strategy will be defined in consultation with the Environment Agency, the LLFA (RCBC and STBC) and other statutory agencies and will be a Requirement of the DCO. The principles of the Drainage Strategy are outlined in the H2 Teesside PreFEED Vent and Drain Philosophy (Worley, 2023) as follows:

- segregate hazardous and non-hazardous effluent;
- contain leaks and accidental spills via carefully designed collection system;
- establish requirement to segregate collection and to eliminate cross contamination prior to recovery and disposal;
- identify recovery and recycle interfaces for the drained fluids;
- ensure safe design with access for maintenance and inspection; and
- account for normal operations, maintenance draining and drainage during an emergency.

9.5.62 The proposed surface drainage system will include the use of SuDS where possible, to enable attenuation of surface water flows due to increases in the impermeable area as a result of the Proposed Development. SuDS will also provide treatment of surface water runoff to ensure potential adverse effects on water quality in receiving watercourses are avoided. SuDS and the treatment train will be selected with reference to the Simple Index Approach of the SuDS Manual (CIRIA, 2016), although a more precautionary approach may be taken due to the industrial land use, which may increase the risk.

9.5.63 The key objectives of the site surface water drainage system are to provide a drainage system which is inherently safe and protects the local environment and the anticipated outfall from accidental discharges of oil, chemicals or run-off from firefighting effluent. Clean, uncontaminated storm water will be segregated from potentially contaminated water. Gravity drainage will be used wherever practicable. Spillage containment measures such as penstocks will also be included in the drainage design.

9.5.64 Process operations on site will require the storage and use of a range of potentially polluting chemicals. These may be associated with washdown water, tank water draw-offs, pump equipment drips and drains, draw-offs from sample connections, instruments, drain cocks and similar equipment fittings and other routinely contaminated wastewater streams. The surface water drainage system for areas of site drainage that may contain chemical pollutants from minor leaks and spills (i.e., surface water drainage near chemical storage tanks or overlying pipework etc.) will therefore need to be separated from the main ‘clean’ surface water drainage system

using appropriate methods such as kerbs, bunds, sumps. Bunded areas may contain valves that can remain closed until the water stored in the bunded area has been tested. Where water is contaminated, this will be directed to the on-site package treatment plant and will be subject to a requirement of an Environmental Permit.

9.5.65 In addition to the above sources of surface water, under exceptional circumstances firewater may be generated. Fire-fighting water may contain chemicals that can be harmful to the water environment. Therefore, the surface water drainage system will include a retention basin to intercept the first flush of potentially contaminated fire-fighting water and divert it away from the existing surface water SuDS system. The contaminated fire water would then be stored prior to being pumped out for appropriate off-site disposal at a licensed waste facility. The storage requirements and the method by which fire-fighting water is diverted (i.e. an automatic or manual operated system) will be further determined in consultation with the EA, LLFAs and the Fire Service post-DCO consent during detailed design.

9.5.66 A Surface Water Drainage Strategy will be developed (as a Requirement of the DCO) which will outline the consequences for the drainage system should the Proposed Development close or be decommissioned. It is envisaged that a Surface Water Maintenance and Management Plan will also be provided by the future site operator. This will detail the requirements of access and frequency for maintaining all drainage systems proposed on the Proposed Development Site. The maintenance regime must be properly implemented to ensure all treatment measures and processes operate as intended for the lifetime of the Proposed Development. It is anticipated that this will be prepared during the detailed design stage.

Process Wastewater

9.5.67 Process waste waters will be generated on Proposed Development Site as follows:

- boiler blowdown (Case A and B) – this will generally be of good quality with some residual TDS that will need removal for use as demineralisation water;
- process condensate (Case A) - this has residual methanol and ammonia that requires removal to prevent a source of organics and nutrients that can lead to biological growth and biofouling; and
- process condensate (Case B) - this has high ammonia, methanol, carbon dioxide, methane and hydrogen that need removal before it can be discharged; and
- hazardous liquid wastes – to be taken off-site (e.g. amine).

9.5.68 Process condensate will be treated by a dedicated on-site Water Treatment Plant. The treated process condensate will be reused as makeup water in the Water Treatment Plant and so will not be discharged.

9.5.69 Other wastewater streams (cooling tower blowdown and demineralisation plant rejects) will be treated in an Effluent Treatment Plant (ETP). Case 1A and 1B is based on Minimalised Liquid Discharge from the ETP. The treatment configuration in the ETP will be ultrafiltration followed by reverse osmosis (close circuit or staged) to provide > 95% recovery of the wastewater (including chemical rejects during the membrane cleaning process). The non-chemical rejects from the ultrafiltration will

flow to a clarifier and the settled solids dewatered and disposed offsite as a wet cake. The reverse osmosis rejects/concentrate will produce a liquid waste stream containing salts and a quantity of nutrients. This will be transported off-site for further treatment. The treated wastewater from the ETP will be reused as make-up water in the Water Treatment Plant.

9.5.70 Case 2A and 2B represents an alternative to Minimalised Liquid Discharge. In this case, wastewater would be discharged via the NZT outfall to Tees Bay.

9.5.71 The continuous flows of effluent are summarised in Plate 9-2a-d. In Case 1A and 1B there would be an overall continuous flow of liquid waste from the ETP for offsite disposal of 5.2 m^3/hr or 3.3 m^3/hr, respectively. For Case 2A and 2B there would be an overall continuous flow of process water effluent to be discharged to Tees Bay via the NZT outfall (or alternatively to Brans Sands WwTW) of 104.6 m^3/hr or 65.1 m^3/hr, respectively.

9.5.72 As outlined above, at this stage two options remain for disposal of treated process water and liquid waste depending on which of the four 'cases' is taken forward. The first option is transport of liquid waste (concentrate sludge/waste) off-site for further treatment based on Minimalised Liquid Discharge from the ETP. The second is discharge of treated process water to the Tees Bay outfall that will be constructed as part of the NZT project, where it will have to meet the standards required by the discharge permit (in combination with cumulative impacts from NZT discharges). If there is discharge of process wastewater to the outfall at Tees Bay, then it is assumed that the wastewater discharge will meet the requirements of the Best Available Techniques (BAT) Reference Document (BREF) for Common Wastewater and Waste Gas Treatment/Management Systems in the Chemical Sector 2016 (EC JRC, 2016).

9.5.73 Amine contaminated water will be contained and where possible should be recovered and recycled for use within the process, or otherwise will be taken off-site by tanker to a specialist treatment plant. Surface water runoff from uncovered external paved areas of the Proposed Development site containing amine equipment, which during normal operation is expected to result in chemical drips, leaks and minor spill and which could be contaminated, will be located within minimised local kerbed areas and be routed to the amine drain vessel for offsite disposal.

9.5.74 Should treated wastewater be discharged to Tees Bay, the indicative effluent quality is currently expected to be as shown in Table 9-19. This will be reviewed during the EIA and reported in the ES.

Table 9-18: Indicative Effluent Quality Following Treatment

DETERMINAND	CONCENTRATION	EQS
Total Suspended Solids	5-35 mg/l	
Total Organic Carbon (TOC)	10-33 mg/l	

DETERMINAND	CONCENTRATION	EQS
Chemical Oxygen Demand	30-100	
Chromium	5-25 µg/l	0.6 µg/l (long term mean)
Copper	5-50 µg/l	3.76 µg/l (dissolved, where DOC ≤1mg – salt water EQS, long-term mean)
Nickel	5-50 µg/l	8.6 µg/l (annual average)
Zinc	20-300 µg/l	6.8 µg/l (plus ambient background concentration, long-term mean)
Total Nitrogen	15 mg/l (annual mean) 40 mg/l (daily maximum)	
Total Phosphorus	0.5-3.0 mg/l	
Adsorbable Organically Bound Halogens	0.1-0.1 mg/l	

9.5.75 Water sampling facilities are to be provided for manual sampling of water prior any required discharge (dependent of which 'case' is progressed). The frequency of testing and parameters to be tested will be agreed with the permitting authority.

Foul Wastewater

9.5.76 Sanitary wastewater from welfare facilities will be at NWL's Marske-by-the-Sea WwTW. It is assumed given the relatively low volumes of foul effluent anticipated from the Proposed Development that NWL will treat this within their consent limits and in accordance with requirements to not cause deterioration or prevent improvement under the WFD.

Management of Hazardous Substances on Site

9.5.77 The use of the chemical products at the Proposed Development Site will follow the product-specific environmental guidelines, as well as the legislative requirements set out in the Control of Substances Hazardous to Health Regulations (COSHH (2002) and Control of Major Accident Hazards (COMAH) Regulations (2015).

9.5.78 A site Emergency Response Plan (prepared for Regulation 9 of the COMAH Regulations) will be in place for dealing with emergency situations involving loss of containment of hazardous substances. This will detail how to contain and control incidents to minimise the effects and limit danger to persons, the environment and property. The Emergency Response Plan will set out the emergency spill control procedure that will include the actions adapted from the Health and Safety

Executive's Emergency Response/Spill Control Technical Measures Document (Health and Safety Executive, n.d.).

9.5.79 Further guidance to be consulted in development of the site Emergency Response Plan include:

- HS(G)191 Emergency planning for major accidents. Control of Major Accident Hazards Regulations 1999 (Health and Safety Executive, 1999);
- HS(G)71 Chemical warehousing: the storage of packaged dangerous substances (Health and Safety Executive, 1992); and
- BS 5908: Fire and explosion precautions at premises handling flammable gases, liquids and dusts. Code of practice for precautions against fire and explosion in chemical plants, chemical storage and similar premises (British Standards Institute, 1990).

Decommissioning

9.5.80 At the end of its design life decommissioning of the Proposed Development will see the removal of all above ground equipment down to ground level and the ground remediated to enable future re-use.

9.5.81 It is assumed that all underground infrastructure will remain in-situ; however, all connection and access points will be sealed or grouted to ensure disconnection. At this stage it is assumed that decommissioning impacts are expected to be limited and will be the same/similar to the construction impacts, as discussed above.

9.5.82 A Decommissioning Environmental Management Plan (DEMP) will be produced pursuant to a DCO Requirement. The DEMP will consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed. This will include details of how surface water drainage should be managed at the Proposed Development Site during decommissioning and demolition.

Permits, Licences and Consents

9.5.83 Various water-related permissions may be required where it is not agreed with the relevant regulating authority to disapply them through the DCO (although the Applicant is seeking to achieve this for as many consents as possible). These permissions may include:

- land drainage consent(s) under section 23 of the Land Drainage Act 1991for works affecting the flow in ordinary watercourses;
- flood risk activity permit(s) from the Environment Agency under the Environmental Permitting Regulations (England and Wales) 2016 in connection with works to main rivers (e.g. Greatham Creek, River Tees);
- water activity permit(s) from the Environment Agency under the Environmental Permitting Regulations (England and Wales) 2016 for temporary construction and permanent operational discharges;
- trade effluent consent under the Water Industry Act 1991 for the purposes of discharging trade effluent from welfare facilities during construction;

- full or temporary water abstraction licence(s) under section 24 of the Water Resources Act 1991 (if more than 20 m3/d is to be dewatered/over-pumped and exemptions do not apply) – see further detail below; and
- temporary water impoundment licence under section 25 of the Water Resources Act 1991 in connection with the laying of cables.

9.5.84 There is the potential for the need for either full or temporary water abstraction licence(s) from the Environment Agency for the abstraction of water from the send and receive pits associated with the underground watercourse crossings or other excavations where groundwater may be encountered, other than where exemptions apply. A full licence is required when more than 20 m^3 per day of water may need to be abstracted for more than 28 days. A temporary licence is applicable where the abstraction is less than 28 days. Where less than 20 m^3 per day of water needs to be abstracted, no licence is required. However, in all circumstances it may be necessary to obtain a water activity permit(s) from the Environment Agency to discharge the water to ground or a watercourse if the water is considered to be 'unclean'.

9.6 Likely Impacts and Effects

9.6.1 The Proposed Development has the potential to cause adverse impacts upon to the water environment during construction, operation and decommissioning phases. Potential impacts and associated effects are described below.

Construction and Decommissioning Phase Impacts

9.6.2 During the Proposed Development construction phase the following surface water environment impacts may occur if appropriate mitigation is not applied:

- temporary impacts on surface water quality due to deposition or spillage of soils, sediments, oils, fuels or other construction chemicals, or through mobilisation of contamination following disturbance of contaminants in sediments, ground or groundwater, or through uncontrolled site run off;
- temporary impacts on the hydromorphology of watercourses from open-cut watercourse crossings;
- potential impacts on groundwater resources and local water supplies (licensed and unlicensed abstractions) and potentially the baseflow to watercourses from temporary dewatering of excavations or changes in hydrology;
- potential increase in volume and rate of surface water runoff from new impervious areas, leading to an impact on flood risk;
- increased risk of groundwater flooding or recharge as a result of the below ground installation of the CO_2 Export Pipeline, Natural Gas Connection Corridor, Electrical Connection Corridor and CO_2 Gathering Network; and
- alteration in fluvial and overland flow paths as a result of works associated with the Hydrogen Pipeline Corridor, Water Connection Corridor, Other Gases Connection Corridor and Electrical Connection Corridor.

Surface Water Quality

9.6.3 Where construction and decommissioning works are undertaken within or in proximity to water features, close to existing land drains providing a pathway to surface watercourses, groundwater or ponds, or on steeper terrain angled towards a water feature, there is the potential for adverse impacts on water quality due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals spilt on site. There may also be indirect water quality impacts to downstream receptors, as spills or contaminated water can propagate along the initial receiving watercourse. In this case the downstream receptors are the Tees transitional and Tees Coastal WFD waterbodies as all watercourses within the Study Area are tributaries of these.

9.6.4 The construction works in general, but particularly earthworks, dewatering of excavations, the construction of watercourse crossing structures, and drainage and outfall installations (if required) have the potential to cause a reduction in water quality through contaminated construction runoff, and the risk of chemical spillages from plant, equipment and materials.

9.6.5 Construction of open cut intrusive pipeline crossings will require works close to and within the receiving watercourses. There will be potential for conveyance of spills and fine sediment during any works to these outfalls to result in direct impacts on the receiving watercourses.

9.6.6 At this stage, it is assumed as a reasonable worst case that direct works will be required to watercourses where open-cut installation of pipelines is required. For the Hydrogen Pipeline Corridor, open-cut works are expected to impact Belasis Beck at approximately NGR NZ 49397 23941 and unnamed watercourses south of the Tees estuary at NZ 51111 24826, NZ 49147 24367 and NZ 51221 26296.

9.6.7 The nature of watercourse crossing methodology for the Electrical Connection Corridor, Water Connection Corridor and Other Gases Corridor is not yet known, and so it is assumed as a worst case that open-cut crossings will be required for the Fleet (Tees Estuary S Bank), Mains Dike, Dabholm Beck, Kinkerdale Beck, the Mill Race, Cross Beck and Knitting Wife Beck. Exact locations are also not known at this stage. Where this open cut installation is required, flow will be maintained by damming and over pumping to create a dry working area and minimise the risk of polluting the flow. Works should therefore be carried out in the drier months of the year where possible as this will reduce the volume of water to manage and the risk of pollution propagating downstream. Once the watercourse is reinstated, silt fences, geotextile matting, or straw bales should be used initially to capture mobilised sediments until the watercourse has returned to a settled state and thereby reduce risks of downstream water quality impacts. Water quality monitoring will also be undertaken prior to, during, and following on from the construction activity to ensure any spillages or other pollution is identified. These mitigation requirements will be outlined in a WMP that will be produced as part of the Final CEMP.

9.6.8 There will be works relatively close to the River Tees and Greatham Beck (both of which are part of the Tees transitional WFD waterbody) for the trenchless installation

of the Hydrogen Pipeline crossings. However, launch and reception pits will be a minimum of 10 m from the channel in each case to reduce the potential for runoff and spillages to the watercourse. Nonetheless, there will remain some risk of sediment mobilisation in runoff and for chemical spillages to occur that could enter the channel if not managed accordingly. There is also a chance of 'frac-out' events (i.e., hydraulic fluid break out) from drilling to the watercourse if not appropriately mitigated for site specific conditions. A site-specific Hydraulic Fracture Risk Assessment will be produced prior to commencing works to define the mitigation required based on ground conditions. As with open-cut crossings, water quality monitoring will also be undertaken prior to, during and following on from the construction activity.

9.6.9 Where there are to be above ground pipelines over watercourses using pipe bridges, there is potential for runoff of sediments and spillages to impact water quality as works will be required immediately adjacent to, and over, the affected watercourses. At this stage, there are expected to be above ground crossings of Knitting Wife Beck (approximate NGR NZ 54580 23003), the Mill Race (approximate NGR NZ 57329 23682), Mains Dike (approximate NGR NZ 58121 22905), the Fleet (Tees Estuary S Bank WFD waterbody) (approximate NGR NZ 56765 23730) and Belasis Beck (approximate NGR NZ 48313 23194) for the Hydrogen Pipeline Corridor.

9.6.10 All waterbodies that are potentially impacted ultimately discharge to Tees Estuary, where there is potential for a cumulative impact in terms of fine sediment impacts on water quality. Furthermore, any existing drainage assets on the Proposed Development Site that receive runoff laden with fine sediment may eventually discharge to Tees Bay through the existing drainage network.

9.6.11 Section 9.5 describes the broad range of surface runoff control measures that will be utilised on the Proposed Development Site, which will be described by the contractor in a WMP that forms part of the Final CEMP, and which will be confirmed with the Environment Agency and NWL as part of future permit applications. All conditions of the permits will be adhered too.

9.6.12 With the embedded mitigation measures described in Section 9.5 in place, it is considered that those watercourses subject to direct works (i.e. open-cut crossings) will receive temporary Minor adverse impacts to water quality. For the Very High importance Belasis Beck and the Fleet (Tees Estuary S Bank WFD waterbody), this will result in a temporary Slight Adverse (Not Significant) effect. For the Medium importance Mains Dike, Dabholm Beck, Kinkerdale Beck, the Mill Race, Cross Beck and Knitting Wife Beck this will result in a temporary Slight Adverse (Not Significant) effect. For the Low importance unnamed watercourses and ditches this will result in a Neutral (Not Significant) effect. No long-term effects on any of these waterbodies are anticipated once the works have been completed and the channels stabilised.

9.6.13 There will be a Negligible impact to Tees estuary and Greatham Creek resulting from works to install the Hydrogen Pipeline crossings using trenchless techniques, given the minimum 10 m buffer of the launch and reception pits from the watercourse, the site-specific hydraulic fracture risk assessment, and implementation of best practice mitigation measures as outlined in the Final CEMP and WMP. Both water features are

part of the Tees transitional WFD waterbody, which is of Very High importance, thereby resulting in a Slight Adverse (Not Significant) effect. No long-term effect on the waterbody is anticipated given the brevity of the impact.

9.6.14 Where works are required close to, and over, watercourses for pipe bridges, the impact to water quality will be Negligible given the embedded mitigation as detailed in Section 9.5. For the High importance Belasis Beck and the Fleet (Tees Estuary S Bank WFD waterbody) this will result in a Slight Adverse (Not Significant) effect. For the Medium importance Knitting Wife Beck, the Mill Race and Mains Dike this will result in a Slight Adverse (Not Significant) effect.

Morphological Effects to Waterbodies

9.6.15 At this stage, as a worst case there are assumed to be opencut installation of the various connection corridors across Belasis Beck, the Fleet (Tees Estuary S Bank), Mains Dike, Dabholm Beck, Kinkerdale Beck, the Mill Race, Cross Beck, Knitting Wife Beck and three unnamed small watercourse (as described in Section 9.5). The affected watercourses south of the Tees estuary and the unnamed watercourses to the north of the estuary are all considered Low importance for morphology given that they are generally artificially straight, modified channels lacking significant geomorphic and bedform features. However, Belasis Beck to the north of the Tees estuary is considered of High importance for morphology, as it exhibits a variety geomorphic forms and bank side vegetation.

9.6.16 A Pre-Works Morphological Survey will be undertaken at each crossing point requiring an intrusive open-cut. The cables will be buried at sufficient depth to prevent exposure (minimum 1.5 m below the bed) and the flow over-pumped or flumed during the works to create a dry working area and minimise the risk of water pollution being carried downstream. However, there will unavoidably be short term, temporary adverse impacts on the watercourse morphology and loss of riparian habitats, as well as temporary interruption of the hydrological and sediment regimes. However, these impacts will be very localised and short in duration, with the channels reinstated taking into account the pre-works morphological condition. Over time riparian vegetation will re-establish, although it is acknowledged that this may take a few years to completely recover.

9.6.17 Overall, physical works are considered to give a localised and temporary Moderate adverse impact against hydromorphological status for all open cut pipeline installation locations. For the High importance Belasis Beck (for morphology) this will result in a Moderate Adverse (Significant) effect. However, this will be temporary with the channel and riparian habitat expected to recover within five years. The remaining affected watercourses are of Low importance (for morphology), and so will be subject to Slight Adverse (Not Significant) effect in all cases.

Groundwater Flow Impacts

9.6.18 Excavations and foundations have the potential to disrupt shallow groundwater. Full details regarding excavation depths for the Main Site are not known at this stage. A Ground Investigation will be undertaken to inform the design development and to guide appropriate construction methods to minimise impacts on groundwater flow,

which may in turn impact baseflow in rivers or groundwater abstractions. At this stage it is considered that with appropriate construction methodologies a Minor adverse impact on groundwater flow is anticipated in relation to the Main Site. Groundwater beneath the Main Site is considered a Medium importance receptor, thereby giving a Slight Adverse (Not Significant) effect. This will be reviewed during the EIA.

9.6.19 Depths required for construction of the Hydrogen Pipeline, Electrical Connection, Other Gases Connections and Water Connection Corridors are anticipated to be below the water table over part of their routes, and particularly where crossings beneath watercourses are required. The profile of the pipelines is considered to be small compared to the spatial and vertical extent of the secondary superficial aquifers, and therefore is considered to have a Negligible impact on groundwater flow. A Negligible magnitude of impact on groundwater flow on Medium importance groundwater features (Mercia Mudstone Group/Redcar Mudstone Group) results in a Neutral (Not Significant) effect and for the Very High importance groundwater beneath parts of the Hydrogen Pipeline Corridor (Sherwood Sandstone Group) results in a Slight Adverse (Not Significant) effect.

Groundwater Dewatering Impact

9.6.20 Construction works to install the Hydrogen Pipeline Corridor beneath the Tees Estuary and Greatham Creek using drilling or boring techniques may involve a temporary pit either side of the watercourse (>10 m measured from the water's/channel edge under normal flows) as well as regularly spaced jointing pits where longer sections of boring are required. Maximum parameters for the pit dimensions will be outlined in the ES, but for the purposes of this assessment are assumed to be 5 m width x 5 m length x 3 m depth.

9.6.21 There is potential for shallow groundwater associated with the various connection corridors, and so there is potential for groundwater ingress to the pits. This will be managed following standard construction techniques potentially including pumping, damming, or shoring up the pits with sheet piling.

9.6.22 A temporary abstraction licence may be required from the Environment Agency when abstracting more than 20 m^3 of water per day. Any discharge of groundwater to a watercourse may also require a discharge consent from the Environment Agency if it is considered to be 'unclean' and the conditions of the Environment Agency's Regulatory Position Statement 'Temporary dewatering from excavations to surface water' (April 2021) cannot be met. This document states that uncontaminated, clean water, is water that is wholly or mainly clear rainwater or infiltrated groundwater that has collected in the bottom of temporary excavations on an uncontaminated site.

9.6.23 The pits will be backfilled with the original excavated material upon completion and will not affect groundwater base flow in the longer term. While groundwater may be encountered, taking into account that it will be appropriately managed in line with any required permit conditions and best industry practice will be outlined in the Framework CEMP in the ES, there is considered to be a Negligible magnitude of impact on groundwater levels and flow. For the Medium importance Mercia

Mudstone Group/Redcar Mudstone Group groundwater aquifers this is considered to have a Slight Adverse (Not Significant) effect. For the Very High importance Sherwood Sandstone Group groundwater aquifer this is again considered to have a Slight Adverse (Not Significant) effect.

9.6.24 No impacts to other watercourses, waterbodies, groundwater abstractions or PWS are predicted from this temporary and short-term effect at this stage. This will be re-assessed within the ES when further construction design details are available.

Potential Flood Risk – Tidal and Fluvial Sources During Construction

9.6.25 The construction phase of the Proposed Development will involve works in areas of Flood Zone 2 and 3a, and close to and within the floodplains of the Tees, The Fleet (Tees Estuary (S Bank)), Belasis Beck, Dabholm Gut, the Mill Race, plus small ditches across the Proposed Development Site, particularly in the vicinity of Saltholme. Should a fluvial flood event occur during construction, this could be a potential high risk to construction workers in the immediate vicinity (very high importance receptors). The baseline risk could be exacerbated during construction works by the temporary increase in the rate and volume of surface water runoff from an increase in impermeable areas such as compacted soils and the presence of stockpiled materials and equipment temporarily stored on the floodplain. Sediment, construction materials and equipment may also be washed downstream where it may block the channel and lead to or increase the risk of flooding.

9.6.26 However, with the implementation of standard construction methods and mitigation as described in Appendix 9A: Preliminary FRA (PEI Report, Volume III), the Final CEMP and WMP, this risk can be effectively managed (for example by monitoring weather forecasts and Environment Agency flood warnings, by undertaking works close to watercourses during periods of dry weather, by ensuring an adequate temporary drainage system is in place and maintained throughout the construction phase and avoiding stockpiling material on floodplains). As such, the magnitude of flooding from these sources during construction, on site and further downstream, is considered to be Negligible, resulting in a Slight Adverse (Not Significant) effect.

Potential Flood Risk – Surface Water Sources During Construction

9.6.27 The Proposed Development Site will in general be at a low risk from surface water flooding, although in some areas associated with watercourses there are areas of medium and high risk as outlined in the baseline and the Preliminary FRA (Appendix 9A, PEI Report, Volume III). However, during the works, existing surface flow paths may be disrupted and altered due to site clearance, earthworks, and excavation work. The exposure and compaction of bare ground and the construction of new embankments and impermeable surfaces may increase the rates and volume of runoff and increase the risk from surface water flooding. However, with the implementation of standard construction methods and mitigation measures (see Section 9.5), this risk can be effectively managed. As such, the impact of flooding from these sources on construction workers is considered to be Negligible, resulting in a Slight Adverse (Not Significant) effect.

Potential Flood Risk – Groundwater Sources During Construction

9.6.28 The Proposed Development Site is considered to be at medium risk of flooding from groundwater sources. Excavation of cuttings has the potential to liberate groundwater in some areas, and open excavations in some locations may also be more prone to becoming inundated by groundwater. With the implementation of the measures outlined in the Final CEMP and WMP (refer to Section 9.5), a Negligible magnitude of impact is predicted to construction workers, resulting in a Slight Adverse (Not Significant) effect.

Potential Flood Risk – Drainage Infrastructure and Artificial Sources During Construction

9.6.29 The Proposed Development is at low to medium risk of flooding from sewers and other water supply infrastructure. With the implementation of the measures outlined in the Final CEMP and WMP and other flood risk mitigation as outlined in Section 9.5, flooding from these sources is considered to be Negligible to construction workers, resulting in a Slight Adverse (Not Significant) effect.

9.6.30 Environment Agency mapping and the Preliminary FRA (Appendix 9A (PEI Report, Volume III)) indicates that the Proposed Development Site is not at risk of flooding from reservoirs or artificial waterbodies. As such, flooding from these sources is considered to have a Negligible impact on construction workers, which gives a Slight Adverse (Not Significant) effect.

Operation Phase

9.6.31 During the operational phase of the Proposed Development, the following potential water environment impacts may occur if appropriate mitigation is not applied:

- impacts on receiving water features from diffuse urban pollutants and sediments in surface water runoff, or as a result of accidental spillages;
- changes in water quality from operational discharges including the discharge of treated process wastewater (this includes increases in nutrients to receiving water features);
- potential nutrient enrichment of ponds located adjacent to the Main Site from atmospheric deposition of nitrogen emitted from the Proposed Development;
- potential increase in volume and rate of surface water runoff from new impervious areas, leading to an impact on flood risk, upstream and downstream of the Proposed Development Site;
- increased local demand for potable water supply; and
- water quality impacts on receiving water features (including the sea) from an increase in foul drainage from the Proposed Development.

9.6.32 The water supply and foul water requirements of the Proposed Development will be managed by the public water company and sewage undertaker in line with their own permits and consents, and without causing significant effects to the water environment. Unlike other aspects of this assessment, the potential impact from foul

water discharges is difficult to assess because the consequences are often indirect and distant from the Proposed Development (e.g. the water supply or the waterbody into which treated final effluent is discharged) and a component of a larger, existing issue. Furthermore, water supply and sewage treatment is a highly regulated industry with existing processes and mechanisms to ensure the supply of services for major developments. Statutory requirements are also placed upon statutory wastewater undertakers to upgrade their infrastructure when required, whilst ensuring they operate within requirements of water abstraction licences and water activity permits to discharge to rivers. It should also be noted that there would be a maximum of approximately 130 personnel for the operational phase of the Proposed Development, operating in a shift pattern of 40-50 staff per daytime shift, whereas Marske-by-the-Sea WwTW has a population equivalent of >93,000 (Stockton-on-Tees Borough Council, 2012). The foul water requirements of the Proposed Development are therefore minimal.

Potential Pollution of Tees Bay due to Surface Water Routine Runoff and Accidental Spillages

9.6.33 The Proposed Development Site is an industrial site with constant use of a range of fuels, oils and other chemicals. There is therefore potential for contaminants to be mobilised by surface water runoff and to discharged into the water environment (assumed to be Dabholm Gut or Tees Bay at this stage). Discharge of a range of pollutants could lead to chronic adverse impacts in terms of the receiving waterbody physicochemical and ecological status, although it should be noted that there is a large capacity for dilution and dispersal in Dabholm Gut/Tees Estuary and Tees Bay. There is also a risk that a significant chemical spillage or pollution incident could occur on the Main Site which could be discharged to Dabholm Gut or Tees Bay.

9.6.34 The provisional drainage arrangements propose to attenuate surface water runoff and contain chemical spillages from the operational Proposed Development Site, whilst minimising flood risk to the Proposed Development Site and surrounding areas. As outlined in Section 9.5, a new surface water drainage network and management system will be provided for the Main Site that will provide interception, conveyance and treatment of surface water runoff from buildings and hard standing. This will be separate to foul systems for welfare facilities and process wastewater generated by the operation of the Proposed Development Site.

9.6.35 Amine contaminated water will be contained and where possible should be recovered and recycled for use within the process, or otherwise taken off-site by tanker to a specialist treatment plant.

9.6.36 The Surface Water Drainage Strategy will require provisions for dealing with chemical spillages and firewater. This includes kerbed/bunded areas, valves (i.e. penstocks), sluices and interception sumps for isolating spillages or contaminated water. The outline principles of the Surface Water Drainage Strategy are outlined in Section 9.5.

9.6.37 The SuDS Manual's Simple Index Approach (CIRIA, 2016) will be applied to demonstrate the suitability of the SuDS treatment trains within the Proposed Development design. At this stage it is assumed that bypass oil separators will be

used (as a minimum) to provide treatment for any oils present in surface water runoff prior to discharge from the Proposed Development Site. It is also assumed that penstocks will be provided so any accidental spillages or fire water can be isolated on site and prevented from entering the surface water drainage system or process water system and disposed of accordingly.

9.6.38 An inventory of hazardous substances used on the Proposed Development Site will be developed throughout the design process. In each case the product will have a Material Safety Data Sheets providing guidance on the safe disposal of waste chemicals, that the operator of the facility will adhere to the guidance stated in Section 9.5 regarding the impact avoidance measures for disposal of product containers and chemical waste.

9.6.39 Water quality monitoring will be regularly undertaken by the site operator to confirm the quality of any water in bunded areas, sumps or tanks to ensure that it is suitable for discharge from the site to the Tees Bay (or other watercourse as later defined), or otherwise is taken by tanker for off-site disposal at a suitably permitted wastewater facility. A Pollution Prevention Plan and an Emergency Response Plan will also be prepared. Should any spillage occur that results in the pollution of controlled waters, the Environment Agency will be immediately informed, or NWL should it impact the foul water system.

9.6.40 A Surface Water Maintenance and Management Plan will be prepared during the detailed design phase to describe the requirements for access and frequency for maintaining drainage infrastructure on the Proposed Development Site. The maintenance regime must be fully implemented throughout the lifetime of the Proposed Development to avoid issues such as blockages which could lead to flooding, or failure of the spillage containment and pollution prevention systems.

9.6.41 Given that the Surface Water Drainage Strategy will have to meet standards required by the environmental permit and the local policy requirements, and that measures will be included for dealing with spillages and firewater (including water quality monitoring), then a Negligible impact is predicted to the Dabholm Gut (part of the Tees estuary WFD waterbody) and Tees Bay (depending on which option is progressed). Given that these are Very High importance receptors, this will result in a Slight adverse effect (Not Significant) in both cases. This will be re-evaluated in the ES.

Demand for Water

9.6.42 The Proposed Development requires a flow rate of 176 m^3/hr (4.2 Ml/day) for Case 1A and 2A and 182 m^3/hr (4.37 Ml/day) for Case 1B and 2B. Water is to be supplied via the existing NWL's raw water pipeline feed from the River Tees. At the time of writing (August 2023), consultation is ongoing with NWL to confirm this arrangement and commercial terms.

9.6.43 Northumbrian Water's Water Resources Management Plan 2019 (Northumbrian Water, 2019) indicates that there should be sufficient resources within the network to accommodate this, if required. The plan undertook a supply and demand forecast for each Water Resource Zone (WRZ) in their jurisdiction (with the Industrial WRZ

being relevant for the Proposed Development) for a scenario of a worst historical drought and a 1 in 200 year return period drought. Based on licensed quantities from the River Tees there is 170 Ml/d of water available for the Industrial WRZ under normal operation. In the 1 in 200 design drought year there is only 130 Ml/d of water available for the Industrial WRZ. This means that based on a current demand of 82 Ml/d the WRZ has a headroom of 48 Ml/d in the design drought year. Furthermore, given advancements in water efficiency in industry, future demand is expected to decline.

9.6.44 The Plan confirms that a water supply surplus will be maintained up to 2060. Furthermore, the volume of water forecast to be abstracted over the planning period will not lead to deterioration in the status of the waterbodies from which NWL abstract.

9.6.45 It should be noted that NWL are producing a new WRMP for publication in 2024 (Northumbrian Water, 2024). Within the draft document, the Industrial WRZ has been integrated into the Kielder WRZ. This is because NWL demonstrate that the Industrial Supply Zone can be supported by Kielder reservoir and the Tyne–Tees Transfer system and is therefore subject to the same risk to supply as the rest of the Kielder WRZ. The final plan supply demand balance in the draft WRMP for 2024 indicates a supply surplus for the Kielder WRZ across the planning period from 2025 to 2084.

9.6.46 A new supply (to be agreed with NWL) from their raw water pipeline from the Tees for the Proposed Development would be undertaken within current allowable limits. The required water demand is 0.76% of the Tees mean annual flow (20.82 m^3/s) as recorded at Low Moor (see Section 9.4).

9.6.47 On the basis that NWL has a supply surplus (although some improvements to transmission infrastructure may be required), a Negligible impact is predicted giving a Slight Adverse effect (Not Significant). However, this will be re-evaluated within the ES when further details regarding water supply arrangements are available.

Potential Impacts on Water Quality from Operational Discharges

9.6.48 At this stage in the design process, preliminary water supply and wastewater discharge assessments have outlined what process wastewaters may be generated by the Proposed Development and how these may be treated with the application of Best Available Techniques (BAT). These assessments indicate that wastewater contaminants will be generated from water from the boiler blowdown, process condensate and hazardous liquid wastes. Refer to Section 9.5 for further details.

9.6.49 Wastewater treatment will be provided for process effluent, which will either be re-used in the process (Case 1A and 1B, with liquid wastes taken off-site for disposal), or otherwise discharged to the Tees Bay outfall (Case 2A and 2B), where it would meet the standards required by an Environmental Permit.

9.6.50 It is anticipated that the wastewater environmental regulatory emission limit values (ELVs) that apply within the Environmental Permit shall be in-line with the target Best Available Technology (BAT) Associated Emission Levels (AELs) from wastewater treatment plants treating effluent from chemicals sites, or processes as identified

within the BAT Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector (2016) (otherwise known as the CWW BREF) and its associated BAT Conclusions document. If the project Environmental Risk Assessment shows that significant impact could occur with the plant discharging at the BAT-AEL concentrations, tighter emission limits could subsequently be applied.

9.6.51 Given the potential option to use the Tees Bay outfall (Case 2A or 2B), hydrodynamic modelling will be undertaken to determine the degree of dispersion from the outfall for constituents of the wastewater, including total nitrogen (given nutrient neutrality requirements applicable to the Teesmouth and Cleveland Coast SPA/Ramsar sites). Further consultation with the Environment Agency will be undertaken to discuss the scope of works and outcomes of this modelling, and this will be undertaken during the EIA. Water sampling facilities will be provided for manual sampling of water prior to discharge through this outfall. The frequency of testing and parameters to be monitored will be agreed with the permitting authority.

9.6.52 Given that the Proposed Development will need to meet the requirements of an environmental permit if discharged to Tees Bay (with an associated H1 screening assessment plus more detailed assessment if required), it is considered that there is limited potential for widespread pollution from process water discharge, especially given the large capacity for dilution and dispersal offered by the Tees Coastal waterbody.

9.6.53 It is noted that development discharging nitrogen into the Teesmouth and Cleveland Coast SPA/Ramsar is required by Natural England to be nutrient neutral, due to the current unfavourable status of the site as a result of excess nutrients causing eutrophication. The conservation and WFD objectives for the estuary and Teesmouth and Cleveland Coast Ramsar/SPA sites also require nitrogen loading of the estuary to be reduced. In particular, it is the intertidal and terrestrial areas of the Tees estuary that are of most concern (notably Seal Sands), and modelling undertaken for the NZT scheme indicated that discharges from the proposed NZT outfall in Tees Bay could also be carried into the estuary by the tides, and thereby contribute nutrients to the designated sites (BP, 2022).

9.6.54 A Nutrient Neutrality Screening Assessment has been undertaken for the Proposed Development and is provided in Appendix 9B (PEI Report, Volume III). This has screened in further assessment of the nitrogen discharged into Tees Bay for Case 2A and 2B, as there is potential for this nitrogen to be dispersed into the Tees estuary due to tidal movements (and thus reach the sensitive areas of the Teesmouth and Cleveland Coast SPA/Ramsar site). This assessment only applies to new sources of nitrogen (i.e. not just nitrogen that was already in Tees river water that has been abstracted and is returned downstream). The hydrodynamic modelling to be undertaken during the EIA will determine the extent to which the designated site may be affected (if at all) via wastewater discharge from the NZT outfall, and so whether there may be a requirement to offset this load from Case 2A or Case 2B through mitigation. A full nutrient neutrality assessment will be undertaken once the

outcome of the modelling is known. The outcomes of the modelling will be presented in the ES.

9.6.55 At this stage, a Minor impact on water quality is predicted on a precautionary basis as there may be some level of change in water quality, but with no changes considered likely to impact on WFD classifications for the Tees Coastal waterbody. Given that this is a Very High importance receptor for water quality, this results in a Moderate adverse effect (Significant). This effect will be re-assessed during the EIA when further details are available regarding effluent quality and proposed water treatments and following consultation with the regulator regarding additional assessments.

Surface Water Ponds: Water Quality

9.6.56 It is considered that there will be limited potential for adverse impacts resulting from receiving 'unclean' water or accidental spillages during Proposed Development operation on any existing 'natural' ponds (i.e. excluding new ponds that may be constructed as part of the Proposed Development for drainage purposes). This is based on all routine runoff during operation being directed to Dabholm Gut, and not to the surface water ponds in the area. Overall, the magnitude of impact is expected to be Negligible for all ponds (Low importance receptors) within the Proposed Development Site, resulting in a potential Neutral effect (Not Significant). There should be no impact to ponds that are outside the Proposed Development Site but within the Study Area.

9.6.57 There is potential for atmospheric deposition of nitrogen emitted from the carbon capture plant to impact adjacent waterbodies, notably open water within Coatham Dunes, where Pond 14 is the only open water pond. Over time, the deposition of nitrogen can lead to the enrichment of still waterbodies, especially where there is limited overturn of the water column and a long residence time, as is the case at Pond 14 where there is little to no groundwater interaction. This in turn has potential consequences for the wider habitat and species that make use of the pond.

9.6.58 An assessment of atmospheric deposition has been undertaken in Chapter 8: Air Quality (PEI Report, Volume I). Emissions from the Proposed Development have been assessed using the Environment Agency's Risk Assessment (Defra and Environment Agency, 2016). Detailed dispersion modelling using the atmospheric dispersion model ADMS (currently ADMS 5.2.2) has been used to calculate the concentrations of pollutants at identified receptors. These concentrations have been compared with the defined Air Quality Assessment Levels (AQALs) for relevant pollutants.

9.6.59 An assessment of nutrient nitrogen enrichment has been undertaken by applying published deposition velocities to the predicted annual average nitrogen dioxide (NO_2) and ammonia (NH_3) concentrations at the Teesmouth and Cleveland Coast SPA, determined through dispersion modelling, to calculate nitrogen deposition rates (expressed as kilograms per ha per year, Kg/ha/yr). These deposition rates have then been compared to the Critical Loads for nitrogen published by UK Air Pollution Information System (APIS) (Centre for Ecology and Hydrology and APIS, 2016), taking into consideration the baseline deposition.

9.6.60 Water quality monitoring of Pond 14 between October 2020 and February 2023 indicates a maximum total nitrogen concentration value of 1.6 mg/l (6th January 2021). This is variable over relatively short time scales with total nitrogen having been below the laboratory limits of detection on five of eleven sampling visits (i.e. <0.5 mg/l). Based on the maximum recorded total nitrogen baseline value of 1.6 mg/l in Pond 14, a predicted deposition of 0.25 kg/N/ha/yr as a worst-case scenario would cause an increase in total nitrogen concentration to 1.72 mg/l after one year, for a hypothetical scenario with no other gains or losses of nitrogen. This is considered to be within the likely range of concentrations that would be observed in the pond over a year and would not be of detriment to the pond ecosystem.

9.6.61 Given the low level of enrichment of Pond 14 a negligible impact is predicted for this very high importance receptor. This results in a Slight adverse effect (not significant) for Pond 14.

Foul Water Discharge

9.6.62 It has been assumed that all foul water from welfare facilities will be directed to the nearby NWL Marske-by-the-Sea WwTW. It is assumed that NWL will treat foul water from the Proposed Development Site within their consent limits and in accordance with requirements to not cause deterioration or prevent improvement under the WFD or will upgrade their facilities if necessary.

9.6.63 Operation workforce peak numbers will be a maximum of 130 staff (if both Phase 1 and Phase 2 of the Proposed Development are progressed). Operations staffing will be on a shift basis to be spread over a 24-hour period. Normally staff levels will be 40-50 peak during the week, however, during 28-day maintenance periods which are likely to occur approximately every four years, there would be up to 400 people. For context, the population equivalent of the proposed WwTW was reported as >93,000 at Marske, in the Tees Valley Water Cycle Study (2012).

9.6.64 As such, the impact of treated foul water discharge is considered to be Negligible to the Tees coastal waterbody (via Marske-by-the-Sea WwTW). As this is a Very High importance receptor, this results in a Slight Adverse (Not Significant) effect.

Flooding from Tidal Sources during Operation

9.6.65 Appendix 9A: Preliminary FRA (PEI Report, Volume III) indicates that the Proposed Development Site and the majority of the Connection Corridors are at a ‘low’ risk of flooding from tidal sources (River Tees and Greatham Creek) during events that exceed a 0.5% AEP (1 in 200 chance) flood event. This includes access roads to the east of the Proposed Development Site.

9.6.66 During a future scenario resulting from climate change up to 2125 and a H++ scenario to 2100, the Main Site remains at 'low' risk of flooding during events that exceed a 0.5% AEP (1 in 200 chance) of flooding and the 0.1% AEP (1 in 1000 chance) event when mitigation comprising a minimum site elevation of 6.83 mAOD is included (based on 1 in 200-year event including climate change allowance plus 600 mm freeboard). The level of 6.83 mAOD would be the minimum once site clearance and remediation has been undertaken.

9.6.67 The western extent of the Hydrogen Pipeline corridor located between the tidal River Tees and Greatham Creek is at high risk of flooding from tidal sources during events that exceed a 0.5% AEP (1 in 200 chance) flood event and the climate change flooding scenarios. This section of the Proposed Development Site is also at high residual risk of flooding should a failure or breach of the flood defences occur. However, works in this area comprise either underground pipework or installation of pipelines on existing pipe racking.

9.6.68 Elements of the Proposed Development Site that are located within Flood Zone 3a will not result in a loss of floodplain storage volume and will not result in a change in flood routes, therefore, flood risk to third parties will not increase.

9.6.69 In EIA terms, tidal flooding is considered of Very High importance due to the nature of the development as essential infrastructure (i.e. Hydrogen Plant). Given that the Main Site is expected to have Negligible impact on flood levels on or off site, then a Slight adverse effect (Not Significant) is anticipated in terms of tidal flooding (based on the classification approach in Table 9-4).

9.6.70 However, the western extent of the Hydrogen Pipeline Corridor located between the tidal River Tees and Greatham Creek is at high risk of flooding from tidal sources during events that exceed a 0.5% AEP (1 in 200 chance) flood event and the climate change flooding scenarios. This section is also at high residual risk of flooding should a failure or breach of the flood defences occur. Appropriate mitigation measures will therefore be implemented to mitigate this risk. These are described further in the Preliminary FRA (Appendix 9A, PEI Report, Volume III) and include a Flood Emergency Response Plan. Given this mitigation a Negligible impact is considered appropriate for flood levels on and off site, resulting in a Slight Adverse (Not Significant) effect.

Flooding from Fluvial Sources during Operation

9.6.71 Appendix 9A: Preliminary FRA (PEI Report, Volume III) identifies the Main Site to be at 'low' risk of fluvial flooding from Ordinary watercourses located in proximity to the Proposed Development Site.

9.6.72 During a future scenario resulting from climate change up to 2125 the Main Site remains at 'low' risk of fluvial flooding therefore appropriate mitigation measures are not required to be implemented at the Proposed Development Site to mitigate this risk.

9.6.73 Where the risk of flooding from fluvial sources is currently assessed as high, the risk category of flooding to the Proposed Development Site is not likely to increase due to climate change. If a flood event did occur, the impact of climate change would result in an increase in the depth and extent of floodwater across the areas of the site affected by flooding from this source during a 1% (1 in 100 chance) event. Refer to the Preliminary FRA (PEI Report, Volume III) for further detail.

9.6.74 The Connection Corridors to the south and south-west of the Main Site will generally be located above ground and will remain at low risk of flooding from fluvial sources, including all climate change scenarios. The only exception is the proposed open-trench channels for the Hydrogen Pipeline Corridor, running to the east and alongside Seaton Carew Road.

9.6.75 Flood risk from fluvial sources (ordinary watercourses) on the north bank of the River Tees, between Billingham and Seal Sands, will increase for all climate change scenarios. Therefore, the Hydrogen Pipeline Corridor will be at risk of flooding over the lifetime of the development. However, most of this will be located underground and in an existing unattended service corridor and is therefore considered acceptable development within Flood Zone 3a. Any maintenance work will be undertaken in accordance with the Flood Emergency Response Plan.

9.6.76 The Main Site will be constructed at a level no lower than the highest flood level of 6.83m AOD (6.23m AOD flood level for a 1 in 200-year event including climate change allowance plus 600 mm freeboard). 6.83 mAOD would be the minimum level once site clearance and remediation has been undertaken.

9.6.77 In EIA terms, fluvial flooding is considered of Very High importance due to the nature of the development as essential infrastructure (i.e., Hydrogen Production Plant). Given that the Main Site is expected to have Negligible impact on flood levels on or off site and that the areas at higher risk relate only to pipelines, then a Slight adverse effect (Not Significant) is anticipated in terms of fluvial flooding (based on the classification approach in Table 9-4).

Flooding from Surface Water Sources During Operation

9.6.78 The risk of surface water flooding within the Proposed Development Site from elsewhere or generated within the Proposed Development Site is considered to be 'low to very low'.

9.6.79 An Outline Drainage Strategy will be prepared for the Proposed Development (as a Requirement of the DCO) which covers the use of SuDS, site discharge rates and surface water management/exceedance flows. Given the implementation of this proposed strategy, surface water from the Proposed Development Site will be carefully managed, treated and directed to Dabholm Gut at controlled rates. Given this increased management of surface water runoff from the development there will likely be a reduction in the surface water flood risk in comparison to existing conditions where the drainage arrangements are dated.

9.6.80 It is considered that the Proposed Development will have a Negligible impact, resulting in a Neutral (Not Significant) effect on surface water flood risk.

Flooding from Ground Water Sources During Operation

9.6.81 The risk of groundwater flooding within the Proposed Development Site is considered to be medium. However, should the Proposed Development comprise below ground development within strata where groundwater is recorded as present, mitigation measures, including those outlined in British Standard 8102 (BS8102) will be required to reduce the risk of groundwater flooding to underground structures as is best practice. BS8102 includes guidance on waterproofing barrier materials applied to structures, structurally integral watertight construction, and drained cavity construction. This is described further in Appendix 9A: Preliminary FRA, (PEI Report, Volume III). Assuming this to be the case, the magnitude of impact from groundwater flooding during operation is considered Negligible, resulting in a Neutral (Not Significant) effect.

Flooding from Drainage Infrastructure and Artificial Sources during Operation

9.6.82 Flooding from drains, sewers and surface waters are normally interconnected. Insufficient or reduced drainage capacity within the sewer network can result in drainage capacity being exceeded causing extensive surface water flooding. Likewise, increased volumes of surface water can overload sewers and drains, causing the drainage network to backup and surcharge causing surface water flooding. All new pipes to be installed for the Proposed Development will be appropriately sized to accommodate their calculated capacity requirements. The impact of climate change on expected flows will be accommodated in the design of drainage infrastructure as part of the drainage strategy. Given this, the magnitude of impact is considered to be Minor adverse, resulting in a Slight Adverse (Not Significant) effect.

9.6.83 Land between the north bank of the River Tees and the south bank of Greatham Creek is located in an area at residual risk of flooding should a failure or breach of a reservoir occur. However, this is considered very unlikely and so an impact magnitude of Minor Adverse is considered appropriate, resulting in a Slight Adverse (Not Significant) effect.

Decommissioning Phase

9.6.84 At the end of its operating life (25 years for Phase 1 and Phase 2), all above-ground equipment associated with the Proposed Development will be decommissioned and removed from the site. The same timescales apply for the Hydrogen Pipeline and other connections. It is assumed that all underground infrastructure would remain in-situ, however, all connection and access points would be sealed or grouted to ensure disconnection.

9.6.85 On this basis, decommissioning impacts are expected to be limited to waterbodies in proximity to the Proposed Development Site (i.e., Tees Estuary (including Dabholm Gut and Greatham Creek), Tees Bay, The Fleet (Tees Estuary (S Bank)) and will be similar to the impacts reported for the construction phase, but with fewer earthworks, excavations and tunnel arisings to manage.

9.6.86 A detailed Decommissioning Environmental Management Plan (DEMP) would be prepared to identify required measures to prevent pollution during this phase of the development. The DEMP would be agreed with the Environment Agency.

9.6.87 There may be marginal improvement to the water quality of the Tees transitional and Tees Coastal waterbodies following decommissioning of the Proposed Development, with the discharge of process effluent ceasing.

9.6.88 Overall, no significant effects are anticipated during Proposed Development decommissioning provided that the appropriate mitigation measures are implemented.

9.7 Mitigation and Enhancement Measures

Construction

9.7.1 Mitigation of adverse impacts on the water environment during the construction phase will be achieved principally through embedded measures as identified in Section 9.5, notably the adoption of a CEMP and WMP.

9.7.2 A water quality monitoring programme will be set out in the WMP within the Final CEMP. This will need to be further developed by the contractor in consultation with the Environment Agency (due to works potentially impacting flow in a Main River and WFD waterbodies), the LLFA (due to works potentially impacting flow in an Ordinary Watercourse), the MMO and potentially Natural England pursuant to DCO Requirements or during the process of obtaining Environmental Permits/Consents/Licences for works affecting, or for temporary discharges to, waterbodies during the construction period.

9.7.3 The programme will be expected to include a combination of daily observations and monitoring using a calibrated, handheld water quality probe through the upstream and downstream reaches of water features hydrologically connected to the Proposed Development Site. It is expected that water quality sampling will be undertaken on a periodic as well as ad-hoc basis, dependent upon circumstances/activities on site. Monitoring and sampling will be undertaken prior to the commencement of construction to allow for sufficient baseline data.

Operation

9.7.4 The need for a number of additional mitigation strategies will be considered during the design process for the Proposed Development to ensure the operation of facility is maintained in the event of an extreme flood or significant pollution event. These strategies include:

- a Flood Emergency Response Plan - providing flood resistance and resilience measures into the design of the buildings (i.e., minimum floor levels) and designing for failure, maintenance and capacity exceedance of the surface water drainage network. More details are provided in the Preliminary FRA (Appendix 9A: Preliminary FRA (PEI Report, Volume III).

9.7.5 Assessment work is ongoing with regard to the wastewater discharge to Tees Bay for Case 2A and Case 2B of the Proposed Development. See Chapter 4: Proposed Development, (PEI Report, Volume I) for details. Should further nutrient neutrality assessment, WFD assessment and/or associated hydrodynamic modelling indicate that additional mitigation is required to avoid significant effects, then this will be undertaken during the EIA and reported in the ES.

9.7.6 It is assumed that the need for long term water quality monitoring will be set out and agreed with the Environment Agency through the environmental permitting process. This will be set out as a Requirement within the DCO.

Decommissioning

9.7.7 As no significant effects are anticipated during the decommissioning of the Proposed Development, no additional mitigation measures have been identified at this stage (above the embedded mitigation measures). This will be reviewed as the EIA progresses.

9.8 Limitations or Difficulties

9.8.1 The EIA process enables good decision-making based on the best possible available information about the environmental implications of a proposed development. However, there is often a degree of uncertainty as to the exact scale and nature of the environmental impacts, and in such cases the reasonable worst-case scenario has been considered.

9.8.2 This assessment has been undertaken using available data and Proposed Development design details at the time of writing in August 2023. However, at this stage some details of the Proposed Development remain under development, such as the exact location of the water discharge outfall, the volume, rate and source of water, the quality of the treated process effluent, and the location and methodology for connection corridor crossings. The assumptions used are listed in Section 9.3 and have followed the Rochdale Envelope approach. As such, the assessment is a worst-case scenario, and actual effects may be less than those presented herein. Effects will be re-evaluated during the EIA.

9.9 Residual Effects and Conclusions

9.9.1 Having taken into account the emerging design and mitigation, along with additional information described in the preceding sections, this preliminary water environment assessment has identified two potential significant adverse effects.

9.9.2 The first relates to a potential open-cut crossing of Belasis Beck (which is of High importance for morphology) for the installation of the Hydrogen Pipeline Corridor. This will be a temporary Moderate adverse effect, with the watercourse morphology expected to recover over a number of years (approximately five years). It is anticipated that the significance of effect may be scaled down once further details regarding the watercourse crossings is known, and further mitigation or compensation measures considered - this will be re-assessed during the EIA.

9.9.3 The second potential significant effect relates to water quality impacts to the Tees Coastal waterbody from operational discharges. The scale of impact relates to nitrogen as well as other potential pollutants in the operational effluent from the Proposed Development is yet to be fully determined. Where discharged water contains new sources of nitrogen (i.e., not just nitrogen that was already in Tees river water that has been abstracted), then there may be a requirement to offset this load through mitigation. The concentration and redistribution of nitrogen from existing sources is also something that may require further assessment to ensure that the status quo is not perturbed by the Proposed Development.

9.9.4 No other significant adverse water environment effects have been identified relating to construction, operation or decommissioning of the Proposed Development. However, the preliminary assessment is based on a number of assumptions, and a more detailed assessment will be undertaken during the EIA taking into account ongoing design development, and greater clarity on aspects of the Proposed Development such as the process water discharge details and the drainage arrangements. These issues are also relevant to achieving WFD compliance and nutrient neutrality. The Tees Estuary and designated nature conservation sites are sensitive to water quality impacts, but there is also a need to support improvement for which stringent conservation objectives have been proposed. Further, more detailed nutrient neutrality and WFD assessment will be required to ascertain likelihood for significant effects relating to the Tees Estuary and Tees Coastal waterbodies. This will be undertaken in consultation with the Environment Agency and Natural England, and will include water quality modelling, which will be undertaken during the EIA and reported in the ES.

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10.0 GEOLOGY, HYDROGEOLOGY AND CONTAMINATED LAND

10.1 Introduction

10.1.1 This chapter of the Preliminary Environmental Information (PEI) Report identifies the potential impacts and effects on geology, hydrogeology and contaminated land as associated with the Proposed Development Site. Consideration has been given to geology: superficial soils and bedrock, geological and hydrogeological designations, soils and Agricultural Land Classification (ALC), land contamination and minerals.

10.1.2 This chapter presents a preliminary assessment of potential impacts and effects and outlines proposed design and other measures to help mitigate potential effects.

10.1.3 This chapter is supported by the following figures (PEI Report, Volume II):

- Figure 10-1: Artificial Geology;
- Figure 10-2: Superficial Geology;
- Figure 10-3: Bedrock Geology;
- Figure 10-4: BGS Boreholes;
- Figure 10-5: Faults and Linear Features;
- Figure 10-6: Waste and Landfills;
- Figure 10-7: Hazardous Sites;
- Figure 10-8a to 10-8e: Historical Industrial Land Uses;
- Figure 10-9: Historical Tanks;
- Figure 10-10: Ecological Designations;
- Figure 10-11: Discharge Consents;
- Figure 10-12: Superficial Aquifers;
- Figure 10-13: Bedrock Aquifers:
- Figure 10-14: Groundwater Vulnerability;
- Figure 10-15: Groundwater Source Protection Zones;
- Figure 10-16: Groundwater Abstractions;
- Figure 10-17: Surface Water Abstractions;
- Figure 10-18a: Natural Ground Subsidence – Collapsible Deposits;
- Figure 10-18b: Natural Ground Subsidence – Compressible Deposits;
- Figure 10-18c: Natural Ground Subsidence – Ground Dissolution of Soluble Rocks;
- Figure 10-18d: Natural Ground Subsidence – Landslides;
- Figure 10-18e: Natural Ground Subsidence – Running Sand;

- Figure 10-18f: Natural Ground Subsidence – Shrink / Swell Clays;
- Figure 10-19: Agricultural Land;
- Figure 10-20: BritPits;
- Figure 10-21: Non-Coal Mining;
- Figure 10-22: Surface Ground Workings;
- Figure 10-23: Underground Workings.

10.2 Legislation and Planning Policy Context

Legislative Background

10.2.1 This section sets out key aspects and implications of policy and guidance that are relevant to the assessment of likely impacts on geology, hydrogeology and contaminated land.

EU Legislation

The Water Framework Directive (2000/60/EC) (2000)

10.2.2 The Water Framework Directive (WFD) (European Parliament and of the Council, 2000) came into force in 2000. Its primary objective is for all groundwater, surface water and coastal water bodies to achieve 'good' status by 2015 and maintain this status. It includes broader ecological objectives as well as aiming to prevent the deterioration of all water bodies. The framework aims to develop sustainable water use and reduce and eliminate the presence of hazardous substances within water bodies. It must be considered in any development that has the potential to have an impact on any part of the water environment.

Groundwater Daughter Directive (2006/118/EC) (2006)

10.2.3 This Groundwater Daughter Directive (European Environment Agency, 2006) classifies groundwater bodies, establishes pollutant threshold values, and identifies trends and starting points for their reversal. Specific measures to control groundwater pollution are described, including good groundwater chemical status criteria and provisions to control groundwater pollutant inputs. The Directive provides further details on groundwater pollution control that are outlined within the WFD (2000/60/EC).

The Environmental Liability Directive (2004/35/EC) (2004)

10.2.4 This Environmental Liability Directive (European Parliament and of the Council, 2004) relates to the prevention and remedying of environmental damage. The Directive refers to environmental damage to habitats and protected species, water damage (chemical and ecological) and land damage caused by land contamination. In this instance, damage is defined as "*a measurable adverse change in a natural resource or measurable impairment of a natural resource service which may occur directly or indirectly*". It also establishes a framework based on the 'polluter pays' principle to prevent and remedy environmental damage. Operators are therefore liable to the cost of prevention measures and remediation strategies.

Dangerous Substances Directive (2006/11/EC) (2006)

10.2.5 This Dangerous Substances Directive (European Parliament and of the Council, 2006) sets out the measures of pollution caused by certain dangerous substances discharged into the aquatic environment (inland surface water, territorial waters and internal coastal waters). As part of this Directive, List I and List II substances are described, whereby List I substances should be eradicated, and List II substances should be reduced.

UK Legislation

Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (1990)

10.2.6 Part 2A of the Environmental Protection Act 1990 (Department for Environment Food and Rural Affairs, 1990) provides a means of dealing with unacceptable risks posed by land contamination to human health and the environment. Enforcing authorities are required to identify and deal with such land.

The Environment Act (1995)

10.2.7 The Environment Act (Environment Agency (EA), 1995) established the EA and the Scottish Environment Protection Agency corporate bodies. This makes provision with respect to contaminated land and abandoned mines. Further provisions are provided for National Parks, pollution controls, natural resource conservation and environment conservation/enhancement.

The Environment Act (2021)

10.2.8 The Environment Act (EA, 2021) makes provision with respect to water (surface and groundwater), waste and improvement of the environment. It provides a legal framework for environmental governance and for specific improvement of the environment, including measures on waste and resource efficiency, air quality and environmental recall, water, nature and biodiversity and nature conservation covenants.

The Water Act (2003)

10.2.9 The Act provides measures with regards to holding and issuing licences for water abstractions. The four broad aims of the Act are to ensure sustainable use of water resources, to strengthen the voice of consumers, to increase competition and to promote water conservation. This Act also considers controlled water pollution and coal mine water discharges and describes provisions for land drainage and flood defence. This was issued to amend the 1991 Water Resources Act (UK Parliament, 1991) and Water Industry Act (UK Parliament, 1991).

The Water Act (2014)

10.2.10 The aim of the Act was to reform the water industry to make it more innovative and responsive to customers and to increase the resilience of water supplies to natural hazards such as droughts and floods. The Act describes provisions for the following: abstraction water licence modifications, waterworks records, flood insurance for

households, internal drainage boards, regulations for the water environment and Regional Flood and Coastal Committees.

The Water Resources Act (1991)

10.2.11 The Act gives the EA powers and duties to prevent or remedy the pollution of controlled waters. Previously under the Act and now under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) it is a criminal offence for a person to cause or knowingly permit pollution of controlled waters. Sections within the Act refer to water resources management, pollution of water resources, flood defences, fishery controls, financial provisions, land and works powers and information provisions.

Anti-Pollution Works Regulations (as amended) (1999)

10.2.12 These Regulations empower the EA to serve a notice to remediate or mitigate on "*any person who has caused or knowingly permitted poisonous, noxious or polluting matter or any solid waste to be present in controlled waters*". The notice will either describe a potential incident and the risk to associated controlled waters, or for a pollution incident that has already occurred, the notice will describe the pollution event. Furthermore, the notice will describe the necessary operations or works which should be carried out.

The Environmental Permitting (England and Wales) Regulations (2016) and The Environmental Permitting (England and Wales) (Amendment) (EU Exit) Regulations (2019)

10.2.13 The Regulations set out the measures for those carrying out activities that may cause imminent threats of, or actual 'environmental damage', which require a permit. These Regulations also outline the authorities responsible for enforcing the Regulations. Such Regulations cover environmental permits, discharge into regulated facilities, abstractions of groundwaters, enforcement and offences, public registers and powers/functions of the regulator and authority.

The Environmental Damage (Prevention and Remediation) (England) Regulations (2015)

10.2.14 The Regulations describe the legal framework for the prevention of environmental damage and the requirements for the remediation of damage when it occurs. It sets out the UK Government's views on how they should be applied and how particular terms should be interpreted.

The Contaminated Land (England) Regulations (2012)

10.2.15 The Contaminated Land Regulations set out the processes of risk assessment and identification/evaluation of remediation options. This is an amendment of the 2006 Contaminated Land (England) Regulations (UK Parliament, 2006).

The Waste (England and Wales) (Amendment) Regulations 2014 (as amended)

10.2.16 The Regulations set out the measures required for the prevention of, production and management of waste. The Regulations describe the purpose of waste prevention

programmes with waste prevention measures and refers to monitoring by appropriate authorities using qualitative or quantitative benchmarks.

Planning Policy Context

National Planning Policy

Overarching National Policy Statement (NPS) for Energy (EN-1) 2011)

10.2.17 The National Policy Statements (NPSs) for energy infrastructure set out the Government's policy for delivery of major energy infrastructure (UK Government, 2023). The Overarching NPS for Energy (EN-1) is of relevance to the geology, hydrogeology and contaminated land assessment.

10.2.18 Section 4.10 (Pollution Control and Other Environmental Regulatory Regimes) details that issues relating to discharges or emissions from a proposed project which may affect air quality, land quality and the marine environment, or which include noise and vibration may be subject to separate regulation under the pollution control framework or other consenting and licensing regimes. Before consenting any potentially polluting developments it should be confirmed that:

- the relevant pollution control authority is satisfied that potential releases can be adequately regulated under the pollution control framework; and
- the effects of existing sources of pollution in and around the site are not such that the cumulative effects of pollution when the proposed development is added would make that development unacceptable, particularly in relation to statutory environmental quality limits.

10.2.19 Other relevant Sections include Section 5.3 Biodiversity and Geological Conservation, and Section 5.15 Water Quality and Resources.

National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) 2011)

10.2.20 The NPS for gas supply infrastructure and gas and oil pipelines set out the Government's policies for delivering natural gas and oil products (UK Government, 2023) and is in conjunction with the Overarching Energy NPS (EN-1). This NPS is of relevance to the geology, hydrogeology and contaminated land assessment.

10.2.21 Section 2.2 (Climate change adaptation) details the policy context for mitigating climate change for nationally significant energy infrastructure. Climate change resilience measures should account for increased risk of flooding, effects of rising sea levels and storm surges, higher temperatures, increased risk of earth movement and subsidence and any other increased risks identified in the assessment within the ES.

10.2.22 Section 2.8 (Underground Natural Gas Storage) sets out the limitations of site selection of underground storage due to geology and aquifers. The applicant's assessment must give consideration to the long-term integrity of affected strata within the construction, operational and decommissioning phases. The section also identifies non-exhaustive impacts which result from gas storage and supply infrastructure such as gas emissions, water quality and disposal of brine.

10.2.23 Section 2.10 further details the effects on water environments and aquifers as a result of underground gas storage facilities and the increased demand on water supplies due to the volume of extractions required to leach salt caverns. The assessment should consider the effects to groundwater resources such as reduction in water availability for other abstractions, the effects to ecological receptors that are dependent upon groundwater as well as the impact of the mobilisation of salt and other pollutants. It is likely an abstraction license will be required.

10.2.24 Section 2.23 (Gas and Oil Pipelines Impacts: Soil and Geology) details the importance of understanding the underlying strata and ground conditions along the route of the pipeline. This includes consideration for proposals of horizontal directional drilling (HDD) and whether the geological conditions are suitable. Appropriate mitigation can be used to reduce adverse impacts in line with the principles and practices outlined in the Code of Practice for the Sustainable Management of Soils on Construction Sites.

10.2.25 Section 2.22 (Gas and Oil Pipelines Impacts: Water Quality and Resources) details the importance of understanding the water quality and resources and the effects that the surface clearance and excavation for pipelines can have on water courses, aquifers, water abstractions and discharge points, areas prone to flooding and ecological receptors. Impacts during construction should be avoided through route selection or mitigated and ground reinstated after construction. The section further details possible appropriate mitigation measures.

10.2.26 Paragraph 2.23.3 describes how “When considering any application where the pipeline goes under a designated area of geological or geomorphological interest, the applicant should submit details of alternative routes, which either bypass the designated area or reduce the length of pipeline through the designated area to the minimum possible, and the reasons why they were discounted".

National Policy Statement for Electricity Networks Infrastructure (EN-5) 2011)

10.2.27 The NPS for electricity networks infrastructure set out the Government’s policies for delivering natural gas and oil products (UK Government, 2023) and is in conjunction with the Overarching Energy NPS (EN-1). This NPS is of relevance to the geology, hydrogeology and contaminated land assessment.

10.2.28 Section 2.4 (Climate change adaptation and resilience) details the considerations for flooding (particularly of substations vital for the network), effects of adverse weather on overhead lines, effects of increased temperatures, earth movement or subsidence caused by flooding or drought and coastal erosion for the landfall of offshore transmission cables and their associated substations in the inshore and coastal locations, which should be considered within the ES.

10.2.29 Paragraph 2.8.9 details the disruptive effects of undergrounding on the environment, archaeological sites, sensitive habitats, soils and geology and damage heritage assets. Applications should take into account that the Government has not laid down general rules of when an overhead line should be considered unacceptable.

10.2.30 Section 1.20 (Electric and Magnetic Fields) details the risks of electric and magnetic fields (EMFs) to human health, possible mitigation measures and highlights that there

is no direct statutory provision in the planning system relating to protection from EMFs.

Draft National Planning Policy

Draft Overarching National Policy Statement (NPS) for Energy (EN-1) 2023)

10.2.31 The UK Government is currently reviewing and updating the NPS for Energy the Draft Overarching NPS for Energy (EN-1) is of relevance to the geology, hydrogeology and contaminated land assessment.

10.2.32 Section 4.11 (Pollution control and other environmental regulatory regimes) (Department for Energy and Climate Change, 2011) includes the details as NPS EN-1 but includes consideration for discharges or emissions and indirect or direct impacts to terrestrial, freshwater, onshore and offshore environments. The section also refers to pollution from industrial sources is controlled through the Environmental Permitting (England and Wales) Regulations 2016 (EPR) and it is a requirement for industrial facilities to have an environmental permit (EP). There is a requirement for larger industrial facilities undertaking specific types of activities to use Best Available Technology (BAT) to reduce emissions to air, water and land. Other relevant Sections include Section 5.4 Biodiversity and Geological Conservation, and Section 5.16 Water Quality and Resources.

10.2.33 In 2020 the Government launched a review of the energy NPSs. The Draft Overarching NPS for Energy (EN-1) was published in September 2021 by the former Department for Business, Energy and Industrial Strategy (BEIS) (BEIS, 2021), and updates the existing NPS EN-1. A further update was published in March 2023 by the Department for Energy Security & Net Zero. The 2023 Draft EN-1 repeats the requirements as detailed above in the current EN-1.

Draft National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) 2023

10.2.34 The UK Government is currently reviewing and updating the NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4). This NPS is of relevance to the geology, hydrogeology and contaminated land assessment. The draft NPS is noted to refer to 'Natural Gas' rather than 'Gas' as within the current NPS EN-4.

10.2.35 Section 2.3 (Climate change adaptation) details the policy context for mitigating climate change for nationally significant energy infrastructure. The draft represents the requirements as the current NPS EN-4 detailed above.

10.2.36 Section 2.9 (Underground Natural Gas Storage: Applicant assessment) sets out the limitations of site selection of underground storage and considerations to geology and aquifers as detailed in the current NPS EN-4.

10.2.37 Section 2.21 (Natural Gas and Oil Pipelines: Applicant assessment) details the importance of understanding pipeline safety, impacts such as water quality and resources, and soils and geology and the potential impact that development might have on these. The section also highlights the effects of hydrostatic testing of pipelines which may take place during commissioning which may affect water quality and abstraction licenses and environmental permits are likely to be required.

Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) 2023

10.2.38 The UK Government is currently reviewing and updating the NPS for Electricity Networks Infrastructure (EN-5). This NPS is of relevance to the geology, hydrogeology and contaminated land assessment.

10.2.39 Section 2.6 (Climate change adaptation and resilience) details the considerations for flooding as within the current NPS EN-5 but includes the addition of coastal erosion for the landfall of offshore transmission cables and their associated substations in the inshore and coastal locations, which should be considered within the ES.

10.2.40 Section 2.9 (Applicant assessment) details the impacts the applicant should consider; however, it notes that the list is not exhaustive and site-specific information should also be provided. This section also includes reference to the Horlock Rules, which provide guidance for the design and siting of substations and include consideration for environmental issues from the earliest stage to keep adverse effects to a reasonably practicable minimum. The guidance also refers to internationally and nationally designated areas of amenity, cultural or scientific value; the protection of local amenity value, existing habitats and landscape features including ancient woodland, historic hedgerows, surface and groundwater sources and nature conservation areas; and consider the land use effects.

10.2.41 Sections 2.13 and 2.14 (Electric and Magnetic Fields, and Sulphur Hexafluoride) detail the mitigation measures the applicant should consider to avoid and minimise the environmental impacts to both onshore and offshore at the early design stage in the development process. This includes considerations to electric and magnetic fields (EMFs) and sulphur hexafluoride on the environment.

National Planning Policy Framework (NPPF) (2021)

10.2.42 The NPPF sets out the government's planning policies for England and how these are expected to be applied. This Framework contains policies relevant to the geology and soils assessment. The 'Reforms to national planning policy' document has been put forward to the government by the Levelling Up, Housing and Communities Committee with recommendations to the government on the NPPF. This document is still within the consultation process and a response from the government is anticipated in September 2023.

10.2.43 Paragraph 120 c describes how "*Planning policies and decisions should give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land*".

10.2.44 Paragraph 170 details that planning policies and decisions for coastal areas should take account of the UK Marine Policy Statement and marine plans. This would include the North East Inshore Marine Plan to ensure effective alignment of the terrestrial and marine planning regimes.

10.2.45 Paragraph 173 describes the limits local planning authorities should place on the planned lifetime of a development in a Coastal Change Management Area. Temporary permissions and restoration conditions should be implemented where

necessary to reduce a potentially unacceptable level of risk to future people and the development.

10.2.46 Paragraph 174b relates to contributing to and enhancing the local environment through recognising the benefits of natural capital, ecosystem services, agricultural land, trees and woodland.

10.2.47 Paragraphs 183 – 188 form part of a section called 'Ground conditions and pollution'.

10.2.48 Paragraph 183 details requirements of planning policies in the context of proposed development on a site including adequate site investigation, suitability in the context of ground conditions, land instability and contamination and proposals for mitigation. This requires that land cannot be classified as contaminated post remediation as defined under the Environmental Protection Act 1990 Part IIA.

10.2.49 Paragraph 184 relates to the responsibility of developers and/or landowners for safe development.

10.2.50 Paragraph 185 refers to minimising the effects of pollution and adverse impacts from the proposed development.

Planning Practice Guidance (PPG) (2019)

10.2.51 The guidance was published to provide more in-depth guidance to the NPPF. The PPG of relevance to the geology and soils assessment is Land Affected by Contamination (MHCLG, 2019). The PPG aims to provide guiding principles on how planning can deal with land affected by contamination.

Local Planning Policy

Redcar and Cleveland Local Plan and Policies Map (2018)

10.2.52 The following policies and statements of the Redcar and Cleveland Borough Council (RCBC) Local Plan and Policies Map (RCBC, 2018) are relevant to the geology, hydrogeology and contaminated land assessment:

- Paragraph 1.70 – *"Redcar and Cleveland has substantial areas of contaminated land. The Local Plan will support the reclamation of contaminated land to enable the redevelopment of brownfield sites and help shift the perception of South Tees, presenting a cleaner, greener image of industry."*
- Policy SD 2 Locational Policy – *"Wherever possible, priority will be given to the development of brownfield land in sustainable locations, providing it is not of high environmental value, the reuse of existing buildings and limiting development in the countryside."*
- Paragraph 2.14 – *"In seeking to prioritise the re-use of previously developed land, the Council will continue to work with delivery partners including private developers, the Homes and Communities Agency and the Tees Valley Combined Authority which is, among other things, overseeing the preparation of a Brownfield and Surplus Public Sector Land Register, in line with government policy."*

- Paragraph 2.28 – *"Applicants proposing development on or near potentially contaminated land will be required to evidence that risks associated with contamination will be successfully addressed through remediation without undue environmental impact during and following the development in accordance with the Model Procedures for the Management of Land Contamination (CLR 11) [replaced by LC:RM (EA, 2021)], which have been developed to provide the technical framework for applying a risk management process when dealing with land affected by contamination."*
- Policy SD 7 Flood and Water Management – *"Discharge rates into surface water and combined sewers resulting from the redevelopment of brownfield sites will be limited to a maximum of 50% of flows consented for previous uses."*
- Paragraph 6.13 – *"To support these housing delivery aspirations, and in accordance with government policy a brownfield land register is currently being prepared by the Tees Valley Combined Authority in collaboration with the five local authorities."*
- Paragraph 6.26 – "*Prioritising where possible and including in terms of economic viability considerations, the development of previously developed ('brownfield') sites and other available land within existing settlement boundaries."*
- Policy N 4 Biodiversity and Geological Conservation – "*We will protect and enhance the borough's biodiversity and geological resources. Support will be given to high quality schemes that enhance nature conservation and management, preserve the character of the natural environment and maximise opportunities for biodiversity and geological conservation, particularly in or adjacent to, Biodiversity Opportunity Areas in the wider Tees Corridor, Teesmouth, East Cleveland and Middlesbrough Beck Valleys areas."*
    - *"…Priority will be given to protecting our internationally important sites, including the Teesmouth and Cleveland Coast Special Protection Area/Ramsar and European Marine Site, and the North York Moors Special Protection Area and Special Area of Conservation."*
    - *"…Development that is likely to have an adverse impact on nationally important SSSI sites, including broader impacts on the national network and combined effects with other development, will not normally be allowed. Where an adverse effect on the site's notified interest features is likely, an exception will only be made where: c. the benefits of the development, at this site, clearly outweigh both any adverse impact on the features of the site that makes it of special scientific interest, and any broader impacts on the network of SSSIs; d. no reasonable alternatives are available; and e. mitigation, or where necessary compensation, is provided for the impact."*
- Policy LS 4 South Tees Spatial Strategy – "The strategy includes:
    - Wilton International

- South Tees Development Corporation area, as illustrated on the Policies Map (including current and former steelworks at South Tees and Redcar)
- Teesport
- South Tees Industrial Estates and Business Parks"

- The Strategy ensures the Council, and its partners will aim to consider the economy, connectivity and environment as the points detailed within the Strategy to secure decontamination and redevelopment of potentially contaminated land.

Redcar & Cleveland, South Tees Area Supplementary Planning Document (May 2018)

10.2.53 The following policies and statements of the Redcar & Cleveland South Tees Planning Area (STPA) Supplementary Planning Document (SPD, 2018) are relevant to the geology, hydrogeology and contaminated land assessment:

- Development Principle STDCI: Regeneration Principles
  - "To reduce pollution, contribute to sustainable flood risk management and habitat protection and encourage biodiversity and long term sustainability;
  - To support development which makes the best use of available land and existing infrastructure;
  - To support development that contributes to the creation of a healthy, active, safe and secure environment; and
  - To support the protection of heritage assets and the historic environment and the protection and enhancement of landscape character."
- Development Principle STDC3 – Phasing Strategy
  - Development that can be implemented in the early phases will be supported including areas which require ground remediation and site preparation.
  - "The redevelopment of areas requiring more extensive remediation, demolition and/or new or upgraded infrastructure will also be supported, although it is recognised that this is likely to take longer to secure. Development within the more contaminated areas should have regard to Development Principle STDC9 and the forthcoming Ground Remediation Strategy."
- Development Principle STDC7 – Natural Environmental Protection and Enhancement
  - "The Council will, in partnership with the STDC and investment partners and other key stakeholders, protect and, where appropriate, enhance designated and non-designated sites of biodiversity and geodiversity value and interest within the South Tees Area. The need to remediate known

contamination, including to reduce environmental harm, and to redevelop the South Tees Area for productive uses is fully recognised and supported by the Council. In doing so it will be important for all development proposals to be in accordance with the requirements of STDC7 and to respond to their environmental setting, in particular to protect and, where possible enhance, biodiversity and geodiversity interests.

- All proposals will be required to comply with Local Plan Policy N4 Biodiversity and Geological Conservation. Proposals with the potential to affect the Teesmouth and Cleveland Coast SPA should undergo a Habitat Regulations Assessment (HRA) with regard to the conservation objectives of the designation.
- The Council will support the delivery of a strategy for the regeneration area which promotes the provision of green infrastructure, in accordance with Local Plan Policy N2, including a series of connected open, private and public spaces, using open space as connectors not barriers to development.
- All proposals will be required to have regard to the forthcoming Environment and Biodiversity and Open Space Strategies and, where appropriate, the Redcar & Cleveland Teesmouth and Cleveland Coast SPA Recreation Management Plan, including in the mitigation of likely cumulative impacts on the natural environment. Net environmental gains should be provided where appropriate and viable, in accordance with Policies N2 and N4.

- Development Principle STDC9 – Site Remediation
  - "The Council supports the following approach to the remediation of land; Remediation will be proportionate, based on a risk assessment and respond to the development typology and its needs;
  - Where appropriate, remediation of the site will provide for environmental betterment;
  - The Ground Remediation Strategy will consider opportunities for the area of land identified as the Landfill Zone, subject to other regulatory requirements, to be used to support the remediation of STDC development land in the short term. Once the use of this area is no longer required it shall, itself, be the subject of a remediation scheme and may be made available for renewable energy or other appropriate development.
  - Development proposals should be in accordance with the forthcoming Ground Remediation Strategy and all remediation activities will be required to avoid adverse effects on the integrity, conservation objectives

or qualifying features of the Teesmouth and Cleveland Coast SPA and Ramsar site, in line with Policy N4 of the Local Plan.

- Development proposals and remediation activities will be required to avoid unacceptable impacts on water quality and contamination of the water environment.
- As the site incorporates large areas of previously developed land with a history of industrial uses there will be a requirement to remediate land in advance of development. The approach is one that will match the degree of remediation with end user requirements, to this end, the remediation of the South Tees Area will respond to investment needs and the release of land for development.
- It is recognised that areas of land will be subject to different levels of contamination and the approach of the STDC will be to assess the degree of contamination and to adopt a Ground Remediation Strategy in order to deal with that contamination based on site delivery and viability. Wherever possible and following an appraisal of remedial options, remediation of the site will provide a degree of environmental betterment of site conditions. The Ground Remediation Strategy, which is being prepared for the South Tees Area shall be the subject of a phasing plan which itself will balance the need to incentivise development to secure early investment in development opportunities.
- The area of land currently identified as the Landfill Zone (see Development Principle STDC14 - South Industrial Zone) is one which could be used to offset the costs of remediation of development sites once this site is no longer required, as utilising this area as a repository for residual, unsuitable materials from site preparation will save significant cost over offsite disposal. The site itself may be capped and remediated in accordance with the landscape strategy and is likely to be appropriate for future renewable energy development, or other forms of development, after it is capped. This approach will be considered in the site wide Ground Remediation Strategy.
- Development proposals located in proximity to former landfill sites should be supported by a Gas Risk Assessment and should incorporate any necessary protection measures, such as those to protect buildings from landfill gas migration."

Stockton-on-Tees Borough Council Local Plan (2019)

10.2.54 The following policies and statements of the Stockton-on-Tees Borough Council (STBC) Local Plan (STBC, 2019) are relevant to the geology, hydrogeology and contaminated land assessment:

- Natural Environment – Paragraph 8.45 – "*The planning system should contribute to and enhance the natural and local environment by:*
  - *protecting and enhancing valued landscapes, geodiversity and soils;*
  - *recognising the wider benefits of ecosystem services;*
  - *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including the establishment of coherent ecological networks that are more resilient to current and future pressures;*
  - *preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability; and*
  - *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate."*
- Policy ENV5 Preserve, Protect and Enhance Ecological Networks, Biodiversity and Geodiversity – "*Development proposals should seek to achieve net gains in biodiversity wherever possible. It will be important for biodiversity and geodiversity to be considered at an early stage in the design process so that harm can be avoided and wherever possible enhancement achieved (this will be of particular importance in the redevelopment of previously developed land where areas of biodiversity should be retained and recreated alongside any remediation of any identified contamination). Detrimental impacts of development on biodiversity and geodiversity, whether individual or cumulative should be avoided."*
- Policy ENV7 Ground, Air, Water, Noise and Light Pollution – "*Where future users or occupiers of a development would be affected by contamination or stability issues, or where contamination may present a risk to the water environment, proposals must demonstrate via site investigation/assessment that:*
  - *a. Any issues will be satisfactorily addressed by appropriate mitigation measures to ensure that the site is suitable for the proposed use, and does not result in unacceptable risks which would adversely impact upon human health and the environment; and*
  - *b. Demonstrate that development will not cause the site or the surrounding environment to become contaminated and/or unstable.*
    - Groundwater and surface water quality will be improved in line with the requirements of the European WFD and its associated legislation and the Northumbria River Basin Management Plan. Development that would adversely affect the quality or quantity of surface or groundwater, flow of groundwater or ability to abstract water will not be permitted unless it can be demonstrated that no significant adverse

impact would occur, or mitigation can be put in place to minimise this impact within acceptable levels."

- Paragraph 8.73 – "*For development to be supported, such assessments will be required and demonstrate that pollution is or can, (through mitigation) be brought within acceptable levels. For the purposes of this policy 'levels' refers to statutory limits (such as those relating to air quality and contaminated land) and the wider consideration of impacts under the Environmental Protection Act (1990).*"
- Paragraph 8.75 – "*Stockton Borough has a legacy of previously developed land which can make an important contribution to its land supply for development. It is the responsibility of the developer and/or landowner to ensure development on site(s) affected by contamination or land stability issues result in a safe development.*"
- Paragraph 8.76 – "*Planning applications for new development on sites which are contaminated or are underlain by potentially unstable land must be accompanied by information which shows that investigations have been carried out to determine the nature and extent of any hazard, as well as the possible impact it is likely to have on future users and the environment. Any assessment should set out the detailed measures needed to allow the development to proceed safely, including, as appropriate those needed to improve and treat the land, address land stability and any other public safety issues. A Preliminary Risk Assessment should be submitted as a minimum which includes a desk study, conceptual model and initial assessment of risk; this information must satisfactorily demonstrate to the local planning authority that the risk to human health and controlled waters has been fully understood and can be addressed through appropriate measures. After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990. The aim is not to prevent development of the land but to ensure that new development is appropriate for its location and that the physical constraints on the land are taken into account at the planning application stage.*"

Hartlepool Local Plan (2018)

10.2.55 The following policies and statements of the Hartlepool Local Plan (HBC, 2018) are relevant to the geology, hydrogeology and contaminated land assessment:

- CC3: "*Renewable and Low Carbon Energy Generation (excluding strategic wind turbines and large scale solar photovoltaic developments) - Where appropriate, developers will need to include a satisfactory scheme to restore the site to a quality of at least its original condition when the development has reached the end of its operational life, including addressing any resultant land contamination issues.*"
- Paragraph 9.45 – "*The presence of any contamination on the land must be investigated and any necessary remediation measures put in place.*"

- QP6: Technical Matters – *"Point 2) The presence of any contamination on the land must be investigated and any necessary remediation measures put in place."*
- Paragraph 10.36 – "*Aquifers are vulnerable to various forms of pollution. Proposed developments should therefore ensure that suitable pollution prevention measures are in place to protect the water supplies from pollution. In particular, any future development that requires piling, deep foundations or removal of soil and clay cover should be suitably managed so that they do not produce new pathways for contaminants to enter the underlying groundwater. In addition, creation of new pathways which would allow high groundwater to inundate land causing localised groundwater flooding should be prevented."*

10.2.56 NE1: Natural Environment – "*Point 10) In prioritising the re-development of brownfield land, areas that are important for biodiversity will be retained or recreated within the site, and remediation of contaminated land will be pursued"* and *"Point 11) The major/principal aquifers underlying Hartlepool along with watercourses and other surface and coastal waters will be protected from over abstraction and contamination from pollutants and saline intrusion resulting from development. Developments will be required to demonstrate that they do not impact on the major/principal aquifer underlying Hartlepool, along with watercourses and other surface and coastal waters and they can achieve access to a sustainable water supply prior to approval."*

10.3 Assessment Methodology and Significance Criteria

Study Area

10.3.1 The Study Area for this assessment is the area over which the potential direct and indirect effects of the Proposed Development Site are predicted to occur during the construction, operation (including maintenance as necessary) and decommissioning phases.

10.3.2 The direct effects on geology and hydrogeology are those that may arise during construction, operation (including maintenance) and decommissioning. Effects may occur simultaneously during the period when Phase 1 has been constructed and is operational and Phase 2 is under construction.

10.3.3 The indirect effects involve disturbing the ground in such a way that contaminant linkages (source-receptor-pathway) are created, for example, introducing a new pathway for the migration of a pollution plume within Made Ground into aquifers or by allowing potentially contaminated dusts, during construction/decommissioning, to migrate offsite to nearby residential and/or commercial properties.

10.3.4 The Study Area for geology, hydrogeology and contaminated land is considered to be the entirety of the ground within the Proposed Development Site, along with a buffer extending 250 m around the Proposed Development Site to identify potential offsite sources of contamination to inform the baseline condition within and adjacent to the Proposed Development Site. For assessment of effects to controlled waters including designated sites, groundwater abstractions and groundwater source protection

zones, a buffer extending 1 km from the Proposed Development Site is considered appropriate.

10.3.5 These Study Areas are considered to be appropriate for the assessment of geology, hydrogeology and contaminated land in accordance with methodology set out in Design Manual for Roads and Bridges (DMRB) LA109 Geology and Soils (National Highways, 2019a). The Study Areas are also based on professional judgement by competent experts with relevant and appropriate experience of assessing land contamination and contamination dispersion.

Impact Assessment Methodology

10.3.6 The geology, hydrogeology and contaminated land assessment considers the following resources:

- geology: artificial ground, superficial deposits and bedrock;
- mineral Resources;
- aquifer designations;
- soils and ALC; and
- contamination of soils and groundwater.

10.3.7 A detailed assessment of potential Source-Pathway-Receptor linkages and a risk assessment have been used to develop the Conceptual Site Model (CSM) – details will be provided in the Environmental Statement (ES).

10.3.8 To facilitate the impact assessment process and ensure consistency in the terminology of effect significance, a standard assessment methodology has been applied. This methodology has been developed using a range of guidance, including DMRB LA109 (National Highways, 2019a). The methodology is discussed in Chapter 2: Assessment Methodology (PEI Report, Volume I).

10.3.9 The terminology for the receptor value (sensitivity), magnitude of potential impacts and significance of effect differs from the assessment criteria terminology in Chapter 2: Assessment Methodology (PEI Report, Volume I). This methodology is appropriate for assessing the likely significant effects of the Proposed Development on geology, hydrogeology and contaminated land because it follows the standard guidance in DMRB LA109 (National Highways, 2019a) and DMRB LA113 (National Highways, 2020a), DMRB LA 104 (National Highways, 2020b), Land Contamination: Risk Management (Environment Agency, 2023) and A New Perspective on Land and Soil in Environmental Impact Assessment (Institute of Environmental Management and Assessment, 2022).

10.3.10 The assessment of receptor value (sensitivity) for geology, soils and controlled waters follows the procedure described in Table 3.11 of the DMRB LA 109 (National Highways, 2019a). The assessment of receptor value (importance) for groundwater resources follows the procedure described in Table 3.70 of the DMRB LA 113, Road Drainage and the Water Environment (National Highways, 2020a).

10.3.11 The value (sensitivity or importance) of a resource, ranges from Very High to Negligible (or Low for groundwater) and is dependent on the assessment area or features of importance and conservation value. The criteria for determining the value of a resource and typical examples for geology, soils, human health and controlled waters are provided in Table 10-1.

10.3.12 The magnitude of potential impacts upon geology, soils, human health and controlled waters receptors considers the scale of the predicted change to baseline conditions and where there are potential pathways between an impact source/hazard and identified receptors. This takes into account the spatial scale of the impact, as well as its duration and reversibility (e.g., the impact magnitude may be moderated if the impacts are temporary rather than permanent; or are reversible rather than irreversible).

The magnitude of impact on a receptor (geology, soils, human health and controlled waters) ranges from Major to No Change, with additional magnitude descriptions of Minor Beneficial, Moderate Beneficial and Major Beneficial prescribed to groundwater receptors. The criteria for determining the magnitude of impact upon receptors are provided in Table 10-2.

Table 10-1: Sensitivity (Value) of Geology, Soil and Water Environment Attributes (Adapted from DMRB LA109 Table 3.11 (National Highways, 2019) and DMRB LA113 Table 3.70 (National Highways, 2020a) Therein)

RECEPTOR VALUE (SENSITIVITY) IMPORTANCE	CRITERIA	ASPECT	TYPICAL EXAMPLES
Very High	Very rare and of international importance with no potential for replacement. Geology meeting international designation citation criteria which is not designated as such.	Geology	UNESCO (United Nations Educational, Scientific and Cultural Organisation) World Heritage Sites, UNESCO, Global Geoparks, Sites of Special Scientific Interest (SSSIs) and Geological Conservation Review sites where citations indicate features of international importance.
	Soil directly supporting an ES designated site.	Soils	Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar Site, ALC Grades 1 and 2 (as defined in Table 10-7).
	Human Health: very high sensitivity land use.	Contamination	Residential or allotments.
	Nationally significant attributed of high importance.	Groundwater	Principal aquifer providing a regionally important resource and/or supporting a site protected under EC and UK legislation Ecology and Nature Conservation. Groundwater locally supports Groundwater Dependent Terrestrial Ecosystems (GWDTEs) or Source Protection Zone (SPZ) 1.

RECEPTOR VALUE (SENSITIVITY) IMPORTANCE	CRITERIA	ASPECT	TYPICAL EXAMPLES
High	Rare and of national importance with little potential for replacement. Geology meeting national designation citation criteria which is not designated as such.	Geology	Geological SSSIs and National Nature Reserves (NNRs).
	Soils directly supporting a UK designated site.	Soils	SSSIs. ALC Grade 3a.
	Human Health: high sensitivity land use.	Contamination	Public Open Space.
	Locally significant attribute of high importance.	Groundwater	Principal aquifer providing locally important resource or supporting a river ecosystem. Groundwater supports a GWDTE or SPZ2.
Medium	Of regional importance with limited potential for replacement. Geology meeting regional designation citation criteria which is not designated as such.	Geology	Regionally Important Geological Sites (RIGS).
	Soils supporting non-statutory designated sites.	Soils	Local Nature Reserves (LNRs), Local Geological Sites (LGS), Sites of Nature Conservation Importance (SNCIs). ALC Grade 3b.
	Human Health: medium sensitivity land use.	Contamination	Commercial or industrial land.
	Of moderate quality and rarity.	Groundwater	Aquifer providing water for agricultural or industrial use with limited connection to surface water. SPZ3.

RECEPTOR VALUE (SENSITIVITY) IMPORTANCE	CRITERIA	ASPECT	TYPICAL EXAMPLES
Low	Of local importance/interest with potential for replacement.	Geology	Non designated geological exposures, former quarries / mining sites.
	Soils supporting non-designated notable or priority habitats.	Soils	ALC Grades 4 and 5.
	Low sensitivity land use.	Contamination	Highways and rail.
	Lower quality.	Groundwater	Unproductive Strata.
Negligible	No geological exposures, little/no local interest.	Geology	Significant depth of Made Ground.
	Soils: previously developed land formerly in 'hard uses' with little potential to return to agriculture.	Soils	Industrial land/soils not present.
	Human health: undeveloped surplus land, no sensitive land use proposed.	Contamination	Extensive areas of existing hard standing.
	Negligible is not applicable to Groundwater under Table 3.7 of LA 113.	Groundwater	N/A

Table 10-2: Magnitude of Impact of a Resource (Adapted from DMRB LA 109 Table 3.12 and Table E/2.1 (National Highways, 2019) Therein)

MAGNITUDE	CRITERIA	ASPECT	TYPICAL DESCRIPTION
Major	Result in loss of resource/designation or quality of the resource.	Geology	Loss of geological feature/designation and/or quality and integrity, severe damage to key characteristics, features or elements.
		Soils	Physical removal or permanent sealing of soil resource or agricultural land.
	Human health: significant contamination identified. Contamination levels significantly exceed background levels and relevant screening criteria (e.g. category 4 screening levels – SP1010 (Contaminated Land: Applications in Real Environments (CL:AIRE, 2014)). Potential for significant harm to human health.	Contamination	Contamination heavily restricts future use of land.
Major Adverse	Results in loss of attribute and/or quality and integrity of the attribute.	Groundwater	Loss of, or extensive change to, an aquifer. Loss of regionally important water supply. Calculated risk of pollution from spillages ≥2% annually (Spillage Assessment). Potential high risk of pollution to groundwater from routine runoff – risk score >250 (Groundwater quality and runoff assessment). Loss of, or extensive change to GWDTE or baseflow contribution to protected surface water bodies. Reduction in water body WFD classification.

MAGNITUDE	CRITERIA	ASPECT	TYPICAL DESCRIPTION
			Loss or significant damage to major structures through subsidence or similar effects
Moderate	Results in partial loss of resource/designation or quality of the resource.	Geology	Partial loss of geological feature/designation, potentially adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
		Soils	Permanent loss/ reduction of one or more soil function(s) and restriction to current or approved future use (e.g. through degradation, compaction, erosion of soil resource).
	Human health: contaminant concentrations exceed background levels and are in line with limits of relevant screening criteria (e.g., category 4 screening levels SP1010). Significant contamination can be present.	Contamination	Control/ remediation measures are required to reduce risks to human health/ make land suitable for intended use.
Moderate Adverse	Results in effect on integrity of attribute, or loss of part of attribute.	Groundwater	Partial loss or change to an aquifer. Degradation of regionally important public water supply or loss of significant commercial/industrial/agricultural supplies. Potential medium risk of pollution to groundwater from routine runoff – risk score 150-250.

MAGNITUDE	CRITERIA	ASPECT	TYPICAL DESCRIPTION
			Calculated risk of pollution from spillages ≥1% annually and <2% annually. Partial loss of the integrity of GWDTE. Contribution to reduction in water body WFD classification. Damage to major structures through subsidence or similar effects or loss of minor structures.
Minor	Results in minor measurable change in resource/designation.	Geology	Minor measurable change in geological feature/designation attributes, quality or vulnerability; minor loss of, or alteration to, one (may be more) key characteristics, features or elements.
		Soils	Temporary loss/reduction of one or more soil function(s) and restriction to current or approved future use (e.g., through degradation, compaction, erosion of soil resource).
	Human health: contaminant concentrations are below relevant screening criteria (e.g. category 4 screening levels SP1010). Significant contamination is unlikely with a low risk to human health.	Contamination	Best practice measures can be required to minimise risks to human health.

MAGNITUDE	CRITERIA	ASPECT	TYPICAL DESCRIPTION
Minor Adverse	Results in some measurable change in attributes, quality or vulnerability.	Groundwater	Potential low risk of pollution to groundwater from routine runoff – risk score <150. Calculated risk of pollution from spillages ≥0.5% annually and<1% annually. Minor effects on an aquifer, GWDTEs, abstractions and structures.
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use and integrity.	Geology	Very minor loss or detrimental alteration to one or more characteristics, features or elements of geological feature/designation. Overall integrity of resource not affected.
		Soil	No discernible loss/reduction of soil function(s) that restrict current or approved future use.
	Human health: contaminant concentrations substantially below levels outlined in relevant screening criteria (e.g., category 4 screening levels SP1010).	Contamination	No requirement for control measures to reduce risks to human health/ make land suitable for intended use.
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use and integrity.	Groundwater	No measurable impact upon an aquifer and/or groundwater receptors and risk of pollution from spillages <0.5%.
Minor Beneficial	Results in some beneficial effect on attribute or a reduced risk of negative effect occurring.	Groundwater (only)	Reduction of groundwater hazards to existing structures. Reductions in waterlogging and groundwater flooding.

MAGNITUDE	CRITERIA	ASPECT	TYPICAL DESCRIPTION
Moderate Beneficial	Results in moderate improvement of attribute quality.	Groundwater (only)	Contribution to improvement in water body WFD classification. Improvement in water body catchment abstraction management Strategy (CAMS) (or equivalent) classification. Support to significant improvements in damaged GWDTE.
Major Beneficial	Results in major improvement of attribute quality.	Groundwater (only)	Removal of existing polluting discharge to an aquifer or removing the likelihood of polluting discharges occurring. Recharge of an aquifer. Improvement in water body WFD classification.
No Change	No temporary or permanent loss in resource of designation.	Geology	No temporary or permanent loss/disturbance of characteristics features or elements.
		Soils	No loss/reduction of soil function(s) that restrict current or approved future use.
	Human health: reported contaminant concentrations below background levels.	Contamination	No intervention required.
No Change	No loss or alteration of characteristics, features or elements.	Groundwater	No observable impact in either direction.

Significance Criteria

10.3.13 Once the value (significance) of each resource and the magnitude of the potential impact has been established, the significance (effect) matrix from Table 3.8.1 DMRB LA 104 (National Highways, 2020b) has been used to determine the effect significance reproduced in

10.3.14 Table 10-3. This takes into account the details of effect descriptions presented in Table 3.7 of DMRB LA 104 (National Highways, 2020b) which has been reproduced in Table 10-4.

Table 10-3: Significance (Effect) Matrix

RECEPTOR VALUE	MAGNITUDE OF IMPACT (DEGREE OF CHANGE)				
	NO CHANGE	NEGLIGIBLE	MINOR	MODERATE	MAJOR
Very High	Neutral	Slight	Moderate or large	Large or very large	Very large
High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

Table 10-4: Significance (Effect) Categories and Typical Descriptions

SIGNIFICANCE CATEGORY	TYPICAL DESCRIPTION
Very large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.

SIGNIFICANCE CATEGORY	TYPICAL DESCRIPTION
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

10.3.15 Where relevant, effects have been classified before and after mitigation measures have been applied, although embedded measures are taken into account prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic in practice. Effects remaining after mitigation are referred to as 'residual effects.'

Sources of Information/Data

10.3.16 Current baseline conditions have been determined by a desk-based review of available information, supplemented by a site walkover which was undertaken on 17th November 2022 and relevant interpretive reports of previous ground investigation works. The full desk-based review will be included as an Appendix in the ES to be submitted with the DCO application. The baseline characterisation is considered to be sufficient to inform this preliminary assessment.

10.3.17 Further confirmatory intrusive investigation will be undertaken to support the assessments and will also be used to inform the Proposed Development Site detailed design, the scope of which will be agreed with the relevant authorities prior to commencing works.

Consultation

10.3.18 An EIA Scoping Opinion was requested from the Planning Inspectorate (the Inspectorate) in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to geology, hydrogeology and contaminated land are outlined in Table 10-5.

Table 10-5: Responses to Scoping Opinion Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE'S COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	**Potential Effects:** In addition to the impact pathways described at paragraph 6.4.88 of the Scoping Report, the ES should include an assessment of effects arising from changes to groundwater flow, levels and quality during construction, operation and decommissioning, including from the presence of below ground pipelines, where likely significant effects could occur. The Inspectorate notes that paragraph 6.3.20 of the Scoping Report states that potential impacts to groundwater flow would be assessed as part of this aspect.	The ES will include an assessment of effects arising from changes in groundwater flow, levels and quality during construction, operation and decommissioning including from presence of below ground pipelines
The Inspectorate	Scoping Opinion 17th May 2023	**Drainage Strategy:** The Scoping Report refers to implementation and maintenance of operational drainage systems to control potential impacts from pollution to surface watercourses. The Applicant should provide a draft/outline version of the drainage strategy and demonstrate how this will be secured through the DCO or other legal mechanism. Potential construction phase impacts should also be addressed in a drainage strategy.	An outline drainage philosophy will be submitted with the ES, and referenced in the Geology, Hydrogeology and Contaminated Land ES Chapter. The drainage strategy and detailed drainage design will be secured by a Requirement in the DCO.
The Inspectorate	Scoping Opinion 17th May 2023	**Baseline Information:** The desk-based assessments and conceptual site model should be	A desk-based assessment for the Proposed Development Site is included herein, and a CSM

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE'S COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		submitted as part of the ES. In addition to Main Sites A and B, these documents should provide information about land within the connection corridors. The baseline information should be sufficient to enable an assessment of the likely significant effects arising from the construction and operation of the Proposed Development, including consideration of the range of construction methods proposed or on the basis of any assumed construction methods where they are not known at time of ES preparation. This should include ground investigation if deemed necessary to sufficiently understand the baseline environment.	has been prepared. Details of these will be included in the ES.
The Inspectorate	Scoping Opinion 17th May 2023	**Intrusive Investigation:** The ES should include a full description of any further intrusive investigation required and confirm how this is to be secured. Effort should be made to agree the scope with all relevant consultation bodies e.g. Hartlepool Council and Stockton-on-Tees Council where it relates to land within their administrative area.	Details of the confirmatory intrusive investigation will be included within the ES.
The Inspectorate	Scoping Opinion 17th May 2023	**Drinking Water Protected Areas:** The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding groundwater bodies being	Drinking water protected areas will be included in the baseline information and assessment to be included in the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE'S COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		designated as drinking water protected areas. The status of the groundwater bodies should be reflected in the baseline description and assessment of potential impacts in the ES.	
Redcar and Cleveland Borough Council	14th April 2023 Updates to Planning Application for R/2023/1079/SCP	**Environmental Protection (Contamination):** The Consultee notes that the scoping opinion report recommends that geology, hydrogeology and contaminated land topic is scoped into the future impact assessment. In order to minimise the environmental impact I would recommend that the principles of the councils full standard contaminated land condition are followed in any future environmental impact assessment.	The principles of the council's full standard contaminated land condition will be followed in any future environmental impact assessment.
Redcar and Cleveland Borough Council	14th April 2023 Updates to Planning Application for R/2023/1079/SCP	**Local Lead Flood Authority (LLFA):** The Consultee recommends that applications are based on the guidance within the Tees Valley Design Guide and the principal of LLFA conditions 1, 2 and 3. The guidance for the design of the drainage scheme includes a discharge point for the disposal of surface water (LLFA 1).	An Outline Drainage Stragey will be submitted with the ES, and referenced in the Geology, Hydrogeology and Contaminated Land ES Chapter. The final Drainage Strategy and detailed Drainage Design will be secured by a Requirement in the DCO. The Outline Drainage Strategy will also be assessed in the ES in the Surface Water, Flood Risk and Water Resources Chapter.
Redcar and Cleveland Borough Council	14th April 2023	**Natural England:** The Consultee notes that Natural England must be consulted on Environmental Statements. The Environmental	Natural England will be consulted through statutory consultation via this PEI Report. The ES will be prepared in accordance with the

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE'S COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
	Updates to Planning Application for R/2023/1079/SCP	Statement should include a description of the development, an assessment of alternatives and reasoning as to why the option has been chosen, a description of the aspects of the environment likely to be affected by the development, a description of the likely significant effects on the environment, a description of the measures envisaged to prevent, reduce and offset adverse effects on the environment, a non-technical summary of the information and an indication of the difficulties encountered by the applicant in compiling information.	responses received as part of the statutory consultation.

Use of the Rochdale Envelope

10.3.19 To ensure a robust assessment of the likely significant environmental effects of the Proposed Development Site, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with the Inspectorate's Advice Note 9 (The Planning Inspectorate, 2018). This involves assessing the maximum (or where relevant, minimum)/worst case parameters for the elements of the Proposed Development where flexibility needs to be retained (building dimensions or operational modes for example).

10.4 Baseline Conditions

10.4.1 The baseline conditions relevant to geology, hydrogeology and contaminated land includes a detailed desk-based assessment of geological and hydrogeological conditions across the Proposed Development Site, a CSM, and an initial assessment of potential risks to human health and controlled waters.

10.4.2 At the time of writing this report, scheme specific ground investigation (GI), laboratory testing, and contamination assessment was not available. The baseline assessment as presented herein will be further reviewed and presented in the ES. A ground investigation (GI) and interpretive report will be undertaken to confirm ground conditions and chemical status. The data will be used to undertake human health, controlled waters and ground gas risk assessments to inform detailed design of the Proposed Development Site.

Existing Baseline

Ecological Designations

10.4.3 Ecological designations within the Proposed Development Site are summarised in Table 10-6 and are shown on Figure 10-10.

Table 10-6: Ecological Designations

SITE/RELEVANT FEATURE	DESCRIPTION
Main Site	No ecological designations are located within the Main Site
CO_2 Export Corridor	No ecological designations are located within the CO_2 Export Corridor.
Natural Gas Connection Corridor	No ecological designations are located within the Natural Gas Connection Corridor.
Water Connection Corridor	No ecological designations are located within the Water Connection Corridor.
Electrical Connection Corridor	No ecological designations are located within the Electrical Connection Corridor.
Hydrogen Pipeline Corridor	Ramsar Site (majority of corridor north of River Tees):

SITE/RELEVANT FEATURE	DESCRIPTION
	Teesmouth And Cleveland Coast Reference: UK11068 Total Area (m^2): 12,537,569.88
	SSSI: Teesmouth And Cleveland Coast Reference: 1000263 Total Area (m^2): 29,770,346.88
	SPA (as Ramsar Site above): Teesmouth And Cleveland Coast Reference: UK9006061 Total Area (m^2): 12,515,083.54
Other Gases Connection Corridor	No areas of sensitive land use are located within Other Gases Connection Corridor.

Soils – Agricultural Land Classification

10.4.4 Information is provided on DEFRA's interactive MAGIC online map (Magic, 2023) for ALC in the form of Provisional ALC and Post 1988 ALC maps. The Provisional ALC data covers the entire Study Area, whereas the Post 1988 ALC data shows a localised area in greater detail. Figure 10-19 presents Provisional ALC data of the Proposed Development Site. ALC definitions (provided by Natural England) are presented in Table 10-7. ALC grades 1, 2 and 3a deemed to be Best and most Versatile agricultural soils and ALC information for each part of the Proposed Development Site is presented in Table 10-8.

Table 10-7: Agricultural Land Classification Definitions

AGRICULTURAL LAND CLASSIFICATION	AGRICULTURAL LAND CLASSIFICATION DEFINITION
Urban Land	Outside classification
Non-Agricultural Land	Outside classification
Grade 5 – Very Poor Quality	Land with very severe limitations that restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.
Grade 4 – Poor Quality	Land with severe limitations which significantly restrict the range of crops or level of yields. It is mainly suited to grass with occasional arable crops (for example cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties using the land. The grade also includes arable land that is very dry because of drought.

AGRICULTURAL LAND CLASSIFICATION	AGRICULTURAL LAND CLASSIFICATION DEFINITION
Subgrade 3b – Moderate Quality	Land capable of producing moderate yields of a narrow range of crops.
Subgrade 3a – Good Quality	Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of crop
Grade 3 – Good to Moderate Quality	Land with moderate limitations that affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in grades 1 and 2.
Grade 2 – Very Good Quality	Land with minor limitations that affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown. On some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops, such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than grade 1.
Grade 1 – Excellent Quality	Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of crops

Table 10-8: Agricultural Land Classification of each Part of the Proposed Development Site

PART OF THE PROPOSED DEVELOPMENT SITE	AGRICULTURAL LAND CLASSIFICATION
Main Site	Urban and Non-Agricultural – Entirety of Main Site.
CO_2 Export Corridor	Urban and Non-Agricultural – Entirety of the corridor.
Natural Gas Connection Corridor	Urban and Non-Agricultural – Entirety of the corridor.
Water Connection Corridor	Urban and Non-Agricultural – Majority of the corridor. Grade 2 – Adjacent to the end of the Urban Classification in the south-east along Mains Dyke.
Electrical Connection Corridor	Urban and Non-Agricultural – Entirety of the corridor.

PART OF THE PROPOSED DEVELOPMENT SITE	AGRICULTURAL LAND CLASSIFICATION
Hydrogen Pipeline Corridor, North of River Tees	Urban – Adjacent to the River Tees up to the start of Greatham Creek and then followed south. Including the far west of the Corridor from Cowpen Bewley Road, encompassing the CF Fertiliser Site and surrounding area. Urban also located north of Greatham Creek. Grade 5 – Adjacent to the end of the Urban Classification from the end of Greatham Creek and moving west to encompass, Swallow Fleet, Holme Fleet and Greatham Creek, and the surrounding land. Grade 4 – Adjacent to the Grade 5 Classification and encompassing Cowpen Bewley Wood and the A1185 Road. Grade 3 – In the area of Marsh House Farm and to the north of this. Grade 2 – Adjacent to the Urban Classification and encompasses Mains Dyke.
Hydrogen Pipeline Corridor, South of River Tees	Urban and Non-Agricultural – Entirety of the corridor.
Other Gases Connection Corridor	Urban and Non-Agricultural – Entirety of the corridor.

Geology

10.4.5 The geology beneath the Proposed Development Site is shown on British Geological Survey (BGS) 1:50,000 Sheet 33 Stockton (1987) and Sheet 34 Guisborough (1998). It is also shown on extracts of the BGS 1:50,000 Digital Geological Map of Great Britain that were obtained as part of the Groundsure Reports.

10.4.6 BGS 1:50,000 scale mapping reproduced from the BGS digital data is shown on Figures 10-1: Artificial Geology, 10-2: Superficial Geology and 10-3: Bedrock Geology (PEI Report, Volume II).

10.4.7 BGS 1:10,000 Sheet NZ52NE (Warrenby) does not show the full extent of the superficial geology at the site and the straight line shown on other maps is an artifact noting the historical extent of geological mapping undertaken by the BGS (NZ52NE (BGS, 2006)).

10.4.8 A summary of the geology of the Proposed Development Site is provided in Table 10-9.

Table 10-9: Artificial, Superficial and Bedrock Geology of the Proposed Development Site

PART OF THE PROPOSED DEVELOPMENT SITE	ARTIFICIAL GEOLOGY	SUPERFICIAL GEOLOGY	BEDROCK GEOLOGY
Main Site	Present – entire area	Tidal Flat Deposits Glaciolacustrine Deposits Till, Devensian	Redcar Mudstone Formation) Penarth Group (Rhaetic) Mercia Mudstone Group
CO_2 Export Corridor	Present – entire area	Blown Sand Tidal Flat Deposits Glaciolacustrine Deposits	Redcar Mudstone Formation Penarth Group Mercia Mudstone Group
Natural Gas Connection Corridor	Present – entire area	Blown Sand Tidal Flat Deposits Glaciolacustrine Deposits	Redcar Mudstone Formation Penarth Group Mercia Mudstone Group
Water Connection Corridor	Present – north-western extent	Blown Sand Tidal Flat Deposits Glaciolacustrine Deposits Till, Devensian	Redcar Mudstone Formation Penarth Group Mercia Mudstone Group
Electrical Connection Corridor	Present – western extent	Blown Sand Tidal Flat Deposits Glaciolacustrine Deposits Till, Devensian	Redcar Mudstone Formation Penarth Group Mercia Mudstone Group
Hydrogen Pipeline Corridor	Present – central and western extent east of the River Tees and eastern extent and localised areas west of the River Tees	Blown Sand Tidal Flat Deposits Glaciolacustrine Deposits Till, Devensian	Redcar Mudstone Formation Penarth Group Mercia Mudstone Group Sherwood Sandstone Group

PART OF THE PROPOSED DEVELOPMENT SITE	ARTIFICIAL GEOLOGY	SUPERFICIAL GEOLOGY	BEDROCK GEOLOGY
		Peat Alluvium	
Other Gases Connection Corridor	Present – entire area	Blown Sand Tidal Flat Deposits Glaciolacustrine Deposits	Redcar Mudstone Formation Penarth Group Mercia Mudstone Group

Geological Features and Minerals

10.4.9 There are no recorded Regionally Important Geological Sites (RIGS) or Locally Important Geological Sites within the Proposed Development Site.

10.4.10 RIGS within Redcar and Cleveland outside of the Proposed Development Site include:

- Coatham Rocks RIGS, located approximately 2 km north-east of the Proposed Development Site; and
- Redcar Rocks RIGS (also a SSSI) located approximately 3.1 km north-east of the Proposed Development Site.

10.4.11 There are no recorded RIGS within Stockton-on-Tees.

10.4.12 RIGS within Hartlepool outside of the Proposed Development Site include:

- Hartlepool Headland Local Geological Site (LGS), located approximately 6.5 km north of the Proposed Development Site;
- Carr House Sands and West Harbour Long Scar and Little Scar LGS, located approximately 3 km north of the Proposed Development Site; and
- Dalton Batts River Claiff LGS, located approximately 5.7 km north of the Proposed Development Site.

10.4.13 The Tees Valley has a long history of mineral extraction, the specialist nature of which supported the development of the chemical and steel making industries on the Tees. However, the range of current primary mineral extraction is limited to crushed rock and sand and gravel with some brine extraction at Seal Sands and small-scale clay extraction at Cowpen Bewley. The Tees Valley has relatively few remaining minerals operations.

10.4.14 In taking forward minerals development in the plan area, and particularly along the river corridor and the Tees Estuary, any proposals will need to demonstrate that there will be no adverse impact on the integrity of the Teesmouth and Cleveland Coast SPA and Ramsar Site.

10.4.15 There is one brinefield, for salt production, currently active in the Study Area which is near Seal Sands in Stockton-on-Tees. Two further brinefields in the Seal Sands area have existing planning permissions and two brinefield cavities at Wilton in Redcar and Cleveland have existing permission for extraction under an 'Instrument of Consent'. The Wilton cavities are presently used for gas storage rather than extraction. Information from the BGS indicates brine extraction has limited viability itself, but it is acknowledged that there may be future interest to create storage caverns for gas and other fluids. Anydrite was formerly mined.

10.4.16 Permission was granted in 2009 for the extraction of natural gas at Kirkleatham from a Permian limestone reservoir. Permission also exists for the extraction of anhydrite from a deep mine at Billingham (Stockton-on-Tees), although the mine has not been worked since 1971.

10.4.17 Ten dormant minerals sites were identified in the Tees Valley, one of which has had new conditions approved for minerals extraction (the anhydrite mine at Billingham).

Of the remaining nine it is now considered that seven of these sites are highly unlikely to ever resume extraction due to recent development, designations or proposed allocations for other uses. Land at the remaining sites at Low Middlesfield Farm and Eaglescliffe Brickworks (Stockton-on- Tees) may require new planning permissions to be approved before they could be reopened.

10.4.18 The sterilisation of minerals occurs when other non-minerals developments take place on, or close to, mineral deposits and render them incapable of being extracted. Minerals Policy Statement 1 states inter alia that minerals safeguarding areas should be identified in Development Plan Documents (DPDs) to avoid such sterilisation. Sand and gravel, limestone, potash, salt, gypsum/anhydrite and coal are widespread across the Tees Valley. Whilst the extraction of these resources may not be currently viable for reasons of price, geology, quality and previous extractive work, this situation may change, and they may be required at some point in the future. The spatial extent of these deep and shallow resources, excluding certain areas of constraint, are identified as safeguarding areas on the plans of the Tees Valley Joint Minerals and Waste Core Strategy DPD (Stockton-on-Tees, 2011b) in Appendix A and the appropriate areas will be shown on each of the individual planning authority's adopted proposals maps.

10.4.19 Appendix C of the Tees Valley Joint Minerals and Waste Core Strategy DPD (Stockton-on-Tees Borough Council, 2011b) indicates Safeguarded Minerals (deep, salt and gypsum) extending below the whole of the Proposed Development Site (including service corridors). The MSA for gypsum (anhydrite) covers the whole of the Tees Valley plan area.

10.4.20 Safeguarded marine dredged sand and gravel (shallow resources) are present locally at Tees Dock. These resources may extend below the footprint of the CO_2 Export Connection Corridor and the Natural Gas Connection Corridors. Tees Dock is also identified as a Safeguarded Wharf. Billingham Reach Industrial Estate is identified as a Safeguarded Wharf.

Hydrogeology

10.4.21 The following WFD Groundwater Bodies are present within the Proposed Development Site:

- Tees Sherwood Sandstone, Good chemical rating and Good quantitative rating (2019); and
- Tees Mercia Mudstone, Poor chemical rating and Good quantitative rating (2019).

10.4.22 Figures 10-12 and 10-13 present the designated superficial and bedrock aquifers within the Proposed Development Site.

10.4.23 Hydrogeological classifications for each area of the Proposed Development Site are summarised in Table 10-10.

10.4.24 It should be noted that the Tidal Flat Deposits are designated as two separate aquifers on the DEFRA Magic Maps, which are based on Environment Agency data. On the DEFRA mapping the two aquifers are split by an artificial line orientated north

to south crossing the Main Site, see Figure 10-12. Tidal Flat Deposits – Sand and Silt (BGS) are designated as Secondary A within the majority of the Main Site and to the east, whilst Tidal Flat Deposits – Sand, Silt and Clay (BGS) are designated Secondary Undifferentiated within the minority of the Main Site and to the west. With reference to paragraph 10.4.9, BGS 1:10,000 Sheet NZ52NE (Warrenby) does not show the full extent of the superficial geology at the Main Site and the artificial straight line shown on the mapping appears to be an artifact noting the extent of mapping undertaken by the BGS (NZ52NE (BGS, 2006)).

10.4.25 There are no Groundwater Dependent Terrestrial Ecosystems (GWDTEs) or Source Protection Zone (SPZs) (SPZ 1 to 3) within 1 km of the Proposed Development Site.

Table 10-10: Hydrogeology of the Proposed Development Site

RELEVANT HYDROGEOLOGICAL FEATURE	DESIGNATION	STRATA
Main Site		
Superficial Aquifer	• Secondary A • Unproductive • Secondary Undifferentiated	• Tidal Flat Deposits – Sand and Silt (eastern half of the Main Site) • Glaciolacustrine Deposits (silt) • Glaciolacustrine Deposits (clay) • Till and Tidal Flat Deposits – Sand, Silt and Clay (western half of the Main Site)
Bedrock Aquifer	• Secondary B • Secondary Undifferentiated/ Secondary B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	High (Secondary Superficial)	-
Source Protection Zone	None within 1 km	-
CO_2 Export Corridor		
Superficial Aquifer	• Secondary A	• Tidal Flat Deposits – Sand and Silt • Blown Sand

RELEVANT HYDROGEOLOGICAL FEATURE	DESIGNATION	STRATA
	• Secondary A • Secondary Undifferentiated • Unproductive	• Glacial Till • Glaciolacustrine Deposits - clay
Bedrock Aquifer	• Secondary B • Secondary Undifferentiated/ Secondary B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	High (Secondary Superficial)	-
Source Protection Zone	None within 1 km	-
Natural Gas Connection Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary Undifferentiated • Unproductive	• Tidal Flat Deposits – Sand and Silt • Blown Sand • Till • Glaciolacustrine Deposits - clay
Bedrock Aquifer	• Secondary B • Secondary Undifferentiated/B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	High (Secondary Superficial)	-
Source Protection Zone	None within 1 km	-
Water Connection Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary Undifferentiated • Unproductive	• Tidal Flat Deposits – Sand and Silt • Blown Sand • Till

RELEVANT HYDROGEOLOGICAL FEATURE	DESIGNATION	STRATA
		• Glaciolacustrine Deposits - clay
Bedrock Aquifer	• Secondary B • Secondary Undifferentiated/B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	• High (Secondary Superficial) • Medium (Secondary Superficial) • Low (Secondary Superficial) • Medium (Secondary Bedrock) • Low (Secondary Bedrock)	-
Source Protection Zone	None within 1km	-
Electrical Connection Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary Undifferentiated • Unproductive	• Tidal Flat Deposits – Sand and Silt (north-eastern extent of the Corridor) • Blown Sand • Till and Tidal Flat Deposits – Sand, Silt and Clay (for north-western and southern extend of the Corridor) • Glaciolacustrine Deposits - clay
Bedrock Aquifer	• Secondary B • Secondary Undifferentiated/B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	• High (Secondary Superficial)	-

RELEVANT HYDROGEOLOGICAL FEATURE	DESIGNATION	STRATA
	• Medium (Secondary Superficial) • Medium (Secondary Bedrock) • Low (Secondary Bedrock)	
Source Protection Zone	None within 1km	-
Hydrogen Pipeline Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary Undifferentiated • Unproductive	• Tidal Flat Deposits – Sand and Silt (north-eastern extent of the Corridor) • Blown Sand • Till and Tidal Flat Deposits – Sand, Silt and Clay (north-west and south-west extent of the Corridor) • Glaciolacustrine Deposits - clay
Bedrock Aquifer	• Secondary B • Secondary Undifferentiated/B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	• High (Secondary Superficial) • Medium (Secondary Superficial) • Medium (Secondary Bedrock) • Low (Secondary Bedrock)	-
Source Protection Zone	None within 1 km	-

RELEVANT HYDROGEOLOGICAL FEATURE	DESIGNATION	STRATA
Oxygen and Nitrogen Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary A	• Tidal Flat Deposits – Sand and Silt (most of the Corridor) • Blown Sand • Tidal Flat Deposits – Sand, Silt and Clay (far western and southernmost extend)
Bedrock Aquifer	• Secondary B • Secondary Undifferentiated/B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	High (Secondary Superficial)	-
Source Protection Zone	None within 1 km	-

Historical Development

10.4.26 The Main Site has been subject to extensive industrial development since before the date of earliest Ordnance Survey map (1854), with potential contaminative uses present to the current day.

10.4.27 Possible historical industrial contaminative uses within 250 m of the Proposed Development Site include: unspecified heaps, tramway sidings, unspecified tanks, refuse heaps, unspecified works, slag and tarmacadam works, railway sidings, unspecified commercial/industrial, sand pits, unspecified ground workings, iron and steel works, railways building, slag works, iron works, pumping stations, oxygen works, unspecified warehouses, corporation yards, unspecified pits, unspecified factories, chimneys, old clay pits, cuttings, brick works, electricity substations, salt works, power stations, engine sheds, a fire station, a mortuary, disused brine wells, an oil storage depot, a cemetery, a smithy, a bedding works, rifle ranges, telephone exchange, electricity switch house, gas handling station, tunnel, oil refinery, oil terminal, oil supply terminal, slag wool works, dock, transit shed and terminal.

10.4.28 A CSM has been prepared using a Source-Pathway-Receptor model to identify potential pathways by which sources of contamination may impact on identified receptors.

Environmental Risk Assessment

10.4.29 Based upon the CSM produced for the Proposed Development, an evaluation of the risks posed by the identified potential pollutant linkages at the Proposed Development Site has been prepared.

Geotechnical Risk Register

10.4.30 An Engineering Assessment and Geotechnical Risk Register will be provided in the ES.

Future Baseline

10.4.31 The future baseline conditions are expected to be the same as the existing baseline conditions described above. Future ground conditions may be improved relative to the existing baseline conditions, where existing soil resources are being treated/ remediated, prior to commencement of the Proposed Development Site.

10.5 Proposed Development Design and Impact Avoidance

10.5.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development Site (known as 'embedded measures'). Some embedded measures are required as a result of legislative requirements and/or standard sectoral practices. Some of these embedded mitigation measures as applicable to the geology, hydrogeology and contaminated land assessment are described below.

10.5.2 Embedded measures are taken into account prior to the assessment of effects in order to avoid considering assessment scenarios that are unrealistic in practice i.e., effects do not take account of measures even though they are likely to be standard practice and/or form part of the design of the Proposed Development Site. These have then been followed through the assessment to ensure that realistic likely environmental effects are identified.

Proposed Development Design

10.5.3 The Proposed Development Site design will take into account existing ground conditions and the potential constraints that they pose. Prior to the design and construction of the Proposed Development on the Main Site, a GI will be undertaken which will include gathering data on the ground and groundwater conditions including testing for potential contaminants in the soil and groundwater, within the Main Site. The GI will also determine groundwater characteristics such as existing groundwater levels and flow regime, soil permeability, ground stratigraphy, chemical and environmental conditions and waste classification of soils. The GI will be specified in accordance with the UK Specification for Ground Investigation (Site Investigation Steering Group, 2012) and carried out in accordance with BS EN 1997-2:2007, BS5930:2015+A1:2020 and BS10175:2011+A2:2017.

10.5.4 The GI findings will inform the detailed design for the Proposed Development, such as, building and foundation design. In addition, existing pipeline infrastructure will be used where possible, running along existing pipe racking and using existing culverts and overbridges, to minimise impacts upon the ground and groundwater.

10.5.5 Information and findings from the ground investigation will also be used to confirm scope of remediation works on the Main Site required to mitigate risks to controlled waters and/or human health. At this stage, it is assumed that any remediation works required to create a suitable development platform would be undertaken by the landowner before the commencement of the construction of the Proposed Development on the Main Site, with the landowner obtaining all necessary consents and permits.

10.5.6 Remediation by the landowner will be subject to further review following assessment of ground condition information and permitting strategy. If a requirement for remedial measures to be undertaken during the construction phase of the Proposed development is identified, for example based on facility design, efficiency, or sustainability, the scope of those will be assessed by the Applicant. Therefore, the potential effects of site remediation have been considered in this assessment.

10.5.7 Estimates of waste from the Proposed Development Site in Chapter 21: Materials and Waste (PEI Report, Volume I), conservatively assume that some hazardous and non-hazardous material generated during the targeted remediation works before or during construction activities could require disposal from the Proposed Development Site, with re-use of some soil materials under appropriate permitting. The volume estimates will be further refined following supplementary site investigation.

Construction

10.5.8 A Framework Construction Environmental Management Plan (CEMP) will be included within the ES which will accompany the DCO Application which will set out the key measures to be employed during the Proposed Development Site construction phase to control and minimise the impacts on the environment. The CEMP will include measures associated with material management, land contamination and water resources.

10.5.9 A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

10.5.10 In order to manage and monitor waste generated on the Main Site during Proposed Development Site construction, a Framework Site Waste Management Plan SWMP will be developed as part of the Framework CEMP which will allow for waste streams to be estimated and monitored and goals set with regards to the waste produced. The Framework SWMP will require that the construction contractor segregates waste streams on-site, prior to them being taken to a waste facility for recycling, disposal or reuse in accordance with appropriate permit. All waste removal from the Main Site will be undertaken by fully licensed waste carriers and taken to permitted waste facilities. In addition, the Final CEMP will also include a Materials Management Plan (MMP) following guidance in DoWCoP (CL:AIRE, 2011) and a Hazardous Materials Management Plan including an Asbestos Management Plan (AMP).

10.5.11 Construction phase mitigation measures in relation to the geological and hydrogeological environment are summarised here:

- Prior to the design and construction of the Proposed Development Site, a GI will be undertaken which will include taking geo-environmental samples of soils and groundwater across the proposed development site to assess for the potential for contamination and identify the potential impacts this may have to site users and the environment. The findings will feed into the CEMP to further define appropriate mitigation measures.
- Best practice will be adopted during construction to prevent or reduce as far as reasonably practicable spillage risk and spillage effects by adhering to the CEMP. The CEMP will address the management of concrete batching, concrete usage and accidental spillage relating to foundation and building construction.
- Should the GI Interpretive Report, foundation design strategy and remediation strategy prove the need for piling or soil mixing to take place, the construction methodology will be assessed, via a piling risk assessment, to reduce as far as reasonably practicable the risk of development of preferential pathways (e.g. groundwater flow) between the Made Ground present and the underlying Secondary 'A' or 'B' bedrock Aquifers. If piling is required, low noise piling techniques will be adopted where possible. The remediation strategy will be prepared if contaminant linkages are identified as part of the risk assessment undertaken as part of the GI Interpretive Report. The remediation strategy will be prepared either by the landowner or bp. The strategy will be in accordance with the requirements of the Land Contamination: Risk Management (Environment Agency, 2023) .
- The SWMP and MMP will be implemented to provide suitable controls to facilitate the re-use of materials such as soils and crushed concrete.
- An AMP will be required prior to the start of construction. Particular emphasis is placed on this with regards to the development of the Main Site.
- If any contamination is found during the construction of the Proposed Development, which has not been previously identified, an appropriate risk assessment will be prepared. Any actions/remedial measures resulting from the risk assessment will be agreed with the Local Planning Authorities (LPAs) and in consultation with the EA where risks to controlled waters are identified. The contamination assessment will be conducted in accordance with the CIRIA C552 - Contamination Land Risk Assessment, A Guide to Good Practice and the Land Contamination: Risk Management guidance (EA, 2021). Any required remedial measures will be adopted as part of the Proposed Development Site.
- The Proposed Development Site design is actively working towards a net cut and fill balance of zero. The suitability of excavated materials for potential re-use, and/or any permitting required to re-use excavated materials, will be assessed as part of the proposed GI works. All earthwork operations will need to be undertaken in accordance with BS6031:2009 (British Standards Institution, 2009) and applicable guidelines, including the Manual for Contract Documents for Highway Works (MCHW) Series 600 'Earthworks' (National Highways, 2017).

- Land disturbance will be reduced as far as is reasonably practicable and disturbed areas outside the development footprint will be revegetated as soon as possible after construction. Soil excavation will be undertaken with consideration given to the prevailing ground and weather conditions when programming the execution of the works to reduce the potential for mobilisation of exposed soil and/or sediment. Although not anticipated to be widely present across the majority of the Proposed Development Site, if encountered, topsoil and subsoil will be kept separately during excavation.
- Stockpiled excavation material will be kept to a minimum as far as is reasonably practicable and stored away from watercourses to prevent surface water entering or leaving the stockpile area.
- All areas of stockpiled material may be reseeded or otherwise covered temporarily until restoration activities commence. All areas of unused and exposed soil following reinstatement of the Proposed Development Site will be reseeded or otherwise covered as soon as possible. Erosion protection matting may also be used to reduce as far as is reasonably practicable sediment being entrained by water flow or becoming entrained by the wind if allowed to dry out.
- Temporary construction compound areas will be located away from all significant surface water bodies where possible. If the buffer zone has to be reduced, impermeable liners and bunds will need to be used to prevent materials entering watercourses.
- Washing out of vehicles or equipment will only take place in controlled areas.
- Suitable areas for specific construction activities will be identified within the CEMP and consultation with the EA will take place before construction commences.

10.5.12 Various fuels, oils and chemicals will be required during the construction of the Proposed Development Site. Measures to reduce potential effects associated with these substances during construction will include:

- The preparation of a map that highlights all potential contamination sources, which will be included as part of the CEMP, SWMP, MMP, and a Hazardous Materials Management Plan (including an AMP).
- The preparation of an inventory of all chemicals, fuels and oils will be kept up to date and be available on-site. Spill contingency plans will be created for each of the items on the inventory. These will be supported by warning notices and appropriate spillage containment equipment and materials at key locations.
- Chemicals, fuels and oils will be stored in secure and designated storage areas in accordance with the appropriate regulatory requirements, including the Control of Pollution (Oil Storage) (England) Regulations 2001 (UK Gov, 2001) and Control of Substance Hazardous to Health (COSHH) Regulations 2002 (UK Gov, 2002). Storage areas will need to be located on hardstanding areas to prevent the possible infiltration of contaminants into soils.

- Re-fuelling of plant will take place in appropriate areas to be agreed in the CEMP i.e. in locations with an impervious base and are bunded or provided with interceptor drains. Spill kits will be kept with all vehicles on-site and all bowsers are to be double skinned or have a bund. Vehicles and equipment will not be left unattended during re-fuelling. To prevent materials leaking from static plant, such as pumps and generators, static plant will be placed on drip trays wherever practicable.
- All pumps, generators and similarly fuelled equipment will be placed on drip trays or in a bunded area, and no vehicles or equipment will be allowed to enter any watercourses at any stage. Refuelling areas will be positioned a minimum of 50 m away from any watercourse or drain. All vehicles, generators and similarly fuelled equipment will be maintained to a high standard to reduce as far as is reasonably practicable potential pollution incidents.
- All valves, hoses and associated re-fuelling equipment will be regularly inspected to ensure that they are still in a suitable condition. This equipment will be protected from vandalism and unauthorised interference and will be turned off and securely locked when not in use.
- All storage of drums containing hazardous material will be located within the temporary construction compound. Any spillages or leaks will be dealt with promptly and all waste disposed of in an appropriate manner. All tanks, drums and other containers will be clearly marked as to their contents. Before any tank is removed or perforated, all contents and residues will be emptied by a competent operator for safe disposal.
- All bunds will have a capacity of at least 110% of the storage volume and will be covered where practical to prevent the collection of rainwater.
- Any staff involved in fuel handling will be given appropriate training, and site-specific procedures will be developed for all staff. Workers will be made aware of their statutory responsibility under Section 85 of the Water Resources Act 1991 (HMSO, 1991) not to 'cause or knowingly permit' water pollution. In addition, they will be made aware of their statutory responsibility under Regulations 38(1) and 12(1) of the Environment Permitting Regulations 2010 (HMSO, 2010) not to 'cause or knowingly permit' a water discharge activity or groundwater activity without an environmental permit.

10.5.13 Reference should also be made to the controlled water mitigation measures as detailed in Chapter 9: Surface Water, Flood Risk and Water Resource (PEI Report, Volume I).

Operation

10.5.14 The Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016.

10.5.15 Prevention of contamination is a specific requirement of the Environmental Permit for the operation of the Proposed Development Site. Therefore, it will be designed

so that it will not create any new areas of ground contamination or pathways to receptors as a result of both construction and operation.

10.5.16 The Proposed Development Site will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

10.5.17 Mitigation measures proposed during the operation of the Proposed Development Site include:

- the implementation of standard industry practices to mitigate potential impacts from accidental spills or leaks;
- the storage and handling of processed chemicals will be undertaken in properly surfaced and bunded areas;
- implementation of rapid spill response planning and training; and
- the preparation of a groundwater quality monitoring plan.

Decommissioning

10.5.18 The Proposed Development Site has a long design life and as such it is not considered possible to reliably forecast decommissioning requirements and infrastructure far in the future.

10.5.19 The decommissioning phase is anticipated to involve the removal of all above surface structures. It is assumed that all underground infrastructure would remain in-situ; however, all connection and access points would be sealed or grouted to ensure disconnection.

10.5.20 Potential environmental effects during the decommissioning phase would be broadly similar to those during the construction phase, although there would be a need to address impacts from the production of bulk wastes from demolition of buildings and hardstanding to be recycled for re-use.

10.5.21 Decommissioning activities would be conducted in accordance with the appropriate guidance and legislation at the time of the Proposed Development Site's closure. It is anticipated that a large proportion of the materials resulting from the demolition would be recycled and a record kept to demonstrate that the maximum level of recycling and reuse has been achieved.

10.5.22 A Decommissioning Environmental Management Plan (DEMP) would be prepared which would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated.

10.5.23 The DEMP would be produced and agreed with the EA as part of the Environmental Permitting and site surrender process. The DEMP would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated. This would include details of

how surface water drainage should be managed on the Main Site during decommissioning and demolition.

10.5.24 Upon completion of the decommissioning programme, including any remediation works that might be required, the EA will be invited to witness a post-decommissioning inspection by site staff.

10.6 Likely Impacts and Effects

10.6.1 Table 10-11 summarises the resource value (sensitivity) of the identified receptors within the Proposed Development Site.

10.6.2 A summary of phased effects during Proposed Development Site construction, operation and decommissioning (taking into account the mitigation measures as detailed in Section 10.5) is provided in Table 10-12. Where significance of effects are considered to be not significant (inclusive of embedded mitigation), further mitigation is recommended in the form of ground investigation to confirm assessment.

10.6.3 Further discussion on the likely effects impacts and effects noted in Table 10-12 are discussed in the sections that follow the table.

Table 10-11: Resource Value (Sensitivity)

ASPECT/ CRITERIA	RESOURCE/ RECEPTOR	PART OF THE PROPOSED DEVELOPMENT SITE	RESOURCE VALUE/ SENSITIVITY	JUSTIFICATION
Geology – See Figure 10-3 – Bedrock Geology				
Geology Bedrock	Sherwood Sandstone Group – Sandstone	Hydrogen Pipeline Corridor	Medium	The Sherwood Sandstone is not a designated RIGS, geological unit, however considered medium due to aquifer designation described below.
Geology Bedrock	Mercia Mudstone Group – Mudstone	Entirety of the Proposed Development Site	Low	The Mercia Mudstone is a non-designated geological exposure.
Geology Bedrock	Penarth Group – Mudstone	Entirety of the Proposed Development Site	Low	The Penarth Group is a non-designated geological exposure.
Geology Bedrock	Redcar Mudstone Formation – Mudstone	Entirety of the Proposed Development Site	Low	The Redcar Mudstone is a non-designated geological exposure.
Geology Minerals	Concealed Permian Formations – Salt and Gypsum	Entirety of the Proposed Development Site	Medium	There is one brinefield reported in the Tees Value Minerals Core Strategy to be active near Seal Sands (Stockton-on-Tees), although the BGS have suggested this ceased operation in 2002. Two further brinefields in the Seal Sands area have existing planning permissions and two brinefield cavities at Wilton (Redcar and Cleveland) have existing permission for extraction under an 'Instrument of Consent'. Permission also exists for the extraction of anhydrite from a

ASPECT/ CRITERIA	RESOURCE/ RECEPTOR	PART OF THE PROPOSED DEVELOPMENT SITE	RESOURCE VALUE/ SENSITIVITY	JUSTIFICATION
				deep mine at Billingham (Stockton-on-Tees) although the mine has not been worked since 1971.
Soils – See Figure 10-19 – Agricultural Land				
Soils (ALC)	Agricultural Land Value (measured using the ALC)	Main Site CO_2 Export Corridor Natural Gas Connection Corridor Water Connection Corridor Electricity Connection Corridor Other Gases Connection Corridor	Low	Soils are recorded as non-agricultural/urban.
Soils (ALC)	Agricultural Land Value (measured using the ALC)	Hydrogen Pipeline Corridor	Grade 5 – Low Grade 4 – Low Grade 3 (Subgrade not defined) – High	Areas of ALC Grade 3 (3a (Moderate) or 3b (Good) not defined) north of River Tees. Areas of Grade 4 (Poor) and 5 (Very Poor) north of River Tees.
Soils – See Figure 10-1 – Artificial Geology and 10-2 – Superficial Geology				
Soils	Blown Sand	CO_2 Export Corridor (may be present)	High	Soils in sensitive environmental designations (Teesmouth and Cleveland Coast SPA, Ramsar Site and SSSI).

ASPECT/ CRITERIA	RESOURCE/ RECEPTOR	PART OF THE PROPOSED DEVELOPMENT SITE	RESOURCE VALUE/ SENSITIVITY	JUSTIFICATION
		Natural Gas Connection Corridor (may be present) Water Connection Corridor Electrical Connection Corridor Hydrogen Pipeline Corridor Other Gases Connection Corridor (may be present)		
Soils	Tidal Flat Deposits – Sand and Silt Tidal Flat Deposits – Sand, Silt and Clay Till, Devensian – Diamicton	Entirety of the Proposed Development Site	Low	Soils supporting non-designated notable or priority habitats. The majority of the Tidal Flat Deposits are exposed south west of the coastline and along the margins of the River Tees. Inland these soils are already overlain by Artificial Ground/Made Ground.
Soils	Glaciolacustrine Deposits, Clay and Silt Glaciolacustrine Deposits, Sand	Entirety of the Proposed Development Site	Low	Soils supporting non-designated notable or priority habitats.

ASPECT/ CRITERIA	RESOURCE/ RECEPTOR	PART OF THE PROPOSED DEVELOPMENT SITE	RESOURCE VALUE/ SENSITIVITY	JUSTIFICATION
	Glaciofluvial Deposits – Sand and Gravel Alluvium			
Groundwater – See Figure 10-13 – Bedrock Aquifers				
Groundwater Contamination (Bedrock)	**Principal Aquifer** Sherwood Sandstone Group – Sandstone	Entirety of the Proposed Development Site	High	Area is outside of any designated SPZ. The Principal Aquifer is of Low Vulnerability because at subcrop it is overlain by a thick cover of low permeability superficial deposits, and to the east of its subcrop it is overlain by low permeability mudrocks of the Mercia Mudstone Group and/or Penarth Group and/or Redcar Mudstone Formation.
Groundwater Contamination (Bedrock)	**Secondary Aquifer – B** Mercia Mudstone Formation - Mudstone	Entirety of the Proposed Development Site	Medium	Area is outside of any designated SPZ. Secondary Aquifer – B.
Groundwater Contamination (Bedrock)	**Secondary Aquifer – Undifferentiated** Penarth Group - Mudstone	Entirety of the Proposed Development Site	Medium	Area is outside of any designated SPZ. Secondary Aquifer – Undifferentiated/Secondary B.
Groundwater Contamination (Bedrock)	**Secondary Aquifer – Undifferentiated** Redcar Mudstone Formation - Mudstone	Entirety of the Proposed Development Site	Medium	Area is outside of any designated SPZ. Secondary Aquifer – Undifferentiated.

ASPECT/ CRITERIA	RESOURCE/ RECEPTOR	PART OF THE PROPOSED DEVELOPMENT SITE	RESOURCE VALUE/ SENSITIVITY	JUSTIFICATION
Groundwater – See Figure 10-12 Superficial Geology				
Groundwater Contamination (superficial)	**Secondary Aquifer - A** Blown Sand Tidal Flat Deposits – Sand and Silt	Main Site CO_2 Export Corridor Natural Gas Connection Corridor Water Connection Corridor Electrical Connection Corridor Hydrogen Connection Corridor	**High**	Area is outside of any designated SPZ. Secondary Aquifer – A.
Groundwater Contamination (superficial)	**Secondary Aquifer – Undifferentiated** Tidal Flat Deposits – Sand, Silt and Clay Till, Devensian – Diamicton	Entirety of the Proposed Development Site	**Medium**	Area is outside of any designated SPZ. Secondary Aquifer – Undifferentiated.
Groundwater Contamination (superficial)	**Unproductive Strata** Glaciolacustrine Deposits, Clay and Silt Glaciolacustrine Deposits – Sand	Entirety of the Proposed Development Site	**Low**	Area is outside of any designated SPZ. Unproductive Strata.

ASPECT/ CRITERIA	RESOURCE/ RECEPTOR	PART OF THE PROPOSED DEVELOPMENT SITE	RESOURCE VALUE/ SENSITIVITY	JUSTIFICATION
	Glaciofluvial Deposits – Sand and Gravel Alluvium			
Contamination (Soils)				
Contamination (Soils)	Blown Sand Tidal Flat Deposits – Sand and Silt Tidal Flat Deposits – Sand, Silt and Clay Till, Devensian – Diamicton Glaciolacustrine Deposits, Clay and Silt. Glaciofluvial Deposits, Sand and Gravel. Glacial Till, Devensian – Diamicton	Entirety of the Proposed Development Site	**Low**	Extensive existing Highways, Rail and Industrial Land Use. The majority of the Tidal Flat Deposits are exposed south west of the coastline or along the margins of the River Tees. Inland these soils are already overlain by Artificial Ground / Made Ground.

Table 10-12: Summary of Geology, Hydrogeology and Contaminated Land Effects

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
Construction						
Geology Sherwood Sandstone Group – Sandstone Mercia Mudstone Group - Mudstone Penarth Group – Mudstone Redcar Mudstone Formation - Mudstone	Sherwood Sandstone Group – Sandstone: **Medium** Mercia Mudstone Group - Mudstone, Penarth Group – Mudstone and Redcar Mudstone Formation – Mudstone: **Low**	**Minor** (From Foundations)	Sherwood Sandstone Group – Sandstone: **Slight Adverse** (Not Significant) Mercia Mudstone Group - Mudstone, Penarth Group – Mudstone and Redcar Mudstone Formation – Mudstone: **Neutral or Slight Adverse** (Not Significant)	GI is required to confirm baseline assumptions and provide geotechnical parameters to inform foundation design including piling.	**Slight Adverse (Not Significant)**	P

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
Geology Mercia Mudstone Group - Mudstone Penarth Group – Mudstone Redcar Mudstone Formation -	**Low**	**Minor** (From Directional drilling through mudstones to form crossing below the River Tees. Spoil generated from construction)	**Neutral or Slight Adverse** (Not Significant)	GI to confirm desk-based assumptions and to obtain specific geotechnical data/parameters to inform specification/design of drilling works. All earthworks operations will need to be undertaken in accordance with BS6031:2009 'Code of Practice for Earthworks' and applicable guidelines including MHCW Series 600 'Earthworks'. Mudstone / sandstone will not be reused across the Proposed Development Site due to geotechnical unsuitability (both) and high sulphate content (mudstone) which will erode / degrade	**Neutral or Slight Adverse (Not Significant)**	T

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
				reinforced concrete structures. Encountered mudstone / sandstone will be removed from the Proposed Development Site.		
Minerals Deep Resources Salt and Gypsum	**Medium**	**Minor** (from sterilisation of minerals. Non-minerals developments take place on, or close to, mineral deposits and render them incapable of being extracted. Development to take place across an area defined in the Tees Valley Joint Minerals and Waste Development Plan Core Strategy as protected to allow for future Gypsum and Salt extraction)	**Slight Adverse** (Not Significant)	Minerals are at depth and are already primarily covered by existing development. The Proposed Development Site does not preclude the future extraction of these minerals.	**Slight Adverse (Not Significant)**	P

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
Minerals Shallow Resources Marine dredge Sand and Gravel	**Medium**	**Minor** (Safeguarded under the Tees Valley Joint Minerals and Waste Development Minerals and Waste Core Strategy DPD)	**Slight Adverse** (Not Significant)	Minerals are at depth and are already primarily covered by existing development. The Proposed Development Site does not preclude the future extraction of these minerals.	**Slight Adverse (Not Significant)**	T
Soils Agricultural Land Classification	**Medium/High**	**Minor** (From extraction / removal)	**Slight or Moderate Adverse** (Significant)	Soils to be stockpiled and re-used within landscaping areas.	**Slight Adverse (Not Significant)**	P
Soils General	**Medium**	**Minor** (From spoil resulting from excavations and earthworks)	**Slight Adverse** (Not Significant)	GI is required to confirm baseline assumptions. All earthworks operations will need to be undertaken in accordance with BS6031:2009 'Code of Practice for Earthworks' and applicable guidelines including MCHW Series 600 'Earthworks'.	**Slight Adverse (Not Significant)**	T

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
				Scheme will actively work towards achieving an earthworks balance.		
Groundwater (Bedrock Contamination) Principal Aquifer Sherwood Sandstone	**High**	**Minor** (from changes to hydrogeological regime. Mobilisation of contaminants during construction)	**Slight or Moderate Adverse** (Significant)	GI and groundwater level and quality to confirm baseline assumptions. Construction of piled foundations or deep excavations resulting in disturbance of the Sherwood Sandstone are not anticipated over the length of the Hydrogen Pipeline Corridor.	**Slight Adverse (Not Significant)**	P/T
Groundwater (Bedrock Contamination) Secondary Aquifer – B Mercia Mudstone	**Medium**	**Minor** (from changes to hydrogeological regime. Mobilisation of contaminants during construction)	**Slight Adverse** (Not Significant)	GI and groundwater level and quality to confirm baseline assumptions. The need for piling works will be assessed following GI works and/or foundation design. Any piling works required would be planned in	**Slight Adverse (Not Significant)**	P

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
Group – Mudstone and Penarth Group – Mudstone Secondary Undifferentiated Redcar Mudstone Formation – Mudstone				accordance with best practice guidance 'Piling and Penetrative Ground Improvement. Methods on Land Affected by Contamination: Guidance on Pollution Prevention', EA National Groundwater & Contaminated and Centre Report NC/99/73. Any piling operations required would be subject to foundation works risk assessment and any potential to cause pollution to the aquifer would be covered by measures to be detailed in piling method statements. Where contaminated soils and elevated groundwater levels are proved by GI and piling is required, consideration to be given		

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
				construction of cased rotary bored piled foundations to remove potential pathway between Made Ground and underlying bedrock aquifer.		
Groundwater – (Soil Contamination) Secondary Aquifer – A Blown Sand Beach and Tidal Flat Deposits	**Medium**	**Minor** (from potential mobilisation of existing contaminants during construction. New contaminant pathways or mobilisation of existing contaminants may result from exposure of soils/increase in rainwater infiltration through changes in ground cover/in excavations)	**Slight Adverse** (Not Significant)	Remedial measures likely to comprise clean cover layer/capping. (Resultant effect may be beneficial).	**Slight Adverse (Not Significant)**	T
Groundwater – (Soil Contamination)	**Medium**	**Minor** (from Potential mobilisation of existing contaminants during construction. New contaminant pathways or	**Slight Adverse** (Not Significant)	Remedial measures likely to comprise clean cover layer/capping. (Resultant effect may be beneficial).	**Slight Adverse (Not Significant)**	T

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
Secondary Aquifer – Undifferentiated Tidal Flat Deposits – Sand and Silt Tidal Flat Deposits – Sand, Silt and Clay		mobilisation of existing contaminants may result from exposure of soils/increases in rainwater infiltration through changes in ground cover/in excavations)				
Contamination (Soils) Blown Sand Tidal Flat Deposits	**High**	**Minor** (from potential contaminant pathways are reduced or removed by construction of remedial works including clean cover or capping layer as well as through construction of new structures, hardstanding,	**Slight or Moderate Beneficial** (Significant)	Note DMRB LA104, does not include for a magnitude category 'Beneficial' category. However, any remedial works such as placement of clean cover, soil treatment, soil stabilisation, removal of localised 'hotspots' of identified contamination	**Slight or Moderate Beneficial (Significant)**	P

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
		pavements over existing contaminated soils. Infiltration and pathways are reduced)		would provide improvement to the existing condition. GI and soils testing is required to quantify potential contamination and confirm baseline assumptions.		
Contamination (Soils) Blown Sand Tidal Flat Deposits - Sand and Silt Tidal Flat Deposits – Sand, Silt and Clay Glaciolacustrine	**Low**	**Minor** (from potential contaminant pathways are reduced or removed by construction of remedial works including clean cover or capping layer as well as through construction of new structures, hardstanding, pavements over existing contaminated soils. Infiltration and pathways are reduced)	**Neutral or Slight Beneficial** (Not Significant)	Note DMRB LA 104, does not include for a magnitude category 'Beneficial' category. However, any remedial works such as placement of clean cover, soil treatment, soil stabilisation, removal of localised 'hotspots' of identified contamination would provide improvement to the existing condition. GI and soils testing is required to quantify potential contamination and confirm baseline assumptions.	**Neutral or Slight Beneficial (Not Significant)**	P

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
Deposits, Clay and Silt. Glaciofluvial Deposits, Sand and Gravel. Glacial Till, Devensian – Diamicton						
Operation						
Contamination (Soils) Blown Sand Tidal Flat Deposits	**High**	**Minor** (from impacts on soil quality could potentially occur during operation caused by accidental spills resulting from handling or leakage of fuels, lubricants, stored chemicals and processed liquids)	**Slight or Moderate Adverse** (Significant)	Storage and handling of processed chemicals to be undertaken in properly surfaced and bunded areas. All bunded area will provide 110% of stored volume and constructed with impermeable materials.	**Slight Adverse (Not Significant)**	P

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
				Rapid spill response planning and training and the implementation of EMS.		
Groundwater (Bedrock Contamination) Principal Aquifer Secondary B Aquifers Secondary Undifferentiated	**Medium / High**	**Minor** (Impacts on groundwater and watercourses could potentially occur during operation caused by accidental spills resulting from handling or leakage of fuels, lubricants, stored chemicals and processed liquids)	**Slight or Moderate Adverse** (Significant)	Storage and handling of processed chemicals to be undertaken in properly surfaced and bunded areas. All bunded area will provide 110% of stored volume and constructed with impermeable materials. Rapid spill response planning and training and the implementation of EMS.	**Slight Adverse (Not Significant)**	P
Decommissioning						
Contamination (Soils)	**Medium**	**Minor** (from excavation of materials/soil removal Demolition workers exposed to historic and current potentially	Slight Adverse (Not Significant)	Ground investigation to be undertaken to inform any earthworks to be undertaken as part of the decommissioning works.	**Slight Adverse (Not Significant)**	T

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
		contaminated soil sources on Site)				
Contamination (Soils)	**Medium**	**Minor** (from accidental spills. Impacts on soil quality could potentially occur during decommissioning caused by accidental spills resulting from handling or leakage of fuels, lubricants, stored chemicals and processed liquids)	**Slight Adverse** (Not Significant)	-	-	T
Groundwater (Bedrock Contamination) Principal Aquifer Secondary A	**Medium / High**	**Minor** (from impacts on groundwater and watercourses could potentially occur during decommissioning caused by accidental spills resulting from handling or leakage of fuels, lubricants, stored	**Slight Adverse** (Not Significant)	-	-	T

RESOURCE/ RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS	NATURE OF EFFECT (PERMANENT OR TEMPORARY)
Secondary Undifferentiated		chemicals and processed liquids)				
Soils (General)	**Medium**	**Minor** (from export, excavation, stockpiling, redistribution and/or removal of the Made Ground)	**Slight Adverse** (Not Significant)	All earthworks operations will need to be undertaken in accordance with BS6031:2009 'Code of Practice for Earthworks' and applicable guidelines including MHCW Series 600 'Earthworks'.	**Slight Adverse (Not Significant)**	T

Note: Lt = long term, Mt = medium term, St = short term, P = permanent, T = temporary

Construction

10.6.4 The Proposed Development Site may require supporting infrastructure which may impact the geology, hydrogeology and contaminated land. This may include foundation construction (e.g. piled supports, strip and pad footings), earthworks and excavations (foundations and service conduits).

10.6.5 Most of the impacts relating to geology, hydrogeology and contaminated land that are expected to arise as a result of the Proposed Development are anticipated to occur during construction.

10.6.6 Activities that may result in potential impacts to ground and groundwater at the Proposed Development Site include the following:

- creation of new contaminant linkages (e.g. pile foundation construction through existing Made Ground into underlying natural soils or bedrock, pile foundation construction or excavation through an existing aquiclude (impermeable fine/cohesive soils) into an aquifer (comprised of coarse or sandy soils);
- the mobilisation of existing contaminants via the exposure of soils/increases in rainwater infiltration through changes in ground cover/in excavations or bulk earthworks;
- changes to the hydrogeological regime (e.g. dewatering activities) may impact groundwater;
- surface water quantity and quality changes, and potential effects on surface water supplies, surface water run-off and drainage quantity and quality could result due to activities relating to bulk earthworks;
- activities relating to foundation construction, earthworks and excavations and associated transportation activities have the potential to expose construction workers to potentially contaminated dust;
- on site construction traffic, through compaction of the existing soils, could increase the speed of surface water run-off and increase the potential for erosion and transportation of sediment; and
- potential temporary impacts may result from the accidental leak of fuels and oils from vehicular plant or from stored liquids. Other temporary impacts may also result from the use of materials and substances polluting potential (e.g., concrete, fuel, oils and soil) which have the potential to be mobilised to ground or controlled waters.

10.6.7 Potential impacts associated with risks of major accidents and disasters (by leaks or spillages for example) are assessed in Chapter 20: Major Accidents and Disasters (PEI Report, Volume I).

10.6.8 There may also be beneficial effects if any previously unidentified contaminated soil is identified and remediated and have been assessed as Slight Beneficial (Non-Significant).

Geology

10.6.9 There are no bedrock exposures or outcrops present within the Proposed Development Site. Potential impacts upon the underlying geology are primarily related to the potential risk of creating a new Source-Pathway-Receptor linkage.

10.6.10 As indicated in in Table 10-12, geological effects during the construction of the Proposed Development (taking into account the mitigation measures as detailed in Section 10.5) would be no worse than Slight Adverse (Not Significant).

Mineral Resources

10.6.11 Mineral resources are present at depth below the Proposed Development Site and are already primarily covered by existing industrial development at the Main Site. It is not anticipated that the construction of the Proposed Development Site would preclude the potential future extraction of these minerals.

10.6.12 As indicated in Table 10-12: Summary of Geology, Hydrogeology and Contaminated Land Effects, effects upon mineral resources during Proposed Development Site construction (taking into account the mitigation measures as detailed in Section 10.5) would be no worse than Slight Adverse (Not Significant).

Potential Soil Resource and Agricultural Land Quality

10.6.13 The Proposed Development Site is largely already covered in Made Ground or in industrial land use. Soils are predominantly recorded as Grade 4 or 5 and are Non-Agricultural/Urban. Therefore, the magnitude of impact associated with the loss of such soils (Low value) during the construction of the Proposed Development would be considered Negligible, resulting in Slight effects (Not Significant).

10.6.14 However, localised parts of the Hydrogen Pipeline Corridor north of the River Tees are of ALC Grade 3 (subgrade not distinguished) agricultural land. The area of land is along a road with Billingham Cemetery located adjacent to the road and the remainder of the area is covered by trees. The potential impact of the Proposed Development on this resource is considered to be Minor, with effects considered to be Slight Adverse (Not Significant).

Hydrogeology – Changes to Hydrogeological Regime

10.6.15 Excavations and foundations have the potential to disrupt shallow groundwater. Temporary groundwater controls such as dewatering or physical cut-offs may be required to prevent the excavations filling with water, which would be likely to result in the lowering of groundwater levels in the immediate area of the excavation. Service trenches can also provide preferential flow pathways for groundwater. Dewatering of excavations could result in an adverse risk to groundwater and could also draw contaminated groundwater on site, should any be present. The potential impact to Proposed Development Site is considered to be Slight Adverse (Not Significant).

10.6.16 With appropriate design of Proposed Development Site construction activities and the implementation of the measures included in the CEMP, it is anticipated that

impacts would be no worse than Minor, resulting in effects no more than Slight Adverse (Not Significant).

Controlled Waters – Contamination

10.6.17 The Proposed Development Site construction works have the potential to impact upon controlled water – pathways (without mitigation) include the following:

- Potential effects upon groundwater could arise from contamination of the Secondary 'A' Aquifers. Disturbance and/or removal of the ground and groundwater could potentially remove, relocate or mobilise potential contaminants e.g., during foundation construction, earthworks and excavations. The potential impact of the Proposed Development Site is considered to be Slight Adverse (Not Significant).
- Pollution of groundwater (and surface water) could result from concrete, fuel, oil and hydrocarbon spillages. The risk of pollution is greater near to excavations where higher permeability strata are exposed i.e., close to the River Tees within the Tidal Flat Deposits or across connection corridors that extend through the Blown Sands. The potential impact of the Proposed Development Site is considered to be Slight Adverse (Not Significant).
- Creation of new potential contaminant linkages e.g., pile foundation construction through existing Made Ground into underlying natural soils or bedrock, or pile foundation construction or excavation through an existing aquiclude (impermeable fine/cohesive soils) into an aquifer (comprised of coarse or sandy soils). The potential impact of the Proposed Development Site is considered to be Slight Adverse (Not Significant). A Piling Risk Assessment will be undertaken to mitigate the risks from foundation construction.
- Creation of new potential contaminant linkages or mobilisation of existing contaminants may result from exposure of soils/increases in rainwater infiltration through changes in ground cover/in excavations or bulk earthworks. The potential impact of the Proposed Development Site is considered to be Neutral or Slight Adverse (Not Significant).
- Changes to the hydrogeological regime and potential mobilisation of contamination into groundwater during construction (and decommissioning) and potential effects on groundwater aquifers e.g., from dewatering activity required as part of construction. The potential impact of the Proposed Development Site is considered to be Slight Adverse (Not Significant).
- Surface water quantity and quality changes during construction (and decommissioning) and potential effects on surface water supplies, surface water run-off and drainage quantity and quality e.g., during bulk earthworks. All works will comply with either a water management plan and any abstraction/discharge permits required.

10.6.18 With appropriate design of the Proposed Development Site construction activities and the implementation of the measures included in the CEMP, it is anticipated that

impacts would be no worse than Minor, resulting in effects no more than Slight Adverse (Not Significant).

Operation

10.6.19 The operational impacts of the Proposed Development Site with regards to geology, hydrogeology and contaminated land are associated with the permanent site infrastructure which includes plant and buildings, roadways, service corridors and areas of hardstanding.

10.6.20 The potential impacts (without mitigation) that could arise during the operational phase of the Proposed Development include:

- Impacts to soil quality, groundwater and watercourses could potentially occur during operation as a result of accidental spills from the handling or leakage of fuels, lubricants, stored chemicals and process liquids. The potential impact of the Proposed Development Site is considered to be Slight Adverse (Not Significant).

10.6.21 With appropriate operational management of the Proposed Development Site in accordance with the Environmental Permit, it is anticipated that impacts would be Negligible, resulting in effects no more than Slight Adverse (Not Significant).

Decommissioning

10.6.22 At the end of its design life, decommissioning of the Proposed Development Site is anticipated to involve the removal of all above ground equipment down to ground level. It is assumed that all underground infrastructure will remain in-situ; however, all connection and access points will be sealed or grouted to ensure disconnection.

10.6.23 As detailed in Section 10.5, a DEMP would be prepared and implemented that would consider potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated. With the implementation of the DEMP, it is assumed that decommissioning impacts would be similar to those experienced during construction as discussed above.

10.6.24 As such, with the implementation of the measures as detailed in the DEMP, geology, soils, hydrogeology and contaminated land effects are anticipated to be no worse than Slight Adverse (Not Significant).

10.7 Mitigation and Enhancement Measures

10.7.1 Section 10.6 indicates that with the implementation of the mitigation measures as detailed in Section 10.5, significant effects associated with geology, hydrogeology and contaminated land are anticipated to be avoided and thus additional mitigation measures are not anticipated to be required.

10.7.2 However, prior to the design and construction of the Proposed Development, a GI will be undertaken to determine ground conditions. The results of the GI may indicate the need to undertake a further risk-based assessment to develop the current CSM that has been produced. This will also involve further assessment of the contamination sources, receptors, and plausible pollutant linkages at the Proposed

Development Site, in accordance with government guidance and the UK framework for the assessment of risk arising from contaminated land. The assessment will use principles adopted by the EA in Land Contamination: Risk Management (2021). The significance of impacts will take into account the principles of assessment identified in CIRIA Report C552, (CIRIA, 2011) and EAs guiding principles for land contamination in assessing risks to controlled waters (EA, 2010). Any such risk-based assessment may indicate the need for mitigation measures additional to those as detailed herein.

10.7.3 A piling risk assessment will be undertaken to determine the risk of possible contaminants becoming mobile and migrating through soils to receptors by the installation of piles through Made Ground. The assessment will be in accordance with the EA's guidance documents including, piling into contaminated sites (EA, 2001) and will determine the risk to receptors through potential pollution scenarios.

10.8 Limitations and Difficulties

10.8.1 The assessment has been undertaken based on the following assumptions:

- the assessment undertaken is based on the collation and evaluation of available information obtained from the EA, BGS, Groundsure Report and other sources made available;
- a site-specific GI was not available during the time of writing (August 2023); however, GI will be undertaken at the Main Site, based on the findings of the desk study, to assess the presence of contamination and determine the impacts this may have on site users and the environment. The findings will inform the identification of mitigation measures, the detailed design, the CEMP and management plans for the operation and decommissioning phases of the Proposed Development.

10.9 Residual Effects and Conclusions

10.9.1 The effects of the Proposed Development Site following the implementation of additional mitigation measures are known as 'residual effects.' The residual effects range between Neutral (Not Significant) and Slight Adverse (Not Significant) for the Proposed Development Site during the construction, operation (including maintenance) and decommissioning phases as presented in Table 10-12.

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11.0 NOISE AND VIBRATION

11.1 Introduction

11.1.1 This chapter of the Preliminary Environmental Information (PEI) Report identifies the potential noise[1] and vibration effects associated with the Proposed Development. The assessment has been undertaken in accordance with current best practice guidance.

11.1.2 This chapter presents a preliminary assessment of potential noise and vibration impacts and effects during the construction, operation and decommissioning of the Proposed Development (including both phases 1 and 2, as outlined in Chapter 4: Proposed Development (PEI Report, Volume I)). In particular, the chapter considers potential impacts on identified receptors in terms of:

- preliminary predicted noise and vibration levels during the construction works associated with the Proposed Development;
- predicted changes in road traffic noise levels on the local road network during the construction phase; and
- predicted noise resulting from operation of the Proposed Development.

11.1.3 This chapter is supported by the following figure (PEI Report, Volume II) and technical appendices (PEI Report, Volume III):

- Figure 11-1: Noise Sensitive Receptors;
- Appendix 11A: Construction Noise Levels and Assumptions;
- Appendix 11B: Operational Noise Information; and
- Appendix 11C: Baseline Sound Survey Monitoring Information.

11.2 Legislation and Planning Policy Context

11.2.1 This section sets out the legislation, planning policy context and standards relevant to assessing the impacts of noise and vibration upon residential and other human receptors.

11.2.2 The legislation, planning policy context and standards applicable to assessment of noise impacts upon ecological receptors are discussed in Chapter 12: Ecology and Nature Conservation, Chapter 13: Ornithology and Chapter 14: Marine Ecology (PEI Report, Volume I).

Legislative Background

Environmental Protection Act 1990

11.2.3 The Environmental Protection Act 1990 (EPA) (UK Government, 1990) Part 3 prescribes noise (and vibration) emitted from premises (including land) so as to be prejudicial to health or a nuisance as a statutory nuisance.

[1] In this chapter "noise" and "sound" refer to in air noise and sound.

11.2.4 Local authorities are required to investigate any public complaints of noise and if they are satisfied that a statutory nuisance exists, or is likely to occur or recur, they shall serve a noise abatement notice. A notice is served on the person responsible for the nuisance. It requires either simply the abatement of the nuisance or works to abate the nuisance to be undertaken, or it prohibits or restricts the activity. Contravention of a notice without reasonable excuse is an offence. Right of appeal to the Magistrates Court exists within 21 days of the service of a noise abatement notice.

11.2.5 In determining if a noise complaint amounts to a statutory nuisance, the local authority can take account of various guidance documents and existing case law; no statutory noise limits exist. Demonstrating the use of 'Best Practicable Means' (BPM) to minimise noise levels is an accepted defence against a noise abatement notice.

11.2.6 A Statutory Nuisance Statement will be submitted as part of the DCO application.

Control of Pollution Act (1974)

11.2.7 Sections 60 and 61 of the Control of Pollution Act 1974 (CoPA) (UK Government, 1974) provide the main legislation regarding demolition and construction site noise and vibration. If noise complaints are received, a Section 60 notice may be issued by the Local Planning Authority (LPA) with instructions to cease work until specific conditions to reduce noise have been adopted.

11.2.8 Section 61 of the CoPA provides a means for applying for prior consent to undertake noise generating activities during construction. Once prior consent has been agreed under Section 61, a Section 60 notice cannot be served provided the agreed conditions are maintained on-site.

11.2.9 The CoPA requires that BPM (as defined in Section 72 of CoPA) be adopted for construction noise on any given site. CoPA makes reference to British Standard (BS) 5228 (British Standards Institute (BSI), 2014a and b) as BPM.

Environmental Permitting Regulations 2016 (as amended 2020)

11.2.10 The Environmental Permitting Regulations require the application of Best Available Techniques (BAT) to activities performed within installations regulated by the legislation to manage the impact of these operations on the surrounding environment. This therefore just applies to the operational period, not construction.

11.2.11 In terms of noise specifically, the selection of BAT will have to be considered and balanced with releases to different environmental media (air, land and water) and to give due consideration to issues such as usage of energy and raw materials. Noise, therefore, cannot be considered in isolation from other impacts on the environment.

11.2.12 The definition of pollution includes "*emissions which may be harmful to human health or the quality of the environment, cause offence to human senses or impair or interfere with amenities and other legitimate uses of the environment*". BAT is therefore likely to be similar, in practice, to the requirements of the Statutory Nuisance legislation which requires the use of BPM to prevent or minimise noise nuisance. In the case of noise, "*offence of any human senses*" may be judged by the likelihood of complaints. However, the lack of complaint should not necessarily imply the absence of a noise problem. In some cases, it may be possible, and desirable, to

reduce noise emissions still further at reasonable costs and this may therefore be BAT for noise emissions. Consequently, the aim of BAT should be to ensure that there is no reasonable cause for annoyance to persons beyond the installation boundary.

11.2.13 Guidance regarding Environmental Permitting and noise is available in the Environment Agency's 'Noise and Vibration Management: Environmental Permits' (Environment Agency, 2022) which was last updated in January 2022.

Planning Policy Context

National Planning Policy

National Policy Statements (NPS) for Energy (EN-1) (2011)

11.2.14 The National Policy Statements (NPSs) for energy infrastructure set out the Government's policy for delivery of major energy infrastructure (UK Government, 2011). The Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011) published in 2011 is of relevance to the noise and vibration assessment.

11.2.15 Section 5.11 of the EN-1 refers to the Government's policy on noise within the Noise Policy Statement for England (discussed further below) and sets out requirements for noise and vibration assessment for Nationally Significant Infrastructure Projects (NSIPs) such as the Proposed Development.

11.2.16 With regard to decision making, NPS EN-1 states that "*The project should demonstrate good design through selection of the quietest cost-effective plant available; containment of noise within buildings wherever possible; optimisation of plant layout to minimise noise emissions; and, where possible, the use of landscaping, bunds or noise barriers to reduce noise transmission*." (paragraph 5.11.8). Section 11.5 of this chapter describes the impact avoidance measures identified as relevant to the Proposed Development.

National Policy Statement (NPS) for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (2011)

11.2.17 The National Policy Statement (NPSs) for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Department for Business, Energy and Industrial Strategy (BEIS), (BEIS, 2021b) published in 2011 is of relevance to the noise and vibration assessment.

11.2.18 Section 2.17 covers noise and vibration impacts at Gas reception facilities and Section 2.20 covers noise and vibration impacts in relation to Gas and Oil Pipelines. Both sections state that a noise and vibration assessment should be included as part of the Environmental Statement (ES), provide specific issues which should be included in the assessment, and cross reference NPS EN 1.

National Policy Statement (NPS) for Electricity Networks Infrastructure Pipelines (EN-5) (2011)

11.2.19 The National Policy Statement (NPSs) for Electricity Networks Infrastructure (EN-5) (Department for Business, Energy and Industrial Strategy (BEIS), (BEIS, 2021c) published in 2011 is of relevance to the noise and vibration assessment in relation to substations.

11.2.20 Section 2.9 covers noise and vibration impacts and cross references NPS EN-1.

Draft Overarching National Policy Statements (NPS) for Energy (EN-1) (2023)

11.2.21 In 2020 the Government launched a review of the energy NPSs. The Draft Overarching NPS for Energy (EN-1) was published in September 2021 by the former Department for Business, Energy and Industrial Strategy (BEIS) (BEIS, 2021a), and updates the existing NPS EN-1. A further update was published in March 2023 by the Department for Energy Security & Net Zero (DESNZ) (DESNZ, 2023a).

11.2.22 Section 5.12 of the Draft EN-1 relates to noise and vibration and retains the reference to the Noise Policy Statement for England. Paragraph 5.12.7 states that "*the nature and extent of the noise assessment should be proportionate to the likely noise impact".*

11.2.23 At paragraph 5.12.15, with regards decision making, Draft NPS EN-1 states "*The project should demonstrate good design through selection of the quietest or most acceptable cost-effective plant available; containment of noise within buildings wherever possible, taking into account any other adverse impacts that such containment might cause (e.g. on landscape and visual impacts; optimisation of plant layout to minimise noise emissions; and, where possible, the use of landscaping, bunds or noise barriers to reduce noise transmission)".* Section 11.5 of this chapter describes the impact avoidance measures identified relevant to the Proposed Development.

Draft National Policy Statement (NPS) for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (2023).

Liquified Natural Gas (LNG) Import Facilities

11.2.24 Paragraph 2.13.8 of draft NPS EN-4 (DESNZ, 2023b) states "*LNG import facilities will be located in coastal regions. Noise sources will include process plant, including compressors*".

11.2.25 Paragraph 2.13.9 states "*In addition, noise may be generated by the LNG pumps located on board the LNG tankers, and this source of noise, including its underwater noise impacts, should be included in a noise assessment".*

11.2.26 Paragraph 2.13.10 states "*The ES must include an assessment of noise and vibration effects including the specific issues outlined above, where they are relevant".*

Natural Gas Reception Facilities

11.2.27 Paragraph 2.17.11 states "*Gas reception facilities may be located in coastal regions and sources of noise will include above ground pipework, compressors (usually located in buildings) and process equipment such as heaters and inter-stage coolers".*

11.2.28 Paragraph 2.17.12 states "*The compressors may either be electric motor or gas turbine driven. Electric motors are preferable in terms of environmental noise considerations".*

11.2.29 Paragraph 2.17.13 states: "*Where gas turbines are used, the gas turbine exhausts may be a significant source of low frequency noise unless adequately controlled.*

Control valves may also be a source of noise which can be radiated by the associated pipework systems".

11.2.30 Paragraph 2.17.14 states "*The ES must include an assessment of noise and vibration effects including the specific issues outlined above, where they are relevant".*

Natural Gas and Oil Pipelines

11.2.31 In addition, there are specific noise and vibration considerations which apply to gas and oil pipelines during the pre-construction and construction phases.

11.2.32 Paragraph: 2.21.17 states "*The applicant will need to identify all the noise and vibration sensitive receptors likely to be affected during these phases and consider any associated pipeline maintenance or protection that may be additionally required".*

11.2.33 Paragraph 2.21.18 states "*During the pre-construction phase there could be vibration effects from seismic surveys. During construction, tasks may include site clearance, soil movement, ground excavation, tunnelling, trenching, pipe laying and welding, and ground reinstatement".*

11.2.34 Paragraph 2.21.19 states "*In addition, increased HGV traffic may be generated on local roads by the movement of materials. These types of noise and vibration impacts will need to be assessed".*

11.2.35 Paragraph 2.21.20 states "*The commissioning of a new pipeline can involve extensive periods of drying after hydrotesting, using air compressors, and noise mitigation may be required for this type of activity".*

11.2.36 Paragraph 2.21.21 states "*A new gas pipeline may require an above ground installation such as a gas compression station on the route of the pipeline to boost transmission line pressure; these should be outside of protected landscapes wherever possible*".

11.2.37 Paragraph 2.21.22 states "*A new oil pipeline may require pumping stations. These may be located in quiet rural areas, and therefore the control of noise from these facilities is likely to be an important consideration*".

11.2.38 With regard to mitigation the NPS states that "*Applicants should consider the following design measures which are typically taken to mitigate noise for gas supply and storage infrastructure:*

- *acoustic cladding for buildings;*
- *the use of sound attenuators on ventilation systems;*
- *acoustic lagging on pipework, multi-stage (inherently quiet) control valves;*
- *gas turbine exhaust silencers; and*
- *acoustic enclosures on pumps and low-speed cooler fans."*

Draft National Policy Statement (NPS) for electricity Networks Infrastructure (EN-5) (2023)

11.2.39 The Draft NPS EN-5 (DESNZ, 2023c) states the following with regard to noise impacts from electricity network infrastructure:

11.2.40 Paragraph 2.9.26 states "*All high voltage transmission lines have the potential to generate noise under certain conditions".*

11.2.41 Paragraph 2.9.39 states "*For the assessment of noise from substations, standard methods of assessment and interpretation using the principles of the relevant British Standards17 are satisfactory".*

11.2.42 Paragraph 2.9.40 states "*For the assessment of noise from overhead lines, the applicant must use an appropriate method to determine the sound level produced by the line in both dry and wet weather conditions, in addition to assessing the impact on noise-sensitive receptors".*

11.2.43 Paragraph 2.9.41 states: "*For instance, the applicant may use an appropriate noise modelling tool or tools for the prediction of overhead line noise and its propagation over distance".*

11.2.44 Paragraph 2.9.42 states "*When assessing the impact of noise generated by overhead lines in wet weather relative to existing background sound levels, the applicant should consider the effect of varying background sound levels due to rainfall".*

11.2.45 With regard to mitigation for electricity infrastructure the NPS states in paragraph 2.10.9 that "*Applicants must consider the following measures:*

- *the positioning of lines to help mitigate noise;*
- *ensuring that the appropriately sized conductor arrangement is used to minimise potential noise;*
- *quality assurance through manufacturing and transportation to avoid damage to overhead line conductors which can increase potential noise effects;*
- *ensuring that conductors are kept clean and free of surface contaminants during stringing/installation; and*
- *the selection of quieter cost-effective plants".*

National Planning Policy Framework (2021)

11.2.46 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2021) sets out that planning should make sufficient provision for "*conservation and enhancement of the natural, built and historic environment"* (Paragraph 20d). Consequently, the aim is to prevent both new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise pollution.

11.2.47 Paragraph 174 of the NPPF states that:

"planning policies and decisions should contribute to and enhance the natural and local environment by:

……preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans."

11.2.48 Paragraph 185 states that:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development - and avoid noise giving rise to significant adverse impacts on health and the quality of life; [and]

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason".

11.2.49 With regards to 'adverse effects' and 'significant adverse effects' the NPPF refers to the Noise Policy Statement for England Explanatory Note (NPSE) (Department for Environment, Food and Rural Affairs (Defra), 2010), which is described below.

Noise Policy Statement for England (2010)

11.2.50 The NPSE (Defra, 2010) seeks to clarify the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. The NPSE applies to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise.

11.2.51 The statement sets out the long-term vision of the government's noise policy, which is to "promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development".

11.2.52 This long-term vision is supported by three aims:

- *"avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvements of health and quality of life."*

11.2.53 The long-term policy vision and aims are designed to enable decisions to be made regarding what is an acceptable noise burden to place on society.

11.2.54 The 'Explanatory Note' within the NPSE provides further guidance on defining 'significant adverse effects' and 'adverse effects' using the concepts:

- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
- Lowest Observed Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and
- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

11.2.55 The three aims can, therefore, be interpreted as follows:

- the first aim is to avoid noise levels above the SOAEL;
- the second aim considers situations where noise levels are between the LOAEL and SOAEL. In such circumstances, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur; and
- the third aim seeks, where possible, to positively improve the health and quality of life through the pro-active management of noise, whilst also taking account of the guiding principles of sustainable development. It is considered that the protection of quiet places and quiet times, as well as the enhancement of the acoustic environment, will assist with delivering this aim.

11.2.56 The NPSE recognises that it is not possible to have single objective noise-based measures that define the SOAEL, LOAEL and NOEL that are applicable to all sources of noise in all situations. The levels are likely to be different for different noise sources, receptors and at different times of the day.

Planning Practice Guidance- Noise (2014)

11.2.57 The Planning Practice Guidance (PPG) was first published on 6th March 2014 to provide a web-based resource with more in-depth guidance to the NPPF. The PPG aims to make planning guidance more accessible, and to ensure that the guidance is kept up to date. The PPG noise guidance (PPG-N) was last updated in July 2019 (MHCLG, 2019).

11.2.58 The guidance advises that local planning authorities should take account of the acoustic environment and consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved.

11.2.59 This guidance introduced the additional concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level). Details of the PPG on effects are provided in Table 11-1.

Table 11-1: Relevant Planning Practice Guidance Noise Advice

PERCEPTION	EXAMPLES OF OUTCOMES	INCREASING EFFECT LEVEL	ACTION
No Observed Effect Level			
Not present	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	Noticeable and not intrusive
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g., turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g., turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Significant Observed Adverse Effect	Avoid

PERCEPTION	EXAMPLES OF OUTCOMES	INCREASING EFFECT LEVEL	ACTION
Unacceptable Adverse Effect Level			
Present and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g, regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g, auditory and non-auditory	Unacceptable Adverse Effect	Prevent

11.2.60 Factors to be considered in determining if noise is a concern are identified including the absolute noise level of the source, the existing ambient noise climate, time of day, frequency of occurrence, duration, character of the noise and cumulative impacts.

11.2.61 With regard to mitigating noise impacts on residential development, the guidance highlights that impacts may be partially offset if residents have access to a relatively quiet façade as part of their dwelling, or a relatively quiet amenity space (private, shared or public).

Local Planning Policy

11.2.62 As described in Chapter 7: Legislative Context and Planning Policy Framework (PEI Report, Volume I), policy (including policy relevant to this noise assessment) is provided in the Redcar and Cleveland, Stockton-on-Tees and Hartlepool Local Plans.

Redcar and Cleveland Local Plan (2018)

11.2.63 The Redcar and Cleveland Local Plan (Redcar and Cleveland Borough Council (RCBC), 2018) states in Policy SD 4 that "*development proposals will be expected to:… n. minimise pollution including light and noise and vibration levels to meet or exceed acceptable limits".*

Stockton -on-Tees Local Plan (2019)

11.2.64 The Stockton-on-Tees Local Plan (Stockton-on-Tees Borough Council (STBC), 2019) in Policy ENV7 states:

"*All development proposals that may cause groundwater, surface water, air (including odour), noise or light pollution either individually or cumulatively will be required to incorporate measures as appropriate to prevent or reduce their pollution so as not to cause unacceptable impacts on the living conditions of all existing and potential future occupants of land and buildings, the character and appearance of the surrounding area and the environment."*

11.2.65 It also states at paragraph 4.53:

"The Tees Lowlands National Character Area description, and the Stockton-on-Tees Landscape Character Assessment and Capacity Study (2011) provide the evidence base to consider proposals in landscape terms. The NPPF supports the protection and enhancement of valued landscapes and areas of tranquillity; countryside, limits to development and green wedge policies assist in delivering this aim. Proposals within and adjacent to these designations should be designed to avoid impacts on areas within that have remained relatively undisturbed by noise and are prized for their recreational and amenity value."

Hartlepool Local Plan (2018)

11.2.66 The Hartlepool Local Plan (Hartlepool Borough Council (HBC), 2018) states:

Policy CC3: "*In determining applications for energy generation from renewable and low carbon sources, significant weight will be given to the achievement of wider environmental and economic benefits. Applications will be approved subject to the proposal satisfactorily addressing the following criteria, including cumulative impacts within and outside the Borough:…*

3) Impact on the amenity of local residents and nearby occupiers, including visual intrusion, air, dust, noise, odour, traffic generation and access …."

Policy QP6: *"The Borough Council expects development to be incorporated into the Borough with minimal impact….. Where appropriate all proposals must ensure that the following matters are investigated and satisfactorily addressed: ….*

8) The effects on, or impact of, general disturbance including noise, vibration and dust, fumes, smell, air and water quality. …".

Policy EMP4*: "Proposals will be permitted where they meet the following criteria: 1) proposals will not have a significant adverse visual impact, noise impacts, air quality, water quality and supply, health or safety risk to people in the surrounding area and also to existing and proposed land uses…"*

Other Guidance

British Standard 7445-1:2003 and 7445-2:1991

11.2.67 BS 7445 'Description and Measurement of Environmental Noise' (BSI, 1991 and 2003) defines parameters, procedures and instrumentation required for noise measurement and analysis.

British Standard 5228:2009+A1:2014

11.2.68 BS 5228-1 'Code of Practice for Noise and Vibration Control on Construction and Open Sites. Noise' (BSI, 2014a) provides a 'best practice' guide for noise control and includes sound power level (L_w) data for individual plant as well as a calculation method for noise from construction activities. BS 5228-2 'Code of Practice for Noise and Vibration Control on Construction and Open Sites. Vibration' (BSI, 2014b)

provides comparable 'best practice' for vibration control, including guidance on the human response to vibration.

British Standard 6472:2008

11.2.69 BS 6472-1 'Guide to Evaluation of Human Exposure to Vibration in Buildings Part 1: Vibration Sources other than Blasting' (BSI, 2008) presents recommended frequency weighted vibration spectra (for continuous vibration) and vibration dose values (VDV) (for intermittent vibration) above which adverse comment is likely to occur in residential properties.

British Standard 7385:1993

11.2.70 BS 7385-2 'Evaluation and Measurement for Vibration in Buildings. Guide to Damage Levels from Groundborne Vibration' (BSI, 1993) presents guide values for transient and continuous vibration, above which there is a likelihood of cosmetic damage. The standard establishes the basic principles for carrying out vibration measurements and processing the data, with regard to evaluating vibration effects on buildings.

British Standard 4142:2014+A1:2014

11.2.71 BS 4142 'Methods for Rating and Assessing Industrial and Commercial Sound' (BSI, 2014c) can be used for assessing the effect of noise of an industrial nature, including mechanical services plant noise. The method compares the difference between 'rating level' of the industrial noise, with the 'background sound level' at the receptor position.

ISO 9613-2:1996: Attenuation of Sound during Propagation Outdoors

11.2.72 ISO 9613-2:1996 'Attenuation of Sound during Propagation Outdoors, Part 2: General Method of Calculation' (ISO, 1996) specifies an engineering method for calculating the attenuation of sound during propagation outdoors to predict the levels of environmental noise at a distance from a variety of sources.

Calculation of Road Traffic Noise

11.2.73 Department for Transport (DfT)/Welsh Office Memorandum 'Calculation of Road Traffic Noise' (CRTN) (DfT, 1998) describes procedures for traffic noise calculation and measurement and is suitable for environmental assessments of schemes where road traffic noise may have an effect.

Design Manual for Road and Bridges

11.2.74 The National Highways 'Design Manual for Road and Bridges LA 111 (Revision 2) Noise and Vibration' (DMRB) (Highways England, 2020) provides guidance on the appropriate level of assessment to be used when assessing the noise and vibration effects arising from road projects, including new construction, improvements, and maintenance. The guidance is also useful for assessing changes in traffic noise levels as a result of non-road projects such as the Proposed Development.

World Health Organization

11.2.75 The World Health Organization's (WHO's) 'Environmental Noise Guidelines for the European Region' (WHO, 2018) provides recommendations to protect human health

from noise from transportation, wind turbines and leisure. These guidelines do not cover industrial noise however, the WHO recommends that 'Guidelines for Community Noise' (WHO, 1999) should remain valid. This recommends external daytime and evening environmental noise limits, and internal night-time limits to avoid sleep disturbance.

11.2.76 The WHO 'Night Noise Guidelines for Europe' (WHO, 2009) recommend updated guidelines on night-time noise limits to avoid sleep disturbance.

The Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment

11.2.77 The IEMA 'Guidelines for Environmental Noise Impact Assessment' (2014) (IEMA, 2014) provide criteria for the assessment of magnitude of impacts due to noise level changes from a project.

11.3 Assessment Methodology and Significance Criteria

Study Area

11.3.1 The extent of the Study Area has been defined to include the closest receptors/ communities in each direction from the Main Site, the CO_2 Export Corridor, Hydrogen Pipeline Corridor, Natural Gas Connection Corridor and Water Connections Corridor, and those that may be affected by changes in road traffic flows during the construction phase of the Proposed Development as described below:

- Construction Noise: The construction noise assessment study area is typically 300m (based on BS 5228-1 guidance (BSI, 2014a)) from the works, however the construction noise study area has been extended to include the closest Noise Sensitive Receptors (NSRs) to the construction works from the Main Site.
- Construction Vibration: NSRs within 100 m from the closest construction activity with the potential to generate vibration.
- Construction Traffic: based on traffic links in the transport model (as discussed in Chapter 15: Traffic and Transport (PEI Report, Volume I)).
- Operational Noise: based on the closest NSRs to the Main Site.

11.3.2 The NSRs included in the noise and vibration assessments are shown in Figure 11-1: Noise Sensitive Receptors (PEI Report, Volume II). It is considered that if noise and vibration levels are suitably controlled at the nearest and most exposed receptors identified, then noise and vibration levels will be suitably controlled at other sensitive receptors in the surrounding area.

Determining Baseline Conditions and Noise Sensitive Receptors

Noise Monitoring Locations and Protocol

11.3.3 The location of potential NSRs in proximity to the Proposed Development Site has been considered when assessing the effects associated with noise and vibration levels from the construction, operation and decommissioning phases of the Proposed Development.

11.3.4 NSRs include residential properties, education facilities, places of worship, health buildings/ care homes and libraries. The sensitivity of receptors is discussed later in Table 11-13. Potential noise impacts upon ecological receptors are assessed in Chapter 12: Ecology and Nature Conservation, Chapter 13: Ornithology and Chapter 14: Marine Ecology (PEI Report, Volume I).

11.3.5 Adopting a 'worst case scenario' approach, key NSR locations considered to be representative of the nearest and likely most sensitive existing receptors to the Proposed Development have been identified and selected. All residential receptors are of high sensitivity. The office at Seal Sands is classed as medium sensitivity. These receptors are shown on Figure 11-1: Noise Sensitive Receptors (PEI Report, Volume II) and distances to the Proposed Development Site are shown in Table 11-2.

Table 11-2: Key Representative Noise Sensitive Receptors

RECEPTOR	ADDRESS	ASSESSED FOR	DISTANCE FROM PROPOSED DEVELOPMENT SITE
H1	Manor House Farm, Cowpen Bewley, Billingham	Construction noise for the Connection Corridors.	58 m
H2	Cresswell Road, Grangetown	Construction noise for the Connection Corridors.	59 m
H3	Kirkleatham Village	Construction noise for the Connection Corridors.	398 m
H4	Seal Sands Office	Construction noise for the Main Site and Connection Corridors. Operational noise for the Main Site.	30 m
H5	Marsh House Farm, Warrenby	Construction noise for the Main Site and Connection Corridors. Operational noise for the Main Site.	199 m
H6	58 Broadway West, Redcar	Construction noise for the Main Site and Connection Corridors. Operational noise for the Main Site.	238 m

11.3.6 In order to define existing sound conditions at selected NSRs, ambient sound measurements have been undertaken at representative residential locations (H1-H3 and H5-H6) as well as at locations representative of non-residential (office use) and ecological receptors (H4 and Eb1- Eb7). The monitoring locations listed in Table 11-2 are shown on Figure 11-1: Noise Sensitive Receptors (PEI Report, Volume II).

11.3.7 A description of ecological receptors in the vicinity of the Proposed Development Site is available Chapter 12: Ecology and Nature Conservation, Chapter 13: Ornithology and Chapter 14: Marine Ecology (PEI Report, Volume I). The baseline data collected at locations Eb1-Eb7 will be used in the assessments of impacts on ecological receptors.

Table 11-3: Monitoring Locations

MONITORING LOCATION	ADDRESS	DETAILS	DATE/TIME OF MEASUREMENTS
H1	Manor House Farm, Cowpen Bewley	Unattended sound measurement Weather station location	26/06/2023 15:17 to 04/07/2023 13:20
H2	Cresswell Road, Grangetown	Attended sound measurement	17:28 to 19:28 26/06/2023
H3	Land bounded by Kirkleatham Lane, Kirkleatham Village	Unattended sound measurement	26/06/2023 16:43 to 04/07/2023 10:13
H4	Seal Sands Office, Stockton-on-Tees	Attended sound measurement	13:55 to 14:55 27/06/2023
H5	Marsh House Farm, Tod Point Road, Redcar	Unattended sound measurement Weather station location	21/07/2023 12:15 to 31/07/2023 11:45
H6	58 Broadway West, Dormanstown	Unattended sound measurement	27/06/2023 10:51 to 04/07/2023 12:06
Eb1	Thorn Tree Lane, Greatham	Attended sound measurement	13:23 to 13:53 26/06/2023, 13:50 to 14:20 27/06/2023
Eb2	Venator Greatham Works, Tees Road, Hartlepool	Unattended sound measurement	26/06/2023 13:45 to 04/07/2023 12:17

MONITORING LOCATION	ADDRESS	DETAILS	DATE/TIME OF MEASUREMENTS
Eb3	Seal Sands Emergency Access Road, Stockton-on-Tees	Unattended sound measurement	27/06/2023 13:01 to 04/07/2023 14:25
Eb4	Land by Hospital of God, Greatham	Unattended sound measurement	27/06/2023 13:05 to 06/07/2023 13:20
Eb5	Cowpen Marsh, Stockton-on-Tess	Attended sound measurement	14:12 to 15:12 26/06/2023
Eb6	Seal Sands Office, Stockton-on-Tees	Unattended sound measurement	27/06/2023 13:30 to 04/07/2023 14:45
Eb7	Cowpen Bewley Landfill and Composting Facility off the A1185	Unattended sound measurement	27/06/2023 15:00 to 04/07/2023 14:00

11.3.8 All measurements were made at approximately 1.2 - 1.5 m above ground level, and in accordance with the requirements of British Standard BS 7445 (BSI, 1991 and 2003). All monitoring locations were positioned at least 3.5 m from any reflecting surface, other than the ground (i.e., free-field). Details of ongoing activities and typical noise sources in the area were recorded during visits to the monitoring locations to set up and collect the measurement equipment.

11.3.9 Details of the instrumentation used at each location during the surveys are included in Appendix 11C: Baseline Sound Monitoring Survey Information (PEI Report, Volume III).

11.3.10 All sound level meters (SLMs) used were Class 1 precision instruments. Each has been programmed to log a range of sound indicators including L_{Aeq}, L_{A90}, L_{A10} and L_{Amax}, in 15-minute contiguous intervals.

11.3.11 The calibration levels were checked prior to and following all measurements. No significant drift, more than 0.2 dB[2] occurred.

Meteorological Conditions

11.3.12 A weather station was set up to monitor meteorological conditions during measurements, this was set up at H6 and then H5.

[2] Where decibel (dB) is used in this chapter it refers to dB re 20 mPa unless otherwise stated

11.3.13 Measurement periods during which the weather is not suitable for environmental sound measurements (i.e., when wind speeds >5 m/s and during precipitation or wet conditions) have been removed during analysis of the measured data.

11.3.14 The results of the sound monitoring are presented in Section 11.4 (Baseline Conditions).

Impact Assessment Methodology

Assessment of Construction Noise Effects

11.3.15 As no construction contractor has yet been appointed, site-specific details on the construction activities, programme and numbers and types of construction plant are not yet available. Therefore, detailed construction noise predictions cannot be based on site-specific construction information. Nevertheless, indicative construction noise predictions have been undertaken using the calculation methods set out in BS 5228:2009+A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' (BSI, 2014a), based upon construction information from other energy and pipeline construction projects.

11.3.16 The calculation method provided in BS 5228 (2014a) takes account of factors including the number and types of equipment operating, their associated sound power levels (L_w), their modes of operation (% on-times within the working period), the distance to NSRs, and the effects of any intervening ground cover or barrier/ topographical screening. This allows prediction of the magnitude of impact. Construction activities away from the Main Site (including the construction in the connection corridors) have been assessed separately from the construction assessment for the Main Site because the types of plant and activities are likely to be different and construction will extend over a greater area. Construction noise effects from activities away from the Main Site will be assessed based on the same significance criteria described in this section as for construction noise from activities within the Main Site.

Residential NSRs

11.3.17 The 'ABC' method (detailed in BS 5228 Part 1 Section E.3.2 (BSI, 2014a)) sets construction noise thresholds for residential NSRs for different time periods (e.g., day, evening, night and weekends) based on the corresponding existing ambient noise levels. For each appropriate period (day, evening, night, weekend etc.), the existing ambient noise level is determined and rounded to the nearest 5 dB and the appropriate threshold value is then derived. The predicted construction noise level is then compared with this construction noise threshold value. The construction noise thresholds are derived from Table 11-4.

Table 11-4: Construction Noise Thresholds at Residential Receptors

ASSESSMENT CATEGORY AND THRESHOLD VALUE PERIOD	THRESHOLD VALUE $L_{Aeq,\ T}$ dB – FREE FIELD		
	CATEGORY A (A)	CATEGORY B (B)	CATEGORY C (C)
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends (d)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
NOTE 1: A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level. NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise. NOTE 3: Applies to residential receptors only.			
(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values. (b) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values. (c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values. (d) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.			

11.3.18 Based upon the BS 5228 ABC method (BSI, 2014a), the criterion adopted in this assessment for the determination of potentially significant effects is the exceedance of the $L_{Aeq,T}$ threshold level for the category appropriate to the ambient noise level at each NSR. This is considered to be equivalent to the SOAEL, although as stated in BS 5228 (BSI, 2014a), other project-specific factors, such as the number of NSRs affected and the duration and character of the impact are also considered when determining if there is a potentially significant effect.

11.3.19 For residential receptors and other high sensitivity human receptors, the criterion for the LOAEL (see Table 11-13 for further details) is a predicted construction noise level equal to the existing ambient noise level at each NSR i.e. resulting in a 3 dB increase in noise level when combined with the existing ambient noise level (decibels are measured on a logarithmic scale so noise levels cannot be summed arithmetically – two sounds of equal level combine to raise the overall sound level by 3 dB).

11.3.20 Based on the above, the magnitude of construction noise on residential NSRs is classified in accordance with the criteria in Table 11-5. These are based on professional judgement and precedent.

Table 11-5: Magnitude of Construction Noise Impacts for residential NSRs

MAGNITUDE OF IMPACT	$L_{AEQ,T}$ dB (FAÇADE)
High	Exceedance of ABC Threshold Value by >+5 dB
Medium	Exceedance of ABC Threshold Value by up to +5 dB
Low	Equal to or below the ABC Threshold Value by up to -5 dB
Very low	Below the ABC Threshold Value by >-5 dB

Non-residential NSRs

11.3.21 The '5 dB change' method (detailed in BS 5228 Part 1 Section E.3.3 (BSI, 2014a)) has been used to develop the methodology for the assessment of non-residential NSRs. Noise levels generated by site activities are deemed to be potentially significant, depending upon the sensitivity of the receptor, if:

- the total noise level (pre-construction ambient noise level plus site noise level) exceeds the pre-construction ambient noise level by 5 dB or more (subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively); and
- the exceedance occurs for a duration of one month or more, unless works of a shorter duration are likely to result in a significant effect.

11.3.22 Based on the above, the magnitude of construction noise on non-residential NSRs can be classified in accordance with the criteria in Table 11-6. These are based on professional judgement.

Table 11-6: Magnitude of Construction Noise Impacts for Non-residential NSRs

MAGNITUDE OF IMPACT	PREDICTED CONSTRUCTION NOISE LEVEL COMPARED WITH TOTAL NOISE* LEVEL
High	Total noise level exceedance of the pre-construction ambient noise level, or the lower cut-off value, by >+10 dB for duration of one month or more
Medium	Total noise level exceedance of the pre-construction ambient noise level, or the lower cut-off value, by ≥+5 dB for duration of one month or more
Low	Total noise level exceedance of the pre-construction ambient noise level, or the lower cut-off value, by between 0 and <5 dB
Very low	Below the pre-construction ambient noise level, or the lower cut-off value
Note: *Total noise = pre-construction ambient noise level + construction noise level (subject to the lower cut off value)	

11.3.23 At this stage in the design the Proposed Development, the full and detailed construction programme is not yet defined, therefore as a reasonable worst-case approach, and to ensure a robust assessment, it has been assumed that all assessed construction activities will be of a duration greater than one month. This means that the initial indication of potential significant effects (before application of professional judgement) is based solely upon the total noise level exceedance of the pre-construction ambient noise level for a given working period.

Assessment Daytime Construction Works Traffic on the Public Highway

11.3.24 The Proposed Development will affect traffic flows on existing roads in the area within and surrounding the Proposed Development Site during construction – refer to Chapter 15: Traffic and Transport (PEI Report, Volume I). This preliminary assessment focuses on the impact at existing residential properties located alongside the existing local road network.

11.3.25 Construction traffic noise has been assessed by considering the increase in traffic flows during the construction works, following the guidance of CRTN (DfT/ Welsh Office, 1998) and DMRB (National Highways, 2020).

11.3.26 18-hour (06:00 – 24:00) Annual Average Weekday Traffic (AAWT) data have been obtained for the year 2025 'with' and 'without' construction traffic during the peak construction period, determine if any existing roads are predicted to be subject to a potentially significant change in 18-hour traffic flows. Basic Noise Level (BNL) calculations have been undertaken to predict the change in noise level between the 'with' and 'without' scenarios.

11.3.27 The criteria for the assessment of traffic noise changes arising from construction works have been taken from Table 3.17 of DMRB and are provided in Table 11-7. The magnitude descriptors in parentheses are provided to align with the descriptors used in this assessment.

Table 11-7: Construction Traffic Noise Criteria

MAGNITUDE OF IMPACT	CHANGE IN TRAFFIC NOISE LEVEL $L_{A10,18HR}$ dB
Major (High)	≥ 5
Moderate (Medium)	≥3 to <5
Minor (Low)	≥1 to <3
Negligible (Very low)	<1

11.3.28 An increase in road traffic flows of 25% (where the traffic speed and composition remain consistent) equates to an approximate increase in road traffic noise of 1 dB L_A. A doubling of traffic flow would be required for an approximate increase in 3 dB L_A.

11.3.29 It is generally accepted that changes in noise levels of 1 dB L_A or less are imperceptible, and changes of 1 to 3 dB L_A are not widely perceptible. Consequently, at the selected road traffic noise receptors the magnitude of the predicted change in

noise levels uses the scale shown in Table 11-7 with respect to construction traffic. The criteria are based on the current guidance on short-term changes in traffic noise levels in DMRB. The SOAEL is set at a change in traffic noise of +3 dB and the LOAEL at +1 dB.

Assessment of Construction Vibration Effects

Impacts on Humans

11.3.30 Vibration due to construction activities has the potential to result in adverse impacts at nearby NSRs. The transmission of ground-borne vibration is highly dependent on the nature of the intervening ground between the source and receptor and the activities being undertaken. BS 5228-2: 2009+A1: 2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites - Vibration' (BSI, 2014b) provides data on measured levels of vibration for various construction works, with particular emphasis on piling. Impacts are considered for both damage to buildings and annoyance to occupiers.

11.3.31 Table 11-8 details Peak Particle Velocity (PPV) vibration levels and provides a semantic scale for the description of demolition and construction vibration effects on human receptors, based on guidance contained in BS 5228-2 (BSI, 2014b).

Table 11-8: Construction Vibration Threshold at Residential Dwellings

PEAK PARTICLE VELCOCITY (PPV) LEVEL	DESCRIPTION	MAGNITUDE OF IMPACT
>= 10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.	High
1.0 to < 10 mm/s	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.	Medium
0.3 to < 1.0 mm/s	Vibration might be just perceptible in residential environments.	Low
0.14 to < 0.3 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Very low

11.3.32 For residential receptors and other high sensitivity receptors, the LOAEL is defined as a PPV of 0.3 mm/s (millimetres per second), this being the point at which construction vibration is likely to become perceptible. The SOAEL is defined as a PPV of 1.0 mm/s, this being the level at which construction vibration can be tolerated with warning.

11.3.33 At receptors above the SOAEL, further consideration of whether an effect is significant is undertaken using professional judgement, taking account of the duration and frequency of the effect, as well as the time of evening/night that the effect would be experienced.

11.3.34 At this stage and in the absence of specific information on likely construction activities and plant, indicative information has been provided and used to undertake a qualitative assessment based upon professional judgement. Given the significant distance to residential receptors, no significant vibration is expected to result from the proposed construction activities within the Main Site. However, works within the Connection Corridors could be much closer to residential receptors, and so construction vibration impacts are likely to be higher.

Impacts on Buildings

11.3.35 In addition to human annoyance, building structures may be damaged by high levels of vibration. The levels of vibration that may cause building damage are far more than those that may cause annoyance. Consequently, if vibration levels are controlled to those relating to annoyance (i.e, 1.0 mm/s), then it is highly unlikely that buildings will be damaged by construction vibration levels.

11.3.36 The criteria used in this assessment relate to the potential for cosmetic damage, not structural damage. The principal concern is generally transient vibration, for example due to piling.

11.3.37 BS 7385-2: 1993 'Evaluation and Measurement for Vibration in Buildings – Part 2: Guide to Damage Levels from Groundborne Vibration' (BSI, 1993) provides guidance on vibration levels likely to result in cosmetic damage and is referenced in BS 5228-2: 2009+A1:2014 (BSI, 2014b). Guide values for transient vibration, above which cosmetic damage could occur, are given in Table 11-9.

Table 11-9: Transient Vibration Guide Values for Cosmetic Damage

TYPE OF BUILDING	PEAK COMPONENT PARTICLE VELOCITY IN FREQUENCY RANGE OF PREDOMINANT PULSE	
	4 HZ TO 15 HZ	15 HZ AND ABOVE
Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

NOTE 1: Values referred to are at the base of the building.
NOTE 2: For un-reinforced or light framed structures and residential or light commercial buildings, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

11.3.38 BS 7385-2:1993 (BSI, 1993) states that the probability of building damage tends to zero for transient vibration levels less than 12.5 mm/s PPV. For continuous vibration, such as from vibratory rollers, the threshold is around half this value.

11.3.39 It is also noted that these values refer to the likelihood of cosmetic damage. ISO 4866:2010 (ISO, 2010) defines three different categories of building damage:

- cosmetic – formation of hairline cracks in plaster or drywall surfaces and in mortar joints of brick/concrete block constructions;
- minor – formation of large cracks or loosening and falling of plaster or drywall surfaces or cracks through brick/block; and
- major – damage to structural elements, cracks in support columns, loosening of joints, splaying of masonry cracks.

11.3.40 BS 7385-2:1993 (BSI, 1993) defines that minor damage occurs at a vibration level twice that of cosmetic damage and major damage occurs at a vibration twice that of minor damage. Therefore, this guidance can be used to define the magnitude of impact identified in Table 11-10.

Table 11-10: Magnitude of Impact – Construction Vibration Building Damage

MAGNITUDE OF IMPACT	DAMAGE RISK	CONTINUOUS VIBRATION LEVEL PPV MM/S	
		UNREINFORCED OR LIGHT FRAMED STRUCTURES	REINFORCED OR FRAMED STRUCTURES
High	Major	≥30	≥100
Medium	Minor	15 to <30	50 to <100
Low	Cosmetic	6 to <15	25 to <50
Very low	Negligible	<6	<25

11.3.41 In the absence of specific information on likely construction activities and plant, a qualitative assessment based upon professional judgement has been undertaken. Again, given the significant distance to residential and ecological receptors, no significant vibration is expected to result from construction on the Main Site. However, construction of the Connection Corridors may be closer to residential receptors, and thus there is the potential for higher impacts. This will depend on the nature of the construction with buried pipes having a greater potential for impact than above ground pipes. This possibility will be considered when defining mitigation methods, with suitable techniques and buffer distances being developed and implemented.

Assessment of Operational Noise

11.3.42 A noise propagation model has been developed using the noise modelling software CadnaA to assess the current layout options for the Proposed Development. CadnaA implements the noise prediction method ISO 9613-2: 1996 'Attenuation of Sound during Propagation Outdoors' (ISO, 1996), which has been employed to calculate noise levels at surrounding NSRs due to noise breakout from the proposed buildings and plant at the Production Facility.

11.3.43 The noise model consists of a three-dimensional representation of an indicative layout of the Production Facility and its surroundings. Indicative noise level data for the key noise emitting plant/buildings within the Production Facility have been used supplemented with indicative data from other projects. Details of the proposed plant and assumptions can be found in Appendix 11B: Operational Noise Information (PEI Report, Volume III).

11.3.44 Significant topographical details and buildings that may influence the transmission of noise to NSRs are included in the noise model. This does not include buildings associated with other proposed developments on the Teesworks Site. A digital terrain model created using ground elevation spot height data has been used to position buildings and other noise sources at the correct height. The model assumes that the prevailing wind direction is always from source to receiver, which is likely to overestimate the noise effect associated with the Proposed Development.

11.3.45 Based upon the predicted noise levels from the noise model, an assessment of potential noise impact at nearby NSRs has been undertaken using the guidance in BS 4142: 2014 'Methods for Rating and Assessing Industrial and Commercial Sound' (BSI, 2014c).

11.3.46 A key aspect of the BS 4142(BSI, 2014c) assessment procedure is a comparison between the background sound level in the vicinity of residential locations and the rating level of the sound source under consideration. The relevant parameters in this instance are as follows:

- Background sound level – $L_{A90,T}$ – defined in the Standard as the "*A-weighted sound pressure level that is exceeded by the residual sound for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels*";
- Specific sound level – Ls ($L_{Aeq,Tr}$) – the "*equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr*"; and
- Rating level – $L_{Ar,Tr}$ – the "*specific sound level plus any adjustment made for the characteristic features of the sound*".

11.3.47 BS 4142 (BSI, 2014c) allows for corrections to be applied based upon the presence or expected presence of the following:

- tonality: up to 6 dB penalty;
- impulsivity: up to 9 dB penalty (this can be summed with tonality penalty); and

- other sound characteristics (neither tonal nor impulsive but still distinctive): 3 dB penalty.

11.3.48 Once any adjustments have been made, the background sound level and the rating level are compared. The standard states that:

- "*Typically, the greater the difference, the greater the magnitude of impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending upon the context.*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending upon the context.*
- *The lower the rating level is to the measured background sound level, the less likely it is that the specific sound will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon the context*."

11.3.49 Importantly, as suggested above, BS 4142:2014 (BSI, 2014c) requires that the rating level of the noise source under assessment be considered in the context of the environment when defining the overall significance of the impact.

11.3.50 BS 4142:2014 (BSI, 2014c) suggests that a one-hour assessment period is considered during the day and a 15-minute assessment period at night.

11.3.51 Table 11-11 illustrates the adopted magnitude of impact scale used in this assessment based upon the numerical level difference. For BS 4142(BSI, 2014c) assessment purposes, for a residential receptor, the SOAEL is set at a rating level above the background sound level of +10 dB, and the LOAEL at +5 dB, although the consideration of context (including the absolute level of the sound under consideration) can vary the overall classification of effects.

Table 11-11: Magnitude of Impact for Industrial Noise

MAGNITUDE OF IMPACT	BS 4142 DESCRIPTOR	RATING LEVEL – BACKGROUND SOUND LEVEL (dB)
High	No BS 4142 descriptor for this magnitude level	+14/> =15
Medium/ High	No BS 4142 descriptor for this magnitude level	+12/+13
Medium	Indication of a significant adverse effect, depending upon context	+9/+10/+11
Low Medium	No BS 4142 descriptor for this magnitude level	+7/+8

MAGNITUDE OF IMPACT	BS 4142 DESCRIPTOR	RATING LEVEL – BACKGROUND SOUND LEVEL (dB)
Low	Indication of an adverse effect, depending upon context	+4/+5/+6
Very low/Low	No BS 4142 descriptor for this magnitude level	+2/+3
Very Low	Indication of low impact, depending upon context	≤ 0/+1

IEMA Guidelines for Environmental Noise Impact Assessment

11.3.52 The Institute of Environmental Management and Assessment's (IEMA) 'Guidelines for Environmental Noise Impact Assessment' (IEMA, 2014) have been used to undertake a preliminary assessment of the impact of changes in ambient sound level at NSRs due to Proposed Development operation. On the impact of noise level changes, paragraph 2.7 of the guidelines state "*For broad band sounds which are very similar in all but magnitude, a change or difference in noise level of 1 dB is just perceptible under laboratory conditions, 3 dB is perceptible under most normal conditions, and a 10 dB increase generally appears to be twice as loud. These broad principles may not apply where the change in noise level is due to the introduction of a noise with different frequency and/or temporal characteristics compared to sounds making up the existing noise climate. In which case, changes of less than 1 dB may be perceptible under some circumstances*". The IEMA Guidelines provide criteria for magnitude of impacts due to noise level changes from a project, as shown in Table 11-12, and these have been used within this preliminary assessment respect to predicted changes in ambient sound levels.

Table 11-12: Categorising the Magnitude of the Noise Change

MAGNITUDE OF IMPACT	NOISE CHANGE, dB
No Change	0
Low	0.1 to 2.9
Medium	3 to 4.9
High	>5

Assessment of Operational Vibration

11.3.53 The type of equipment proposed is unlikely to not pass significant levels of vibration into the ground. Taking this into account, together with the distances between the proposed indicative location of the equipment and residential NSRs, it is not anticipated that vibration levels will be significant. Therefore, further assessment of operational vibration is scoped out of this assessment.

11.3.54 No significant sources of vibration are associated with the operation of the Hydrogen Pipeline Corridor, Electrical Connection Corridor, CO_2 Export Corridor / Natural Gas Connection Corridor or Water Connections Corridor therefore further assessment of operational vibration for these sources has been scoped out.

Significance Criteria

Receptor Sensitivity

11.3.55 Effects are classified based on the magnitude of the impact (as outlined above) for the various potential impacts during construction and operation, and the sensitivity or value of the affected receptor. A scale of receptor sensitivity is presented in Table 11-13.

Table 11-13: Sensitivity/Value of Receptors

SENSITIVITY/ VALUE OF RESOURCE/ RECEPTOR	DESCRIPTION	EXAMPLES OF RECEPTOR USAGE
Very high	Receptors where noise or vibration will significantly affect the function of a receptor.	• Auditoria/studios; • Specialist medical/teaching centres, or laboratories with highly sensitive equipment.
High	Receptors where people or operations are particularly susceptible to noise or vibration. Sensitive ecological receptors known to be vulnerable to the effects of noise or vibration.	• Residential; • Quiet outdoor areas used for recreation; • Conference facilities; • Schools/educational facilities in the daytime; • Hospitals/residential care homes; • Libraries; • Ecologically sensitive areas for example Special Protection Areas (SPAs).
Medium	Receptors moderately sensitive to noise or vibration where it may cause some distraction or disturbance	• Offices; • Restaurants/retail; • Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf).
Low	Receptors where distraction or disturbance	• Residences and other buildings not occupied during working hours;

SENSITIVITY/ VALUE OF RESOURCE/ RECEPTOR	DESCRIPTION	EXAMPLES OF RECEPTOR USAGE
	of people from noise or vibration is minimal	• Factories and working environments with existing high noise levels; • Sports grounds when spectator or noise is a normal part of the event.

Significance of Effects

11.3.56 The following terminology has been used in the preliminary assessment to define noise and vibration effects:

- adverse – detrimental or negative effects to an environmental resource or receptor;
- neutral – effects to an environmental resource or receptor that are neither adverse nor beneficial; or
- beneficial – advantageous or positive effect to an environmental resource or receptor.

11.3.57 The effect resulting from each individual potential impact type above has been classified according to the magnitude of the impact and the sensitivity or value of the affected receptor using the matrix presented in Table 11-14, but where necessary also considering the context of the acoustic environment.

Table 11-14: Classification of Effects

SENSITIVITY/ VALUE OF RESOURCE/ RECEPTOR	MAGNITUDE OF IMPACT			
	HIGH	MEDIUM	LOW	VERY LOW
Very high	Major	Major	Moderate	Minor
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

11.3.58 Where adverse or beneficial effects have been identified, these have been assessed against the following significance scale, derived using the matrix presented in Table 11-14:

- Negligible – imperceptible effect of no significant consequence;

- Minor – slight, very short or highly localised effect of no significant consequence;
- Moderate – limited effect (by extent, duration or magnitude), which may be considered significant; or
- Major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

11.3.59 For the purposes of this assessment, Negligible and Minor effects are considered to be Not Significant, whereas Moderate and Major effects are considered to be Significant.

Sources of Information/ Data

11.3.60 The following sources of information that define the Proposed Development have been reviewed and form the basis of the preliminary assessment of likely significant noise and vibration effects:

- baseline sound monitoring survey data
- construction plant and equipment from similar construction projects;
- pipeline construction plant noise data and indicative activities;
- construction noise data referenced from BS 5228 (BSI, 2014a);
- indicative concept layout plans for the Production Facility;
- items of plant including sound power level data for the Production Facility. Where data is not currently available, noise source data from similar projects has been used;
- AAWT traffic data (refer to Chapter 15: Traffic and Transport (PEI Report, Volume III));
- Ordnance Survey (OS) mapping of the Proposed Development and surrounding area; and
- topographical data (LIDAR data) and aerial photography.

Use of the Rochdale Envelope

11.3.61 In order to ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with the Planning Inspectorate's ('the Inspectorate's') Advice Note 9 (The Inspectorate, 2018). This involves assessing the maximum (or where relevant, minimum)/worst case parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example).

11.3.62 In line with the Inspectorate's guidance, the following assumptions have been made with regard to the Proposed Development construction stage as applicable to this preliminary noise and vibration assessment:

- There are currently two technology options being considered: Case A and Case B, as outlined in Chapter 4: Proposed Development (PEI Report, Volume I) and Chapter 6: Need, Alternatives and Design Evolution (PEI Report, Volume I). These have been reviewed and the worst-case option for noise based on current information (Case A) has been assessed. This will be reviewed and reassessed as the EIA progresses.
- Pipeline construction has been assumed to take place at the nearest part of the Connection Corridors to NSRs.
- Pipeline construction activities and plant have been assumed to be in constant operation through the 07:00 to 19:00 working day, for further information see Appendix 11A: Construction Noise Levels and Assumptions (PEI Report, Volume III)).
- Initial predictions made for construction noise in the evening and night-time period for residential NSRs assume the same intensity of operation as during the daytime.
- For the non-residential NSR (H4) which is an office, it has been assumed that the office will only be occupied during daytime hours, therefore excluded from evening and night-time assessment.

11.3.63 The following assumptions have been made for the Proposed Development operational stage:

- tonal, impulsive and intermittent characteristics will be designed out of the Proposed Development during the detailed design phase by the selection of appropriate plant, building cladding, louvres and silencers/attenuators as necessary;
- assumed that noise sources will be located at their locations in the indicative concept layout plans, given the distance from receptors to the minor changes in the site layout are unlikely to make a significant difference;
- noise emission data assumptions are detailed in Appendix 11B: Operational Noise Information (PEI Report, Volume III) and are based on sound levels provided as A-weighted values at 1 m from the source, applying professional judgement and data from other comparable projects
- For the non-residential NSR (H4) which is an office, it has been assumed that the office will only be occupied during daytime hours, therefore excluded from the night-time assessment.

11.3.64 Given the above, this preliminary assessment presents a potential reasonable 'worst case' approach.

Consultation

11.3.65 Consultation has been undertaken with the Environmental Health Departments at RCBC, STBC and HBC to seek agreement for the baseline noise monitoring locations and monitoring durations. The outcome of such consultation is detailed in Table 11-15.

11.3.66 An EIA Scoping Opinion was requested from the Inspectorate in April 2023, with a response received on 17 May 2023. A high-level summary of responses to the Scoping Opinion comments relevant to the noise and vibration assessment are also provided in Table 11-15.

Table 11-15: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
RCBC	Letter via email on 14th March 2023	The identified monitoring locations for RCBC cover the main noise sensitive communities and the scope of the surveys is considered sufficient.	The results of the baseline survey have been reported in Section 11.4 of this PEI Report chapter and used in the assessments.
STBC	Letter via email on 14th March 2023	The only residential area likely to be affected is Cowpen Bewley Village (represented by monitoring location H1.) Please notify if any other residential areas with STBC area likely to be affected by the Proposed Development. Recommend long term unattended measurement of 7 days instead of short term attended. Noise from the operation of the Proposed Development should not exceed the existing background levels by more than 5dB during the day (07:00hrs- 23:00hrs) and there to be no exceedance of the existing background levels at night (23:00hrs- 07:00hrs). There should also be no increase on the existing ambient baseline sound levels at the nearest sensitive receptors as an $L_{Aeq,T}$ during the day and night. Should this work involve significant construction work then a noise impact assessment in accordance with BS5228 is required.	The results of the baseline survey have been reported in Section 11.4 and used in the assessments in this chapter. A preliminary operational noise assessment is provided in Section 11.6. A preliminary construction phase noise assessment is provided in Section 11.6.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
HBC	Letter via email on 14th March 2023. Follow up email sent on 10th August. Follow up email sent on 8th September to confirm the findings of the initial assessment.	No response received to initial email, follow up email issued informing that the baseline sound surveys have been completed and stated if no response is received it is assumed that they have no objection to the sound monitoring locations.	Telephone discussion with Environmental Health Officer (EHO) on 10th August regarding the potential for baseline surveys in Greatham and Seaton Carew. As baseline surveys have already been undertaken, it was agreed to undertake assessment of construction and operational impacts at these locations. An initial assessment has indicated that significant adverse effects are not likely due to the distance to the receptors in Greatham and Seaton Carew. As stated in Paragraph 11.3.1 it is considered that if noise and vibration levels are suitably controlled at the nearest and most exposed receptors identified, then noise and vibration levels will be suitably controlled at other sensitive receptors in the wider surrounding area.
The Inspectorate	Scoping Opinion 17th May 2023	Operational road traffic noise. The scoping report seeks to scope out effects from operational road traffic noise. The Inspector states that the ES should provide further information on the predicted number of movements required for consumables during operation to demonstrate that these will remain under the thresholds.	The generation of traffic during Proposed Development operation will be minimal when compared to the construction phase (as described in Chapter 15: Traffic and Transport (PEI Report, Volume I)). Therefore, residual traffic effects during operation are also considered to be Negligible (Not Significant). A detailed assessment will be provided in the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	The Scoping Report states that significant vibration impacts during operation are not likely due to the distance between the Proposed Development and receptors, but operational activities will be briefly considered in the ES. The ES should describe the activities likely to give rise to vibration effects.	Such information will be provided in the ES.

11.4 Baseline Conditions

Existing Baseline

Sound Survey Results

11.4.1 The processed results from each sound survey position are provided in Table 11-16. The L_{Aeq} values presented combine all measurements taken in each time period (day/night). The L_{AF90} values presented are the those deemed to be 'representative' of Background Sound Levels, for use in the BS 4142 assessment. Representative Background Sound Levels have been selected through consideration of the outcome of different methods of analysing the measured 15-minute measurement data.

11.4.2 Observations regarding the general baseline sound environment at each monitoring location are presented below Table 11-16. The observations of the general baseline sound environment were recorded during the daytime for all locations except receptor H5 where both night-time and daytime observations were recorded as this is the closest receptor for the operational noise assessment.

Table 11-16: Baseline Sound Survey Results

MONITORING LOCATION	TIME PERIOD	$L_{Aeq,T}$ dB	Highest L_{AFmax} dB	$L_{AF90,T}$ dB
H1	Daytime	50	98	43
	Night-time	44	90	36
H2	Daytime	51	73	48
	Night-time*	-	-	-
H3	Night-time	49	78	42
	Daytime	57	84	53
H4	Daytime	51	73	48
	Night-time*	-	-	-
H5	Daytime	51	96	39
	Night-time	44	80	36
H6	Daytime	56	102	46
	Night-time	45	77	42

*Only attended daytime measurements made at H2 and H4.

H1 - Manor House Farm, Cowpen Bewley

11.4.3 The dominant sound source at this location was observed to be road traffic from the A1185 which is to the north east of the receptor. There was an additional sound source of the wind.

H2 – Cresswell Road, Grangetown

11.4.4 The dominant sound source at this location was observed to be road traffic from local roads, Broadway/Trunk Road and Greystone Road, A1053. Occasional light aircraft sound was also observed.

H3 – Kirkleatham Village

11.4.5 The dominant sound source at this location was observed to be road traffic from the A1042 and A174 as well as local roads. Additionally, there was sound from birdsong and the wind in the trees. It was observed there was some sound of an industrial character most likely from the nearby Wilton International site.

H4 – Seal Sands Office

11.4.6 Industrial sound from the nearby Sembcorp site was dominant with additional contributions from other industrial facilities in the area. Road traffic sound from the Seal Sands Road was an additional source.

H5 – Marsh House Farm

11.4.7 During the daytime, industrial sound came from operations to the east along Tod Point Road, and additionally from more distant industrial sources to the west made the largest contribution. There were also contributions from road traffic along Tod Point Road and from birdsong.

11.4.8 During the night-time the dominant sound source was the more distant industrial sources to the west. This was characterised as a whirring sound with occasional clanging and horns. There was additionally noise from occasional cars on Tod Point Road.

H6 – 58 Broadway West

11.4.9 The dominant sound sources at this location during the daytime were noted to be road traffic on Broadway West and other nearby roads. Additional sound sources were the industrial estate to the north and birdsong.

Future Baseline

11.4.10 In the absence of the Proposed Development, future baseline noise levels at NSRs will depend largely on traffic flows on surrounding road networks, and the future operations at other industrial and commercial premises. There is the potential for noise levels to increase in the future baseline as other developments become operational. However, as a worst-case scenario the preliminary assessments are based on the baseline sound surveys undertaken in 2023.

11.5 Proposed Development Design and Impact Avoidance

11.5.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development Site (known as ‘embedded measures’). Some embedded measures are required as a result of legislative requirements and/or standard sectoral practices. Some of these

embedded mitigation measures as applicable to the noise and vibration assessment are described below.

Construction

11.5.2 A Framework Construction Environmental Management Plan (CEMP) will be included within the ES which will accompany the DCO Application which will set out the key measures to be employed during the Proposed Development Site construction phase to control and minimise the impacts on the environment. The Framework CEMP will include measures associated with noise and vibration. A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

11.5.3 Construction activities will typically be undertaken during weekday daytimes (07:00 to 19:00) and Saturdays (07:00 to 16:00) plus, up to one hour before and/or after for mobilisation (start-up and close down) procedures as well as some level of flexibility allowed for some activities that cannot be stopped or paused subject to LPA approval.

11.5.4 Some works will need to take place outside of normal working hours, if they do not give rise to unacceptable noise impacts (this would be where they do not exceed site noise limits). Measures to mitigate noise will be implemented during the Proposed Development construction phase to minimise impacts at local residential receptors and ecological receptors, particularly with respect to activities required outside of normal working hours. Mitigation (to be included in the CEMP) will include, but not be limited to:

- abiding by agreed construction noise limits at nearby NSRs;
- avoidance of working in the more sensitive evening and night times where possible;
- ensuring that processes are in place to minimise noise before works begin and ensuring that BPM are being achieved throughout the construction programme;
- ensuring that modern plant is used, complying with the latest European noise emission requirements. Selection of inherently quiet plant where possible;
- hydraulic techniques for breaking to be used in preference to percussive techniques where practical;
- use of rotary bored rather than driven piling techniques (if required), where possible;
- off-site pre-fabrication where practical;
- all plant and equipment being used for the works to be properly maintained, silenced where appropriate, operated to prevent excessive noise and switched off when not in use;
- all contractors to be made familiar with current legislation and the guidance in BS 5228 (Parts 1 and 2) (BSI, 2014a and b);

- loading and unloading of vehicles, dismantling of site equipment such as scaffolding or moving equipment or materials within the Proposed Development Site to be conducted in such a manner as to minimise noise generation;
- Where possible, the noisiest items of plant will be located the furthest distance from the nearby NSRs. Plant known to emit noise strongly in one direction will, where practicable, be orientated so that the noise is directed away from NSRs; Machines such as cranes that may be in intermittent use will be shut down between work periods or will be throttled down to a minimum. Machines will not be left running unnecessarily.
- appropriate routing of construction traffic on public roads and along access tracks, to minimise noise level increase (see Chapter 15: Traffic and Transport (PEI Report, Volume I));
- consultation with the local authorities (RCBC, STBC and HBC) and local residents to advise of potential noisy works that are due to take place; and
- noise complaints should be monitored, reported to the contractor and immediately investigated.

11.5.5 Method statements regarding construction management, traffic management and overall site management will be prepared in accordance with best practice and relevant British Standards, to help to minimise impacts of the construction works. One of the main aims of such method statements will be to minimise noise disruption to local residents during the construction phase.

11.5.6 Regular communication with the local community throughout the construction period will also serve to publicise the works schedule, giving notification to residents regarding periods when higher levels of noise may occur during specific operations, and providing lines of communication where complaints can be addressed.

11.5.7 The appointed Construction Contractor would be encouraged to be a member of the 'Considerate Constructors Scheme' which is an initiative open to all contractors undertaking building work.

11.5.8 As mentioned above, a Final CEMP will be prepared, including setting out provisions to ensure that noise and vibration impacts relating to construction activities are minimised based on the measures outlined above. To assist in the preparation of the Final CEMP, a detailed noise and vibration assessment will be undertaken once the contractor is appointed to identify specific mitigation measures for the Proposed Development (including construction traffic).

Operation and Maintenance

11.5.9 Details of the sound performance and breakout noise from on-site buildings can be found in Appendix 11B Operational Noise Information (PEI Report, Volume III).

11.5.10 The control and monitoring of noise during operation will be secured by a Requirement under Schedule 2 of the draft DCO.

11.5.11 The Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. This will

require operational noise from the generating station to be controlled using BAT, which will be determined through the Environmental Permit application.

11.5.12 The Proposed Development Site will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

Decommissioning

11.5.13 The decommissioning phase is anticipated to involve the removal of all above surface structures. It is assumed that all underground infrastructure would remain in-situ; however, all connection and access points would be sealed or grouted to ensure disconnection. The mitigation measures set out in this section for construction noise and vibration will also be appropriate mitigation during the decommissioning stage.

11.5.14 Decommissioning activities would be conducted in accordance with the appropriate guidance and legislation for the closure of the Proposed Development Site. A Decommissioning Environmental Management Plan (DEMP) will be prepared which would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated.

11.5.15 The DEMP will be produced pursuant to a DCO requirement. The DEMP will consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated. This will include details of how noise and vibration should be managed on the Main Site during decommissioning and demolition, and likely include the mitigation measures set out for construction noise as detailed above.

11.6 Likely Impacts and Effects

Construction

11.6.1 The measured ambient baseline sound levels have been used to determine indicative BS 5228 'ABC' noise threshold categories as shown in Table 11-17 at each of the representative residential NSRs (as detailed in Table 11-2). Where baseline data is not available for a NSR, a category has been assigned using conservative assumptions as follows:

- if evening data is unavailable, it has been categorised as the same as the lowest category of day and night;
- if there is no representative baseline data available, the NSR has been categorised as 'BS 5228 ABC Category A'.

Table 11-17: Measured Free-Field $L_{Aeq,T}$ Noise Levels and Associated 'ABC' Assessment Category - Residential Receptors

RECEPTOR	WEEKDAY DAYTIME 07:00-19:00		WEEKDAY EVENING 19:00 – 23:00		NIGHT 23:00-07:00	
	L_{Aeq} dB	ABC	L_{Aeq} dB	ABC	L_{Aeq} dB	ABC
H1	51	A	46	A	44	B
H2	51	A	-	A	-	A
H3	52	A	50	A	49	C
H5	51	A	49	A	44	B
H6	57	A	51	A	45	B

11.6.2 Construction noise limits have been derived for each NSR in Table 11-18 using the BS5228 ABC methodology (described in Table 11-4). Where baseline data is not available for H2 during the evening, weekend and night-time periods, limits have been assigned using conservative assumptions.

Table 11-18: Indicative Construction Noise Limits for residential NSRs

RECEPTOR	CONSTRUCTION NOISE LIMIT $L_{Aeq,T}$ dB (FREE-FIELD)					
	Weekday daytime 07:00 – 19:00	Evenings 19:00 – 23:00	Night 23:00 – 07:00	Saturday 07:00 – 13:00	Saturday 13:00 – 23:00	Sunday 07:00 – 23:00
H1	65	55	50	65	55	55
H2	65	55	45	65	55	55
H3	65	55	55	65	55	55
H5	65	55	50	65	55	55
H6	65	55	50	65	55	55

11.6.3 For location H4 (Seal Sands Office) which is a non-residential receptor, based on the existing daytime ambient noise levels of 51dB $L_{Aeq,T,}$ the lower cut-off value of 65 dB $L_{Aeq,12hr}$ is applied to derive the construction noise limits based on the BS 5288 '5dB change' method described in Section 11.3. However, as the sensitivity of the NSR is also taken into account when defining the significance of effect, it follows that the different sensitivity of these NSRs needs to be considered when setting the construction noise limit that would lead to potentially significant effects.

11.6.4 The construction noise limit is based on the total noise level (from predicted construction noise plus the lower cut off value) and the sensitivity of the NSR. The different sensitivity of non-residential NSRs needs to be considered when setting the construction noise limit that would lead to potentially significant effects. The office related use of the Seal Sands Office is assigned as being of Medium sensitivity (based upon Table 11-13). To avoid a significant adverse effect, a construction noise limit of

75 dB $L_{Aeq,12hr}$ would apply. This is based on the total noise level from predicted construction noise plus the lower cut off value of 65 dB $L_{Aeq,12hr}$, +10 dB (i.e. 65+10 =75). This would result in a medium magnitude of impact (in accordance with Table 11-6) and resulting a Minor Adverse (Not Significant) effect (for a NSR classed as Medium sensitivity, in accordance with Table 11-14).

Construction Noise Predictions

11.6.5 This section discusses the potential noise and vibration effects on sensitive receptors arising during the construction of the Proposed Development, construction noise effects are assessed for:

- construction of the Production Facility; and
- construction of the Connection Corridors and laydown areas.

11.6.6 Noise levels experienced by NSRs during such works depend upon several variables, the most significant of which are:

- the noise generated by plant or equipment used on site, generally expressed as sound power levels (L_w) or the vibration generated by the plant;
- the periods of use of the plant on site, known as its on-time;
- the distance between the noise/vibration source and the receptor;
- the noise attenuation due to ground absorption, air absorption and barrier effects;
- in some instances, the reflection of noise due to the presence of hard surfaces such as the sides of buildings; and
- the time of day or night the works are undertaken.

11.6.7 The closest residential NSRs to the Main Site are Marsh House Farm (NSR H5) (approximately 1.3 km to the east) and residential properties Dormanstown (NSR H6) (approximately 1.9 km to the south-east).

11.6.8 The Proposed Development Site covers the full area in which construction may take place, including the Connections Corridors. NSRs located near to the Proposed Development Site have been assessed for the likely noise impact during construction. This includes residences at Cowpen Bewley (NSR H1), Kirkleatham (NSR H3) and Seal Sands Office (NSR H4), which are adjacent to the Hydrogen Pipeline Corridor, and the residences at Grangetown (NSR H2), which are adjacent to the Electrical Connection Corridor. Distances between the NSRs and the closest construction areas are included in Table 11-19.

Table 11-19: Distances Between NSRs and the Nearest Construction Activities

RECEPTOR	ADDRESS	APPROXIMATE MINIMUM DISTANCE TO CONSTRUCTION (M)							
		The Main Site	Hydrogen Pipeline Corridor	Water Connections Corridor	CO_2 Export Corridor	Natural Gas Connection Corridor	Other Gases Connection Corridor	Electrical Connection Corridor	Laydown Areas (Main Site)
H1	Manor House Farm, Cowpen Bewley, Billingham	7356	43	7534	8030	8035	7627	7238	2495
H2	Cresswell Road, Grangetown	4263	1291	2113	4184	3238	2408	245	3903
H3	Kirkleatham Village	4224	562	1233	3612	3282	3235	2515	2783
H4	Seal Sands Office	1722	30	1867	2353	2359	1960	1794	809
H5	Marsh House Farm, Warrenby	1312	689	217	662	662	912	636	217
H6	58 Broadway West, Redcar	1849	302	270	1180	1152	1073	605	270

11.6.9 The indicative construction programme for the Proposed Development is set out in Chapter 5: Construction Programme and Management (PEI Report, Volume I). Construction working hours have been outlined in this chapter in Section 11.5.

11.6.10 As exact construction activities are unknown at this stage, indicative predicted noise levels for construction of the Proposed Development have been based on construction methods used for similar energy and pipeline projects. This gives an indication of where construction noise is at risk of leading to potentially significant effects. These levels will be reassessed as information becomes available to predict the noise impacts more accurately – such information will be reported in the ES.

11.6.11 The construction noise predictions have been undertaken using noise data for plant and calculation methodologies from BS 5228 (2014a). As a worst-case approach, it is assumed that all plant and activities take place at the closest approach to each NSR. As the design progresses with the refinement of the Connection Corridors and construction programme, these activities may not occur for any significant duration if at all.

11.6.12 The predicted levels apply to normal weekday daytime (07:00 – 19:00) working, although they could approximate to other time periods where working at the same rate and intensity is proposed. These assume constant operation of equipment throughout the 07:00 – 19:00 working day – this is a worst-case assumption. Details on the noise prediction methodology, including a full list of construction plant and associated sound power levels (L_w) for each construction activity, are presented in Appendix 11A: Construction Noise Assessment Methodology (PEI Report, Volume III).

11.6.13 A summary of indicative noise predictions at residential NSR locations around the Main Site (using H5 and H6, the closest residential NSRs to the proposed works) is presented in Table 11-20 and indicative noise predictions at all residential NSR locations for the pipeline construction works are presented in Table 11-21 and Table 11-22. Free-field noise levels have been predicted to allow subsequent comparison with the ABC categories derived from free-field baseline ambient noise levels at the NSRs.

11.6.14 The indicative predicted total noise levels (predicted construction noise + lower cut off value of 65 dB) for non-residential NSR (H4) are presented in Table 11-23.

11.6.15 The indicative predicted noise levels include 5 dB to 10 dB attenuation (based on guidance in BS 5228 Table B.1 (BSI 2014a) due to the standard mitigation as detailed in Section 11.5.

11.6.16 As advised by BS 5228 (BSI, 2014a), noise levels predicted at distances over 300 m (of which both NSRs for the Main Site are significantly greater than) should be treated with caution due to the increasing importance of meteorological effects. However, given that predicted noise levels at NSRs greater than 300 m from the Main Site are significantly below the LOAEL, the margin of uncertainty is considered insignificant.

11.6.17 With respect to the construction noise for the Connection Corridors, the indicative noise predictions have been undertaken for both Horizontal Directional Drilling

(HDD) (a trenchless construction methodology) and open-cut trenches. It is assumed that the electrical connection corridors will be laid by stripping the topsoil.

11.6.18 Indicative noise predictions have been based on the current proposed laydown locations. The locations of the layout areas are subject to change during more detailed design refinements and will be assessed further during the EIA and reported in the ES.

11.6.19 At this stage in the design process, various options are being considered for the Electrical Connections, which include connection to existing and proposed 66 kilovolt (kV) substations at Teesworks. There is also potential to connect at other substations locally such as Lackenby, Grangetown and Kinkerdale. The final decision on substation choice will be subject to design development and further work based on constructability and electrical network resilience and capacity. The shortest approximate distance between any of the proposed substations and the nearest NSR (H5) is over 1.5 km. The noise impacts associated with such works will be reported in the ES, however, these works are unlikely to result in any significant effects given the distance and the impacts reported for similarly distanced receptors elsewhere in this Chapter.

Table 11-20: Indicative Construction Noise Predictions for the Main Site (for Residential NSRs)

RECEPTOR	PREDICTED FREE-FIELD NOISE LEVEL FOR DAYTIME CONSTRUCTION ACTIVITY dB $L_{Aeq,12h}$			
	PILING AND FOUNDATIONS	BUILDING & GENERAL SITE ACTIVITIES	FIT OUT	LAYDOWN AREA
H5	46-51	46-51	44-49	47-52
H6	45-51	43-48	41-46	45-50

Table 11-21: Indicative Construction Noise Predictions for Pipeline Construction Open Cut Trenches and Electrical Connection Corridor Topsoil Strip (for Residential NSRs)

RECEPTOR	PREDICTED FREE-FIELD NOISE LEVEL FOR DAYTIME CONSTRUCTION ACTIVITY dB $L_{Aeq,12h}$					
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTIONS CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR	ELECTRICAL CONNECTION CORRIDOR
H1	59-64	19-24	19-24	19-24	19-24	26-31
H2	34-39	30-35	24-29	26-31	29-34	48-53
H3	41-46	35-40	25-30	26-31	26-31	38-43
H5	39-44	49-54	40-45	40-45	37-42	44-49
H6	46-51	46-51	35-40	35-40	36-41	59-64

Table 11-22: Indicative Construction Noise Predictions for Pipeline Construction Trenchless (Horizontal Directional Drilling) (Residential NSRs)

RECEPTOR	PREDICTED FREE-FIELD NOISE LEVEL FOR DAYTIME CONSTRUCTION ACTIVITY dB $L_{Aeq,12h}$				
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTIONS CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR
H1	68-73	23-28	23-28	23-28	23-28
H2	39-44	34-39	28-33	31-36	33-38

RECEPTOR	PREDICTED FREE-FIELD NOISE LEVEL FOR DAYTIME CONSTRUCTION ACTIVITY dB $L_{Aeq,12h}$				
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTIONS CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR
H3	46-51	39-44	30-35	30-35	31-36
H5	44-49	54-59	44-49	44-49	42-47
H6	51-56	52-57	39-44	40-45	40-45

Table 11-23: Indicative Construction Noise Predictions for Non-Residential NSRs (H4)

ACTIVITY	PREDICTED CONSTRUCTION NOISE +EXISITNG AMBIENT NOISE LEVEL, $L_{Aeq,T}$ dB (TOTAL NOISE)	
	H4	DIFFERENCE COMPARED WITH EXISTING AMBIENT NOISE LEVEL (65DB)
The Main Site		
Piling and Foundations	65	0
Buildings & General Site Activities	65	0
Fit Out	65	0
Laydown	65	0
Connection Corridors		
Hydrogen Pipeline Corridor (Open Cut)	67-70	2-5
Water Connections (Open Cut)	65	0
CO_2 Export Corridor (Open Cut)	65	0
Natural Gas Connection Corridor (Open Cut)	65	0
Other Gases Connection Corridor (Open Cut)	65	0
Electrical Connection Corridor (Topsoil Strip)	65	0
Hydrogen Pipeline Corridor (HDD)	72-77	7-12
Water Connections (HDD)	65	0
CO_2 Export Corridor (HDD)	65	0
Natural Gas Connection Corridor (HDD)	65	0
Other Gases Connection Corridor (HDD)	65	0

Construction Noise Effects

Daytime Effects

11.6.20 The effects of the predicted daytime construction noise levels for the Main Site (as presented in Table 11-20 for H5 and H6) and the Connection Corridors (as presented

in Table 11-21 and Table 11-22 for residential NSRs) and in Table 11-23 for the non-residential receptor H4 have been classified by considering the construction noise thresholds in Table 11-18 and paragraph 11.6.3 and using the semantic scales in Table 11-5, Table 11-6, Table 11-13 and Table 11-14. These effects are summarised in Table 11-24, Table 11-25 and Table 11-26.

Table 11-24: Indicative Construction Noise Effects for The Main Site - Daytime

RECEPTOR	CLASSIFICATION OF EFFECTS			
	Piling and Foundations	Building & General Site activities	Fit Out	Laydown Areas
H4	Negligible	Negligible	Negligible	Negligible
H5	Negligible	Negligible	Negligible	Negligible
H6	Negligible	Negligible	Negligible	Negligible

Table 11-25: Indicative Construction Noise Effects for Pipeline Construction -Daytime - Open Cut Trench

RECEPTOR	CLASSIFICATION OF EFFECTS					
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTION CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR	ELECTRICAL CONNECTION CORRIDOR
H1	Minor	Negligible	Negligible	Negligible	Negligible	Negligible
H2	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
H3	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
H4	Minor	Negligible	Negligible	Negligible	Negligible	Negligible
H5	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
H6	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

Table 11-26: Indicative Construction Noise Effects for Pipeline Construction Daytime - Trenchless - HDD

RECEPTOR	CLASSIFICATION OF EFFECTS				
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTION CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR
H1	Major	Negligible	Negligible	Negligible	Negligible
H2	Negligible	Negligible	Negligible	Negligible	Negligible
H3	Negligible	Negligible	Negligible	Negligible	Negligible
H4	Moderate	Negligible	Negligible	Negligible	Negligible

RECEPTOR	CLASSIFICATION OF EFFECTS				
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTION CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR
H5	Negligible	Negligible	Negligible	Negligible	Negligible
H6	Negligible	Negligible	Negligible	Negligible	Negligible

11.6.21 Construction noise effects at all receptors during construction works at the Main Site are predicted to be Negligible (Not Significant) during the daytime period due largely to the distances between the works and NSRs.

11.6.22 There is the potential for Moderate and Major Adverse (Significant) noise effects during daytime connection corridor construction at the following NSRS:

- NSRs H1 and H4 during the daytime for trenchless construction of the Hydrogen Pipeline Corridor,

11.6.23 Otherwise, all connection corridor construction effects are minor or negligible adverse (Not Significant) during the daytime.

Evening and Night-time Effects

11.6.24 It will be necessary for some construction activities to take place continuously, including evening and night periods, during peak construction times of the Proposed Development, although the exact nature of the works is uncertain at this stage. Noise limits for residential NSRs during non-weekday daytime periods have been defined in Table 11-18. The effects of the indicative construction noise levels during the evening and weekends, if the same intensity of working as for the daytime is assumed as worst case, are shown in Table 11-27 for residential NSRs closest to the Main Site (NSRs H5 and H6); Table 11-28 and Table 11-29 show the effects of the indicative construction noise levels during the evening and weekends for all NSRs for the open cut and the HDD construction methods respectively. It is assumed the office building at NSR H4 will not be used during the evening and weekend and so is not included in these tables.

Table 11-27: Indicative Construction Noise Effects for the Main Site - Evening and Weekends - Nearest Residential NSRs

RECEPTOR	CLASSIFICATION OF EFFECTS			
	PILING AND FOUNDATIONS	BUILDING & GENERAL SITE ACTIVITIES	FIT OUT	LAYDOWN AREAS
H5	Minor	Minor	Negligible	Minor
H6	Minor	Negligible	Negligible	Minor

Table 11-28: Indicative Construction Noise Effects for Pipeline Construction - Evening and Weekends - Open Cut Trench

RECEPTOR	CLASSIFICATION OF EFFECTS					
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTION CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR	ELECTRICAL CONNECTION CORRIDOR
H1	Major	Negligible	Negligible	Negligible	Negligible	Negligible
H2	Negligible	Negligible	Negligible	Negligible	Negligible	Minor
H3	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
H5	Negligible	Minor	Negligible	Negligible	Negligible	Negligible
H6	Minor	Minor	Negligible	Negligible	Negligible	Major

Table 11-29: Indicative Construction Noise Effects for Pipeline Construction - Evening and Weekends - Trenchless

RECEPTOR	CLASSIFICATION OF EFFECTS				
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTION CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR
H1	Major	Negligible	Negligible	Negligible	Negligible
H2	Negligible	Negligible	Negligible	Negligible	Negligible
H3	Minor	Negligible	Negligible	Negligible	Negligible
H5	Negligible	Moderate	Negligible	Negligible	Negligible
H6	Moderate	Moderate	Negligible	Negligible	Negligible

11.6.25 Comparison of the predicted daytime noise levels for construction on the Main Site against the construction noise limits for evening and weekend working indicate Negligible or Minor Adverse effects (Not Significant) for all NSRs.

11.6.26 There is the potential for Moderate and Major Adverse (Significant) noise effects during evening and weekend connection corridor construction at the following NSRs:

- At NSR H1 for both open cut and trenchless construction methods of the Hydrogen Pipeline Corridor, NSRs H6 for trenchless construction methods of the Hydrogen Pipeline Corridor and construction of the Electrical Connections Corridor.

11.6.27 Otherwise, all connection corridor construction effects are minor or negligible adverse (Not Significant) during the evening and weekend.

11.6.28 The effects of the indicative construction noise levels during the night, if the same intensity of working as for the daytime is assumed as worst case, are shown in Table 11-30 for residential NSRs closest to the Main Site and Table 11-31 and Table 11-32 for all NSRs, for the open cut and the HDD construction methods respectively. It is assumed that the office building at NSR H4 will not be used during the night-time and so is not included in these tables.

Table 11-30: Indicative Construction Noise Effects for the Main Site - Night-Time - Nearest Residential NSRs

RECEPTOR	CLASSIFICATION OF EFFECTS			
	PILING AND FOUNDATIONS	BUILDING & GENERAL SITE ACTIVITIES	FIT OUT	LAYDOWN AREA
H5	Moderate	Moderate	Minor	Moderate
H6	Moderate	Minor	Minor	Minor

Table 11-31: Indicative Construction Noise Effects for Pipeline Construction - Night-Time - Open Cut Trench

RECEPTOR	CLASSIFICATION OF EFFECTS					
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTION CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR	ELECTRICAL CONNECTION CORRIDOR
H1	Major	Negligible	Negligible	Negligible	Negligible	Negligible
H2	Negligible	Negligible	Negligible	Negligible	Negligible	Major
H3	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
H5	Negligible	Moderate	Minor	Minor	Negligible	Minor
H6	Moderate	Moderate	Negligible	Negligible	Negligible	Major

Table 11-32: Indicative Construction Noise Effects for Night-Time - Trenchless - HDD

RECEPTOR	CLASSIFICATION OF EFFECTS				
	HYDROGEN PIPELINE CORRIDOR	WATER CONNECTION CORRIDOR	CO_2 EXPORT CORRIDOR	NATURAL GAS CONNECTION CORRIDOR	OTHER GASES CONNECTION CORRIDOR
H1	Major	Negligible	Negligible	Negligible	Negligible
H2	Minor	Negligible	Negligible	Negligible	Negligible
H3	Minor	Negligible	Negligible	Negligible	Negligible
H5	Minor	Major	Minor	Minor	Negligible
H6	Major	Major	Negligible	Minor	Negligible

11.6.29 Comparison of the predicted daytime noise levels for construction on the Main Site against the construction noise limits for night-time working indicate Moderate Adverse (Significant) effects during piling and foundation works for NSRs H5 and H6 and during building and general site activities and laydown areas for NSR H5. All other construction activities on the Main Site are predicted to result in Minor Adverse (Not Significant) effects at all NSRs.

11.6.30 There is the potential for Moderate and Major Adverse (Significant) noise effects during connection corridor construction at night at the following NSRS:

- At NSRs H5 and H6 for Main Site construction works, NSRs H1 and H6 for the Hydrogen Pipeline Corridor (both open cut and trenchless construction methods), NSRs H5 and H6 for the Water Connections Corridor (both open cut and trenchless construction methods) and NSR H2 during the construction of the Electrical Connection Corridor.

11.6.31 Otherwise, all Connection Corridor construction effects are Minor or Negligible Adverse (Not Significant).

11.6.32 Major Adverse (Significant) effects at some of the assessed receptors when working at the closest approach. This is largely due to the short distance from these properties to the Connection Corridors. It is unlikely that the noisiest construction activities associated with the construction of the pipelines will take place as close to properties as assumed in the calculations for a significant period and further design refinements will better define the Connection Corridors and increase the separation distance to identified sensitive noise receptors. Also, as the site works progress and move further away from NSRs, adverse effects will reduce. This should therefore reduce the predicted disruption.

11.6.33 Construction activities taking place outside normal working hours will need to be planned, managed and controlled appropriately so they do not exceed the limits for construction noise that have been defined in Table 11-18. Provided noise limits are not exceeded, construction activities outside of normal working hours can be considered as having a Minor Adverse effect or less (Not Significant). Potential measures to ensure that appropriate embedded mitigation is in place during the works have already been discussed in Section 11.5.

Construction Traffic Noise

11.6.34 The potential changes in road traffic noise as a result of the Proposed Development have been considered by calculating the BNL at 10 m from the road and comparing the change.

Table 11-33: Changes in Road Traffic Noise due to the Construction of the Proposed Development

LINK	'WITHOUT' PROPOSED DEVELOPMENT CONSTRUCTION FLOWS 2026			'WITH' PROPOSED DEVELOPMENT CONSTRUCTION FLOWS 2026			CHANGE IN BNL, DB	MAGNITUDE OF IMPACT
	AAWT	% HGV	SPEED (km/h)	AAWT	% HGV	SPEED (km/h)		
A1085 Trunk Road, 100 m east of Ennis Road	14,003	7.9	60	14,292	7.7	60	0.1	Very Low
A1085 Trunk Road, 1345 m south of West Coatham Lane	17,194	10.8	60	18,183	10.8	60	0.2	Very Low
A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	13,273	7.2	50	13,418	7.1	50	0.0	No Change
A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	18,324	14.0	97	19,314	13.8	97	0.2	Very Low
A1085 Broadway, 235 m east of Birchington Avenue	9,377	7.7	50	9,615	7.5	50	0.1	Very Low
A1380 High Street, 50 m east of Lackenby Lane	11,069	9.1	50	11,126	9.0	50	0.0	No Change
A66, 140 m east of Whitworth Road	23,115	20.2	80	23,792	19.8	80	0.1	Very Low
A1046 Port Clarence Road, 20 m north of Beech Terrace	9,718	12.1	50	9,825	12.2	50	0.0	No Change
A178 Seaton Carew Road, 535 m north of Huntsman Drive	9,813	13.2	81	10,028	13.3	81	0.1	Very Low
Unnamed Road, 725 m east of A178 Seaton Carew Road	5,256	19.0	81	5,507	18.8	81	0.2	Very Low
A1053 Greystone Road	17,024	10.3	97	17,179	10.5	97	0.0	No Change

LINK	'WITHOUT' PROPOSED DEVELOPMENT CONSTRUCTION FLOWS 2026			'WITH' PROPOSED DEVELOPMENT CONSTRUCTION FLOWS 2026			CHANGE IN BNL, DB	MAGNITUDE OF IMPACT
	AAWT	% HGV	SPEED (km/h)	AAWT	% HGV	SPEED (km/h)		
A174 (West of Greystone Roundabout)	37,578	6.5	97	37,676	6.6	97	0.0	No Change
B1275 Belasis Avenue	2,900	3.1	50	3,008	3.6	50	0.2	Very Low
A1185 (west of A178 Seaton Carew Road)	6,687	19.4	81	6,757	19.7	81	0.0	No Change

11.6.35 Table 11-31 shows either no change or very low change in road traffic noise due to traffic flows along the construction traffic routes of the Proposed Development. This will result in Negligible (Not Significant) effects at local residential NSRs. Based upon the above, no further specific mitigation measures are proposed in addition to those as detailed in Section 11.5.

Construction Vibration from the Main Site

11.6.36 The level of vibration impact at different receptors will be dependent upon a number of factors including the distance between the works and receptors, ground conditions, the nature and method of works required close to receptors and the specific activities being undertaken at any given time.

11.6.37 There are no residential receptors within proximity to the Main Site to be significantly affected by construction vibration. Due to distances of at least 1.3 km to residential receptors vibration effects are likely to be Negligible (Not Significant).

Construction Vibration from the Connection Corridors

11.6.38 The Hydrogen Pipeline Corridor are in proximity (less than 100 m) to NSRs H1 and H4. There is the potential for some vibration impacts upon NSRs during construction of the pipelines. Whilst it is considered unlikely that most typical construction working routines will generate levels of vibration above which building damage would be expected to be sustained (subject to final plant and working requirements), there is the potential that vibration impacts could cause annoyance to occupants and exceed the LOAEL and SOAEL as set out in Section 11.3 unless appropriate control measures are applied.

11.6.39 If heavy earthworks, vibratory rollers or other significant vibration producing operations are proposed for use in close proximity to any sensitive buildings during pipeline construction then there is the potential for significant effects from construction vibration. Further consideration will be given to potential impacts and construction methods as the Connection Corridors are refined and further assessment will be undertaken and reported in the ES.

Operation

11.6.40 Operational noise modelling has been undertaken using available sound data for the Proposed Development plant and information based on similar projects. The operational noise assessment has been based on the Case A data as this is considered the worst-case for noise. The preliminary assessment presented below sets out the potential impacts and effects associated with the operation of the Production Facility. An updated assessment will be prepared and included in the ES.

11.6.41 The following assumptions have been made when undertaking the operational noise modelling:

- the Production Facility will operate continually at full load, 24 hours a day;
- sound power levels (L_w) used in modelling of previous similar projects have been inputted for all principal noise emitting buildings/elements (air inlet filters,

electrical buildings, transformers, workshops etc.); these sound power levels have been supplemented by octave band data from similar projects;

- enclosed sound sources have been modelled as steel clad buildings with an internal sound pressure level of 85 dB; and
- corrections for tonality, impulsivity, and intermittency have not been applied on the assumption that these potential features will be designed out of the Proposed Development during the detailed design phase by the selection of appropriate plant, building cladding louvres and silencers/attenuators.

11.6.42 For the NSRs assessed for operational noise (H4, H5 and H6), there are other industrial sound sources closer than the Proposed Development Site. However, a +3 dB character correction for other distinctive character has been included at this stage as a conservative approach for NSR H5 as there is the potential that the Proposed Development may be identifiable in the acoustic environment once operational. However, the predicted indicative sound levels produced by the Production Facility are below Background Sound Levels at NSR H4 and NSR H6 as shown in Table 11-35. It is therefore not expected that noise from operation of the Production Facility will be distinctive above the residual acoustic environment at these NSRs. Therefore, no correction has been applied for other sound characteristics.

11.6.43 Details of the noise source sound power level (*L*w) data, the settings used in the noise modelling software and the list of assumptions used are presented in Appendix 11B: Operational Noise Information (PEI Report Volume III).

11.6.44 The predicted free-field operational specific sound levels at the NSRs around the Production Facility are presented in Table 11-34. The results presented are for the storey of the residence with the highest predicted level. Assuming continual 24-hr operation, the predicted noise levels could apply to 1-hour daytime or 15-minute night-time BS 4142 assessment periods.

Table 11-34: Indicative Predicted Operational Sound Levels

RECEPTOR	PREDICTED OPERATIONAL SPECIFIC SOUND LEVEL $L_{Aeq,1h,}$ dB
H4	42
H5	45
H6	41

11.6.45 The daytime and night-time BS 4142 assessments are presented in Table 11-35. In addition, the magnitude of impact and effect classification has been included based upon the BS4142 assessment outcomes, with reference to the semantic scales in Table 11-11, Table 11-13 and Table 11-14.

Table 11-35: Indicative BS 4142 Assessment

RECEPTOR	NSR H4	NSR H5		NSR H6	
TIME PERIOD	DAYTIME	DAYTIME	NIGHT-TIME	DAYTIME	NIGHT-TIME
Specific sound level Ls ($L_{Aeq,Tr}$), dB	42	45	45	41	41
Acoustic feature correction, dB	+0	+3	+3	+0	+0
Rating level ($L_{Ar,Tr}$), dB	42	48	48	41	41
Representative background sound level ($L_{A90,T}$), dB	53	39	36	45	43
Excess of rating level over background sound level ($L_{Ar,Tr}$ - $L_{A90,T}$), dB	-11	+9	+12	-4	-2
BS 4142:2014 assessment outcome	Low impact	Significant Adverse impact	Significant Adverse impact	Low impact	Low impact
Magnitude of impact (assigned from Table 11-11)	Very low	Medium	Medium/ High	Very low	Very low
Receptor Sensitivity	Medium	High	High	High	High
Classification of effect (assigned from Table 11-14)	Negligible	Moderate	Moderate /Major	Negligible	Negligible

11.6.46 For NSRs H4 and H6, the indicative BS 4142 rating level is below the background sound levels. Predicted effects are therefore categorised as negligible (Not Significant) with no specifically designed mitigation in place. The predicted noise levels at NSRs are significantly below the LOAEL (+5 dB) for residential receptors at both NSRs H4 and H6 during the day and night for the BS 4142 assessment comparison of rating levels and background sound levels. For NSR H5, the indicative BS 4142 rating level is above the LOAEL (+5dB) and there is the potential for Moderate Adverse (Significant) effects in the daytime and Moderate/Major Adverse (Significant) effects during night-time periods, subject to consideration of context as below.

Consideration of Context Working

11.6.47 There are other industrial noise sources in the vicinity of the selected NSRs. Several new industrial sources will be introduced by the Proposed Development, noting that

the area has a history of industrial noise sources, including from the former Redcar Steelworks site. This is likely to mean that many residents in the local communities are already accustomed to an industrial sound environment.

11.6.48 NSR H5 (Marsh House Farm) is representative of a single dwelling rather than a receptor group. There are significant effects only at this single dwelling.

11.6.49 Table 11-36 presents the existing ambient sound levels and future predicted specific sound levels during the operation of the Proposed Development at NSR H5 (Marsh House Farm) which is the closest residential receptor to the Main Site. Table 11-36 also presents the future predicted ambient sound levels (assuming constant operation of the Production Facility) and compares them to the BS 8233:2014 and WHO 'Guidelines for Community Noise' recommended indoor ambient sound level for bedrooms and sleeping. The recommended internal criterion is 30 dB $L_{Aeq,8h}$ at night and 35 dB $L_{Aeq,16h}$ during the day, which would be equivalent to an external criterion of 45 dB $L_{Aeq,8h}$ and 50 dB $L_{Aeq,16h}$ assuming open bedroom windows for ventilation. The predicted change in ambient sound levels can also be contextualised in accordance with Table 11-12.

Table 11-36: Comparison of Ambient Sound Levels at NSR H5

TIME PERIOD	EXISTING AMBIENT SOUND LEVEL $L_{Aeq,T,}$ dB	WHO 'GUIDELINES FOR COMMUNITY NOISE' EXTERNAL CRITERION	EXISTING DIFFERENCE FROM WHO CRITERION	PREDICTED SPECIFIC SOUND LEVEL, L_s ($L_{Aeq,T}$) dB	LOGARITHMIC SUM OF EXISTING AMBIENT SOUND LEVEL WITH PREDICTED SPECIFIC SOUND LEVEL, $L_{Aeq,T,}$ dB	PREDICTED INCREASE IN AMBIENT SOUND LEVEL DUE TO THE PROPOSED DEVELOPMENT, $L_{Aeq,T,}$ dB	MAGNITUDE OF IMPACT OF NOISE CHANGE USING IEMA GUIDELINES AS PRESENTED IN TABLE 11-12.	PREDICTED FUTURE DIFFERENCE FROM WHO CRITERION
Daytime (16hr)	51	50	+1	45	52	+1	Low	+2
Night-time (8hr)	44	45	-1	45	48	+4	Medium	+3

11.6.50 As shown in Table 11-36, there is a predicted increase in the daytime ($L_{Aeq,16hr}$) ambient sound level of +1 dB and during the night-time the ambient sound level ($L_{Aeq,8hr}$) is predicted to increase by +4 dB. These predicted levels of increase in ambient sound would be classified as low for daytime period and medium for the night-time period. WHO 'Guidelines for Community Noise' recommend indoor ambient sound levels for resting during the daytime and sleeping at night-time.

11.6.51 The recommended internal criterion is 35 dB $L_{Aeq,16hr}$ during the day 30 dB $L_{Aeq,8hr}$ at night, which would be equivalent to an external criterion of 50 dB $L_{Aeq,16hr}$ and 45 dB $L_{Aeq,8hr}$ respectively assuming open windows for ventilation. During the day this criterion is exceeded without the Proposed Development and there is an increase of 1 dB in ambient sound level due to noise from the Proposed Development. This is below the level of change in a sound level that would be just perceptible under normal environmental conditions. In accordance with Table 11-12, the magnitude of impact due to noise level changes from the Proposed Development is categorised as Low during the daytime and the significance of effect is assigned Minor Adverse (Not Significant) from Table 11-14.

11.6.52 At night, the criterion is not exceeded without the Proposed Development however, there is an increase of 4 dB, due to noise from the Proposed Development. In accordance with Table 11-12, the magnitude of impact due to noise level changes from the Proposed Development is categorised is Medium, and the significance of effect assigned from Table 11-14 is Moderate Adverse (Significant) effect.

11.6.53 Based on the above BS 4142 assessment, and the aim to mitigate significant adverse effects, potential options to reduce noise levels at NSR H5 are discussed in Section 11.7.

Decommissioning

11.6.54 The full details of the decommissioning of the Production Facility are uncertain at this time. However, the assessment of the decommissioning has been undertaken using the same methodology as the construction assessment and at this stage assume the same construction noise limits will apply for the decommissioning work. The mitigation measures set out in Section 11.5 for construction noise and vibration will also be appropriate mitigation during the decommissioning stage. The indicative predicted decommissioning noise levels include 5 dB to 10 dB attenuation (based on guidance in BS 5228 Table B.1 (BSI 2014a) due to the standard mitigation as detailed in Section 11.5.

11.6.55 The potential decommissioning noise levels from the demolition of the Main Site have been predicted at the closest representative NSRs as presented in Table 11-37 to Table 11-40.

Table 11-37: Indicative Predicted Daytime Decommissioning Noise Level - Residential NSRs

RECEPTOR	PREDICTED DECOMMISSIONING NOISE LEVEL $L_{Aeq,12h,}$ dB	CLASSIFICATION OF EFFECTS
H5	41-46	Negligible
H6	39-44	Negligible

Table 11-38: Indicative Predicted Daytime Decommissioning Noise Level – Non-residential NSRs

RECEPTOR	PREDICTED DECOMMISSIONING NOISE +EXISTING AMBIENT NOISE LEVEL, $L_{Aeq,T}$ dB (TOTAL NOISE)	DIFFERENCE COMPARED WITH EXISTING AMBIENT NOISE LEVEL (65DB)	CLASSIFICATION OF EFFECTS
H4	65	0	Negligible

Table 11-39: Indicative Predicted Evening/ Weekend Decommissioning Noise Level -Residential NSRs

RECEPTOR	PREDICTED DECOMMISSIONING NOISE LEVEL $L_{Aeq,12h,}$ dB	CLASSIFICATION OF EFFECTS
H5	41-46	Negligible
H6	39-44	Negligible

Table 11-40: Indicative Predicted Night-time Decommissioning Noise Level - Residential NSRs

RECEPTOR	PREDICTED DECOMMISSIONING NOISE LEVEL $L_{Aeq,12h,}$ dB	CLASSIFICATION OF EFFECTS
H5	41-46	Minor
H6	39-44	Negligible

11.6.56 During decommissioning of the Main Site, Negligible (Not Significant) noise effects are predicted during the daytime. If the decommissioning work were to be undertaken during the evening/weekend, at the same intensity as the daytime activities, Negligible (Not Significant) effects would be expected at all NSRs. If decommissioning works were to be undertaken during the night-time, at the same

intensity as the daytime activities, Minor Adverse (Not Significant) effects at NSR H5, and Negligible (Not Significant) effects at NSR H6 would be expected.

11.7 Additional Mitigation Measures

Construction

11.7.1 The working methods and extents of the Connection Corridors are currently being refined, noting that evening, weekend and night-time working will be kept to a minimum. In addition, during pipeline construction there is the potential for some vibration effects at NSRs H1 and H4 adjacent to the Hydrogen Pipeline Corridor.

11.7.2 The preferred approach for controlling construction noise and vibration is to reduce levels at source where possible, but with due regard to practicality. Sometimes a greater noise or vibration level may be acceptable if the overall construction time, and therefore length of disruption, is reduced.

11.7.3 The list of noise control measures presented within Section 11.5 provides a detailed but not exhaustive list of construction noise management measures. The measures listed will be implemented and supplemented via the CEMP as necessary, with further bespoke measures identified through further detailed assessment.

11.7.4 In addition to the noise control measures presented within Section 11.5 where significant construction effects are predicted, additional noise-control equipment such as jackets on pneumatic drills, acoustic covers on compressors, shrouds on piling rigs and cranes will be implemented. The use of temporary barriers or screens can also provide additional mitigation. These additional mitigation measures can provide up to 15 to 20 dB sound reduction (based on Table B.1 in BS 5228. These additional methods, along with further bespoke measures identified through further detailed assessment, will be detailed in the final CEMP once the final construction plant and methods have been confirmed.

11.7.5 Residual effects after mitigation are described in Section 11.9.

Operation

11.7.6 Based on the current assessment, potential significant adverse effects are predicted during the daytime and night-time periods at NSR H5.

11.7.7 The assessment has assumed that potential noise of a tonal, impulsive or intermittent nature will be designed out of the Proposed Development during the detailed design phase by the selection of appropriate plant, building cladding, louvres and silencers/attenuators as necessary. However, a +3 dB correction for distinctive character has been applied to the specific sound levels predicted from the Production Facility, for NSRs with the potential to identify the new sound source in their existing acoustic environment.

11.7.8 Based on the worst-case results presented in Table 11-35 mitigation would be required to avoid significant adverse effects from operational noise. Table 11-41 outlines the overall range of attenuation to plant items required to achieve the daytime and night-time LOAEL of *rating level* no greater than +5 dB above the defined

representative *background sound level* at NSR H5. If this is achieved, it is considered there will not be adverse impact.

Table 11-41: Required Attenuation of Plant during Operation

PLANT ITEM	PLANT ITEM NUMBER	ATTENUATION REQUIRED TO ACHIEVE A RATING LEVEL NO GREATER THAN + 5 DB ABOVE THE DEFINED REPRESENTATIVE BACKGROUND SOUND LEVEL (IN BOTH DAYTIME AND NIGHT-TIME) DB $L_{AEQ,T}$
Air Coolers	EA-113003 EA-13005 EA-11108 EA-112004 EA-119001	10
Cooling water Train	X-124001	8
Fired Heater	HPH-111001	5
Compressor	K-114001 K-110001	5
H2 Compressor	K-115001A K-115001B	5
Note: These reductions apply to both Phase 1 and Phase 2.		

11.7.9 Mitigation measures and general principles to achieve this will be considered further at the ES stage and during detailed design, may include, but not limited to the following depending on the potential benefits achieved from such measures:

- reducing the breakout noise from plant through use of enhanced enclosures, or potentially containing them within a building;
- screening or enclosing the compressors or other equipment; or
- orientation of plant within the site to provide screening of low-level noise sources by other buildings and structures, or orientating fans and the air inlets away from sensitive receptors.

11.7.10 The levels of sound reduction identified in Table 11-41 can be achieved either through reduction of sound power level at source of the plant procured or the measures listed in this Section. During detailed design of the Proposed Development, it may be desirable or more practical to apply higher attenuation to some plant items/buildings than listed in Table 11-41 and to reduce the attenuation applied to other plant items/buildings and still achieve noise levels below the LOAEL.

11.7.11 Operational noise from the generating station to be controlled using the application of BAT. Further assessment of these measures will be made during detailed design of the Proposed Development.

11.7.12 Residual effects after mitigation are described in Section 11.9 and are considered to be Not Significant if noise levels are reduced to the LOAEL for residential receptors (no greater than +5 dB excess of rating level over the background sound level).

Decommissioning

11.7.13 As no significant effects are predicted, no further mitigation measures are required for the decommissioning of the Proposed Development.

11.8 Limitations and Difficulties

Construction

11.8.1 Detailed construction information is not yet available and therefore this preliminary assessment draws upon preliminary design information, experience and assessments undertaken for other similar projects. The assessment is therefore indicative. Further assessment has been identified to ensure that appropriate mitigation is developed to achieve the limit. This and other mitigation measures detailed in Section 11.5 and Section 11.7 will be included in the CEMP to minimise construction noise and vibration effects. However, it is inevitable, as with most construction projects, that some temporary adverse noise effects will be experienced.

11.8.2 It should also be noted that the detail for the proposed connection corridor is to be further refined. At present, construction effects are predicted on the assumption that construction activities may occur at the closest point on the corridor to each NSR (as a worst case), but the refinement of the corridor has the potential to increase the distance from the works to some NSRs. This will reduce the impact and associated effects.

11.8.3 Details of the construction plant associated sound power levels (L_w) and assumed % on time for each construction activity are presented in Appendix 11A: Construction Noise Assessment Methodology (PEI Report, Volume III).

Operation

11.8.4 A list of assumptions made during the noise modelling and operational assessment for the operational Proposed Development are presented in paragraph 11.6.41 and detailed in Appendix 11B: Operational Noise Information (PEI Report, Volume III). Further assessment will be undertaken with more detailed design information during the EIA, to ensure that appropriate noise limit values are achieved.

Decommissioning

11.8.5 Detailed information regarding the decommissioning works is not available at this stage. The preliminary assessment has been undertaken based on typical site clearance activities and demolition plant on the Main Site.

11.9 Residual Effects and Conclusions

11.9.1 A summary of the residual noise effects, assuming the implementation of all appropriate mitigation to reduce noise and vibration during construction, operation and decommissioning of the Proposed Development is presented in Table 11-42.

11.9.2 Table 11-42 indicates that with the specification of additional mitigation measures associated with the construction, operation and decommissioning of the Proposed Development, it is currently anticipated that noise and vibration effects can be reduced to non-significant levels. This preliminary assessment will be updated, and the results presented in the ES.

Table 11-42: Residual Noise Effects

DEVELOPMENT STAGE	ENVIRONMENTAL EFFECT (FOLLOWING DEVELOPMENT DESIGN AND IMPACT AVOIDANCE MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S) (LT/ MT/ ST AND P/ T AND D/ IN)
Construction	Noise effects during construction on the Main Site.	Negligible (Not Significant) at the nearest residential NSRs (NSRs H5 and H6) during the daytime. Up to Minor Adverse (Not Significant) at the nearest residential NSRs (NSRs H5 and H6) during the evening and weekend period. Up to Moderate Adverse (Significant) at the nearest residential NSRs (NSRs H5 and H6) during night-time.	Further detailed assessment to inform the ES and CEMP particularly regarding working outside of daytime working hours.	Minor Adverse or less (Not Significant) on the basis that similar construction techniques to those used in indicative calculations are used.	St, T, D
Construction	Noise effects during construction of the Connection Corridors.	Up to Major Adverse (Significant) effects at the NSRs H1 and H4 during the daytime for trenchless construction of the Hydrogen Pipeline Corridor. Up to Major Adverse (Significant) effects during the evening and	Further detailed assessment to inform the ES and CEMP, particularly regarding working outside of daytime working hours.	Minor Adverse or less (Not Significant) on the basis that BS 5228 ABC noise limits are met.	St, T, D

DEVELOPMENT STAGE	ENVIRONMENTAL EFFECT (FOLLOWING DEVELOPMENT DESIGN AND IMPACT AVOIDANCE MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S) (LT/ MT/ ST AND P/ T AND D/ IN)
		weekend period at NSR H1 for both open cut and trenchless construction methods of the Hydrogen Pipeline Corridor, NSRs H6 for trenchless construction methods of the Hydrogen Pipeline Corridor and construction of the Electrical Connections Corridor. Up to Major Adverse (Significant) effects during the night-time period, at NSRs H5 and H6 for Main Site construction works, NSRs H1 and H6 for the Hydrogen Pipeline Corridor (both open cut and trenchless construction methods), NSRs H 5 and H6 for the Water Connections Corridor (both open cut and trenchless construction methods) and NSR			

DEVELOPMENT STAGE	ENVIRONMENTAL EFFECT (FOLLOWING DEVELOPMENT DESIGN AND IMPACT AVOIDANCE MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S) (LT/ MT/ ST AND P/ T AND D/ IN)
		H2 during the construction of the Electrical Connection Corridor			
Construction	Noise effects due to construction traffic.	Negligible (Not Significant).	None.	Negligible (Not Significant).	St, T, D
Construction	Vibration effects during Pipeline Construction	Potential for Moderate Adverse (Significant) effects at NSRs H1 and H4	Further detailed assessment to inform the ES and CEMP avoid the use of vibratory plant in proximity to NSRs where possible	Minor Adverse or less (Not Significant)	St, T, D
Operation	Operation of the Production Facility.	Up to Moderate Adverse (Significant) effects at the nearest NSR. (NSR H5) during the daytime and Moderate/Major Adverse (Significant) effects at H5 during the night-time. Negligible Adverse (Not Significant) effects at all other receptors	Limits on noise emissions from plant and equipment at source. Further detailed assessment at design stage in conjunction with design engineers to further reduced adverse effects where possible.	Up to Moderate Adverse at NSR H5 (Significant) however can be reduced to Minor Adverse or less (Not Significant) on the basis that sound source limits are achievable.	Lt, P, D

DEVELOPMENT STAGE	ENVIRONMENTAL EFFECT (FOLLOWING DEVELOPMENT DESIGN AND IMPACT AVOIDANCE MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S) (LT/ MT/ ST AND P/ T AND D/ IN)
				Negligible Adverse (Not Significant) effects at all other receptors	
Decommissioning	Noise effects during decommissioning of the Main Site.	Negligible (Not Significant) at the nearest NSRs (NSRs H4, H5 and H6) during the daytime. Negligible (Not Significant) at the nearest residential NSRs (NSRs H5 and H6) during the evening and weekend period. During the night-time period, Negligible (Not Significant at NSR H6 and Minor Adverse (not Significant) at NSR H5.	Further detailed assessment and DEMP prior to decommissioning, particularly regarding working outside of daytime working hours.	Negligible or less (Not Significant) on the basis that similar decommissioning techniques to those used in indicative calculations are used.	St, T, D

Note: Lt = long term, Mt = medium term, St = short term, P = permanent, T = temporary, D = direct and In = indirect

11.10 References

- Department for Energy and Climate Change (2011b).
- British Standards Institute (1991) BS 7445-2 – Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use.
- British Standards Institute (1993) BS 7385-2 – Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration.
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12 ECOLOGY AND NATURE CONSERVATION (INCLUDING AQUATIC ECOLOGY)

12.1 Introduction

12.1.1 This chapter of the Preliminary Environmental Information (PEI) Report identifies the potential impacts and effects on terrestrial and aquatic (freshwater, i.e., above Mean High Water Springs (MHWS)) ecology and nature conservation associated with the Proposed Development.

12.1.2 This chapter is supported by the following figures (PEI Report, Volume II) and appendices (PEI Report, Volume III):

- Figure 12-1: Statutory Designated Sites within 15 km;
- Figure 12-2: Non-statutory Designated Sites within 2 km;
- Figure 12-3: Potential Habitats of Principal Importance within 2 km; and
- Figure 12-4: Phase 1 Habitat Survey Results (draft based on data available to date).
- Appendix 8A: Habitat Regulation Assessment Screening
- Appendix 8B: Figure B1 6.4.28 NZT ES Vol III Appendix 13A Aquatic Ecology Supplementary Desk Study and Field Study Report

12.1.3 This chapter provides a preliminary evaluation of relevant ecological receptors (including nature conservation designations, priority habitats, protected species and invasive non-native species (INNS) scheduled under the Wildlife and Countryside Act 1981 (as amended)) associated with the Proposed Development, with each being assigned a preliminary nature conservation value (sensitivity/value). The Proposed Development's potential direct and indirect impacts and effects on ecological receptors and their conservation status, interrelationships, and their contribution to local (and if appropriate regional and national) biodiversity are identified. This preliminary assessment considers impact avoidance design measures and management activities (embedded mitigation) when determining the potential for significant effects. The requirement for potential further mitigation measures is then described and these mitigation measures are then considered in the assessment of potential residual effects.

12.1.4 This preliminary assessment reports on the ecology baseline available at the time of writing (August 2023). A final assessment of the potential impacts of the Proposed Development on ecological features including updates to the baseline will be undertaken and reported in the Environmental Statement (ES) that will be submitted with the DCO Application.

12.2 Legislation, Planning Policy and Guidance

12.2.1 A summary of the international, national and local legislation, planning policy and guidance relevant to this chapter is set out below.

Legislative Background

12.2.2 The following legislation is relevant to this chapter of the PEI Report for the Proposed Development:

- Countryside and Rights of Way Act 2000 (CRoW);
- Salmon and Freshwater Fisheries Act 1975; and
- The Conservation of Habitats and Species Regulations 2017 (Habitats Regulations)[1];
- The Eels (England and Wales) Regulations 2009;
- The Hedgerows Regulations 1997;
- Natural Environment and Rural Communities Act 2006 (NERC);
- Protection of Badgers Act 1992;
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (2000/60/EC) (WFD);
- Wild Mammals (Protection) Act 1996; and
- Wildlife and Countryside Act 1981 (as amended).

12.2.3 The Habitats Regulations 2017 (as amended) and WCA 1981 (as amended) are domestic legislation that transpose the land and marine aspects of the Habitats Directive (Council Directive 92/43/EEC) and certain elements of the Birds Directive (Council Directive 2009/147/EC) (known as the Nature Directives). Species of European (International) conservation importance are listed on Annexes II, IV and V of the Habitats Directive and Annex I of the Birds Directive.

12.2.4 Several national and local policies are relevant to biodiversity and developments. With regards to national policies these include, the NPS for Energy (Department of Energy and Climate Change, 2011), and the National Planning Policy Framework (NPPF), 2021(Ministry of Housing, Communities and Local Government [MHCLG], 2021).

Planning Policy Context

National Planning Policy

Overarching National Policy Statement (NPS) for Energy (EN-1) (2011)

12.2.5 The Overarching National Planning Policy Statement (NPS) for Energy (EN-1) (Department of Energy and Climate Change, 2011a) sets out national policy for energy infrastructure and is part of a suite of NPSs issued by the Secretary of State (SoS) for Energy and Climate Change.

[1] This transposes into UK law, post-Brexit, the provisions of the European Habitats and Wild Birds Directives and their respective Annexes of species and habitats that are qualifying features of the European network of Special Areas of Conservation (SAC) and Special Protection Areas (SPA). The EU Directives are directly incorporated into Regulation 9 of the domestic legislation.

12.2.6 Paragraph 5.3.3 states "Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. The applicant should provide environmental information proportionate to the infrastructure where EIA is not required to help the IPC consider thoroughly the potential effects of a proposed project."

- Paragraph 5.3.4 states: "The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests".

National Policy Statement (NPS) for Gas and Oil Pipelines (EN-4) (2011)

12.2.7 NPS EN-4 (Department for Energy and Climate Change, 2011b) is relevant for this Proposed Development, as although this NPS only covers those nationally significant infrastructure pipelines which transport natural gas or oil, the information is useful in identifying impacts to be considered in applications for pipelines intended to transport other substances.

12.2.8 Paragraph 2.21.3 states: *"The ES should include an assessment of the biodiversity and landscape and visual effects of the proposed route and of the main alternative routes considered (see Section 5.9 of EN-1). The application should also include proposals for reinstatement of the pipeline route as close to its original state as possible and take into account any requirements for agreements with the landowner to access areas for aftercare and management work. Where it is unlikely to be possible to restore landscape to its original state, the applicant should set out measures to avoid, mitigate, or employ other landscape measures to compensate for, any adverse effect on the landscape."*

12.2.9 Paragraph 2.21.5 states: *"Mitigation measures to protect the landscape and ecology could include reducing the working width required for the installation of the pipeline in order to reduce the impact on the landscape where it will not be possible to fully reinstate the route."*

12.2.10 Paragraph 2.21.6 states: *"In circumstances where the habitat to be crossed contains ancient woodland, trees subject to a Tree Preservation Order, or hedgerows subject to the Hedgerows Regulations 1997, the applicant should consider whether it would be feasible to use horizontal direct drilling under the ancient woodland or thrust bore under the protected tree or hedgerow and the IPC should consider requiring this, where not included in the proposal."*

National Policy Statement (NPS) for Electrical Networks Infrastructure (EN-5) (2011)

12.2.11 EN-5 (Department for Energy and Climate Change, 2011c) provides guidance for electricity generation, storage and interconnection infrastructure required to enable the transition to net zero.

12.2.12 Paragraph 1.8.1 states: "Habitats Regulation Assessments (HRA) have also been carried out and published for the non-locationally specific NPSs EN-1 to EN-5. As EN-1 to EN-5 do not specify locations for energy infrastructure, the HRA is a high-level

strategic overview. Although the lack of spatial information within the EN-1 to EN-5 made it impossible to reach certainty on the effect of the plan on the integrity of any HRA site, the potential for proposed energy infrastructure projects of the kind contemplated by EN-1 to EN-5 to have adverse effects on the integrity of such sites cannot be ruled out, based on following the precautionary principle. The HRA explains why the government considers that EN-1 to EN-5 are nevertheless, justified by imperative reasons of overriding public interest, while noting that its conclusions are only applicable at the NPS level and are without prejudice to any project-level HRA, which may result in the refusal of consent for a particular application."

12.2.13 Paragraph 2.8.1 states: "When planning and evaluating the proposed development's contribution to environmental and biodiversity net gain, it will be important – for both the Applicant and the Secretary of State – to supplement the generic guidance set out in EN-1 (Section 4.5) with recognition that the linear nature of electricity networks infrastructure allows excellent opportunities to: i) reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows; and/or ii) connect people to the environment, for instance via footpaths and cycleways constructed in tandem with biodiversity enhancements."

Draft Overarching NPS for Energy (EN-1) (2023)

12.2.14 The UK Government is currently reviewing and updating the energy NPSs. It is doing this in order to reflect its policies and strategic approach for the energy system that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions. As part of the NPS review process, the government published a suite of revised draft NPSs for new energy infrastructure on 6 September 2021. A further update was published in March 2023 by the Department for Energy Security & Net Zero (DESNZ). Section 5.4 of Draft EN-1 (DESNZ, 2023a) relates to biodiversity and geological conservation as follows:

- Paragraph 5.4.3 states: *"Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally, and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. The applicant should provide environmental information proportionate to the infrastructure where EIA is not required to help the Secretary of State consider thoroughly the potential effects of a proposed project."*
- Paragraph 5.4.4 states: *"The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests. As set out in Section 4.6, the design process should embed opportunities for nature inclusive design. The applicant is encouraged to consider how their proposal can contribute towards Biodiversity Net Gain in line with the ambition set out in the 25 Year Environment Plan. Energy infrastructure projects have the potential to deliver significant benefits and enhancements beyond Biodiversity Net Gain, which result in wider environmental gains. The*

scope of potential gains will be dependent on the type, scale, and location of each project."

Draft National Policy Statement (NPS) for Natural Gas Supply Infrastructure and Gas and Oil Pipelines *(EN-4) (2023)*

12.2.15 Paragraph 2.21.1 of Draft EN-4 (DESNZ, 2023b) *"Sections 4.3 and 5.9 of EN-1 sets out the general principles that should be applied in the assessment of biodiversity and landscape and visual impacts. Additional considerations apply during the construction of a pipeline (which, without mitigation, can affect both landscape and ecology). These comprise the effect upon specific landscape elements within and adjacent to the pipeline route, such as grasslands, field boundaries (hedgerows, hedgebanks, drystone walls, fences), trees, woodlands, and watercourses. There will also be temporary visual impacts caused by the need to access the working corridor and to remove flora and soil. The working width of the pipeline will vary depending on the surrounding terrain. Temporary impacts could include large excavations where deep pits are needed for boring beneath rivers, roads, and sensitive features."*

12.2.16 Paragraph 2.21.2 states: *Long term impacts upon the landscape for pipelines are likely to be limited, as once operational the main infrastructure is usually buried. They are likely to include:*

- *limitations on the ability to replant landscape features such as hedgerows or deep-rooted trees over or adjacent to the pipeline; and*
- *structures and indication points necessary to identify the pipeline route and provide it with service access.*

12.2.17 Paragraph 2.21.3 states: The ES should include an assessment of the biodiversity and landscape and visual effects of the proposed route and of the main alternative routes considered (see Section 5.10 of EN-1). The application should also include proposals for reinstatement of the pipeline route as close to its original state as possible and take into account any requirements for agreements with the landowner to access areas for aftercare and management work. Where it is unlikely to be possible to restore landscape to its original state, the applicant should set out measures to avoid, mitigate, or employ other landscape measures to compensate for, any adverse effect on the landscape.

Draft National Policy Statement (NPS) for electricity Networks Infrastructure (EN-5) (2023)

12.2.18 Paragraph 1.7.1 of Draft EN-5 (DESNZ, 2023c) states: *"All the NPSs have been subject to an Appraisal of Sustainability (AoS) required by the 2008 Act and the Environmental Assessment of Plans and Programmes Regulations 2004. A Habitats Regulations Assessment (HRA) has also been prepared in accordance with the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017."*

12.2.19 Paragraph 2.51 states: *"When planning and evaluating the proposed development's contribution to environmental and biodiversity net gain, it will be important – for both the applicant and the Secretary of State – to supplement the generic guidance set out*

in EN-1 (Section 4.5) with recognition that the linear nature of electricity networks infrastructure can allow for excellent opportunities to:

i. reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows; and/or

ii. connect people to the environment, for instance via footpaths and cycleways constructed in tandem with environmental enhancements."

The National Planning Policy Framework (2021)

12.2.20 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2021) sets out the UK Government's planning policies for England and how these are expected to be applied by local authorities within their Local Development Frameworks (LDF). Chapter 15 of the NPPF Conserving and Enhancing the Natural Environment sets out the requirements to consider biodiversity in planning decisions as follows:

- To protect and enhance biodiversity and geodiversity, plans should:

  a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping-stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and,

  b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

- When determining planning applications, local planning authorities should apply the following principles:

  a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

  b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

  c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons, and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

- The following should be given the same protection as habitats sites:

  a) potential Special Protection Areas and possible Special Areas of Conservation;

  b) listed or proposed Ramsar sites; and

  c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

- *"The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site."*

Planning Practice Guidance (PPG)

12.2.21 The Government's planning practice guidance website (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government, 2021) provides detailed advice regarding the natural environment. This includes detailed guidance regarding biodiversity, ecosystems, and green infrastructure.

Local Planning Policy

Redcar and Cleveland Borough Council

12.2.22 The Redcar and Cleveland Local Plan (RCBC, 2018) was adopted in 2018 and sets out the vision and overall development strategy for the council's area and how it will be achieved for the period until 2032. Policies relevant to ecology/biodiversity are included in Policy N4 – Biodiversity and Geological Conservation which states:

"We will protect and enhance the borough's biodiversity and geological resources. Support will be given to high quality schemes that enhance nature conservation and management, preserve the character of the natural *environment and maximise opportunities for biodiversity and geological conservation, particularly in or adjacent to, Biodiversity Opportunity Areas in the wider Tees Corridor, Teesmouth, East Cleveland and Middlesbrough Beck Valleys areas. We will protect and preserve local, national and international priority species and habitats and promote their restoration, re-creation and recovery.*

Biodiversity and geodiversity should be considered at an early stage in the development process, with appropriate protection and enhancement measures incorporated into the design of development proposals, recognising wider ecosystem services and providing net gains wherever possible. Detrimental impacts of development on biodiversity and geodiversity, whether individual or cumulative,

should be avoided. Where this is not possible mitigation, or lastly compensation, must be provided as appropriate. Proposals will be considered in accordance with the status of biodiversity and geodiversity sites within the hierarchy.

Internationally important sites

Priority will be given to protecting our internationally important sites, including the Teesmouth and Cleveland Coast Special Protection Area/Ramsar and European Marine Site, and the North York Moors Special Protection Area and Special Area of Conservation. Development that is not directly related to the management of the site, but which is likely to have a significant effect on any internationally designated site, irrespective of its location and when considered both alone and in combination with other plans and projects, will be subject to an Appropriate Assessment.

Development requiring Appropriate Assessment will only be allowed where:

a. it can be determined through Appropriate Assessment at the design stage that, taking into account mitigation, the proposal would not result in adverse effects on the site's integrity, either alone or in combination with other plans or projects. Within 6km of the Teesmouth and Cleveland Coast SPA and Ramsar Site, as illustrated on the Policies Map, proposals that would result in a net increase in residential units, or other development that would lead to increased recreational disturbance of the site's interest features, will be expected to contribute towards strategic mitigation measures identified in the Recreation Management Plan. This is to ensure that adverse effects on the site's integrity can be avoided. Any alternative suitable mitigation would need to be proven effective and agreed with the Council, in consultation with relevant statutory consultees or

b. as a last resort, Appropriate Assessment proves that there are no alternatives and that the development is of overriding public interest and appropriate compensatory measures are provided.

Nationally important sites

Development that is likely to have an adverse impact on nationally important SSSI sites, including broader impacts on the national network and combined effects with other development, will not normally be allowed. Where an adverse effect on the site's notified interest features is likely, an exception will only be made where:

c. the benefits of the development, at this site, clearly outweigh both any adverse impact on the features of the site that makes it of special scientific interest, and any broader impacts on the network of SSSIs;

d. no reasonable alternatives are available; and e. mitigation, or where necessary compensation, is provided for the impact.

Locally important sites

Development that is likely to have an adverse impact on Local Sites (Local Wildlife Sites and Local Geological Sites) or Local Nature Reserves will only be approved where:

f. the benefits clearly outweigh any adverse impact on the site;

g. no reasonable alternatives are available; and h. mitigation, or where necessary compensation, is provided for the impact. Wildlife corridors and other habitat networks will be protected and enhanced, particularly hedgerows, watercourses and linking habitat features. Opportunities to deculvert watercourses will be encouraged.

We will continue to protect our ancient woodland and ancient and veteran trees, including our tree-lined becks. Development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and aged or veteran trees, will only be allowed in very exceptional circumstances where the need for, and benefits of, the development in that location clearly outweigh the loss and the development cannot be located elsewhere."

Stockton-on-Tees Borough Council (STBC)

12.2.23 The Stockton- on- Tees Local Plan (STBC, 2019) was adopted in 2019 and sets out policies and proposals to guide planning decisions and establishes a framework for sustainable economic growth and development in the borough up until 2032. Policies relevant to ecology/biodiversity are included in SD8 - Sustainable Design Principles which states:

"1. The Council will seek new development to be designed to the highest possible standard, taking into consideration the context of the surrounding area and the need to respond positively to the:

a. Quality, character and sensitivity of the surrounding public realm, heritage assets, and nearby buildings, in particular at prominent junctions, main roads and town centre gateways;

b. Landscape character of the area, including the contribution made by existing trees and landscaping;

c. Need to protect and enhance ecological and green infrastructure networks and assets;

d. Need to ensure that new development is appropriately laid out to ensure adequate separation between buildings and an attractive environment;

e. Privacy and amenity of all existing and future occupants of land and buildings;

f. Existing transport network and the need to provide safe and satisfactory access and parking for all modes of transport;

g. Need to reinforce local distinctiveness and provide high quality and inclusive design solutions, and

h. Need for all development to be designed inclusively to ensure that buildings and spaces are accessible for all, including people with disabilities.

2. New development should contribute positively to making places better for people. They should be inclusive and establish a strong sense of place, using streetscapes and buildings to create attractive and comfortable places to live, work and visit.

3. All proposals will be designed with public safety and the desire to reduce crime in mind, incorporating, where appropriate, advice from the Health and Safety Executive, Secured by Design, or any other appropriate design standards.

4. New development will seek provision of adequate waste recycling, storage and collection facilities, which are appropriately sited and designed.

5. New commercial development will be expected to provide appropriately designed signage and shop fronts."

Policy EG4 – Seal Sands, North Tees and Billingham states: *"Development proposals for hazardous installations, uses related to the process industries, or emerging specialist sectors will be directed to available sites and expansion land in the following locations:*

a. Billingham Chemical Complex including 45 ha of available land.

b. North Tees including 46 ha of available land. c. Seal Sands including 144 ha of available land.

2. Development proposals in the North Tees and Seal Sands area will recognise the cumulative importance for bird species associated with the Teesmouth and Cleveland Coast SPA and Ramsar site. Appropriate development proposals will be encouraged at locations within the limits to development where:

a. If necessary, land has been identified to provide appropriate strategic mitigation; or

b. The applicant can demonstrate that the proposed development, in-combination with other proposals, will not adversely impact the Teesmouth & Cleveland Coast SPA and Ramsar site.

3. Should it become apparent that proposals for strategic mitigation cannot be identified, the Council will work with the Tees Estuary Partnership and relevant stakeholders to take appropriate action."

ENV5 - Preserve, Protect and Enhance Ecological Networks, Biodiversity and Geodiversity:

- *"1. The Council will protect and enhance the biodiversity and geological resources within the Borough. Development proposals will be supported where they enhance nature conservation and management, preserve the character of the natural environment and maximise opportunities for biodiversity and geological conservation particularly in or adjacent to Biodiversity Opportunity Areas in the River Tees Corridor, Teesmouth and Central Farmland Landscape Areas.*
- *2. The Council will preserve, restore and re-create priority habitats alongside the protection and recovery of priority species.*
- *3. Ecological networks and wildlife corridors will be protected, enhanced and extended. A principal aim will be to link sites of biodiversity importance by avoiding or repairing the fragmentation and isolation of natural habitats.*

- *4. Sites designated for nature or geological conservation will be protected and, where appropriate enhanced, taking into account the following hierarchy and considerations:*

a. Internationally designated sites – Development that is not directly connected with or necessary to the management of the site, but which is likely to have a significant effect on any internationally designated site, irrespective of its location and when considered both alone and in combination with other plans and projects, will be subject to an Appropriate Assessment. Development requiring Appropriate Assessment will only be allowed where:

i. It can be determined through Appropriate Assessment, taking into account mitigation, the proposal would not result in adverse effects on the site's integrity, either alone or in combination with other plans or projects; or

ii. as a last resort, where, in light of negative Appropriate Assessment there are no alternatives and the development is of overriding public interest, appropriate compensatory measures must be secured.

b. Nationally designated sites - Development that is likely to have an adverse effect on a site, including broader impacts on the national network of Sites of Special Scientific Interest (SSSI) and combined effects with other development, will not normally be allowed. Where an adverse effect on the site's notified interest features is likely, a development will only be allowed where:

i. the benefits of the development, at this site, clearly outweigh both any adverse impact on the sites notified interest features, and any broader impacts on the national network of SSSIs;

ii. no reasonable alternatives are available; and iii. mitigation, or where necessary compensation, is provided for the impact. c. Locally designated sites: Development that would have an adverse effect on a site(s) will not be permitted unless the benefits of the development clearly outweigh the harm to the conservation interest of the site and no reasonable alternatives are available.

All options should be explored for retaining the most valuable parts of the sites interest as part of the development proposal with particular consideration given to conserving irreplaceable features or habitats, and those that cannot readily be recreated within a reasonably short timescale, for example ancient woodland and geological formations. Where development on a site is approved, mitigation or where necessary, compensatory measures, will be required in order to make development acceptable in planning terms.

"1. The Council will protect and enhance the biodiversity and geological resources within the Borough. Development proposals will be supported where they enhance nature conservation and management, preserve the character of the natural environment and maximise opportunities for biodiversity and geological conservation particularly in or adjacent to Biodiversity Opportunity Areas in the River Tees Corridor, Teesmouth and Central Farmland Landscape Areas.

2. The Council will preserve, restore and re-create priority habitats alongside the protection and recovery of priority species.

3. Ecological networks and wildlife corridors will be protected, enhanced and extended. A principal aim will be to link sites of biodiversity importance by avoiding or repairing the fragmentation and isolation of natural habitats.

4. Sites designated for nature or geological conservation will be protected and, where appropriate enhanced, taking into account the following hierarchy and considerations:

a. Internationally designated sites – Development that is not directly connected with or necessary to the management of the site, but which is likely to have a significant effect on any internationally designated site, irrespective of its location and when considered both alone and in combination with other plans and projects, will be subject to an Appropriate Assessment. Development requiring Appropriate Assessment will only be allowed where:

i. It can be determined through Appropriate Assessment, taking into account mitigation, the proposal would not result in adverse effects on the site's integrity, either alone or in combination with other plans or projects; or

ii. as a last resort, where, in light of negative Appropriate Assessment there are no alternatives and the development is of overriding public interest, appropriate compensatory measures must be secured.

b. Nationally designated sites - Development that is likely to have an adverse effect on a site, including broader impacts on the national network of Sites of Special Scientific Interest (SSSI) and combined effects with other development, will not normally be allowed. Where an adverse effect on the site's notified interest features is likely, a development will only be allowed where:

i. the benefits of the development, at this site, clearly outweigh both any adverse impact on the sites notified interest features, and any broader impacts on the national network of SSSIs;

ii. no reasonable alternatives are available; and iii. mitigation, or where necessary compensation, is provided for the impact. c. Locally designated sites: Development that would have an adverse effect on a site(s) will not be permitted unless the benefits of the development clearly outweigh the harm to the conservation interest of the site and no reasonable alternatives are available.

All options should be explored for retaining the most valuable parts of the sites interest as part of the development proposal with particular consideration given to conserving irreplaceable features or habitats, and those that cannot readily be recreated within a reasonably short timescale, for example ancient woodland and geological formations. Where development on a site is approved, mitigation or where necessary, compensatory measures, will be required in order to make development acceptable in planning terms.

5. Development proposals should seek to achieve net gains in biodiversity wherever possible. It will be important for biodiversity and geodiversity to be considered at an early stage in the design process so that harm can be avoided and wherever possible enhancement achieved (this will be of particular importance in the redevelopment of previously developed land where areas of biodiversity should be retained and recreated alongside any remediation of any identified contamination). Detrimental impacts of development on biodiversity and geodiversity, whether individual or cumulative should be avoided. Where this is not possible, mitigation and lastly compensation, must be provided as appropriate. The Council will consider the potential for a strategic approach to biodiversity offsetting in conjunction with the Tees Valley Local Nature Partnership and in line with the above hierarchy.

6. When proposing habitat creation, it will be important to consider existing habitats and species as well as opportunities identified in the relevant Biodiversity Opportunity Areas. This will assist in ensuring proposals accord with the 'landscape scale' approach and support ecological networks.

7. Existing trees, woodlands and hedgerows which are important to the character and appearance of the local area or are of nature conservation value will be protected wherever possible. Where loss is unavoidable, replacement of appropriate scale and species will be sought on site, where practicable."

ENV6 - Green Infrastructure, Open Space, Green Wedges and Agricultural Land:

"1. Through partnership working, the Council will protect and support the enhancement, creation and management of all green infrastructure to improve its quality, value, multi-functionality and accessibility in accordance with the Stockton-on-Tees Green Infrastructure Strategy and Delivery Plan.

2. Where appropriate, development proposals will be required to make contributions towards green infrastructure having regard to standards and guidance provided within the Open Space, Recreation and Landscaping SPD or any successor. Green infrastructure should be integrated, where practicable, into new developments. This includes new hard and soft landscaping, and other types of green infrastructure. Proposals should illustrate how the proposed development will be satisfactorily integrated into the surrounding area in a manner appropriate to the surrounding townscape and landscape setting and enhances the wider green infrastructure network.

3. The Council will protect and enhance open space throughout the Borough to meet community needs and enable healthy lifestyles. The loss of open space as shown on the Policies Map, and any amenity open space, will not be supported unless:

a. it has been demonstrated to be surplus to requirements; or

b. the loss would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location; or

c. the proposal is for another sports or recreational provision, the needs for which, clearly outweigh the loss; or d. the proposal is ancillary to the use of the open

space; and e. in all cases there would be no significant harm to the character and appearance of the area or nature conservation interests.

4. Development within green wedges will only be supported where:

a. it would not result in physical or visual coalescence of built-up areas;

b. it would not adversely impact on local character or the separate identity of communities;

c. it would not adversely impact on recreational opportunities; and

d. it would not adversely impact on biodiversity.

5. Development proposals will be expected to demonstrate that they avoid the 'best and most versatile' agricultural land unless the benefits of the proposal outweigh the need to protect such land for agricultural purposes. Where significant development of agricultural land is demonstrated to be necessary, proposals will be expected to demonstrate that they have sought to use areas of lower quality land in preference to that of a higher quality."

ENV7 – Ground, Air, Water, Noise and Light Pollution:

"1. All development proposals that may cause groundwater, surface water, air (including odour), noise or light pollution either individually or cumulatively will be required to incorporate measures as appropriate to prevent or reduce their pollution so as not to cause unacceptable impacts on the living conditions of all existing and potential future occupants of land and buildings, the character and appearance of the surrounding area and the environment.

2. Development that may be sensitive to existing or potentially polluting sources will not be sited in proximity to such sources. Potentially polluting development will not be sited near to sensitive developments or areas unless satisfactory mitigation measures can be demonstrated.

3. Where development has the potential to lead to significant pollution either individually or cumulatively, proposals should be accompanied by a full and detailed assessment of the likely impacts. Development will not be permitted when it is considered that unacceptable effects will be imposed on human health, or the environment, taking into account the cumulative effects of other proposed or existing sources of pollution in the vicinity. Development will only be approved where suitable mitigation can be achieved that would bring pollution within acceptable levels.

4. Where future users or occupiers of a development would be affected by contamination or stability issues, or where contamination may present a risk to the water environment, proposals must demonstrate via site investigation/assessment that:

a. Any issues will be satisfactorily addressed by appropriate mitigation measures to ensure that the site is suitable for the proposed use, and does not result in unacceptable risks which would adversely impact upon human health and the environment; and

b. Demonstrate that development will not cause the site or the surrounding environment to become contaminated and/or unstable.

5. Groundwater and surface water quality will be improved in line with the requirements of the European Water Framework Directive and its associated legislation and the Northumbria River Basin Management Plan. Development that would adversely affect the quality or quantity of surface or groundwater, flow of groundwater or ability to abstract water will not be permitted unless it can be demonstrated that no significant adverse impact would occur or mitigation can be put in place to minimise this impact within acceptable levels.

6. To improve the quality of the water environment the Council will:

a. Support ecological improvements along riparian corridors including the retention and creation of river frontage habitats;

b. Avoid net loss of sensitive inter-tidal or sub-tidal habitats and support the creation of new habitats; and

c. Protect natural water bodies from modification and support the improvement and naturalisation of heavily modified water bodies (including de-culverting and the removal of barriers to fish migration).”

Hartlepool Borough Council (HBC)

12.2.24 The Hartlepool Local Plan (HBC, 2018) was adopted in May 2018. Policies relevant to ecology/biodiversity are outlined below.

Policy NE1- Natural Environment: *The Borough Council will protect, manage and enhance Hartlepool’s natural environment and will ensure that:*

1) Development proposals are in accordance with the locational strategy outlined in policy LS1.

2) Sites designated for nature conservation as shown on the Policies Map will be protected and, where appropriate, enhanced, taking into account the following hierarchy:

a) Internationally designated sites: these sites receive statutory protection. Development not connected to or necessary for the enhancement and/or management of the site will not be permitted unless it meets relevant legal requirements; A precautionary approach will be taken towards developments that may have indirect impacts on internationally designated sites and appropriate mitigation measures or contributions to avoid detrimental impacts will be sought and delivered via the Hartlepool Mitigation Strategy and Delivery Plan and other mechanisms.

b) Nationally designated sites: these sites also receive statutory protection. Development that would have an adverse, affect on these sites will not be permitted unless it meets the relevant legal requirements; A precautionary approach will be taken towards developments that may have indirect impacts on nationally designated sites and appropriate mitigation measures or contributions to avoid detrimental impacts will be sought.

c) Locally designated sites: development which would adversely affect a locally designated site, which is not also allocated for another use in the Local Plan, will not be permitted unless the reasons for the development clearly outweigh the harm to the conservation interest of the site. Where development on a locally designated site is approved, including sites that are also allocated for other uses, compensatory measures may be required in order to make development acceptable in planning terms and to mitigate against potential loss of interest.

Biodiversity accounting/offsetting may be considered as part of compensatory measures where on-site compensation is not possible.

3) Designated Local Nature Reserves are protected, managed and enhanced as sites with geological and/or wildlife features that are of special local interest. Where appropriate the Borough Council will support the designation of further sites as Local Nature Reserves.

4) *Where appropriate an ecosystems services approach will be used to assess the impact of development proposals on the natural environment and the benefits it provides, including resource use, health and well-being, protection from the affects of climate change, economic growth, and culture*

5) Ecological networks are enhanced and green infrastructure is protected and enhanced

6) Development avoids harm to and, where appropriate, enhances the natural environment. This could include, for example, creating and/or enhancing habitats to meet the objectives of the Tees Valley Biodiversity Action Plan. In seeking to avoid harm, development should follow the sequence of avoidance, mitigation, compensation. Where sufficient on-site mitigation and/or compensation are demonstrably not possible, then off-site compensation will be considered. Where significant harm from a development cannot be avoided (through locating on an alternative site), adequately mitigated or, as a last resort compensated for, the Borough Council will refuse planning permission. The Borough Council will consider the potential for a strategic approach to biodiversity accounting in conjunction with the Tees Valley Local Nature Partnership and in line with the above hierarchy.

7) Existing woodland and trees of amenity value and nature conservation value are protected, and an increase in tree cover will be sought in appropriate locations in line with the Borough Council's Tree Strategy. Areas of ancient woodland, including ancient semi-natural woodland (ASNW), plantations on ancient woodland sites (PAWS), and ancient or veteran trees outside ancient woodland, will be protected unless there are exceptional circumstances. The Borough Council will also ensure that development does not result in the loss of or damage to ancient woodland (including ASNW and PAWS) by requiring the implementation of a buffer of at least 15 metres between development and the ancient woodland site (depending on the size of the site). For ancient or veteran trees, a buffer 15 times the stem diameter or 5 metres beyond the drip line of the leaf canopy should be maintained, whichever is the greater.

8) Where appropriate Tree Preservation Orders will be used to protect trees under threat from development proposals. Where the loss of significant trees/hedgerows cannot be avoided their replacement by trees/shrubs/hedgerows of an appropriate scale and species for the area will be sought where practical.

9) Development avoids the best and most versatile agricultural land – identified as grades 1, 2 and 3a in the National Agricultural Land Classification – unless it can be demonstrated that there will be no impact on the agricultural land and its quality and there are no material consideration that outweigh the loss of such land.

10) In prioritising the re-development of brownfield land, areas that are important for biodiversity will be retained or recreated within the site, and remediation of contaminated land will be pursued.

11) The major/principal aquifers underlying Hartlepool along with watercourses and other surface and coastal waters will be protected from over abstraction and contamination from pollutants and saline intrusion resulting from development. Developments will be required to demonstrate that they do not impact on the major/principal aquifer underlying Hartlepool, along with watercourses and other surface and coastal waters and they can achieve access to a sustainable water supply prior to approval.

12) Opportunities are taken to retain, restore and de-culvert watercourses to improve their role and value as wildlife corridors and habitats.

13) All development proposals, through the careful, sensitive management and design of development will ensure that the character, distinctiveness and quality of the Borough's landscape is protected and, where appropriate, enhanced. Any development within the Special Landscape Areas as defined on the Policies Map or which will have a visual impact on those areas will be required to demonstrate that they are in keeping with the area and will not have an adverse impact on the area's landscape character.

14) Development has regard to coastal change, bathing water quality, and coastal processes over time, and in particular the need to avoid exacerbating coastal squeeze and incorporate measures to mitigate this where appropriate.

Where appropriate Supplementary Planning Documents will be prepared to provide more detailed guidance on safeguarding and enhancing Hartlepool's natural environment and biodiversity.

The Borough Council will seek to maintain and enhance ecological networks throughout the Borough. Priority sections of the network are:

1) Coastal fringe

2) Tees Road/Brenda Road brownfield land

3) Dalton Beck/Greatham Beck riparian corridor 4) Rural west from Wynyard to Thorpe Bulmer and Crimdon Denes.

Policy NE4 - Ecological Networks: *The Borough Council will also work with the Tees Valley Local Nature Partnership and adjoining Local Nature Partnerships to maintain*

and enhance ecological networks at a landscape scale across the Borough boundary. Where appropriate all developments will be required to maintain and enhance ecological networks in the vicinity of the proposal, complying with policy QP5. Where enhancements cannot be incorporated within the site then an off-site contribution may be sought, in accordance with policy NE2 and policy QP1.

12.2.25 In addition to the above local plans, the South Tees Area Supplementary Planning Document (SPD) (Redcar and Cleveland Borough Council, 2018) has been prepared to support adopted planning policies to guide and inform future planning applications. The SPD has been informed by a number of other supporting documents, including a Strategic Environmental Assessment and Habitats Regulations Assessment. The Development Principles of relevance to the Proposed Development are outlined below:

STDC6 – Energy Innovation

All energy generation development should be appropriately sited and designed in order to avoid unacceptable adverse environmental or amenity effects.

STDC7 – Natural Environment al Protection and Enhancement

The Council will, in partnership with the STDC and investment partners and other key stakeholders, protect and, where appropriate, enhance designated and non-designated sites of biodiversity and geodiversity value and interest within the South Tees Area. The need to remediate known contamination, including to reduce environmental harm, and to redevelop the South Tees Area for productive uses is fully recognised and supported by the Council. In doing so it will be important for all development proposals to be in accordance with the requirements of STDC7 and to respond to their environmental setting, in particular to protect and, where possible enhance, biodiversity and geodiversity interests.

All proposals will be required to comply with Local Plan Policy N4 Biodiversity and Geological Conservation. Proposals with the potential to affect the Teesmouth and Cleveland Coast SPA should undergo a Habitat Regulations Assessment (HRA) with regard to the conservation objectives of the designation.

The Council will support the delivery of a strategy for the regeneration area which promotes the provision of green infrastructure, in accordance with Local Plan Policy N2, including a series of connected open, private and public spaces, using open space as connectors not barriers to development.

All proposals will be required to have regard to the forthcoming Environment and Biodiversity and Open Space Strategies and, where appropriate, the Redcar & Cleveland Teesmouth and Cleveland Coast SPA Recreation Management Plan, including in the mitigation of likely cumulative impacts on the natural environment. Net environmental gains should be provided where appropriate and viable, in accordance with Policies N2 and N4.

Local Biodiversity Action Plans

12.2.26 The UK Biodiversity Action Plan (BAP) was withdrawn in March 2011 with the lists of Priority Species and Habitats being superseded by those within Section 41 of the

NERC Act (2006). Local Biodiversity Action Plans (LBAPs) are no longer used as a formal expression of delivery of biodiversity targets but identify sub-regional priorities for nature conservation and propose agreed actions to conserve, maintain, enhance and increase local Priority Species and Habitats.

12.2.27 The Tees Valley Biodiversity Action Plan (Tees Valley Nature Partnership, 2012) is the relevant LBAP for the defined Study Area (refer to Section 12.3) and was updated in in 2012. The LBAP outlines biodiversity conservation objectives within the region and identifies priorities for action for priority habitats, species, locally important wildlife, and sites.

Guidance

12.2.28 This chapter of the PEI Report has been carried out with regard to the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2022).

12.2.29 Species specific guidance used to inform this PEI Report chapter is referenced throughout the chapter and includes:

- The CIEEM guidelines for Preliminary Ecological Appraisal (CIEEM, 2017);
- Natural England's Standing Advice for protected species (Natural England, 2022);
- The Joint Nature Conservation Committee's (JNCC) published *Herpetofauna Workers' Manual* (JNCC, 2003) and the *Great Crested Newt Conservation Handbook* (Froglife, 2001);
- The Bat Conservation Trust's *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016) and interim guidance on the use of night vision aids for bat emergence surveys (Bat Conservation Trust, 2022);
- Otter (*Lutra lutra*) survey guidance outlined in *Monitoring the Otter* (Chanin, 2003);
- Water vole (*Arvicola amphibius*) survey guidance outlined in the *Water Vole Mitigation Handbook* (Strachan *et al*. 2016);
- Badger (*Meles meles*) survey guidance outlined in *Surveying Badgers* (Harris *et al.*, 1989); and
- Biodiversity Net Gain (BNG): good practice principles for development (CIRIA, CIEEM and IEMA, 2016).

12.3 Assessment Methodology and Significance Criteria

Study Area

12.3.1 The Study Areas used in this assessment have been defined with reference to the likely zone of influence where there is the potential for significant effects on relevant ecological features to occur, through the construction, operation and decommissioning of the Proposed Development. The study area boundaries include the likely maximum extent of the construction footprint of the Proposed Development that will be considered during further assessments (which includes any

potential ancillary works, compounds, haul routes, borrow pits and temporary land take).

12.3.2 The spatial scope was informed by professional judgment in line with good practice guidance and standards including British Standard 42020:2013 (British Standards Institution, 2013), and Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal version 1.1 (Chartered Institute of Ecology and Environmental Management [CIEEM], 2018).

12.3.3 The spatial scope also takes account of the potential Zone of Influence (ZoI) of the Proposed Development by extending the desk-based exercise to outside the boundary where required. The ZoI is the area over which biodiversity resources may be subject to likely significant effects as a result of the design proposals and associated activities. These effects (and therefore the distance and area of the ZoI) vary for each biodiversity resource and are dependent on several factors including the presence of connective pathways and sensitivity or importance of the biodiversity resource.

12.3.4 The potential zone of influence of the Proposed Development may vary over time (e.g., the construction zone of influence may differ from the operational zone of influence) and/or depending on the individual sensitivities of different ecological features.

12.3.5 The study areas are as follows:

- 15 km for all statutory designated sites for nature conservation at a European or international level or functionally linked land.
- 15 km for statutory designated sites for nature conservation at a national to local authority level e.g., Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), and Local Nature Reserves (LNR).
- 2 km for non-statutory designated sites for nature conservation such as Sites of Biological Importance (SBI).
- 2 km for Habitats of Principal Importance
- 500 m based upon Natural England's standing advice for assessing potential effects upon great crested newt (GCN).
- Up to 5 km for fish, aquatic macroinvertebrates, macrophytes, invasive species and crayfish
- 2 km for protected and notable habitats and species; for example, European Protected Species EPS); irreplaceable habitats included in The Biodiversity Metric 4.0 User Guide (Natural England Joint Publication 2023) as habitats where bespoke compensation is required for impacts, such as ancient woodland, Lowland fen, Lowland raised bog and; species and habitats listed in accordance with Section 41 of the Natural Environment and Rural Communities (NERC Act) 2006 (Habitats and Species of Principal Importance); birds that are Red Listed as Birds of Conservation Concern (Stanbury *et al*., 2021) or species and habitats with Local Biodiversity Action Plans (LBAP).

- Relevant Water Framework Directive (WFD) waterbodies data for waterbodies at or within proximity to the Proposed Development
- UK Habitat broad habitat type classification of land parcels up to 500 m from the boundary of the Proposed Development using aerial imagery and previously collected targeted field survey data. These surveys were undertaken as part of the baseline assessments for the NZT development. The surveys were undertaken to ground-truth key areas to confirm that correct broad habitat types had been assigned and to further explore areas that may support notable habitats.

Impact Assessment Methodology

Sources of Information

12.3.6 The ecological baseline has been determined through a combination of desk study and field survey, as summarised below.

12.3.7 A desk study was carried out to identify nature conservation designations and protected and notable habitats and species potentially relevant to the Proposed Development.

12.3.8 As part of the desk study the following sources were accessed for ecological data:

- The Multi Agency Geographic Information for the Countryside (MAGIC) online database to search for statutory designated sites, Natural England's Impact Risk Zones (IRZ); priority habitats (as listed in Section 41 of the NERC Act 2006), and European Protected Species (EPS) mitigation licences. Typically, EPS mitigation licenses are granted for development works affecting protected species such as bats and great crested newt (*Triturus cristatus*).
- Joint Nature Conservation Committee online database for information on international statutory nature conservation designations
- Natural England website provided information for national statutory nature conservation designations.
- Aerial imagery and 1:25,000 Ordnance Survey maps to aid identification of the broad habitat types present within the study area in accordance with the UK Habitat Classification user manual (UK Habitat Classification Working Group, 2018). The aerial imagery was also used to identify potential for protected/notable species, for example:
  - Waterbodies and watercourses with potential to support protected and notable species including great crested newt; otter (*Lutra lutra*); water vole (*Arvicola amphibius*); fish, white-clawed crayfish (*Austropotamobius pallipes*), and other notable aquatic invertebrates
  - Habitats with potential to support nesting birds (including open ground nesting birds)

  - Habitats and features of potential to support bats, badger (*Meles meles*) and other notable mammals (including habitats such as dense scrub, hedgerows, woodland)
  - Habitats with potential to support reptiles (such as dense scrub, tussocky grassland and woodland edges)
  - Habitats with potential to support notable invertebrates (such as botanical rich grasslands and hedgerows, and mature woodlands)

- The Environmental Records Information Centre for the North East (ERIC NE) was contacted for records of protected and notable species as well as non-statutory designated sites within the 2 km study area.
- Environment Agency (EA) Catchment Explorer for information on Water Framework Directive (WFD) waterbodies and supporting data.
- A search of the Environment Agency Ecology and Fish Data Explorer and National Biodiversity Network (NBN) Atlas for fish, aquatic macroinvertebrates, macrophytes, invasive species and crayfish in the area of the Proposed Development.
- ERIC, NE Industry Nature Conservation Association (INCA) and Ecology surveys completed to inform the Net Zero Teesside for data on protected and notable species.
- The targeted field survey data was obtained in June 2023 as part of baseline assessments relating to the Proposed Development. The surveys were undertaken to ground-truth key areas to confirm broad habitat types and to aid in the assessment of potential suitability for protected / notable species. Dominant and notable plant species were recorded. Botanical taxonomic nomenclature followed that of the New Flora of the British Isles, Fourth Edition (Stace, 2019). Any evidence of, or potential for, protected / notable species was recorded.
- The scope of habitat and species survey work considered necessary to inform this PEI Report chapter is summarised in Table 12-1. Ornithology survey information is provided in Chapter 13: Ornithology (PEI, Report Volume I).
- This level of desk-based review and field data collection is sufficient to establish a preliminary ecological baseline; to inform an initial assessment of likely significant effects and to achieve the purpose of this assessment.

12.3.9 Protected and notable habitats and species include those listed under Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended), Schedules 2 and 4 of The Habitats Regulations, and species and habitats of principal importance for nature conservation in England listed under Section 41 of the NERC Act 2006.

12.3.10 Other notable habitats and species have also been considered and assessed on a case-by-case basis (e.g., those included in national Red Data Books and Lists, those within the Local Biodiversity Action Plan (LBAP) and/or those listed on BoCC

red/amber lists, but not protected by legislation). This is consistent with the requirements of relevant planning policy.

12.3.11 The extent of field surveys is detailed within Table 12-1, and in Figure 12-4: Phase 1 Habitat Survey Plan (PEI Report, Volume II). The Study Areas are considered sufficient to address the potential worst-case zone of influence of the Proposed Development on the relevant ecological features concerned.

Table 12-1: Scope and Methods of Ecological Field Surveys

SURVEY	SCOPE OF SURVEY	SURVEY DATES (INCLUDING REPORT ON STATUS OF SURVEYS)	SURVEY AREA EXTENT	JUSTIFICATION
Phase 1 Habitat Survey and Habitat Assessment Condition to inform BNG Assessment	Phase 1 Habitat Survey in accordance with the published method (JNCC, 2016 and CIEEM, 2017). The Phase 1 habitat survey will be supplemented by UK Habitat Classification (UKHab) and condition assessment in accordance with Natural England's Biodiversity Metric 4.0 (Natural England, 2023). Assessment of possible presence of protected, priority[2] or otherwise notable species and, where relevant, the likely importance of habitat features for such species. Record of INNS of plants. Incidental records of protected or priority species or their field signs. The Phase 1 Habitat and UKHab	October 2022 – September 2023	Habitats within the Proposed Development Site. This has been extended further where deemed appropriate.	The information will form the basis of the calculation of potential permanent and temporary habitat effects within the EcIA to be presented in the ES. Habitat condition assessments are required to support a BNG assessment for the Proposed Development.

[2] These are also referred to as "protected and notable species/habitats" a definition of which is provided in paragraph 12.2.13

SURVEY	SCOPE OF SURVEY	SURVEY DATES (INCLUDING REPORT ON STATUS OF SURVEYS)	SURVEY AREA EXTENT	JUSTIFICATION
	surveys will also be supplemented by aerial habitat mapping.			
Detailed Botanical Survey	National Vegetation Classification (NVC) surveys completed where areas of potential botanical importance will be affected by the Proposed Development.	June 2023	Areas identified during Phase 1 habitat surveys.	To assess the ecological baseline and determine appropriate mitigation where habitats cannot be avoided.
Great Crested Newt (GCN) (*Triturus cristatus)*	Natural England have been consulted to confirm if (District Level Licencing) DLL will be available for the Proposed Development. eDNA surveys have been completed to confirm presence / likely absence of GCN within 250 m of the Proposed Development.	eDNA surveys were completed between 15th April and 30th June 2023.	Waterbodies within 250 m of the Proposed Development Site have been identified based on OS mapping and aerial photography.	GCN surveys are required to establish the ecological baseline for the Proposed Development. Additionally, further consultation with Natural England is required to confirm if DLL can be used to avoid significant effects upon GCN populations.
Bats - Preliminary Roost Features (PRF) assessment	Permanent impacts on trees, buildings or structures will be avoided where possible. Trees, buildings or structures which directly impacted subject to a PRF assessment survey in accordance	October 2022 – September 2023	As per the Phase 1 Habitat Survey results.	Information collated on the location of trees/buildings/ structures that are suitable for roosting bats used to inform design and offset buffers to avoid direct effects upon potential roost sites (and avoidance of trees and woodland with higher ecological value

SURVEY	SCOPE OF SURVEY	SURVEY DATES (INCLUDING REPORT ON STATUS OF SURVEYS)	SURVEY AREA EXTENT	JUSTIFICATION
	with The Bat Conservation Trust guidance (Collins, 2016).			irrespective of bats which should be avoided). Furthermore, the PRF assessment information used as basis of the scope for roost surveys (as detailed below).
Bats – Foraging/ Commuting	Activity surveys undertaken based upon published guidance (Collins, 2016 and BCT, 2022) where potential effects upon foraging and commuting routes are identified. An appropriate level of survey effort comprising walked transects and periods of remote static detector deployment across the activity season will be undertaken based on the suitability of the habitats for foraging/commuting bats, in accordance with standard survey guidance. Activity transect routes planned to provide representative coverage of all habitats of potential value to foraging/commuting bats within	May to September (surveys ongoing). Surveys commence at dusk for up to 3-4 hours and/or dawn for 3-4 hours.	Limited to areas of suitable habitat which will be permanently lost to facilitate the Proposed Development or areas where changes in lighting are proposed.	Bat activity surveys focussed on areas where suitable habitat may be lost (for example trees, woodland and hedgerows). Where linear habitat features e.g., watercourses/hedgerows are affected by the Proposed Development, which may provide commuting routes or a foraging resource for bats, appropriate robust and precedented mitigation measures can be secured via adoption of construction methods that seek to avoid these features and reduce the temporary effects to a level that would not be significant.

SURVEY	SCOPE OF SURVEY	SURVEY DATES (INCLUDING REPORT ON STATUS OF SURVEYS)	SURVEY AREA EXTENT	JUSTIFICATION
	proximity to the areas of permanent land take (although the requirements for this will be reviewed dependent on the suitability of the habitat for bats within areas where permanent facilities are proposed).			
Badger	Presence/absence survey for setts and field signs completed in combination with Phase 1 habitat survey. The survey will focus on habitat suitable to support setts and will note any observed field signs such as setts, trails and/or latrines. Incidental records obtained through desk study data in combination with the completion of other surveys will also supplement the baseline assessment.	Badger surveys can be undertaken year-round. This survey has been combined with the Phase 1 Habitat survey which took place between October 2022 and September 2023.	The Proposed Development Site plus a 50 m buffer.	To establish the ecological baseline for the Proposed Development and to determine appropriate mitigation (if required) either through avoidance of impacts on setts, or Natural England licensing for sett closures where direct impacts cannot be avoided.
Otter and water vole	Presence/absence survey looking for field signs along watercourses	Otter – surveys ongoing. Survey can be completed at any time of year –	Up to 500 m length of the watercourse – 250 m up and down	To establish the ecological baseline for the Proposed Development and to determine appropriate mitigation (if

SURVEY	SCOPE OF SURVEY	SURVEY DATES (INCLUDING REPORT ON STATUS OF SURVEYS)	SURVEY AREA EXTENT	JUSTIFICATION
	and ditches where open cut crossing techniques will be used. Presence/absence survey based on Monitoring the Otter (Chanin, 2003) and the Water Vole Mitigation Guidelines. (Dean *et al.*, 2016).	though not after heavy rainfall. Water Vole – surveys ongoing. Spring survey was completed between April and end of June 2023; with a second survey before end September 2023.	stream of crossing point.	required) either through avoidance of impacts on water vole/otter habitat, or Natural England licensing where direct impacts cannot be avoided.
Reptiles	Habitats assessed for their potential to support reptiles as part of the Phase 1 Habitat Survey based on technical guidance by Amphibian and Reptile Conservation (ARC) Trust (ARC, 2021). Where habitats appear suitable for reptile populations and are to be permanently affected by the Proposed Development, presence/absence surveys will be undertaken following guidance provided by in Froglife Advice Sheet 10: Reptile Surveys (Froglife, 1999). Survey involves laying	Reptile surveys are ongoing. Surveys completed between May 2023 and September 2023.	Areas of suitable habitat as identified during Phase 1 habitat surveys.	The reptile survey data will inform the EcIA and mitigation strategy to be presented in the ES.

SURVEY	SCOPE OF SURVEY	SURVEY DATES (INCLUDING REPORT ON STATUS OF SURVEYS)	SURVEY AREA EXTENT	JUSTIFICATION
	refugia (carpet tiles/roof felts) and leaving them in situ for up to 1-3 months. They will be checked 7 times and then removed after the last survey.			
Terrestrial Invertebrates	Terrestrial invertebrate surveys are being completed where habitats have suitability to support protected or notable invertebrate species. A focus will be on a broad but relevant selection of taxonomic groups including Coleoptera (beetles), Diptera (flies), Hemiptera (Heteroptera and Auchenorrhyncha (e.g., bugs & plant-hoppers)), aculeate Hymenoptera (e.g. solitary bees & wasps), and Arachnida (spiders and harvestmen). Other groups, which are readily identifiable in the field, such as butterflies and moths (Lepidoptera), will be recorded.	Surveys of suitable habitat were completed in May, June, July and August 2023.	Potentially important terrestrial invertebrate habitat has been identified during the Phase 1 Habitat survey and desk study.	Terrestrial invertebrate surveys are ongoing, and it is anticipated the results of these surveys will be available in November 2023 and will be included in the ES.

SURVEY	SCOPE OF SURVEY	SURVEY DATES (INCLUDING REPORT ON STATUS OF SURVEYS)	SURVEY AREA EXTENT	JUSTIFICATION
Aquatic macroinvertebrates	Surveys carried out on waterbodies within the Proposed Development Site that are potentially to be crossed using open-cut techniques.	For running watercourses; two seasons – Spring (March-May) and Autumn (September-November). Autumn aquatic macroinvertebrate surveys were completed from accessible sites in November 2022. Spring 2023 surveys were completed in March 2023. For standing water bodies (pond PSYM[3]) – surveys were completed in June and July 2023.	Waterbodies within the Proposed Development Site, with particular focus on those that are currently proposed to be crossed using open-cut techniques.	To assess the ecological baseline and to determine appropriate mitigation, if necessary, should notable and/or invasive species be present and to prevent the deterioration of water quality and WFD status.
Aquatic macrophytes	Surveys carried out on waterbodies within the Proposed Development Site that are potentially to be crossed using open-cut techniques.	The aquatic macrophytes surveys were completed in June 2023.	Minor watercourses and ditches within the Proposed Development Site, with particular focus on those that are currently proposed to	To assess the ecological baseline and to determine appropriate mitigation, if necessary, should notable and/or invasive species be present.

[3] Predictive System of Multimetrics (PSYM). Freshwater Habitats Trust (2023). PSYM Method - Freshwater Habitats TrustFreshwater Habitats Trust.

SURVEY	SCOPE OF SURVEY	SURVEY DATES (INCLUDING REPORT ON STATUS OF SURVEYS)	SURVEY AREA EXTENT	JUSTIFICATION
			be crossed using open-cut techniques.	
Fish	eDNA surveys for standing water bodies.	The fish eDNA surveys were completed in June 2023.	Waterbodies within the Proposed Development Site, with particular focus on those that are currently proposed to be crossed using open-cut technology or where suitable habitat could potentially be lost.	To assess the ecological baseline and to determine appropriate mitigation, if necessary, should notable and/or invasive species be present.
Invasive and Non-native species (INNS)	The presence of INNS recorded during baseline ecological surveys of all aquatic surveys and through the desk study.	The survey for invasive non-native species was undertaken during the Phase 1 habitat surveys and botanical and aquatic surveys.	As per the Phase 1 habitat survey.	To assess the ecological baseline and to determine appropriate mitigation, if necessary, should invasive species be present.

Value/Importance of Ecological Features

12.3.12 The value of sites, habitats and potential for protected and notable species are evaluated with reference to both their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations) and their legal status.

12.3.13 The importance of biodiversity resources/ecological features within the study areas is assessed according to a defined geographical framework with reference to Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018).

12.3.14 Current CIEEM guidance have deliberately moved away from the term “receptor” and have adopted the term “Ecological Feature”.

12.3.15 CIEEM Ecological Impact Assessment guidelines recommends that the value/importance of a biodiversity resource/ecological feature be considered within a defined geographical context. The value of each ecological feature has been defined with reference to the geographical level at which it matters, and the results of this assessment are used to identify the relevant features requiring impact assessment. The frames of reference that were used for this assessment, based on CIEEM guidance, are:

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (e.g. north-east);
- District (Hartlepool, Stockton-on-Tees or Redcar and Cleveland);
- Local (ecological features that do not meet criteria for valuation at a District or higher level, but that have sufficient value to merit retention or mitigation); and
- Negligible (common and widespread ecological features of such low priority that they do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status).

12.3.16 All ecological features of Local value and above, where there is the potential for direct and indirect impacts due to the Proposed Development have been taken forward to impact assessment and as such considered to be the ‘Important Ecological Features’ for the purposes of this PEI Report chapter. In line with the CIEEM guidelines, the terminology used draws a clear distinction between the terms ‘impact’ and ‘effect’. These terms are defined as follows:

- impact – actions resulting in changes to an ecological feature; for example, site clearance activities leading to the felling of a tree utilised as a bat roost; and
- effect - outcome resulting from an impact, acting upon the conservation status or structure and function of an ecological feature; for example, killing/injury of bats

and reducing the availability of breeding habitat because of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned.

Assessment of Significance

12.3.17 Potential impacts on important ecological features have been assessed in accordance with CIEEM best practice guidance (CIEEM, 2022).

12.3.18 Magnitude refers to size, amount, intensity, and volume. It should be quantified if possible and expressed in absolute or relative terms, for example, the amount of habitat lost, percentage change to habitat area, percentage decline in a species population. However, at this stage of the design of the Proposed Development and with the existing gaps in the baseline ecological data (due to ongoing ecological surveys), quantifying the magnitude of impact at this stage is indicative only.

12.3.19 The potential magnitude of change on an ecological feature arising from activities occurring as part of the Proposed Development is determined in consideration of their beneficial or adverse nature; extent; duration; timing; frequency; and reversibility of the impact.

12.3.20 It is not necessary in the assessment to address all habitats and species with potential to occur in the zone of influence of a project. Instead, the focus has been on those that are 'relevant'. CIEEM guidance makes it clear that there is no need to "carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable". This does not mean that efforts should not be made to safeguard wider biodiversity, and requirements for this have been considered. National policy documents emphasise the need to achieve no net loss of biodiversity and enhancement of biodiversity.

Significance Criteria

12.3.21 For each ecological feature only those characteristics relevant to understanding the ecological effect and determining the effect significance are described. The determination of the significance of effects is made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

- Not Significant - no, negligible or minor effect on structure and function, or conservation status; and
- Significant - structure and function, or conservation status is subject to a major or moderate effect.

12.3.22 For significant effects (both adverse and beneficial) this is qualified with reference to the geographic scale at which the effect is significant (e.g., an adverse effect significant at a National level).

12.3.23 The CIEEM approach described above broadly accords with the EIA methodology described in Chapter 2: Assessment Methodology (PEI Report, Volume I). However, a matrix approach will not be used to classify effects, as this deviates from CIEEM

guidance. To provide consistency of terminology with other chapters of the PEI Report, the findings of the CIEEM assessment have been translated into the classification of effects scale as outlined in Table 12-2.

Table 12-2: Relationship Between CIEEM Assessment Terms and those used in other PEI Report Chapters

EFFECT CLASSIFICATION	TERMINOLOGY USED IN OTHER PEI REPORT CHAPTERS	EQUIVALENT CIEEM ASSESSMENT
Significant (beneficial)	Major beneficial	Beneficial effect on structure/function or conservation status at regional, national or international level.
	Moderate beneficial	Beneficial effect on structure/function or conservation status at District or County level.
Not significant	Minor beneficial	Beneficial effect on structure/function or conservation status at Site or Local level.
	Negligible	No effect on structure/function or conservation status.
	Minor adverse	Adverse effect on structure/function or conservation status at a local level.
Significant (adverse)	Moderate adverse	Adverse effect on structure/function or conservation status at District or County level. Contravention of wildlife legislation.
	Major adverse	Adverse effect on structure/function or conservation status at Regional, National or International level. Contravention of wildlife legislation.

12.3.24 Significant adverse effects will be mitigated or compensated whilst further ecological enhancements will be recommended where appropriate to help meet planning policy objectives. Following the implementation of mitigation and compensation measures, as appropriate, residual effects on ecological features have been identified.

Consultation

12.3.25 An EIA Scoping Opinion was requested from the Inspectorate in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to ecology and nature conservation are outlined in Table 12-3.

Table 12-3: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	Great Crested Newt (GCN) Surveys. The Scoping Report seeks to scope out surveys on land located to the south of the River Tees on the basis that the Industry Nature Conservation Association (INCA) (a membership organisation including the Tees Valley Wildlife Trust) confirmed for the NZT project that there are known occurrences of GCN in this area. Table 6-3 of the Scoping Report states that land to the north of the River Tees would be surveyed if a District Level Licensing (DLL) approach is not agreed with Natural England. The Inspectorate agrees that surveys on land to the south of the River Tees can be scoped out of the ES.	eDNA surveys have been completed to confirm GCN presence/likely absence within suitable waterbodies north of the River Tees. Natural England were contacted on the 10th March 2023 to confirm if DLL for GCN will be available for the Proposed Development. In their response dated 27th April 2023 (reference DLL-ENQ-NEYK-00025) Natural England provided best and worst-case scenario costs, noting that the scope of the development was yet to be refined and the Main Site location was unconfirmed. Natural England advised that once the scope of the development had been finalised, the Main Site location determined and the number of waterbodies to be impacted known, they could run a final impact assessment to provide the conservation costs of obtaining a DLL. Effects upon GCN will be avoided where possible, and if not possible, a suitable mitigation strategy will be implemented. This may involve a DLL or a mitigation licence from Natural England.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping opinion 17th May 2023	Effects on relevant habitats and species from water quality changes during operation. The Scoping Report states that temporary effects to water quality during construction would be considered but does not reference potential effects during operation, for example from spillages or discharges, extraction of water and/or effluent discharge. The ES should include an assessment of this matter or otherwise demonstrate why significant effects are not likely to occur. Cross-reference should be made to the assessment in the Surface Water, Flood Risk and Water Resources ES Chapter.	Effects upon relevant habitats and species from water quality changes are considered for all phases of the Proposed Development – refer to Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I).
The Inspectorate	Scoping opinion 17th May 2023	Bat activity surveys along the Connection Corridors. The Scoping Report identifies the intention to limit surveys to areas of suitable habitat where permanent effects e.g., loss are predicted. The Inspectorate accepts, as stated in Table 6-3 of the Scoping Report, that such surveys may not be warranted in relation to temporary habitat loss. However, the Inspectorate considers that they may be required to inform the assessment of likely significant effects and the design of appropriate mitigation in relation to the effects of construction lighting and effects resulting from impacts to linear habitat features.	Bat activity surveys are ongoing and are being undertaken within areas of suitable habitat to inform the ecological baseline.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
		These matters should be considered in the ES where likely significant effects could occur, supported by appropriate evidence such as bat activity survey data. The Applicant should seek agreement from relevant consultees and provide a description of the approach taken in the ES, incorporating any relevant advice.	
The Inspectorate	Scoping Opinion 17th May 2023	Air quality effects on sensitive ecological receptors. The Scoping Report states that air quality impacts from construction traffic emissions and operational emissions will be considered but does not specify for which pollutants. Section 6.2 (air quality) of the Scoping Report identifies which pollutants are proposed to be assessed but does not reference nitrogen deposition or acid deposition as potential impacts which could affect sensitive ecological receptors. For the avoidance of doubt, the potential for nitrogen deposition and/or acid deposition to arise and result in effects on ecological receptors should be considered in the ES, and subject to assessment where a pathway for significant effects is identified.	Air quality effects including nitrogen deposition will be considered within the ecology chapter of the ES and the report to inform Habitats Regulations Assessment (HRA).
The Inspectorate	Scoping Opinion 17th May 2023	GCN – information to support of assessment of effects. With regard to the Proposed Development site to the north of the River Tees, the Scoping Report states it is proposed to consult NE about whether a District Level	As discussed above, Natural England have been consulted to confirm if DLL will be available.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
		Licensing (DLL) approach would be available for this project. If not, it is proposed to undertake habitat suitability assessment surveys to inform the assessment in the ES, in addition to eDNA and/or presence/absence surveys. It also sets out the circumstances where population size class assessment surveys may be undertaken to inform the assessment of effects. The Inspectorate is content with this approach to GCN. The Applicant's attention is drawn to Natural England's comments in Appendix 2 and the Inspectorate's Advice Note 11, Annex C.	
The Inspectorate	Scoping Opinion 17th May 2023	Otter and water vole surveys. The Scoping Report states that presence/absence surveys will be undertaken in locations where open cut crossings of watercourses and ditches will be required. The Inspectorate notes that trenchless crossings are proposed at several locations, but no information is presented as to whether otter or water vole are likely to be present here and/or whether crossing installation would generate potential impact pathways. The survey area should include trenchless crossing locations, or the ES should otherwise demonstrate why a significant effect is not likely to occur in these locations.	Otter and water vole surveys are being completed to inform the ecological baseline. Potential effects on otter and water vole will be considered within the ES, including consideration of locations where trenchless crossings are proposed.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	Detailed surveys for reptiles, freshwater species, terrestrial vertebrates and plants. The Scoping Report states that the requirement for species' surveys will be informed by further desk-based assessment and the findings of the Phase 1 Habitat survey. The Inspectorate agrees with the approach set out. Effort should be made to agree the survey scope and methodology with the relevant consultation bodies.	Where possible the survey scope and methodology for these species will be agreed with the relevant consultation bodies.
The Inspectorate	Scoping Opinion 17th May 2023	Biodiversity net gain (BNG). The Scoping Report states that the project will aspire to achieve net gain and that a BNG assessment will be undertaken. The ES should clearly distinguish between mitigation for significant adverse effects on biodiversity from wider enhancement measures. The Applicant's attention is drawn to Natural England's comments in Appendix 2 regarding the latest Biodiversity Metric 4.0.	A BNG assessment will be completed using the relevant metric available at the time of DCO submission. The BNG assessment will be completed once the DCO design is fixed and will quantify the impacts on habitats. Where habitats will be lost, proportionate enhancement and mitigation measures will be proposed to ensure delivery of the BNG target.
The Inspectorate	Scoping Opinion 17th May 2023	Scope of assessment. The assessment of temporary disturbance impacts to habitats should include consideration of likely significant effects arising from the construction of the hydrogen pipeline in proximity to Greatham Creek and Saltern Wetlands. The Applicant's attention is drawn to the EA's comments in Appendix 2 in this regard.	The potential for effects upon wetland habitats will be considered within the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	Confidential annexes. Public bodies have a responsibility to avoid releasing environmental information that could bring about harm to sensitive or vulnerable ecological features. Specific survey and assessment data relating to the presence and locations of species such as badgers, rare birds and plants that could be subject to disturbance, damage, persecution, or commercial exploitation resulting from publication of the information, should be provided in the ES as a confidential annex. All other assessment information should be included in an ES chapter, as normal, with a placeholder explaining that a confidential annex has been submitted to the Inspectorate and may be made available subject to request.	Information on sensitive ecological receptors will be provided in a confidential annex as requested.
The Inspectorate	Scoping Opinion 17th May 2023	The Scoping Report states that temporary effects to water quality during construction would be considered but does not reference potential effects during operation, for example from spillages or discharges, extraction of water and/ or effluent discharge. The ES should include an assessment of this matter or otherwise demonstrate why significant effects are not likely to occur. Cross reference should be made to the assessment in the Surface Water, Flood Risk and Water Resources ES Chapter.	Preliminary effects upon water quality are considered in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I). The ES will consider the operational effects on water quality.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	The Scoping Report states that the requirement for species' surveys will be informed by further desk-based assessment and the findings of the Phase 1 Habitat survey. The Inspectorate agrees with the approach set out. Effort should be made to agree the survey scope and methodology with the relevant consultation bodies. The ES should include an assessment of likely significant effects to these receptors where these could occur, or information demonstrating absence of a likely significant effect and where agreement has been reached with relevant consultation bodies.	Phase 1 habitat surveys and protected and notable species surveys are ongoing, and this information will inform the ecological baseline. The results of these surveys will be taken into consideration in the assessment to be presented in the ES.
The Inspectorate	Scoping Opinion 17th May 2023	Consider potential effects from noise and vibration on migratory fish.	The impact of Noise and vibration on migratory fish will be considered in the ES.
The Inspectorate	Scoping Opinion 17th May 2023	The assessment of temporary disturbance impacts to habitats should include consideration of likely significant effects arising from the construction of the hydrogen pipeline in proximity to Greatham Creek and Saltern Wetlands. The Applicant's attention is drawn to the EA's comments in Appendix 2 in this regard.	The ES will consider temporary disturbance impacts to habitats arising from the construction of the hydrogen pipeline in proximity to Greatham Creek and Saltern Wetlands.
Natural England	Scoping Opinion 9th May 2023	Cumulative and in-combination effects. Natural England acknowledges the applicant's description of projects needing to be assessed for cumulative and in	The potential for in combination effects will be considered within the ES. Nutrient neutrality will be considered within the ES and Stage 2 of the HRA

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
		combination effects alongside the proposal. We are not aware of additional projects needing assessment. We draw the examining authority's attention to the need for and benefits of an early consideration of the proposal's relationship with wider environmental issues in the Tees estuary e.g. the nutrient neutrality theme and the wider need to restore water quality in the Tees catchment to achieve favourable condition of relevant water dependent designated sites such as the Teesmouth & Cleveland Coast Special Protection Area (SPA). For further information please see our comments under Section 9 Water Quality. Further relevant references are made within section 4 (Biodiversity & Geodiversity), with respect to ecological impact pathways for designated sites and Section 10 Climate Change – delivering mitigation and building resilience.	process (Appropriate Assessment), if required. A Nutrient Neutrality Screening assessment is included in Appendix 9B of Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume III).
Natural England	Scoping response 9th May 2023	Environmental Data. At the time of writing Natural England is arranging to provide the applicant with wild bird survey data for the 'Seal Sands' part of the Teesmouth & Cleveland Coast Special Protection Area (SPA). Similarly we are checking the scope for use of the GCN District Level Licensing scheme in relation to land within	Natural England were contacted on the 10th March 2023 to confirm if DLL for GCN will be available for the Proposed Development. In their response dated 27th April 2023 (reference DLL-ENQ-NEYK-00025) Natural England provided best and worst-case scenario costs, noting that the scope of the development was yet to be refined and the Main Site location was unconfirmed. Natural England advised that once the scope of the development had been

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
		(or up to 250m from) the red line boundary lying north of the River Tees.	finalised, the Main Site location determined and the number of waterbodies to be impacted known, they could run a final impact assessment to provide the conservation costs of obtaining a DLL.
Natural England	Scoping response 9th May 2023	The assessment will need to include potential impacts of the proposal upon sites and features of nature conservation interest. We welcome the applicant's approach to gathering relevant data so far and for their reference to including opportunities for nature recovery through biodiversity net gain (BNG).	A BNG assessment will be completed during the EIA and submitted with the DCO Application.
Natural England	Scoping response 9th May 2023	The development site is within or may impact on European/internationally designated nature conservation sites. Aside from the Teesmouth & Cleveland Coast SPA and Ramsar Site the proposal would not appear likely to cause direct impacts upon Habitats Sites within 15km of the application site. Nevertheless, based on the information available so far uncertainty exists over the scope for impacts on sites within this distance threshold. The Habitats Sites listed below fall within 15km of the proposal and have been listed accordingly to allow consideration of indirect effects from the proposal. We welcome inclusion of the listed Habitats Sites within paragraph 6.6.6 accordingly.	A HRA screening report has been prepared during this preliminary stage to determine the potential impacts on the integrity of the internationally designated/protected sites or their qualifying features as a result of the Proposed Development. The HRA Screening identifies likely significant effects of these potential impacts. Further assessment will be undertaken during the EIA to prepare a report to inform Stage 2 of the HRA will be prepared to assess the potential for likely significant effects both alone and in combination with other plans or projects.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
		Figure 13 of EIA scoping report shows these sites' geographical distribution. The ES should thoroughly assess the potential for the proposal to affect internationally designated sites of nature conservation importance/European sites, including marine sites where relevant. This includes Special Protection Areas (SPA), Special Areas of Conservation (SAC), listed Ramsar sites, candidate SAC and proposed SPA. Article 6 (3) of the Habitats Directive requires an appropriate assessment where a plan or project is likely to have a significant effect upon a European Site, either individually or in combination with other plans or projects.	
Natural England	Scoping response 9th May 2023	Natural England welcomes the applicant's approach to scoping whereby the hierarchy of designated and local wildlife sites has been considered holistically using a 15 km area of search. The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within the SSSIs and identify appropriate mitigation measures to avoid, minimise or reduce any adverse significant effects.	Comments noted. The ES will include an assessment of direct and indirect effects upon statutory designated sites.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
		We welcome the applicant's proposal to include consideration of these effects within the Ecological impact assessment (EcIA).	
Natural England	Scoping response 9th May 2023	The ES should assess the impact of all phases of the proposal on protected species (including, for example, GCN reptiles, birds, otter, water vole, badger and bats - paragraph 6.6.14 refers). Natural England does not hold comprehensive information regarding the locations of species protected by law. Records of protected species should be obtained from appropriate local biological record centres, nature conservation organisations and local groups. The applicant should consider the wider context of the site, for example in terms of habitat linkages and protected species populations in the wider area. The area likely to be affected by the development should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES. Surveys should always be carried out in optimal survey time periods and to current guidance by suitably qualified and, where necessary, licensed, consultants.	Comments noted. The ES will assess the impact of all phases of the Proposed Development on protected species. The suite of ecological surveys that have been scoped in for the assessment is provided in Table 12-1. It is important to note that at the time of writing (August 2023), some protected species surveys are still ongoing.

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Natural England	Scoping response 9th May 2023	Natural England is aware that the applicant is interested in district level licensing for relevant land (within the red line boundary or relevant distance threshold for GCN waterbodies). We will continue in dialogue with the applicant accordingly. For reference, where strategic approaches such as district level licensing (DLL) for GCN are used, a letter of no impediment (LONI) will not be required. Instead, the developer will need to provide evidence to the Examining Authority (ExA) on how and where this approach has been used in relation to the proposal, which must include a counter-signed Impact Assessment and Conservation Payment Certificate (IACPC) from Natural England. The DLL approach is underpinned by a strategic area assessment which includes the identification of risk zones, strategic opportunity area maps and a mechanism to ensure adequate compensation is provided regardless of the level of impact. In addition, Natural England will undertake an impact assessment, the outcome of which will be documented in the IACPC. If no GCN surveys have been undertaken, Natural England's risk zone modelling may be relied upon. During the impact assessment, Natural England will	Natural England was contacted on the 10th March 2023 to confirm if DLL for GCN will be available for the Proposed Development. In their response dated 27th April 2023 (reference DLL-ENQ-NEYK-00025) Natural England provided best and worst-case scenario costs, noting that the scope of the development was yet to be refined and the Main Site location was unconfirmed. Natural England advised that once the scope of the development had been finalised, the Main Site location determined and the number of waterbodies to be impacted known, they could run a final impact assessment to provide the conservation costs of obtaining a DLL.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
		inform the Applicant whether their scheme is within one of the amber risk zones and therefore whether the Proposed Development is likely to have a significant effect on GCN. The IACPC will also provide additional detail including information on the Proposed Development's impact on GCN and the appropriate compensation required.	
Natural England	Scoping response 9th May 2023	Priority Habitats and Species are of particular importance for nature conservation and included in the England Biodiversity List published under section 41 of the Natural Environment and Rural Communities Act 2006. Consideration should also be given to the potential environmental value of brownfield sites, often found in urban areas and former industrial land. This is of special relevance to the application site, whose red line boundary contains a significant resource of 'open mosaic habitat' associated with the area's industrial land use.	Potential effects upon Habitats of Principal Importance will be considered in the ES including open mosaic habitat on previously developed land; a habitat present due to the brownfield nature of the site.
Natural England	Scoping response 9th May 2023	The ES should use an appropriate biodiversity metric such as Biodiversity Metric 4.0 together with ecological advice to calculate the change in biodiversity resulting from proposed development and demonstrate how proposals can achieve a net gain.	A BNG assessment will be completed during the EIA and submitted with the DCO Application.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
Natural England	Scoping response 9th May 2023	We welcome detailed assessment of road traffic emissions and refer the applicant to our guidance for public bodies to help assess the impacts of road traffic emissions to air quality capable of affecting European Sites.	The potential for changes in air quality to affect European designated sites will be assessed in the ES and will include an assessment of potential road traffic emissions.
Natural England	Scoping response 9th May 2023	The Teesmouth & Cleveland Coast SPA and Ramsar site includes areas of the River Tees channel, the Tees Estuary, and the Tees Bay. Natural England's advice is that qualifying bird species are being negatively affected by the growth of algal mats on their key foraging habitats within the Tees Estuary, particularly at Seal Sands. As such, Natural England's Nutrient Neutrality advice is that new developments should not result in additional nitrogen entering the catchment of the River Tees upstream of the SPA and Ramsar site (i.e. they are nutrient neutral). The Habitats Regulations Assessment (HRA) process provides the means to assess the proposal and we acknowledge paragraphs 6.6.27-31 accordingly. Natural England looks forward to continued dialogue with the applicant to progress this element of the proposal.	Nutrient neutrality will be considered within the ES and Stage 2 of the HRA process (Appropriate Assessment). A Nutrient Neutrality Screening assessment is included in Appendix 9B of Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume III).

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
Natural England	Scoping response 9th May 2023	Natural England notes and acknowledges the proposal's primary purpose i.e. to produce low carbon hydrogen and capture and store carbon. In terms of climate change mitigation over and above the scheme's primary purpose the proposal also offers scope to: (i) Deliver nature recovery/enhancement (ii) Build ecosystem resilience through careful planning and implementation e.g. with reference to consideration of ongoing wider efforts to restore water quality in the Tees estuary. These include but are not restricted to the provisions of the Levelling up and Regeneration Bill which requires relevant water companies to upgrade the performance of wastewater treatment works to 'technically achievable limits' by 2030. The applicant should explore opportunities to achieve a design solution that optimises the scope to deliver relevant technological advances and land management in the local area over the development's lifetime.	The potential to deliver wider ecological and environmental benefits will be sought through ongoing consultation and through the iterative design process.
Environment Agency	Scoping response 9th May 2023	R1 crosses the no. 4 brinefield (owned by Sabic and used for hydrocarbon storage), and under the flood embankment on the south bank of Greatham Creek (Sabic Embankment). It also lies under the flood embankment on the north bank of Greatham Creek, which is to be significantly repaired as part of EA's	Ongoing consultation with the Environment Agency will seek to identify opportunities to deliver wider ecological and environmental benefits as a result of the Proposed Development.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
		Greatham North East Flood Alleviation Scheme (FAS). This route also crosses the redundant no. 5 brinefield (owned by Inovyn Chlorvinyl Ltd) and the ConocoPhillips oil pipeline corridor and Seal Sands Emergency Access Road. The EA is also developing a scheme (Greatham North East FAS) to improve the defences to the south of the Venator Plant. We expect to submit an application for planning permission in Spring 2024 and hope to start construction of the scheme in summer 2024. We are currently seeking contributions from beneficiaries of the scheme. As the proposed pipeline could benefit from our works, we would welcome discussions with the applicant on the potential for financial contributions from DCO, if R1 is chosen as the preferred route.	

Use of the Rochdale Envelope

12.3.26 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with the Inspectorate's Advice Note 9 (The Planning Inspectorate, 2018). This involves assessing the maximum (or where relevant, minimum)/worst case parameters for the elements where flexibility needs to be retained.

12.3.27 As ecological surveys are ongoing and the design of the Proposed Development is not finalised at the time that this assessment was prepared, this preliminary ecological impact assessment follows the precautionary principle.

12.4 Baseline Conditions

Existing Baseline

12.4.1 The terrestrial and aquatic ecology features (excluding birds and ornithological designations which are presented in Chapter 13: Ornithology (PEI Report, Volume I)) relevant to the Proposed Development are summarised in this section and summarised within Table 12-4. A precautionary approach has been taken when defining the baseline conditions, given not all surveys have been completed. This will be subject to review and update as further information becomes available.

Designated Sites

Statutory Designated Sites

12.4.2 There are three Special Protection Areas (SPAs), three Special Areas of Conservation (SACs) and two Ramsar sites within 15 km of the Proposed Development Site.

12.4.3 There are 20 Sites of Special Scientific Interest (SSSIs) and three National Nature Reserves (NNR) within 15 km of the Proposed Development Site Details are provided in Table 12-4.

12.4.4 Figure 12-1 shows the locations of the statutory designated sites in relation to the Proposed Development Site.

Non-statutory Designated Sites

12.4.5 There are 20 non-statutory designated sites of ecological importance (Local Wildlife Sites (LWS)) within 2 km of the Proposed Development Site – refer to Table 12-5. Figure 12-2 (PEI Report, Volume II) shows the locations of non-statutory designated sites in relation to the Proposed Development Site.

Table 12-4: Statutory Designated Sites within 15 km of the Proposed Development Site

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO MAIN SITE (APPROX.)	PROXIMITY TO CONNECTION CORRIDORS (APPROX.)
Teesmouth and Cleveland Coast SPA	Qualifying features (Natural England, 2020a): • Pied avocet (*Recurvirostra avosetta)* (breeding); • Red knot (*Calidris canutus)* (non-breeding); • Ruff (*Calidris pugnax)* (non-breeding); • Common redshank (*Tringa totanus)* (non-breeding); • Sandwich tern (*Thalasseus sandvicensis)* (non-breeding); • Common tern (*Sterna hirundo)* (breeding); • Little tern (*Sternula albifrons)* (breeding); and • Waterbird assemblage.	10 m north	Adjacent to/overlapping
Teesmouth and Cleveland Coast Ramsar	The site qualifies as a Ramsar for the following Ramsar criteria (Natural England, 2020b): Criterion 5 - Assemblages of international importance: • Species with peak counts in winter: – 26,786 waterfowl (5-year peak mean 2011/12-2015/16). Criterion 6 – Species/populations occurring at levels of international importance: • Qualifying Species/populations (as identified at designation): – Species with peak counts in spring/autumn: ▪ Common redshank; 1,648 individuals representing an average of 1.1% of the East Atlantic population (1987-91).	173 m at closest point	Adjacent to/overlapping

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO MAIN SITE (APPROX.)	PROXIMITY TO CONNECTION CORRIDORS (APPROX.)
	– Species with peak counts in winter: ▪ Red knot; 5,509 individuals representing an average of 1.6% of the NE Canada/Greenland/Iceland/UK population (5 year peak mean 1991/92-1995/96); ▪ Sandwich tern; 1,900 individuals representing an average of 4.3% of the GB population (1988-1992).		
North York Moors SPA	Qualifying Features (Natural England 2019a): • Merlin (*Falco columbarius*)*;* • European golden plover (*Pluvialis apricaria*).	12.1 km south-east	8.0 km south-east
North York Moors SAC	Qualifying features (Natural England, 2014a): Annex I habitats that are a primary reason for selection of this site: • Northern Atlantic wet heaths with cross-leaved heath (*Erica tetralix)*; and • European dry heaths. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • Blanket bogs.	12.1 km south-east	8.0 km south-east
Northumbria Coast SPA	Qualifying features (Natural England, 2013): • Arctic tern (*Sterna paradisaea)*; • Little tern; • Turnstone (*Arenaria interpres*)*;*	13.7 km north	11.0 km north

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO MAIN SITE (APPROX.)	PROXIMITY TO CONNECTION CORRIDORS (APPROX.)
	• Purple sandpiper (*Calidris maritima*).		
Northumbria Coast Ramsar	The site qualifies as a Ramsar for the following Ramsar criteria (JNCC, 2000): Criterion 6 - Species/populations occurring at levels of international importance: • Qualifying Species/populations (as identified at designation): – Species with peak counts in winter: ▪ Purple sandpiper; 787 individuals representing an average of 1.6% of the population (5 year peak mean for 1992/93 to 1996/97); ▪ Turnstone; 1,739 individuals representing an average of 2.6% of the population (5 year peak mean for 1992/93 to 1996/97). – Species with peak counts during the breeding season: ▪ Little tern; 40 pairs representing an average of 1.7% of the GB population (5 year mean for 1993 to 1997).	13.7 km north	11.0 km north
Durham Coast SAC	Qualifying features (Natural England, 2014b): • Vegetated sea cliffs of the Atlantic and Baltic Coasts.	13.7 km north-west	11.0 km north-west
Castle Eden Dene SAC	Qualifying features (Natural England, 2014c): • Yew (*Taxus baccata*) dominated woodland.	Over 15 km	14.3 km north-west
Teesmouth and Cleveland Coast SSSI	The site is of special interest for the following nationally important ecological features (Natural England, 2018): • sand dunes; • saltmarshes;	5 m west	Adjacent to/overlapping

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO MAIN SITE (APPROX.)	PROXIMITY TO CONNECTION CORRIDORS (APPROX.)
	• breeding harbour seals (*Phoca vitulina)*; • breeding avocet, little tern, common tern; • a diverse assemblage of breeding birds of sand dunes, saltmarsh and lowland open waters and their margins; • non-breeding shelduck (*Tadorna tadorna)*, shoveler (*Spatula clypeata)*, gadwall (*Mareca strepera)*, ringed plover (*Charadrius hiacula)*, knot, ruff, sanderling (*Calidris alba)*, purple sandpiper, redshank and sandwich tern; • an assemblage of more than 20,000 waterbirds during the non-breeding season; and • a diverse assemblage of invertebrates associated with sand dunes.		
Lovell Hill Pools SSSI	Habitats includes open water and canals. The SSSI supports nationally rare and scarce dragonfly species including the variable damselfly (*Coenagrion pulchellum*). The pools and surrounding habitats support populations of both GCN and smooth newt (*Triturus vulgaris)*.	6.6 km south-east	2.4 km south-east
Briarcroft pasture SSSI	Species rich unimproved neutral grassland. The relevant NVC community is MG5 crested dog's tail (*Cynosurus cristatus)* – common knapweed (*Centaurea nigra)* grassland.	Over 15 km	7.7 km west
Roseberry topping SSSI	Designated for its geological interest.	12.2 km south	8.0 km south
North York Moors SSSI	Vegetation communities transition between blanket bog and dry heath land and support diverse and extensive upland plant communities. The moorland is dominated by dry heath on the central and western moors and wet heath and mire	12.1 km south-east	8.0 km south-east

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO MAIN SITE (APPROX.)	PROXIMITY TO CONNECTION CORRIDORS (APPROX.)
	communities on the northern and eastern moors. The plateaux are defined by several valleys, the sides of which support extensive strands of bracken (*Pteridium aquilinum)* and small areas of native woodland. Acid grasslands occur along some of the moorland edges. The habitats support breeding birds including golden plover and merlin.		
Saltburn Gill SSSI	A steep sided coastal dene designated for its woodland habitat. Coppiced pedunculate oak (*Quercus robur)* with standards dominate the canopy with ash (*Fraxinus excelsior)* and small pockets of wych elm (*Ulmus glabra)* and wild cherry (*Prunus avium)*. The shrub layer is composed of hazel (*Corylus avellana)*, scattered hawthorn (*Crataegus monogyna)* and blackthorn (*Prunus spinosa)*, with occasional (*holly Ilex aquifolium)*, gooseberry (*Ribes uva-crispa)*, guelder rose (*Viburnum opulus)* and spindle (*Euonymus europaeus)*. Dense patches of regenerating sycamore *Acer pseudoplatanus* are also present.	11.2 km south-east	8.2 km east
Whitton Bridge Pasture SSSI	The site is of national importance for its areas of species-rich unimproved neutral grassland. The relevant NVC community is MG5 crested dog's tail – common knapweed grassland.	Over 15 km	8.3 km west
Langbaurgh Ridge SSSI	A disused quarry designated for its geological interest.	12.5 km south	8.4 km south
Cliff Ridge SSSI	Quarries designated for geological interest.	13.2 km south	9.0 km south
Durham Coast SSSI	Contains magnesian limestone vegetation as well as a species-rich dune system. The site supports breeding cormorant Phalacrocorax carbo, fulmar (*Fulmarus*	12.0 km north-west	9.4 km north-west

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO MAIN SITE (APPROX.)	PROXIMITY TO CONNECTION CORRIDORS (APPROX.)
	glacialis), kittiwake (*Rissa tridactyla)* and little tern. The SSSI also supports non-breeding purple sandpiper and sanderling.		
Hart Bog SSSI	Hart Bog is a small topogenous mire within a steep-sided hollow. The NVC communities present are M19 common heather (*Calluna vulgaris)* - hare's-tail cottongrass (*Eriophorum vaginatum)* blanket mire, M4 – bottle sedge (*Carex rostrata)* - (*Sphagnum recurvum (fallax))* mire, M5 - (*Carex rostrata - Sphagnum squarrosum)* mire and S27 – bottle sedge – marsh cinquefoil (*Potentilla palustris)* swamp.	14.1 km north-west	10.4 km north-west
Pike Whin Bog SSSI	The bog lies in a natural basin, in which the water level is at or above the ground surface for most of the year. The NVC communities present are M23 – soft rush (*Juncus effusus)*/sharp flowered rush (*Juncus acutiflorus)* – marsh bedstraw (*Galium palustre)* rush pasture, M27 – meadowsweet (*Filipendula ulmaria)* – wild angelica (*Angelica sylvestris)* mire and S27 – bottle sedge – marsh cinquefoil swamp.	Over 15 km	10.4 km north-west
Kildale Hall SSSI	Designated for its geological interest.	Over 15 km	11.7 km south-east
Hulam Fen SSSI	The fen supports a supports a range of wetland and grassland vegetation developed over and around a hydrostatic spring-head, fed from the underlying Magnesian Limestone aquifer in an otherwise arable landscape.	Over 15 km	12.9 km north-west
Castle Eden Dene SSSI	The largest and biologically the richest of a series of steep-sided wooded denes, formed as deep ravines in the Magnesian Limestone and boulder clay of the Durham Coast. Designated for woodland and grassland habitats.	Over 15 km	14.3 km north-west

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO MAIN SITE (APPROX.)	PROXIMITY TO CONNECTION CORRIDORS (APPROX.)
Pinkney and Gerrick Woods SSSI	An area of deciduous woodland on the steep slopes of Kilton Beck. It is of importance as one of the few ancient woodland sites in Cleveland which remains in a largely semi-natural condition.	Over 15 km	13.6 km south-east
Fishburn Grassland SSSI	Fishburn Grassland comprises species-rich calcareous grassland developed over magnesian limestone. The grassland is composed of two distinct communities, the first dominated by blue moor-grass (*Sesleria albicans)* and small scabious (*Scabiosa columbaria)* and the second by upright brome (*Bromus erectus)*. Scrub communities form the remainder of the site.	Over 15 km	13.9 km north-west
Charity Land SSSI	This site, situated to the north of Trimdon beside the upper River Skerne comprises a group of fields with species-rich unimproved neutral grassland.	Over 15 km	13.9 km north-west
Newton Ketton Meadow SSSI	Newton Ketton Meadow is important as one of the very few surviving unimproved hay meadows in the coastal plain between the Rivers Tyne and Tees. A small area of fen vegetation adds diversity to the site.	Over 15 km	14.6 km west
Boulby Quarries SSSI	Designated for its geological interest.	Over 15 km	14.9 km east
Teesmouth NNR	The reserve covers 350 ha in two sections separated by Hartlepool PowerStation. North Gare lies to the north, and Seal Sands to the south. North Gare comprises of sand dunes and areas of saltmarsh. The dunes and saltmarsh support a wide variety of plants, and in winter large flocks of birds roost at Seaton Snook. Seal Sands comprises of mudflats and are home to the common and grey seals (*Halichoerus grypus)* and the winter home for hundreds of shelduck. More than	1.77 km west	Within/overlapping

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO MAIN SITE (APPROX.)	PROXIMITY TO CONNECTION CORRIDORS (APPROX.)
	20,000 individual waterfowl visit Teesmouth during the year. The reserve supports four different species of marsh orchid and two nationally scarce species of grass.		
Durham Coast NNR	Designated for vegetated sea cliffs of the Atlantic and Baltic Coasts.	12.7 km north-west	10.0 km north-west
Castle Eden Dene NNR	The NNR is Designated for habitats and species groups including: • amphibians and reptiles; • ash, elm and sycamore dominated woodland and alder (*Alnus glutinosa*); • birds; • calcareous grassland (neutral and wet grassland); • invertebrate assemblage; • mammals; • plants and fungi; • streams and springs; and • woodland (yew and broadleaf).	Over 15 km	14.3 km north-west

Table 12-5: Non-statutory designated sites within 2 km of the Proposed Development Site

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO THE MAIN SITE	PROXIMITY TO CONNECTION CORRIDORS
Phillips Tank Farm Grassland LWS	The site comprises urban grassland which has developed on site that supports at least 10 herb species required for LWS selection in the Tees Valley. The site supports breeding populations of GCN, and the site boundaries encompass both aquatic and terrestrial habitats used by GCN. The site regularly supports green hairstreak (*Callophrys rubi)* or white-letter hairstreak (*Satyrium w-album*) or a significant population (i.e. 10 individuals) of dingy skipper (*Erynnis tages)*. The site supports a good population of water vole, including areas of suitable habitat that link good populations even when the area is not currently occupied.	4.4 km west	Within/overlapping
Saltern Saltmarsh LWS	The site supports a saltmarsh habitat and was created as an inter-tidal habitat of 20 ha in 2014 by the Environment Agency.	4.7 km west	78.3 m north-west
Greenabella Marsh LWS	The site makes up the NVC community MG1 False-oat grass (*Arrhenatherum elatius*) grassland. There are several large pools and ditches and areas of swamp and fen communities. Open mosaic habitat is present on the sea wall and around pathways. The site supports a good population of water vole, including areas of suitable habitat that link good populations even when the area is not currently occupied. The site supports native reptile species where more than one individual has been recorded over a period of more than one year.	3.5 km west	Within/overlapping
Greatham Creek North Bank Saltmarsh LWS	The site supports a saltmarsh habitat, dominated by saltmarsh grass (*Puccinellia* spp.)	4.0 km west	Within/overlapping
Coatham Marsh LWS	The site supports a saltmarsh, coastal grasslands, flushes, seepages, springs, neutral and urban grassland habitats and vascular plants.	1.3 km east	Within/overlapping

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO THE MAIN SITE	PROXIMITY TO CONNECTION CORRIDORS
Eston Pumping Station LWS	The site supports a mosaic of habitats and borderline neutral urban grasslands.	1.1 km south	Within/overlapping
Cowpen Bewley Woodland Park LWS	The site is a former brickworks, landfill and agricultural land that is now a country park comprising new woodland, grassland, ponds and lakes. The site supports GCN.	6.9 km west	Within/overlapping
Queen's Meadow Wetland LWS	The site supports a good population of three or more amphibian species required for Tees Valley LWS Selection.	Over 2 km	1.2 km north-west
Tot Fenny's Meadow LWS	The site supports neutral grassland, fen and/or flushes. The neutral grassland supports at least three grass and three herb species required for Tees Valley LWS selection. There is also an area of marsh habitat.	Over 2 km	599 m west
Billingham Norton Bottoms Reedbed Treatment System LWS	A large reedbed.	Over 2 km	715 m south-west
Norton Bottoms LWS	The site supports neutral grassland with grassland species including common bent (*Agrostis capillaris*), crested dog's-tail, yellow oat-grass (*Trisetum flavescens*), yarrow (*Achillea millefolium*), cat's-ear (*Hypochaeris radicata*), common bird's-foot-trefoil (Lotus corniculatus), selfheal (Prunella vulgaris), salad burnet (Sanguisorba minor) and red clover (Trifolium pratense). The site could also support urban grassland, but all species have not been recorded to confirm. Species recorded include silver hair-grass (*Aira caryophyllea*), soft brome (*Bromus hordeaceus*), viper's-bugloss (*Echium vulgare*) and fairy flax.	Over 2 km	760 m west

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO THE MAIN SITE	PROXIMITY TO CONNECTION CORRIDORS
Power Station Grassland and Wetland LWS	The site is a large area of mainly rank grassland and scrub but also some small areas of wetland and open mosaic habitat. The site supports native reptile species where more than one individual has been recorded over a period of more than one year.	Over 2 km	877 m north-west
Brenda Road Brownfield LWS	The site includes early successional brown field habitat which supports dingy skipper butterfly.	Over 2 km	1.1 km north-west
Teesaurus Park LWS	The site is an urban park and has areas of mown amenity grassland and areas of varied grass and herb mix. The herb species include kidney vetch (*Anthyllis vulneraria*), viper's-bugloss, great lettuce (*Lactuca virosa*) and tansy (*Tanacetum vulgare*).	Over 2 km	890.8 m west
Zinc Works Bird Field LWS	The site is a large flat area of grassland which regularly holds more than 0.1% of the national population of any wintering or passage species and the site regularly holds more than 5% of the cited bird interest of the Teesmouth and Cleveland Coast SPA (this to include 5% of a cited individual bird population or of the combined water bird population, currently stated as 21,406).	Over 2 km	1.3 km north
Wilton Woods Complex LWS	The site supports a broad-leaved, mixed and yew woodland and is an ancient woodland.	Over 2 km	1.2 km south-east
Seaton Common LWS	The site is a wet grassland which attracts large numbers of passage migrants over winter and is a breeding ground for birds in the summer months. Please refer to the Teesmouth and Cleveland Coast SPA for cited birds of interest. The site also has an exceptional number of common toad (*Bufo bufo*); measured in the 1000s in 2012 and 2015.	Over 2 km	1.3 km north

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO THE MAIN SITE	PROXIMITY TO CONNECTION CORRIDORS
Portrack Meadows LWS	The site is a former industrial site on the north bank of the river Tees. The site comprises a central area of urban grassland with surrounding scrub, an area of reedbed, and a brackish pool with remnant saltmarsh. The neutral grassland on site supports sweet vernal-grass (*Anthoxanthum odoratum*), crested dog's-tail, common knapweed, cat's-ear, meadow vetchling (*Lathyrus pratensis*), common bird's-foot-trefoil, cowslip (*Primula veris*), selfheal and yellow-rattle (*Rhinanthus minor*). The urban grassland supports kidney vetch, mugwort (*Artemisia vulgaris*), yellow wort (*Blackstonia perfoliata*), common centaury (*Centaurium erythraea*), wild carrot (*Daucus carota*), hedgerow crane's-bill (*Geranium pyrenaicum*), common toadflax (*Linaria vulgaris*), tall melilot (*Melilotus latissimus*), wild mignonette (*Reseda lutea*), hedge mustard (*Sisymbrium officinale*) and tansy.	Over 2 km	1.6 km south-west
Billingham Beck Valley Country Park LWS	The site is a large area of neutral grassland, wetland, scrub and woodland in the valley of Billingham Beck, that forms the country park. The site supports dingy skipper, has areas of reedbed. The wetland species on site include sneezewort (*Achillea ptarmica*), marsh marigold, (*Caltha palustris*), yellow Iris (*Iris pseudacorus*), meadow vetchling, ragged robin (Lychnis flos-cuculi), amphibious bistort (*Persicaria amphibia*), great burnet (*Sanguisorba officinalis*). The neutral grassland species include common bent, meadow foxtail (*Alopecurus pratensis*), sweet vernal-grass, crested dog's-tail, yellow oat-grass, yarrow, harebell (*Campanula rotundifolia*), common knapweed, meadow vetchling, autumn hawkbit (*Scorzoneroides autumnalis*), common bird's-foot-trefoil, selfheal, yellow-rattle, common sorrel (*Rumex ace*tosa), great burnet, betony (*Betonica officinali*s), devil's-bit scabious (*Succisa pratensis*), zigzag clover (*Trifolium medium*) and red clover.	Over 2 km	1.4 km west

SITE	SUMMARY OF REASONS FOR DESIGNATION	PROXIMITY TO THE MAIN SITE	PROXIMITY TO CONNECTION CORRIDORS
Portrack Marsh LWS	The site is a wetland nature reserve with pools and reed/swamp vegetation. The site supports dingy skipper. The site regularly holds more than 0.1% of the national population of any wintering or passage species of the cited bird interest of the Teesmouth and Cleveland Coast SPA and the site regularly holds more than 5% of the cited gadwall, shoveler and redshank population.	Over 2 km	1.9 km south-west

Habitats of Principal Importance

12.4.6 The following potential Habitats of Principal Importance (HPI) have been identified within the Proposed Development Site:

- coastal and floodplain grazing marsh;
- coastal saltmarsh;
- coastal sand dunes;
- deciduous woodland;
- mudflats;
- saline lagoons;
- open mosaic habitat on previously developed land;
- ponds; and
- hedgerows.

12.4.7 The locations of potential HPI in relation to the Proposed Development Site are provided in Figure 12-3: Potential Habitats of Principal Importance (PEI Report, Volume II). The presence of HPI will be confirmed on completion of the Phase 1 habitat survey and any detailed botanical surveys considered necessary.

Extended Phase 1 Habitat Survey

12.4.8 The habitats present within the Proposed Development Site are summarised below and shown in draft in Figure 12-4: Phase 1 Habitat Survey Results (PEI Report, Volume II) based on data in the MAGiC website. An updated version of this Figure, including the Phase 1 Habitat Survey results will be included in the ES.

12.4.9 Habitats have been identified through a combination of desk-based surveys and field surveys. Habitat surveys were ongoing at the time of writing. Full details of the habitats present, including detailed target notes, will be available within an Extended Phase 1 Habitat Survey Report which will be provided as an appendix to the ES.

Main Site

12.4.10 The following habitats have been identified within the Main Site.

Bare Ground

12.4.11 The majority of the Main Site comprises bare ground, although there are some structures remaining within inaccessible areas.

Ephemeral/Short Perennial Vegetation

12.4.12 Areas which were formerly base ground are becoming colonised by short growing perennial herbaceous and graminoid species. Species include ribwort plantain (*Plantago lanceolata)*, cock's foot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanata*) and red fescue (*Festuca rubra*).

Dense Scrub

12.4.13 A small area of dense bramble (*Rubus fruticosus* agg.) scrub is present within the north of the Main Site.

Amenity Grassland

12.4.14 A small area of amenity grassland is present in the south-west of the Main Site. Species present include white clover (*Trifolium repens*), ribwort plantain, yarrow, bent (*Agrostis* sp.), cranesbill (*Geranium* sp.), Dandelion (*Taraxacum* sp.), Yorkshire fog, cock's foot and creeping buttercup (*Ranunculus repens*).

Hardstanding

12.4.15 Hardstanding is present in the south-east of the Main Site.

Buildings

12.4.16 Buildings are present in the north-east of the Main Site.

Connection Corridors

12.4.17 The following habitats have been identified within the Connection Corridors.

Broadleaved Plantation Woodland

12.4.18 Most of the woodland areas identified during the Phase 1 surveys are of screening plantation around the industrial sites of Teesside. These woodlands comprise of sycamore and ash with sections around the Wilton Complex being willow (*Salix* sp.) plantations. A larger area of broadleaved plantation woodland is located at Cowpen Bewley with species such as pedunculate oak, ash, willow species and field maple (*Acer campestre*). Another smaller area of broadleaved plantation woodland was identified at the Saltholme National Grid Substation site with species such as ash, oak, sycamore, hawthorn, blackthorn and white poplar (*Populus alba*) recorded.

Dense and Scattered Scrub

12.4.19 Scrub habitat was found in various locations within the Connection Corridors. It is typically comprised of bramble, hawthorn, gorse (*Ulex europaeus*) and sea-buckthorn (*Hippophae rhamnoides*). Dense scrub was present around Dorman's Pool and at Cowpen Bewley.

Hedgerows

12.4.20 Native hedgerows are largely restricted to the farmed landscape, disused rail/road and within Cowpen Bewley. These hedgerows are of variable condition with some intact and well-maintained, and others defunct. The hedgerows surveyed during the Phase 1 Habitat surveys comprised mainly of hawthorn, dog rose (*Rosa canina* agg.) and elder (*Sambucus nigra*).

Semi-improved Neutral Grassland

12.4.21 Semi-improved grassland is widespread within the Connection Corridors. These grasslands being neutral, generally unmanaged and therefore relatively rank and often species poor.

12.4.22 These grasslands when found within industrial areas generally forms mosaics with other habitat types contributing to a wider resource of open mosaic habitat on previously developed land (an HPI).

12.4.23 The species composition varies, with the more species-diverse grasslands supporting herb species such as common bird's-foot trefoil, kidney vetch, wild carrot, yarrow and common knapweed. The most species-poor grasslands are generally dominated by false-oat grass. A linear stretch of semi-improved grassland was identified around the Seal Sands industrial complex which was flower-rich secondary grassland developed on previously developed and made ground with potential calcareous influence.

Poor Semi-improved Neutral Grassland

12.4.24 The most species-poor grasslands are generally dominated by false-oat grass. Poor semi-improved grassland grazed by cattle was identified to the east of Seaton Carew Road. This grassland is considered to be floodplain grazing marsh which is a HPI.

Improved Grassland

12.4.25 Fields of improved grassland are mostly grazed and dominated by perennial rye grass (*Lolium perenne*).

Amenity Grassland

12.4.26 Amenity grassland was identified in small areas around buildings and within landscaped areas.

Ephemeral/Short Perennial

12.4.27 Ephemeral/short perennial vegetation is of scattered occurrence within the Connection Corridors. It is recorded colonising bare ground and formed part of a mosaic of habitats at Eston Pumping Station LWS, within the Wilton International Complex and on CF Fertiliser land.

Arable

12.4.28 Arable habitats used for crop production were identified to the east of the Wilton International Complex, to the west of the A185, and to the north of Cowpen Bewley/Greatham Creek.

Running Water

12.4.29 Watercourses within the Connection Corridors include the River Tees, Greatham Creek and Dabholm Gut. There are numerous small watercourses and ditches which flow through areas of saltmarsh and floodplain grazing marsh. Standing Water

12.4.30 Both brackish and freshwater water bodies are present within the Connection Corridors. Ponds and saline lagoons are HPI.

Marshy Grassland

12.4.31 One area of marshy grassland was identified at the North Tees Landfill next to Greatham Creek. Dominant species include sea club-rush (*Bolboschoenus maritimus*) and common reed (*Phragmites australis*).

Swamp

12.4.32 Areas of swamp habitat dominated by common reed were identified in small areas within the South Tees Development corporation land, at Eston Pumping Station LWS and within Cowpen Bewley. Larger areas of swamp habitat outside of the Connection Corridors occur at the RSPB Saltholme Reserve and connected reserves such as Dorman's Pool.

Saltmarsh

12.4.33 Saltmarsh habitat is primarily located in the North Tees area at Seal Sands and Greatham Creek. The saltmarsh habitat located around Greatham Creek is comprised of species such as annual sea-blite (*Suaeda maritima*), common saltmarsh-grass (*Puccinellia maritima*), sea plantain (*Plantagon maritima*), greater sea-spurrey (*Spergularia media*), sea lavender (*Limonium vulgare*), long-spiked glasswort (*Salicornia dolichostacha*), yellow glasswort (*Salicornia fragilis*), sea aster (*Aster tripolium*), sea arrowgrass (*Triglochin maritima*) and saltmarsh rush (*Juncus gerardii*. Saltmarsh habitat within Seal Sands was assessed from viewpoints and public footpaths due to the sensitivity of the area of breeding birds and seals.

Buildings

12.4.34 Buildings are present within the Connection Corridors associated with the various offtakers and industries within Teesside.

Hardstanding

12.4.35 Hardstanding is present around buildings and roads. In some locations the hardstanding contributes to open mosaic habitat on previously developed land.

Protected and Notable Species

12.4.36 The following protected and notable faunal species have been identified through the desk study or Phase 1 habitat survey as present within the Proposed Development Site, or potentially within the zone of influence of the Proposed Development Site.

Invertebrates

12.4.37 The desk study identified records for protected and notable invertebrate species within the Proposed Development Site. These include records for the butterflies, dingy skipper and grayling, both Species of Principal Importance under S41 of the NERC Act. The desk study indicates that colonies of dingy skipper and grayling are focussed on brownfield sites within Teesside, including Seal Sands, South Gare and Coatham Dunes.

12.4.38 Invertebrate surveys were completed to inform the Net Zero Teesside (NZT) application at land within the former Redcar Steelworks (Teesworks). 318 invertebrate species were identified during the surveys and the invertebrate assemblage was assessed to be of County importance (AECOM, 2021a).

12.4.39 Invertebrate surveys are being completed in areas of suitable habitat within the Proposed Development Site and the results will be presented within the ES.

Amphibians

12.4.40 The desk study identified records of GCN within 2 km of the Proposed Development Site. The closest records were within Cowpen Bewley and Philips Tank Farm LWS.

12.4.41 Habitats were assessed for their suitability to support GCN to inform the NZT DCO application. Two potential waterbodies with suitability to support GCN were identified and eDNA surveys were completed to confirm presence/likely absence. The results of these survey were indeterminate, however working methods were designed to avoid potential impacts should GCN be present (AECOM, 2021b).

12.4.42 Habitats will be assessed for their suitability to support amphibians (including GCN) during the ongoing Phase 1 habitat surveys and the results will be presented within the ES.

Reptiles

12.4.43 The desk study identified records of common lizard (*Zootoca vivipara*) along the coast at South Gare. In addition, the Industry Nature Conservation Association (INCA) provided records of common lizard near Dorman's pool. Reptile surveys were completed to inform the NZT DCO in 2018 and 2020 and identified a 'good' population size class of common lizard at Coatham Sands and assessed the population to be of County importance (AECOM, 2021c).

12.4.44 Habitats will be assessed for their suitability to support reptiles during the ongoing Phase 1 habitat surveys and presence/likely absence surveys are being completed where there is potential to the Proposed Development to have an impact upon reptile populations. The results of the surveys will be presented within the ES.

Fish

12.4.45 Several notable fish species were identified within 2 km of the Study Area during the desk study using Environment Agency data, NBN Atlas data, survey results for other developments in the area (e.g., the NZT project) and academically published material. These are summarised in Table 12-6 and include Annex II species Bullhead *Cottus gobio*, the UK BAP Priority species Brown/sea Trout (*Salmo trutta*), in addition to the European eel (*Anguilla Anguilla*), which is covered by both previously mentioned legislations and is classified as 'Critically Endangered' in the International Union for Conservation of Nature (IUCN) and afforded further protection under the Eel Regulations 2009.

Table 12-6: Protected Fish Species Identified within 2 km of the Study Area and Within Relevant Catchment Monitoring Site Records

FISH SPECIES	INCLUDED IN HABITATS DIRECTIVE	SPECIES OF PRINCIPAL IMPORTANCE	LOCATIONS (AND EA MONITORING SITES RECORDED AT IF APPLICABLE)	NUMBER OF RECORDS	MOST RECENT YEAR
Bullhead *Cottus gobio*	Annex II	N	Claxton Beck (Sun *et al.*, 2021)	5	2019
Brown/Sea trout *Salmo trutta*	No	Y	20271 (Environment Agency Location) Claxton Beck (Sun *et al.* 2021)	4 4	2015 2019
European eel *Anguilla anguilla*	Annex II	Y	1350 (Environment Agency) 51509 (Environment Agency) Claxton Beck (Sun *et al.* 2021) NZT Pond 3 Foundry North eDNA) The Mill Race	N/A 1 5 1 1	2019 2015 2019 2020 2020

Bats

12.4.46 The desk study identified records of common pipistrelle (*Pipistrellus pipistrellus*), noctule (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*) and whiskered bat (*Myotis mystacinus*) within 2 km of the Proposed Development Site. Bat surveys were completed to inform the NZT DCO and recorded common pipistrelle, noctule and a *Myotis* genus bat. The overall levels of bat activity recorded through walked transect and static survey was very low to moderate and mainly attributable to common pipistrelle (AECOM, 2021d).

12.4.47 The Proposed Development Site includes woodland, hedgerows and trees which have potential to be used by roosting bats. Ground level tree assessments were undertaken on the 9th April 2023 at Cowpen Bewley Woodland Country Park and three trees were identified as having features suitable for roosting bats.

12.4.48 Bat emergence surveys will be completed to confirm presence or likely absence of roosting bats where trees with bat roost suitability will be affected by the Proposed Development. Bat activity surveys are ongoing and will be completed to inform the subsequent EcIA to be presented in the ES where habitats suitable for foraging and commuting bats will be affected. The full results of the bat surveys will be provided within the ES.

Hedgehog (Erinaceus europaeus)

12.4.49 The desk study identified records of hedgehog within 2 km of the Proposed Development Site. Habitats with suitability to support hedgehog include woodland, hedgerows and grassland.

Water Vole

12.4.50 The desk study identified records of water vole within 2 km of the Proposed Development Site. Water vole surveys were completed to inform the NZT DCO in 2018. The surveys covered five waterbodies to the north-east of Dormanstown Industrial Estate:

- The fleet;
- Power station pond;
- Steel House Pond;
- The Mill Race; and
- Railway Channel.

12.4.51 The Fleet, Mill Race and Railway Channel were considered to be of low potential value for water voles, primarily due to the bank substrate which comprised industrial ballasts and hardcore and was unsuitable for burrowing. Power Station Pond was considered to be of low potential value for water voles as the bank profile was gently sloping (5 - 15 degree slope) and the depth of the channel was less than 1 m with extensive very shallow (<0.05 m) margins. Steel House Pond was considered to be of medium potential value for water voles with a greater sustained depth of water and

more optimal bank profile in places. No evidence of water voles was found within or adjacent to any of the waterbodies surveyed (Quants Environmental, 2018).

12.4.52 Habitats within the Proposed Development Site will be assessed for their suitability to support water vole during the ongoing extended Phase 1 habitat surveys. Water vole surveys are being completed where habitats are suitable to support water vole and will potentially be affected by the Proposed Development – survey results will be provided within the ES.

Otter

12.4.53 The desk study identified records of otter within 2 km of the Proposed Development Site. Water vole surveys were completed to inform the NZT DCO in 2018. The surveys covered five waterbodies to the north-east of Dormanstown Industrial Estate as described in the water vole section above.

12.4.54 The habitats within The Fleet, Power Station Pond, Mill Race and Railway Channel respectively were considered to be of low potential value for otters, primarily due to the bank substrate which comprised industrial ballasts and hardcore. The rank grass and tall herb bank-side communities observed in these locations are less favourable as lie up areas and for holt protection than banks featuring wooded habitats. Steel House Pond was considered to be of medium potential value for otters with substantial areas of bankside vegetation cover in places. No evidence of otters was found within or adjacent to any of the waterbodies surveyed (AECOM, 2021e; Quants Environmental, 2018).

12.4.55 Habitats within the Proposed Development Site will be assessed for their suitability to support otter during the ongoing extended Phase 1 habitat surveys. Surveys are being completed where habitats are suitable to support otter and will potentially be affected by the Proposed Development – survey results will be provided within the ES.

Brown Hare (Lepus europaeus)

12.4.56 The desk study identified records of brown hare within the 2 km of the Proposed Development Site. Habitats will be assessed for their suitability to support brown hare during the ongoing Phase 1 habitat survey, with the results presented in the ES.

Badger

12.4.57 The desk study identified records of badger within 2 km of the Proposed Development Site. A survey for badger will be completed concurrently with the ongoing Phase 1 habitat surveys, with the results presented as a confidential appendix to the ES.

Marine Mammals

12.4.58 Information on marine mammals is provided within Chapter 14: Marine Ecology (PEI Report, Volume I).

Aquatic Macroinvertebrates

12.4.59 There were no specific records of protected macroinvertebrate species identified in the desk study data. However, some notable taxa were identified, including the beetle (*Helochares obscurus)* (Vulnerable), the beetle (*Ilybius subaeneus)* (nationally scarce), the beetle (*Noterus crassicornis)* (nationally scarce) and the caddisfly *Oxyethira simplex* (nationally scarce). These were found in and around the Swallow and Mucky Fleet area, which is outside the Proposed Development Site boundary, but within the Study Area.

12.4.60 Previous surveys for other developments within the Study Area found pygmy backswimmer (*Plea minutissima)* and the beetle (*Haliplus obliquus)*, to be present in The Mill Race at NZ 57823 23277. The pygmy backswimmer was also present in samples collected from The Fleet. Both these species have a Conservation Score 4 and are considered 'Occasional' under the CCI index (Chadd and Extence 2014). Pond 3 from the NZT surveys contained the mayfly (*Caenis robusta*), caddisfly (*Agraylea sexmaculata*) and lesser water boatman (*Micronecta scholzi*). All three of these species are classified as "Local" or locally important under the CCI index (all had CCI score 5). Pond 9 NZT (NZ 56710 26133) contained the horse leech (*Haemopis sanguisuga*) which is considered 'Occasional' (Conservation Score 4) under the CCI index. Pond 14 from NZT contained a beetle *Hydroglyphus geminus* which is classified as "Local" or locally important under the CCI index (CCI 5). However, none of the species identified are listed under statutory or non-statutory designations.

12.4.61 The autumn 2023 aquatic macroinvertebrate survey for the Proposed Development recorded the locally notable bladder snail *Aplexa hypnorum* in Holme Fleet (NZ 49387 23931) and the locally notable Dytiscidae beetle (*Hygrotus confluens)* in a ditch at NZ 49735 24400 (Site 3).

12.4.62 There were no records of the white-clawed crayfish (*Austropotamobius pallipes*) within 2 km of the Proposed Development Site boundary within the last ten years, nor within 10 km of the Study Area, and there is no mention of presence within the Tees Valley BAP. However, there are recent records of American signal crayfish (*Pacifastacus leniusculus*) in the Study Area, which being an invasive species, reduces the likelihood of native white-clawed being present. White-clawed crayfish is therefore considered absent from the Study Area.

Aquatic Macrophytes

12.4.63 The desk identified no records of protected aquatic macrophyte species within 2 km of the Study Area in the last ten years. However, several macrophyte species are included in the Tees Valley BAP. These include the water violet (*Hottonia palustris*) and the tufted sedge *Carex elata.*

12.4.64 Previous surveys for other developments within the Study Area found the 'Near Threatened' (based on IUCN criteria) ragged robin in a pond within Foundry North (referred to as pond 3 in the NZT Aquatic Ecology Assessment AECOM (2021f)) at NZ 56506 25742. In the same pond, uncommon species recorded included spiked water milfoil (*Myriophyllum spicatum*), hornwort (*Ceratophyllum demersum*) and lesser bulrush (*Typha angustifolia*). Pond 9 within the same report (at NZ 56710 26133)

contained uncommon species including small pondweed (*Potamogeton berchtoldii*), water crowfoot (*Ranunculus aquatilis*) and horned pondweed (*Zannichellia palustris*). An additional pond as part of those surveys, Pond 14 (at NZ56986 25902) had five uncommon species recorded within the pond including sea club-rush, spiked water milfoil and horned pondweed.

Notable Plant Species

12.4.65 HPI were identified during the desk study. Detailed botanical surveys will be completed where habitats of botanical importance will be potentially impacted by the Proposed Development, with the results presented within the ES.

Invasive Non-native Species

12.4.66 Several INNS species were identified in the desk study, from Environment Agency data (EA Ecology & Fish Data Explorer) and data from previous NZT surveys). Species identified on the Wildlife and Countryside Act 1981 (Schedule 9) include Floating Pennywort (*Hydrocotyle ranunculoides*), Giant Hogweed (*Heracleum mantegazzianum*), New Zealand pigmyweed (*Crassula helmsii*), Parrot feather (*Myriophyllum aquaticum*), Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*). There are statutory constraints to limit their potential spread, and therefore mitigation will be required during Proposed Development construction to prevent their spread and where possible locally eradicate these species within the construction boundary. Nuttall's waterweed (*Elodea nuttallii*) was also recorded, which is no longer listed in Schedule 9 of the Wildlife and Countryside Act 1981 but is listed in the Invasive Alien Species (Enforcement and Permitting) Order 2019.

12.4.67 The non-native but non-invasive New Zealand mud snail (*Potamopyrgus antipodarum*) and common bladder snails (*Physellsa gyrina* and *Physa fontinalis*) were found at numerous sites within the Study Area, with the most recent records during 2016. Though these species are not listed in UK legislation, biosecurity measures to prevent their spread are recommended.

12.4.68 Similarly, surveys from NZT recorded the New Zealand mud snail *P. antipodarium* in Pond 14, The Mill Race, Dabholm Gut and The Fleet with the freshwater amphipod *Crangonyx sp*. present in Pond 3 (Appendix 12B: Figure B1 6.4.28 NZT ES Vol III Appendix 13A Aquatic Ecology Supplementary Desk Study and Field Study Report, PEI Report Volume II).

12.4.69 Autumn 2022 surveys for the Proposed Development found *P. antipodarium* at Holme Fleet, Site 2 and Site 6 (Appendix 12B: Figure B1 6.4.28 NZT ES Vol III Appendix 13A Aquatic Ecology Supplementary Desk Study and Field Study Report, PEI Report Volume II). Holme Fleet and Site 6 also contained *Physella acuta* and Site 6 also had *Crangonyx sp.* present.

Summary of Baseline

12.4.70 A summary of the baseline ecology conditions within the Proposed Development Site is provided in Table 12-7. As discussed in Section 12.3, all ecology features valued at Local level or above, and with the potential to be affected by the Proposed

Development will be taken forward for impact assessment. Legally controlled species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are also taken forward for assessment.

Table 12-7: Summary of the Baseline Ecology Conditions

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Teesmouth and Cleveland Coast SPA	International	Sites support qualifying features under relevant EC Directives that are of International importance.	Yes – there is potential for direct and indirect habitat loss, loss of functionally linked land, noise and visual disturbance of qualifying bird species, atmospheric pollution, and changes in water quality to affect the designated site.
Teesmouth and Cleveland Coast Ramsar	International	Sites support qualifying features under relevant EC Directives that are of International importance.	Yes – there is potential for direct and indirect habitat loss, loss of functionally linked land, noise and visual disturbance of qualifying bird species, atmospheric pollution, and changes in water quality to affect the designated site.
North York Moors SPA	International	Sites support qualifying features under relevant EC Directives that are of International importance.	No – the North York Moors SPA is considered in the context of air quality effects only. Preliminary modelling indicates no adverse effects upon habitats used by SPA birds.
North York Moors SAC	International	Sites support qualifying features under relevant EC Directives that are of International importance.	No – the North York Moors SAC is considered in the context of air quality effects only. Preliminary modelling indicates no adverse effects on SAC habitats.
Northumbria Coast SPA	International	Sites support qualifying features under relevant EC Directives that are of International importance.	No – the Northumbria Coast SPA is located 10.1 km north of the Proposed Development Site. According to unpublished Natural England guidance on functionally linked land Impact Risk Zones for sites designated for birds (Knight, 2019), significant impacts on functionally- linked habitats from this type of development will not arise more than 10 km at most

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
			from the designated site. There will thus be no significant effects and this pathway can be screened out.
Northumbria Coast Ramsar	International	Sites support qualifying features under relevant EC Directives that are of International importance.	No – the Northumbria Coast Ramsar is located 10.1 km north of the Proposed Development Site. According to unpublished Natural England guidance on functionally linked land Impact Risk Zones for sites designated for birds (Knight, 2019), significant impacts on functionally- linked habitats from this type of development will not arise more than 10 km at most from the designated site. There will thus be no significant effects and this site is not considered further in this assessment.
Durham Coast SAC	International	Sites support qualifying features under relevant EC Directives that are of International importance.	No – the Durham Coast SAC is 13.7 km from the Main Site. The Durham Coast SAC is not identified on the Air Pollution Information System (APIS) as being sensitive to nitrogen or acid deposition and no Critical Loads are available for this site on which to base any assessment. Therefore, there will be no significant effects and this site is not considered any further in this assessment.
Castle Eden Dene SAC	International	Sites support qualifying features under relevant EC Directives that are of International importance.	No - Castle Eden Dene is considered in the context of air quality effects only. As the Main Site is over 15 km from the SAC, there will be no significant effects and this site is not considered further in this assessment.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Teesmouth and Cleveland Coast SSSI	National	Supports habitats and species of National importance.	Yes – the SSSI is within / overlapping the Connection Corridors and 5 m west of the Main Site. There is potential for direct and indirect effects upon habitats, noise and visual disturbance of SPA birds, atmospheric pollution, and changes in water quality to affect the SSSI.
Lovell Hill Pools SSSI	National	Supports habitats and species of National importance.	No – site is 6.6 km from the Main Site and 2.4 km from the Connection Corridors. The SSSI is not hydrologically linked to the Proposed Development and is considered in the context of air quality only. Preliminary air quality modelling indicates no significant effects, and this site is not considered any further in this assessment.
Briarcrost Pasture SSSI	National	Supports habitats and species of National importance.	No – the SSSI is over 15 km from the Main Site and 7.7 km from the Connection Corridors. The SSSI is not hydrologically linked to the Proposed Development and is considered in the context of air quality only. Preliminary modelling indicates no significant effects, and this site is not considered any further in this assessment.
Roseberry Topping SSSI	National	Designated for its geological interest.	No – site is 12.2 km from the Main Site and there are no pathways of effect. This site is not considered any further in this assessment.
North York Moors SSSI	National	Supports habitats and species of National importance.	No – the site is 12.1 km from the Main Site and not hydrologically linked. This site is considered in the context of air quality only. Preliminary modelling indicates no significant

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
			effects, and this site is not considered any further in this assessment.
Saltburn Gill SSSI	National	Supports woodland habitats of National importance.	No – the site is 11.2 km from the Main Site. This site is considered in the context of air quality only. Preliminary modelling indicates no significant effects, and this site is not considered any further in this assessment.
Whitton Bridge Pasture SSSI	National	Supports grassland habitats of National importance.	No – the site is over 15 km from the Main Site. This site is considered in the context of air quality only. Preliminary modelling indicates no significant effects, and this site is not considered any further in this assessment.
Langbaurgh Ridge SSSI	National	A disused quarry designated for its geological interest.	No – no pathways of effect. Designated for geological rather than ecological interest.
Cliff Ridge SSSI	National	A disused quarry designated for its geological interest.	No – no pathways of effect. Designated for geological rather than ecological importance.
Durham Coast SSSI	National	Supports habitats and species of National importance.	No – the site is 12.0 km from the Main Site. Air quality modelling indicates no significant effects on habitats. Potential effects on SSSI birds considered in Chapter 13: Ornithology (PEI Report, Volume I).
Hart Bog SSSI	National	Supports habitats of National importance.	No – the site is 14.1 km from the Main Site. This site is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Pike Whin Bog SSSI	National	Supports habitats of National importance.	No – the site is over 15 km from the Main Site. This site is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.
Kildale Hall SSSI	National	Designated for its geological interest.	No - no pathways of effect. Designated for geological rather than ecological interest.
Hulam Fen SSSI	National	Supports habitats of National importance.	No – the site is over 15 km from the Main Site. This site is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.
Castle Eden Dene SSSI	National	Supports habitats of National importance.	No – the site is over 15 km from the Main Site. This site is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.
Pinkney and Gerrick Woods SSSI	National	Supports habitats of National importance.	No – the site is over 15 km from the Main Site. This site is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.
Fishburn Grassland SSSI	National	Supports habitats of National importance	No – the site is over 15 km from the Main Site. This site is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Charity Land SSSI	National	Supports habitats of National importance	No – the site is over 15 km from the Main Site. This site is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.
Newton Ketton Meadow SSSI	National	Supports habitats of National importance	No – the site is over 15 km from the Main Site. This site is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.
Boulby Quarries SSSI	National	Designated for its geological interest.	No – no pathways of effect. Designated for geological rather than ecological interest.
Teesmouth NNR	National	Designated for habitats and species of National importance.	Yes – within / overlapping the Main Site. There is potential for direct and indirect effects on habitats, noise and visual disturbance of birds / seals, atmospheric pollution, and changes in water quality to affect the designated site.
Durham Coast NNR	National	Designated for habitats of National importance.	No - the site is 12.7 km from the Main Site. This site is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.
Castle Eden Dene NNR	National	Designated for habitats and species of National importance.	No – the site is over 15 km from the Main Site and is considered in the context of air quality only. Modelling indicates no significant effects, and this site is not considered any further in this assessment.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Philips Tank Farm Grassland LWS	District	Designated for grassland habitat, GCN, invertebrates and water vole.	Yes – within / overlapping with the Connection Corridors. Potential for direct / indirect habitat loss and effects on species.
Saltern grassland LWS	District	Designated for saltmarsh habitat	Yes - 78.3 m from Connection Corridors. Potential for indirect effects.
Greatham Creek North Bank Saltmarsh LWS	District	The site supports a saltmarsh habitat, dominated by saltmarsh grass.	Yes – within / overlapping with the Connection Corridors. Potential for direct and indirect effects.
Coatham Marsh LWS	District	Designated for saltmarsh, coastal grasslands, flushes, seepages, springs, neutral and urban grassland habitats and vascular plants.	Yes – Within / overlapping with the Connection Corridors. Potential for direct and indirect effects.
Eston Pumping Station LWS	District	The site supports a mosaic of habitats and borderline neutral urban grasslands.	Yes – within / overlapping the Connection Corridors. Potential for direct and indirect effects.
Cowpen Bewley Woodland Park LWS	District	The site is a former brickworks, landfill and agricultural land that is now a country park comprising new woodland, grassland, ponds and lakes. The site supports GCN.	Yes - within / overlapping the Connection Corridors. Potential for direct and indirect effects.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Queen's Meadow Wetland LWS	District	Designated for its amphibian species.	No – the LWS is 1.2 km from the Connection Corridors and there are no hydrological links to the Proposed Development. The LWS is separated from the Proposed Development by an existing railway line and Philips Tank Farm LWS. As the site is over 2 km from the Main Site, air quality effects can be screened out.
Tot Fenny's Meadow LWS	District	Designated for grassland, fen and marsh habitat.	No – the LWS is 599 m from the Connection Corridors and there are no hydrological links to the Proposed Development. The LWS is separated from the Proposed Development by Cowpen Bewley Woodland Park, an existing railway line and the A1185. As the LWS is over 2 km from the Main Site, air quality effects can be screened out.
Billingham Norton Bottoms Reedbed Treatment System LWS	District	Designated for reedbed habitat	No – The LWS is 715 m from the Connection Corridors and there are no hydrological links to the Proposed Development. As the LWS is over 2 km from the Main Site, air quality effects can be screened out.
Norton Bottoms LWS	District	Designated for grassland habitats.	No – the LWS is 760 m from the Connection Corridors and there are no hydrological links to the Proposed Development. As the LWS is over 2 km from the Main Site, air quality effects can be screened out.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Power Station Grassland and Wetland LWS	District	Designated for grassland, wetland and open mosaic habitats.	No – the LWS is 877 m from the Connection Corridors and there are no hydrological links to the Proposed Development. As the LWS is over 2 km from the Main Site, air quality effects can be screened out.
Brenda Road Brownfield LWS	District	Designated for brownfield habitat and notable invertebrates.	No – the LWS is 1.1 km from the Connection Corridors and there are no hydrological links. As the LWS is over 2 km from the Main Site, air quality effects can be screened out.
Teesaurus Park LWS	District	An urban park designated for grassland habitats.	No- the LWS is 890 m from the Connection Corridors and there are no hydrological links. As the site is over 2 km from the Main Site, air quality effects can be screened out.
Zinc Works Bird Field LWS	District	Designated for grassland habitats and its bird assemblage.	No – effects upon birds considered within Chapter 13: Ornithology (PEI Report, Volume II).
Wilton Woods Complex LWS	District	Designated for woodland habitats including ancient woodland.	No – the LWS is 1.2 km from the Connection Corridors and there are no hydrological links. The LWS is over 2 km from the Main Site and initial air quality modelling indicates no significant effects.
Seaton Common LWS	District	The site is a wet grassland which attracts large numbers of passage migrants over winter and is a breeding ground for birds in the summer months.	No – effects on birds considered within Chapter 13: Ornithology (PEI Report, Volume II).

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Portrack Meadows LWS	District	Designated for habitats and botanical interest.	No – the LWS is 1.6 km from the Connection Corridors. As the LWS is over 2 km from the Main Site, air quality effects can be screened out.
Billingham Beck Valley Country Park LWS	District	Designated for habitats and its botanical interest.	No – the LWS is 1.4 km from the Connection Corridors. As the LWS is over 2 km from the Main Site, air quality effects can be screened out.
Portrack Marsh LWS	District	Designated for habitats, invertebrates and its bird assemblage.	No – effects upon birds considered within Chapter 13: Ornithology (PEI Report, Volume II).
Coastal and floodplain grazing marsh	National	Coastal and floodplain grazing marsh is a HPI under S41 of the NERC Act.	Yes – potential for direct habitat loss and indirect effects from dust and changes in hydrology.
Coastal saltmarsh	National	Habitat forms part of the Teesmouth and Cleveland Coast SSSI. Coastal salt marsh is also a Habitat of Principal Importance under S41 of the NERC Act.	Yes – potential for direct and indirect effects.
Coastal sand dunes	National	Habitat form part of the Teesmouth and Cleveland Coast SSSI. Coastal sand dunes are HPI.	Yes – potential for indirect effects.
Mudflats	National	Habitat form part of the Teesmouth and Cleveland Coast SSSI.	Yes – potential for direct and indirect effects.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
		Mud flats are HPI.	
Saline lagoons	National	Habitat form part of the Teesmouth and Cleveland Coast SSSI. Saline lagoons are HPI.	Yes – potential for direct and indirect effects.
Open mosaic habitat on previously developed land	To be confirmed following survey	Open mosaic habitat on previously developed land is a HPI.	Yes – potential for direct and indirect effects.
Ponds	To be confirmed following survey	Ponds are HPI.	Yes – potential for direct and indirect effects.
Watercourses	International	The River Tees and Greatham Creek form part of the Teesmouth and Cleveland Coast Ramsar.	Yes – potential for direct and indirect effects.
Hedgerows	District	A HPI. Provides habitat for invertebrates, foraging and nesting birds, foraging and commuting bats and small mammals.	Yes – potential for direct and indirect effects.
Broad-leaved plantation woodland	District and Local	Woodland supports invertebrates, nesting birds, foraging and commuting bats and small mammals.	Yes – potential for direct and indirect effects.
Other habitats	To be confirmed following surveys	To be confirmed following surveys.	Yes – potential for direct and indirect effects. To be confirmed and included within the ES.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Invertebrates (including aquatic macroinvertebrates)	To be confirmed following surveys	Phase 1 habitat and aquatic walkover surveys are ongoing. Invertebrate surveys will be completed where habitats are suitable and where they are deemed necessary to inform the impact assessment.	Yes - To be confirmed and included within the ES.
GCN	To be confirmed through consultation with Natural England.	DLL approach sought for this Proposed Development.	Yes - Natural England will undertake an impact assessment, the outcome of which will be documented in an Impact Assessment and Conservation Payment Certificate. This document will also provide additional detail to inform the findings in the ES, including information on the impact of the Proposed Development on GCN and the appropriate compensation required.
Reptiles	To be confirmed	Phase 1 habitat surveys are ongoing. Reptile surveys will be completed where habitats are suitable, and it is deemed necessary to inform the impact assessment.	Yes – surveys are currently ongoing; however, reptiles are confirmed to be present at South Gare.
Fish	To be confirmed	Aquatic walkover survey completed to identify fish habitats at potential impact locations and identify any requirements for targeted aquatic surveys.	To be confirmed and included in the ES if required.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Roosting bats	To be confirmed	Bats are European protected species. Bat emergence surveys and/or aerial climb and inspect surveys will be completed where trees with moderate or high suitability for roosting bats will be directly affected by the Proposed Development. Bat roost assessments of buildings/structures will be completed where these will be directly impacted. Nocturnal surveys will be completed to inform presence/likely absence where necessary.	To be confirmed and included in the ES if required.
Foraging and commuting bats	To be confirmed	Bat activity surveys will be completed where habitats with suitability for foraging and commuting bats will be affected.	Yes – potential for direct loss/disturbance of trees and woodland.
Water vole	To be confirmed	Water vole surveys will be completed where suitable habitats will be affected.	Yes – potential for direct and indirect effects.
Otter	To be confirmed	Otter surveys will be completed where suitable habitats will be affected.	Yes – potential for direct and indirect effects.

ECOLOGY FEATURE	NATURE CONSERVATION VALUE	JUSTIFICATION	TAKEN FORWARD FOR ASSESSMENT?
Brown hare	Local	Brown hare are a SPI.	Yes – potential for disturbance/temporary displacement of brown hare during the construction phase.
Hedgehog	Local	Hedgehog are a SPI.	Yes – potential for harm to hedgehog during the construction phase.
Badger	To be confirmed	Protected under the Badgers Act 1992.	To be confirmed and included in the ES if required.
Aquatic macrophytes	To be confirmed	Aquatic walkover survey to be completed to identify aquatic habitats at potential impact locations and recommend targeted aquatic surveys where required.	To be confirmed and included in the ES if required.
INNS	N/A	Legal offence to plant or otherwise spread in the wild.	Yes

Future Baseline

Construction

12.4.71 Demolition and site remediation works are taking place within the Main Site. Bare ground is present where buildings and structures have been removed, and in the absence of development, these areas may become colonised with vegetation.

12.4.72 Semi-natural habitats surrounding the Main Site, within the Proposed Development Site are unlikely to change over the short term. All existing habitats are likely to largely continue as present, although some minor changes in habitat extent, composition and structure are expected to occur as a result of ecological succession e.g., the gradual establishment of tree and shrub seedlings within open habitats, and minor changes in the extent and distribution of ruderal vegetation as natural processes move towards grassland. Therefore, the habitats and species present are considered unlikely to undergo significant change prior to Proposed Development construction.

12.4.73 It is anticipated that managed habitats within the Proposed Development Site will continue to be subject to management and there will be no significant changes in habitat extent, type or species composition. Semi-natural and natural habitats are also unlikely to change significantly. Changes in the distribution of some species will be likely to occur as habitats develop as a result of ecological succession or other natural processes, but over the short term any such changes will be relatively minor.

12.4.74 The potential for any local strategies or other developments that have the potential to affect the future aquatic baseline will be reviewed and assessed during the EIA and reported in the ES.

Operation

12.4.75 The future ecological baseline at the start of operation of the Proposed Development will not differ substantively from that described above for construction, but change is possible over the anticipated operational life of the Proposed Development to decommissioning.

12.4.76 Based on the available information and the current uses of the Proposed Development Site, there are no grounds to expect that there will have been any marked change in local land management practice and the habitats by the time of the commencement of operations. The short-term baseline described above for construction is equally applicable to the start of Proposed Development operation.

12.4.77 There are a variety of nature conservation designations in the vicinity of the Proposed Development Site. It is difficult to state with certainty how the nature conservation value of these designations might change over the medium to long term operational period, and this will ultimately depend on long-term management regimes.

12.4.78 It is likely that current and former industrial land within Teesworks and surrounding area (e.g., Wilton) will be released for new development e.g., in accordance with existing local plans and policy for regeneration of the South Tees Area. The extent of ecologically valuable open mosaic habitat and grassland habitats in these areas may decrease as a result of such development and therefore the relative nature

conservation value of remaining areas of semi-natural habitat may as a result increase over time.

12.4.79 Counter to this, implementation of planning policy and legal requirements (including anticipated legal requirements to deliver substantive biodiversity enhancement) may mean that future adjacent developments incorporate features of value for biodiversity, resulting in small to moderate improvements in the future baseline over the operational life of the Proposed Development e.g., certain species may colonise or increase in number as a result of such enhancements.

12.4.80 Changes in the distribution of some species will likely occur as habitats develop as a result of ecological succession or other natural processes, but over the short term any such changes will be relatively minor.

Decommissioning

12.4.81 It is noted that sea level rise in response to climate change may have an influence on the sensitivity of habitat and species features present during the post-closure decommissioning of the Proposed Development. For example, some coastal features may be adversely affected by increased inundation or erosion, which may increase the significance of any impacts and effects arising from decommissioning. This is most likely to be relevant to marine ecology receptors and ornithological ecological features. Implications for terrestrial ecology are considered minor given the scale of predicted sea level rise as outlined in Appendix 9A: Preliminary Flood Risk Assessment (PEI Report, Volume III) and within the context of other likely changes in the future baseline (e.g., extreme weather events).

12.4.82 The decommissioning baseline will be strongly influenced by future land-use and nature conservation regimes affecting adjacent land. The balance between adverse effects and beneficial habitat improvements is unknown. This limits the assumptions that can be made for the purposes of this assessment. However, it should also be noted that the likely zone of influence of decommissioning will be much smaller than operation and likely construction also. It is assumed that decommissioning activities will involve the removal of above ground infrastructure only and will primarily be located within the built footprint of the Proposed Development rather than within areas of vegetation. Relevant ecological features will therefore be much reduced relative to those relevant at construction and operation.

12.4.83 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I) decommissioning activities will be conducted in accordance with the appropriate guidance and legislation at the time of the Proposed Developments closure. Ecological surveys will be commissioned as appropriate to inform the scope of the decommissioning works.

12.5 Development Design and Impact Avoidance

12.5.1 The EIA process aims to avoid, prevent, reduce, or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development (also known as ‘embedded measures’).

12.5.2 The following impact avoidance measures have either been incorporated into the design or are standard construction or operational practices. These measures are all to be accommodated within the Proposed Development Site and have, therefore, been taken into account during the impact assessment. Similarly, it has been assumed that the Proposed Development will comply with all relevant protected species legislation. As surveys are continuing, further assessment will be carried out and defined mitigation measures presented within the ES.

Construction Phase

12.5.3 A Framework Construction Environmental Management Plan (CEMP) will be included within the ES which will accompany the DCO Application which will set out the key measures to be employed during the Proposed Development construction phase to control and minimise the impacts on the environment – including the minimisation of impacts upon ecology and nature conservation. A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

12.5.4 Where possible, routing of the Connection Corridors will utilise existing infrastructure and established pipeline corridors north and south of the River Tees, including the extensive existing network of pipeline racks, to minimise excavations and construction activities required and therefore minimise disturbance to species and habitats present.

12.5.5 Where the Hydrogen Pipeline crosses major watercourses such as the River Tees and Greatham Creek, trenchless construction methods as outlined in Chapter 5: Construction Programme and Management (PEI Report, Volume I) will be used to avoid disturbance within the channel and harm to bankside habitats. Design work is currently ongoing to further refine the design and identify the most appropriate methods for each crossing point - further details for all crossing options will be included within the ES.

12.5.6 Where the other Connection Corridors require crossings or new infrastructure the same approach will be applied. The use of trenchless technologies where possible will minimise effects on habitats and species. Where trenchless technologies are not feasible, mitigation measures will be put in place to ensure to identity an appropriate habitat mitigation plan. Any details in relation to this will be included in the ES. Permanent habitat losses associated with pipelines will be minimised through post-construction reinstatement of pipeline routes as close to its original state as possible. While this does not remove the construction impact, it does provide (except for irreplaceable habitats) certainty of reinstatement of habitats back to an appropriate end condition, as a well as a beneficial reduction in the duration and magnitude of the construction effect on habitats and species. The Framework CEMP will set out mitigation proposals required for relevant locations/habitats which will be included in the ES.

12.5.7 An Environmental or Ecological Clerk of Works (ECoW) will be present during Proposed Development construction as appropriate to supervise and instruct implementation of impact avoidance commitments as detailed in the Final CEMP.

Operational Phase

12.5.8 The Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. In addition, the Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

12.5.9 A number of mitigation features will be incorporated into the design of the Proposed Development, to avoid, minimise, reduce and possibly compensate potential adverse impacts on ecology during operation.

12.5.10 As the Proposed Development design continue to progress, the Applicant has sought to avoid nature conservation designations as far as reasonably practicable and will continue to do so. As outlined in Chapter 4: Proposed Development and Chapter 5: Construction Programme and Management (PEI Report, Volume I) route options have been refined since the scoping stage to avoid or minimise adverse environmental effects, including those on receptors of ecological importance including the areas within and around Greatham Creek. These areas include statutory and non-statutory designated sites and HPI. Habitats such as woodland and ponds have been avoided where possible to minimise ecological effects.

12.5.11 The final stack height for the Proposed Development will be determined at the detailed design stage and will be optimised with consideration given to minimisation of ground-level air quality impacts on relevant ecological features. This will be dependent upon the final stack location and building heights for the Proposed Development. Dispersion modelling of emissions to air will inform the optimum design of the facilities (including matters such as stack height, taking account of other environmental considerations) through comparison of the maximum impacts at human health and relevant ecological features. This will be done during the EIA to ensure that potential impacts are minimised and avoided where practicable.

12.5.12 An Indicative Lighting Strategy will be prepared to accompany the DCO Application to demonstrate how lighting impacts on sensitive ecological features, including bats have been considered and addressed in the development design.

Decommissioning Phase

12.5.13 At the end of its design life decommissioning of the Proposed Development will see the removal of all above ground equipment down to ground level and the ground remediated to enable future industrial re-use. It is assumed that all underground infrastructure will remain in-situ; however, all connection and access points will be sealed or grouted to ensure disconnection. At this stage it is assumed that

decommissioning impacts are expected to be limited and will be the same/similar to the construction impacts, as discussed above.

12.5.14 A Decommissioning Environmental Management Plan (DEMP) will be produced and agreed pursuant to a DCO Requirement. The DEMP will consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed. This will include details of how ecology should be managed at the Proposed Development Site during decommissioning and demolition works.

12.6 Likely Impacts and Effects

12.6.1 Tables 12-8 to 12-10 present a preliminary assessment of the likely impacts and effects of the Proposed Development during construction, operation and decommissioning respectively on relevant ecological features. The preliminary assessment is based on standard construction/operational mitigation, and mitigation embedded in the design, or otherwise required for purposes of legislative compliance (as required by CIEEM and detailed in Section 12.5). An updated assessment including further mitigation will be identified and presented in the ES.

Table 12-8: Preliminary Assessment of Ecological Features during the Proposed Development Construction Phase I

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Teesmouth and Cleveland Coast SPA	Potential for direct and indirect habitat loss, loss of functionally linked land for birds, noise and visual disturbance of qualifying bird species, atmospheric pollution, and changes in water quality to affect the designated site.	Short or medium term	Although the Teesmouth and Cleveland Coast SPA overlaps with the Proposed Development, the design will seek to avoid any direct habitat losses. Mitigation will be confirmed following completion of ecology/ornithology surveys and in addition to minimising direct habitat loss, may include timing of works to avoid sensitive periods, the use of screening to prevent visual disturbance or acoustic barriers to minimise noise. A CEMP will detail measures to control and minimise the impacts on the environment during construction.	Potentially significant (adverse). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders. Mitigation measures will be provided in the report to inform the HRA and the ES.
Teesmouth and Cleveland Coast Ramsar	Potential for direct and indirect habitat loss, loss of functionally linked land, noise and visual disturbance of	Short or medium term	Although the Teesmouth and Cleveland Coast Ramsar overlaps with the Proposed Development, the design will	Potentially significant (adverse). Site-specific mitigation will be developed in consultation with Natural England and other

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	qualifying bird species, atmospheric pollution, and changes in water quality to affect the designated site.		seek to avoid any direct habitat losses. Mitigation will be confirmed following completion of ecology/ornithology surveys and in addition to minimising direct habitat loss may include timing of works to avoid sensitive periods, the use of screening to prevent visual disturbance or acoustic barriers to minimise noise. A CEMP will detail measures to control and minimise the impacts on the environment during construction.	stakeholders. Mitigation measures will be provided in the report to inform the HRA and the ES.
Teesmouth and Cleveland Coast SSSI	Potential for direct and indirect effects upon habitats, noise and visual disturbance of SPA birds, atmospheric pollution, and changes in water quality to affect the SSSI.	Short or medium term	Although the Teesmouth and Cleveland Coast SSSI overlaps with the Proposed Development, the design will seek to avoid any direct habitat losses. Mitigation will be confirmed following completion of ecology/ornithology surveys and in addition to minimising direct	Potentially significant (adverse). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			habitat loss may include timing of works to avoid sensitive periods, the use of screening to prevent visual disturbance or acoustic barriers to minimise noise. A CEMP will detail measures to control to and minimise the impacts on the environment during construction.	
Teesmouth and Cleveland Coast NNR	There is potential for direct and indirect effects on habitats, noise and visual disturbance of birds / seals, atmospheric pollution, and changes in water quality to affect the designated site.	Short or medium term	The Teesmouth and Cleveland Coast NNR overlaps with the Proposed Development, the design will seek to avoid any direct habitat losses. Mitigation will be confirmed following completion of ecology/ornithology surveys and in addition to minimising direct habitat loss may include timing of works to avoid sensitive periods, the use of screening to prevent visual disturbance or acoustic barriers to minimise noise.	Potentially significant (adverse). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			A CEMP will detail measures to control to and minimise the impacts on the environment during construction	
Philips Tank Farm Grassland LWS	Potential for direct habitat loss and effects on the species which the site supports.	Short or medium term	Direct habitat loss will be avoided where possible. Where it is not possible to avoid habitat loss, habitats will be reinstated following construction. A CEMP will detail measures to control to and minimise the impacts on the environment during construction. If protected species are to be affected, licenses from Natural England will be sought and mitigation to prevent adverse effects on populations detailed within the licence documents.	Potentially significant (adverse). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders.
Saltern Grassland LWS	Potential for direct habitat loss and effects on the species which the site supports.	Short or medium term	Direct habitat loss will be avoided where possible. Where it is not possible to avoid habitat loss, habitats will be reinstated following construction. A CEMP will detail measures to control to and minimise the	Potentially significant (adverse). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			impacts on the environment during construction. If protected species are to be affected, licenses from Natural England will be sought and mitigation to prevent adverse effects on populations detailed within the licence documents.	
Greatham Creek North Bank LWS	Potential for direct habitat loss.	Long term	Habitat loss will be avoided through the use of HDD.	Not significant (negligible)
Coatham Marsh LWS	Potential for direct and indirect effects	Short or medium term	Direct habitat loss will be avoided where possible. Where it is not possible to avoid habitat loss, habitats will be reinstated following construction. A CEMP will detail measures to control to and minimise the impacts on the environment during construction.	Potentially Significant (adverse)
Eston Pumping Station LWS	Potential for direct and indirect effects	Short, medium or long term	Direct habitat loss will be avoided where possible. Where it is not possible to avoid habitat loss, habitats will be reinstated following construction. A CEMP will detail measures to control to and minimise the	Potentially Significant (adverse)

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			impacts on the environment during construction.	
Cowpen Bewley Woodland Park LWS	Direct loss of woodland habitat.	Medium or long term	Direct habitat loss will be avoided where possible. Where it is not possible to avoid habitat loss, habitats will be reinstated following construction. A CEMP will detail measures to control to and minimise the impacts on the environment during construction	Potentially Significant (adverse)
Coastal and floodplain grazing marsh	Direct and indirect habitat loss. Physical or chemical pollution resulting in degradation of habitats. Changes in hydrology.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 12.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Coastal saltmarsh	Indirect habitat loss/ modification.	Short, medium or long term	Details of committed mitigation measures over and above those	Potentially significant (adverse) without mitigation.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	Physical or chemical pollution resulting in degradation of habitats. Changes in hydrology.		outlined in Section 12.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology surveys and development of design of the Proposed Development. Further assessment work is required which will be provided in the ES.	This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Coastal sand-dunes	Physical or chemical pollution resulting in degradation of habitats. Changes in hydrology.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 12.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology surveys and development of the Proposed Development design. Further assessment work is required which will be provided in the ES.	Not significant
Mudflats	Physical or chemical pollution resulting in degradation of habitats.	Short or medium term	Details of committed mitigation measures over and above those	Potentially significant (adverse) without mitigation.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			outlined in Section 12.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology surveys and development of Proposed Development design. Further assessment work is required which will be provided in the ES.	This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Saline lagoons	Physical or chemical pollution resulting in degradation of habitats. Changes in hydrology.	Short, medium or long term	Details of committed mitigation measures over and above those outlined in Section 12.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology surveys and development of design of the Proposed Development. Further assessment work is required which will be provided in the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Open mosaic habitat on previously developed land	Direct habitat loss within the Proposed Development Site. Physical or chemical pollution resulting in degradation of habitats.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 12.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology surveys and development of design of the Proposed Development. Further assessment work is required which will be provided in the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Ponds	Direct loss of pond habitat. Physical or chemical pollution resulting in degradation of habitats. Changes in hydrology.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 12.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology surveys and development of design of the Proposed Development. Further assessment work is required which will be provided in the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Watercourses	Changes in water quality (chemical or physical) resulting from watercourse crossings (open-cut or otherwise) or a pollution event, or mobilisation of sediment during HDD. Crossing or culverting of watercourses – temporary during construction or permanent.	Short – long term	All WFD main rivers will be crossed by non-intrusive methods. Details of committed mitigation measures will be provided within the ES. Further assessment work is required which will be provided in the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Hedgerows	Direct loss of hedgerows. Damage to retained hedgerows due to encroachment of machinery, compaction of soil or a pollution event.	Short or medium term	Where sections of vegetation or hedgerows are lost, these will be reinstated post-construction. Retained sections of hedgerow will be protected in accordance with BS 5837 (2012). Further assessment work is required which will be provided in the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Broadleaved plantation woodland	Direct loss of woodland habitat within the Proposed Development Site. Damage to retained trees due to encroachment of machinery, compaction of soil or a pollution event.	Medium or long term	Woodland habitats will be avoided where possible. Where trees are to be retained, they will be protected in accordance with BS 5837 (2012). Further assessment work is required which will be provided in the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Other habitats of Local or above importance	Direct and indirect habitat loss. Habitat degradation from encroachment of machinery, compaction of soil or a pollution event.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 12.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology surveys and development of design of the Proposed Development.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Invertebrates	Habitat loss.	Long term	To be confirmed following necessary surveys.	Not significant
Aquatic macroinvertebrates	Crossings of main watercourses will utilise non-intrusive methods where possible. There may be the requirement for be open-cut trench crossings of minor watercourses. Open-cut trenching has the potential to directly impact macroinvertebrates through disturbance, mortality, and pollution, light and noise impacts during construction, with no mitigation in place. During construction, there is potential for pollutant spills and surface runoff into watercourses which could adversely affect habitats and species.	Short term	Open-cut trench crossings should be clear-cut and wide-span, and utilise existing culverts and crossings where possible, to maintain connectivity of watercourses. Mitigation to be confirmed following completion of all ecology surveys and development of full Proposed Development design. Further assessment work is required which will be provided in the ES.	Not significant
GCN	Habitat loss. Killing, injury or disturbance.	Short or medium term	Natural England will be consulted to confirm if strategic	Not significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			options are available for this Proposed Development. Surveys to inform EcIA to be presented in the ES are ongoing.	
Reptiles	Habitat loss. Killing or injury of reptile species.	Short or medium term	To be confirmed following necessary surveys.	Not Significant
Fish	There is potential for disturbance to notable fish species during construction e.g., pollution impacts from surface water run-off, sedimentation, artificial light impacts, noise and vibration, indirect impacts through disturbance of prey species and reduced connectivity of watercourses. Crossings of main watercourses should utilise non-intrusive methods such as HDD. Open-cut crossings may result in direct impacts to fish and fish habitats.	Short or medium term	The construction of the Proposed Development will avoid the migration and spawning periods of fish shown to be present: April to June for European eel; June to October for sea trout. Open-trench crossings will be followed with reinstatement of habitats. Crossings will be clear-cut and wide span to maintain connectivity. Construction should be undertaken during daylight hours to avoid the need for artificial light, and percussive works should be minimised where possible.	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Roosting bats	Direct loss of roosts, killing, injury or disturbance of roosting bats.	Short or medium term	To be confirmed following necessary surveys.	Not Significant
Foraging and commuting bats.	Cowpen Bewley has been identified as an area for high bat foraging and commuting activity. The Proposed Development would potentially result in loss or severance of commuting habitats. Disturbance through noise or changes in lighting.	Short or medium term	The selection and use of low noise and vibration machinery. Avoidance of operations likely to cause significant disturbance during the most sensitive periods. Managing noise, vibration and lighting levels in accordance with industry guidance. Bunding, or screening of noisy activities. Use of directional low light-spill equipment to avoid illumination of woodland, trees, hedgerows and watercourses avoided where possible.	Not Significant
Water vole	Harm or disturbance of water vole. Damage or destruction to water vole burrows. Pollution (physical or chemical) of watercourses.	Short or medium term	Avoidance of watercourses will be considered where water voles are confirmed present, or an appropriate buffer applied to prevent damage or disturbance to burrows.	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			A licence from Natural England will be required if water vole is to be disturbed (for translocation to an alternative site for example).	
Otter	Loss or disturbance of resting places. Pollution (physical or chemical) or watercourses. Disturbance through noise or changes in lighting.	Short or medium term	Avoidance of lighting adjacent to watercourses. A licence from Natural England will be required if otter will be disturbed. .	Not Significant
Brown hare	Disturbance or displacement of brown hare.	Short or medium term	None required – there is sufficient alternative suitable habitat within the wider area.	Not Significant
Hedgehog	Harm to hedgehog during site clearance.	Short term	Any potential hibernacula to be dismantled outside of the hibernation period (November to February).	Not Significant
Badger	Harm to badger or disturbance of setts.	Short or medium	A licence from Natural England will be required if badgers are to be disturbed.	Not Significant
Aquatic macrophytes	There is potential for disturbance to macrophyte species during construction resulting from pollution impacts from surface water	Short-term	These measures will include dust suppression, silt fencing and pollution prevention. Restoration of habitats following open-trench crossings.	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	run-off and sedimentation. Where minor watercourses are to be crossed by open-trench methods, macrophytes may be directly impacted.			
INNS	Spread of INNS resulting in a legal offence.	Short, medium or long term	A contractor will be required to prepare an INNS method statement. This will set out the measures which will be implemented to avoid the spread of INNS during construction and ensure legal compliance.	Not Significant

Table 12-9: Preliminary Assessment of Ecological Features during the Proposed Development Operational Phase

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Teesmouth and Cleveland Coast SPA	Noise and visual disturbance of SPA birds, changes in lighting, air quality effects.	Long term	Lighting will be designed to avoid light spill outside of the Main Site boundaries. Noise and air quality assessments were ongoing at the time of writing. Initial air quality modelling indicates that several of the modelled locations within Teesmouth & Cleveland Coast SPA will be subject to nitrogen deposition as a result of the Proposed Development which	Potentially Significant (adverse)

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			exceeds 1% of the minimum part of the critical load range (reaching 2.7% of the critical load). In line with Natural England guidance this means that likely significant effects cannot be dismissed on purely mathematical grounds. Further consideration will be required of the areas affected and the extent to which this will affect those SPA and Ramsar birds (terns and avocets) that are sensitive to nitrogen deposition.	
Teesmouth and Cleveland Coast Ramsar	Noise and visual disturbance of SPA birds, changes in lighting, air quality effects.	Long term	Lighting will be designed to avoid light spill outside of the Main Site boundaries. Noise and air quality assessments were ongoing at the time of writing. Initial air quality modelling indicates that several of the modelled locations within Teesmouth & Cleveland Coast Ramsar will be subject to nitrogen deposition as a result of the Proposed Development which exceeds 1% of the minimum part of the critical load range (reaching 2.7% of the critical load). In line with Natural England guidance this means that likely significant effects cannot be dismissed on purely mathematical grounds. Further consideration will be required of the areas affected and the extent to which this will affect	Potentially Significant (adverse)

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			those SPA and Ramsar birds (terns and avocets) that are sensitive to nitrogen deposition.	
Teesmouth and Cleveland Coast SSSI	Noise and visual disturbance of birds, changes in lighting, air quality effects	Long term	Lighting will be designed to avoid light spill outside of the Main Site boundaries. Noise and air quality assessments were ongoing at the time of writing. Initial air quality modelling indicates that several of the modelled locations within Teesmouth & Cleveland Coast SSSI will be subject to nitrogen deposition as a result of the scheme which exceeds 1% of the minimum part of the critical load range (reaching 2.7% of the critical load). In line with Natural England guidance this means that likely significant effects cannot be dismissed on purely mathematical grounds. Further consideration will be required of the areas affected and the extent to which this will affect those SPA and Ramsar birds (terns and avocets) that are sensitive to nitrogen deposition.	Potentially significant (adverse)
Teesmouth NNR	Noise and visual disturbance of birds, changes in lighting, air quality effects.	Long term	Lighting will be designed to avoid light spill outside of the Main Site boundaries. Noise and air quality assessments were ongoing at the time of writing.	Potentially significant (adverse)
Philips Tank Farm Grassland LWS	No effects anticipated	N/A	N/A	Not significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Saltern Grassland LWS	No effects anticipated	N/A	N/A	Not significant
Greatham Creek North Bank LWS	No effects anticipated	N/A	N/A	Not significant
Coatham Marsh LWS	Potential air quality effects	Long term	Air quality effects will be considered in greater detail and reported in the ES.	Potentially significant (adverse)
Eston Pumping Station LWS	Potential air quality effects	Long term	Air quality effects will be considered in greater detail and reported in the ES.	Potentially significant (adverse)
Cowpen Bewley Woodland Park LWS	No effects anticipated	Long term	N/A	Not significant
Coastal and floodplain grazing marsh	No effects anticipated.	N/A	N/A	Not Significant
Coastal sand dunes	No effects anticipated.	N/A	N/A	Not Significant
Mudflats	No effects anticipated.	N/A	N/A	Not Significant
Saline lagoons	No effects anticipated.	N/A	N/A	Not Significant
Open mosaic habitat on previously developed land	Habitat creation/ management to increase biodiversity.	Long term	Details of committed mitigation will be provided within the ES following completing of necessary species surveys.	Significant (beneficial)
Ponds	Habitat creation/ management to increase biodiversity. New ponds will be created as compensation if the Proposed Development is	Long term	Creation of new ponds or aquatic habitat.	Significant (beneficial)

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	eligible to join the GCN DLL scheme.			
Broad-leaved plantation woodland Hedgerows	Habitat creation/ management to increase biodiversity.	Long-term	New habitats will be created. A Landscape and Biodiversity Management Plan (LBMP) will be implemented to monitor habitat creation to make sure BNG condition targets are met.	Not significant
Other habitats of Local or above importance	Habitat creation/ management to increase biodiversity.	Long-term	New habitats will be created. A LBMP will be implemented to monitor habitat creation to make sure BNG condition targets are met.	Significant (beneficial)
Invertebrates	Habitat creation/ management.	Long term	To be confirmed following necessary surveys.	Not Significant
Aquatic macroinvertebrates	Impacts to water quality and hydrological regime.	Long term	To be confirmed following necessary surveys.	Not Significant
GCN	Habitat creation/ management.	Long term	Details of committed (embedded) mitigation measures to ensure legal compliance will be provided within the ES following completing of necessary species surveys. This may include creation of new waterbodies as part of the DLL scheme.	Not Significant
Reptiles	No effects anticipated.	N/A	Update to surveys will be completed as necessary to inform mitigation and to ensure legal compliance.	Not Significant
Fish	No effects anticipated	Long term	Avoidance of lighting adjacent to watercourses.	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Roosting bats	No effects anticipated.	N/A	Update to surveys will be completed as necessary to inform mitigation and to ensure legal compliance.	Not Significant
Foraging and commuting bats	No effects anticipated.	N/A	There will be no additional lighting within suitable habitats during the operational phase. Habitats will be reinstated post construction to maintain habitat connectivity.	Not Significant
Water vole	No effects anticipated.	N/A	Update to surveys will be completed as necessary to inform mitigation and to ensure legal compliance.	Not Significant
Otter	No effects anticipated.	N/A	Update to surveys will be completed as necessary to inform mitigation and to ensure legal compliance. There will be no additional lighting within suitable habitats during the operational phase.	Not Significant
Brown hare	No effects anticipated.	N/A	Habitats within pipeline corridors will be reinstated post construction.	Not Significant
Hedgehog	No effects anticipated.	N/A	Habitats will be reinstated post construction to maintain connectivity.	Not Significant
Badger	No effects anticipated.	N/A	Habitats within the Main Site are not suitable for badger. Habitats along the Connection Corridors will be reinstated post construction and will be available to foraging badger.	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Aquatic macrophytes	Impacts to water quality and hydrological regime.	Long term	To be confirmed following necessary surveys.	Not Significant
INNS	Management of INNS.	Long term	A LBMP will be implemented for the operational phase of the Proposed Development and any INNS removed.	Not Significant

Table 12-10: Preliminary Assessment of Ecological Features during the Proposed Development Decommissioning Phase

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Teesmouth and Cleveland Coast SPA	Noise and visual disturbance of breeding and non-breeding birds. Physical or chemical pollution resulting in degradation of habitats.	Short or medium term	Mitigation will be confirmed following completion of ecology/ornithology surveys and in addition to minimising direct habitat loss, may include timing of works to avoid sensitive periods, the use of screening to prevent visual disturbance or acoustic barriers to minimise noise. A DEMP will detail measures to control and minimise the impacts on the environment during Decommissioning.	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Teesmouth and Cleveland Coast Ramsar	Noise and visual disturbance of breeding and non-breeding birds. Physical or chemical pollution resulting in degradation of habitats.	Short or medium term	Mitigation will be confirmed following completion of ecology/ornithology surveys and in addition to minimising direct habitat loss may include timing of works to avoid sensitive periods, the use of screening to prevent visual disturbance or acoustic barriers to minimise noise. A DEMP will detail measures to control and minimise the impacts on the environment during Decommissioning.	Not Significant
Teesmouth and Cleveland Coast SSSI	Noise and visual disturbance of breeding and non-breeding birds. Physical or chemical pollution resulting in degradation of habitats	Short or medium term	Mitigation will be confirmed following completion of ecology/ornithology surveys and in addition to minimising direct habitat loss may include timing of works to avoid sensitive periods, the use of screening to prevent visual disturbance or acoustic barriers to minimise noise. A DEMP will detail measures to control and minimise the impacts	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			on the environment during Decommissioning.	
Teesmouth NNR	Noise and visual disturbance of breeding and non-breeding birds. Physical or chemical pollution resulting in degradation of habitats	Short or medium term	Mitigation will be confirmed following completion of ecology/ornithology surveys and in addition to minimising direct habitat loss may include timing of works to avoid sensitive periods, the use of screening to prevent visual disturbance or acoustic barriers to minimise noise. A Decommissioning Management Plan will detail measures to control and minimise the impacts on the environment during Decommissioning.	Not Significant
Philips Tank Farm Grassland LWS	No effects anticipated	N/A	N/A	Not Significant
Saltern Grassland LWS	No effects anticipated	N/A	N/A	Not Significant
Greatham Creek North Bank LWS	No effects anticipated	N/A	N/A	Not Significant
Coatham Marsh LWS	No effects anticipated	N/A	N/A	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Eston Pumping Station LWS	No effects anticipated	N/A	N/A	Not Significant
Cowpen Bewley Woodland Park LWS	No effect anticipated	N/A	N/A	Not significant
Coastal and floodplain grazing marsh	Direct or indirect habitat loss. Damage to habitats through encroachment of machinery. Physical or chemical pollution resulting in degradation of habitats. Changes in hydrology affecting habitats.	Short or medium term	Details of committed mitigation measures will be provided within the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Coastal saltmarsh	Direct or indirect habitat loss. Damage to habitats through encroachment of machinery. Physical or chemical pollution resulting in degradation of habitats. Changes in hydrology affecting habitats.	Short, medium or long term	Details of committed mitigation measures will be provided within the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Coastal sand dunes	Physical or chemical pollution resulting in degradation of habitats.	Short or medium term	Details of committed mitigation measures will be provided within the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
				consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Mudflats	Physical or chemical pollution resulting in degradation of habitats.	Short or medium term	Details of committed mitigation measures will be provided within the ES.	Potentially significant (adverse) with mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
				consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Saline lagoons	Physical or chemical pollution resulting in degradation of habitats. Changes in hydrology affecting habitats.	Short, medium or long term	Details of committed mitigation measures will be provided within the ES.	Potentially significant (adverse) without mitigation. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Open mosaic habitat	Habitat loss or degradation.	Short term	Details of committed mitigation measures will be provided within the ES.	Not significant
Ponds	Physical or chemical pollution resulting in degradation of habitats. Changes in hydrology affecting habitats.	Short or medium term	Details of committed mitigation measures will be provided within the ES.	Not Significant
Running water	Physical or chemical pollution.	Short, medium or long term	Details of committed mitigation measures will be provided within the ES.	Not Significant
Broad-leaved plantation woodland Hedgerows Other habitats of Local or above importance	No effects anticipated.	N/A	To be confirmed following completion of habitat surveys.	Not Significant
Invertebrates	No effects anticipated.	N/A	N/A	Not Significant
Aquatic macroinvertebrates	Impacts to water quality and hydrological regime.	Long term	Details of committed mitigation measures will be provided within the ES.	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
GCN	Habitat loss. Killing, injury or disturbance of GCN.	Short or medium term	Update to surveys will be completed as necessary to inform mitigation and to ensure legal compliance.	Not Significant
Reptiles	Killing or injury.	Short or medium term	Update to surveys will be completed as necessary to inform mitigation and to ensure legal compliance.	Not Significant
Fish	Impacts to water quality and hydrological regime.	Long term	Details of committed mitigation measures will be provided within the ES.	Not Significant
Roosting bats	No effects anticipated.	N/A	N/A	Not Significant
Foraging and commuting bats	No effects anticipated.	N/A	N/A	Not Significant
Water vole	Disturbance or destruction of water vole burrows. Killing or injury of water voles. Pollution (physical or chemical) of watercourses.	Short, medium term or long term	Update to surveys will be completed as necessary to inform mitigation and to ensure legal compliance.	Not Significant
Otter	Disturbance of otter resting places. Pollution (physical or chemical) of watercourses.	Short, medium or long term	Update to surveys will be completed as necessary to inform	Not Significant

ECOLOGICAL FEATURE	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
			mitigation and to ensure legal compliance.	
Brown hare	No effects anticipated.	N/A	N/A	Not Significant
Hedgehog	No effects anticipated.	N/A	Measures to prevent harm to mammals	Not Significant
Badger	Disturbance of a badger.	Short or medium term	Update to surveys will be completed as necessary to inform mitigation and to ensure legal compliance.	Not Significant
Aquatic macrophytes	Impacts to water quality and hydrological regime.	Long term	To be confirmed following necessary surveys.	Not Significant
INNS	Spread of INNS resulting in a legal offence.	Short, medium or long term	Update surveys will be completed as necessary to inform the decommissioning plan.	Not Significant

12.7 Residual Effects and Conclusions

12.7.1 The preliminary information presented in this PEI Report chapter has identified that in the absence of additional mitigation measures the Proposed Development has the potential to result in a number of potentially significant adverse effects on ecological features during construction, operation and decommissioning (refer to details presented in Table 12-8 to Table 12-10).

12.7.2 Potential significant effects upon international statutory designated sites will be assessed as part of the EcIA to be presented in the ES and through the HRA process as detailed below.

12.7.3 There are potential impact pathways between the Proposed Development and designated sites. The potential for direct and indirect impacts on relevant designated sites will be considered further in the EcIA to be presented in the ES. Where possible secondary or indirect impacts upon qualifying features of the site will be avoided through the design development and, where required, the adoption of appropriate mitigation measures.

12.7.4 Where statutory or non-statutory designated sites will be affected by the Proposed Development, the EcIA to be presented in the ES will examine whether there will be direct or indirect effects during construction, operation or decommissioning and confirm relevant avoidance/mitigation requirements. It is anticipated that predicted effects to be reported in the ES will be less than as presented within this PEI Report chapter.

12.7.5 The Proposed Development will, wherever possible, seek to avoid direct impacts upon ponds and other waterbodies and, as such, the predicted effects upon GCN are limited to effects upon potential terrestrial habitat within 250 m of ponds where GCN is confirmed.

12.7.6 Only minor watercourses and drains will be crossed using open cut techniques to reduce the potential direct impacts upon aquatic habitats and potential effects upon associated protected fauna, such as water vole or otter. Similarly, woodland, trees and other features with potential to support roosting bats and nesting birds will also be avoided as far as possible.

12.7.7 The Proposed Development has the potential to have significant effects upon species/species groups, including invertebrates and macroinvertebrates, GCN, reptiles, fish, bats, water vole, otter, brown hare, badger and hedgehog. There is also the potential for the spread of INNS. Surveys to inform the ecological baseline are ongoing and avoidance and mitigation measures will be developed as the Proposed Development design is further progressed. As such, it is anticipated that predicted effects to be reported in the ES will be less than as presented within this PEI Report chapter.

12.8 Limitations and Difficulties

12.8.1 Baseline ecology surveys were in progress at the time of writing (August 2023). All habitats and species have been valued in accordance with the precautionary principle i.e., the maximum likely nature conservation value has been applied based on the

information available to inform decision-making. Where access for surveys was not available, habitats have been assessed from adjacent parcels or aerial photography.

12.8.2 This assessment has been undertaken using available data and Proposed Development design details at the time of writing in August 2023. However, at this stage some details of the Proposed Development remain under development. As such, the assessment herein is a worst-case scenario, and actual effects may be less than those presented. Effects will be re-evaluated during the EIA and reported in the ES.

12.9 Information to Inform a Habitats Regulations Assessment

12.9.1 It is necessary to consider whether the Proposed Development is likely to have a significant effect on areas that have been designated for their international nature conservation value. Known as European sites, these include SACs, SPAs and, as a matter of government policy, Ramsar sites.

12.9.2 European sites are protected under the Conservation of Habitats and Species Regulations 2017. The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). However, the most recent amendments to the Habitats Regulations – the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 – make it clear that the need for HRA continues to apply.

12.9.3 The Proposed Development is located within 15 km of the following international sites:

- Teesmouth and Cleveland Coast SPA;
- Teesmouth and Cleveland Coast Ramsar;
- North York Moors SAC;
- North York Moors SPA;
- Durham Coast SAC;
- Northumbria Coast SPA;
- Northumbria Coast Ramsar; and
- Castle Eden Dene SAC.

12.9.4 Stage 1 of the HRA process (Test of Likely Significant Effects) (See Appendix 12A: Report to inform Habitats Regulations Assessment Screening, PEI Report, Volume III) considers the potential pathways of impact between the Proposed Development and the European designated sites within 15 km of the Proposed Development Site, and whether there is potential to have a significant adverse effect on the integrity of the European designated sites, either alone or in combination with other plans or projects.

12.9.5 Potential pathways of impact currently include habitat loss, noise and visual disturbance during construction, pollution (via hydrological links to the designated sites) and dust emissions and loss/disturbance of functionally linked land used by

qualifying species. Information used to support the HRA process will include desk study data and the suite of bird surveys outlined in Chapter 13: Ornithology (PEI Report, Volume I).

12.9.6 The North York Moors SAC/SPA, Northumbria Coast SPA/Ramsar and Castle Eden Dene SAC will be considered in the context of any operational aerial emissions (nutrient nitrogen deposition) from the Proposed Development, which have the potential to affect European sites that lie relatively far from industrial developments.

12.9.7 In addition to the above listed sites, the following European designated sites list marine mammals as qualifying species which range great distances and are therefore screened into the assessment of Test of Likely Significant Effects:

- The Wash and North Norfolk Coast SAC;
- Humber Estuary SAC;
- Southern North Sea SAC;
- River Tweed SAC; and
- Tweed Estuary SAC.

12.9.8 Where there is potential for the Proposed Development to have Likely Significant Effects upon the qualifying features of the European designated sites, the pathway will be taken forward to Stage 2: Appropriate Assessment. Baseline surveys are ongoing at the time of writing; however, based on the potential pathways of effect between the Proposed Development and Habitats sites, it is anticipated that Appropriate Assessment will be required. Pathways of effect considered within the HRA will include habitat loss, loss of functionally linked land, noise, visual disturbance, atmospheric pollution, and nutrient neutrality. At Appropriate Assessment, the measures that will be implemented to either avoid the impact in the first place, or to mitigate the ecological effect to such an extent that it is no longer significant, will be set out.

12.9.9 The HRA will be prepared in line with Planning Inspectorate Advice Note 10 (The Planning Inspectorate, 2022) (Habitats Regulations Assessment) and be submitted with the DCO Application.

12.10 Biodiversity Net Gain (BNG)

12.10.1 Schedule 15 of the Environment Act 2021 makes provision for BNG in relation to development consent for Nationally Significant Infrastructure Projects (NSIPs). The requirement for BNG for NSIPs will not become mandatory until 2025, however the Proposed Development will aspire to achieve a net gain in biodiversity. A BNG assessment will be undertaken for the Proposed Development in accordance with the latest published Natural England metric at the time of assessment.

12.10.2 A key aim of the mitigation and enhancement strategy is to achieve an overall net gain in biodiversity across the Proposed Development Site. The ecology and biodiversity assessment chapter in the ES will be supported by a BNG assessment. The Applicant is committed to making a positive contribution to biodiversity net gain and additional details will be included within the ES.

12.11 References

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13.0 ORNITHOLOGY

13.1 Introduction

13.1.1 This chapter of the Preliminary Environmental Information (PEI) Report identifies the potential impacts and effects on ornithological receptors (breeding and wintering birds) as associated with the Proposed Development.

13.1.2 This chapter is supported by the following figures (PEI Report, Volume II) and technical appendix (PEI Report, Volume III):

- Figure 13-1: Study Areas;
- Figure 13-2: Survey Areas;
- Figure 13-3: Net Zero Teesside Breeding Bird Survey Areas;
- Figure 13-4: Statutory Designated Sites with Ornithology Features;
- Figure 13-5: Non-Statutory Designated Sites with Ornithology Features; and
- Appendix 13A: Ornithology Baseline Report.

13.1.3 This chapter provides a preliminary evaluation of relevant ornithological receptors (including nature conservation designations, habitats and protected or notable bird species) associated with the Proposed Development, with each being assigned a preliminary nature conservation value (sensitivity/value). The Proposed Development's potential direct and indirect impacts and effects on ornithological receptors and their conservation status, interrelationships and their value as a contributor to local (and if appropriate regional and national) biodiversity are identified. This preliminary assessment considers impact avoidance design measures and management activities (embedded mitigation) when determining the potential for significant effects. The requirement for potential further mitigation measures is then described and these mitigation measures then considered in the assessment of potential residual effects.

13.1.4 This preliminary assessment reports on the ornithology baseline available at the time of writing (August 2023). A final assessment of the potential impacts of the Proposed Development on ornithological receptors including updates to the baseline will be undertaken as part of the Environmental Impact Assessment (EIA) and reported in the Environmental Statement (ES) that will be submitted with the DCO Application.

13.2 Legislation, Planning Policy and Guidance

13.2.1 A summary of the international, national and local legislation, planning policy and guidance relevant to this assessment is set out below.

<u>Legislative Background</u>

13.2.2 The following legislation is relevant to the ornithological assessment for the Proposed Development

- Environment Act 2021;
- Countryside and Rights of Way (CRoW) Act 2000;

- The Conservation of Habitats and Species Regulations 2017 (Habitats Regulations)[1];
- The Wildlife and Countryside Act 1981 (as amended) (WCA); and
- The Natural Environment and Rural Communities (NERC) Act 2006.

13.2.3 Prior to 31 December 2020, Annex 1 of the European Council (EC) Birds Directive listed rare and vulnerable species of regularly occurring or migratory wild birds that were subject to special conservation measures. The Directive also provided for the designation of Special Protection Areas (SPAs) for the protection of these species, which formed part of the Natura 2000 network of sites protected by European wildlife legislation. European Union (EU) legislation as it applied to the UK on 31 December 2020 is now a part of UK domestic legislation as 'retained EU legislation'. Changes have been made to parts of the Habitats Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 so that they effectively continue the legislation which implemented the EU Habitats and Species Directive and parts of the Wild Birds Directive through the provisions of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Most of these changes involve transferring functions from the European Commission to the appropriate authorities in England. All other processes or terms of the 2017 Regulations remain unchanged. Internationally designated wetlands 'Ramsar Sites' are protected under the CRoW Act 2000 and are not affected by the UK's exit from the EU.

13.2.4 Part 1 of the WCA affords general protection to all species of wild bird, and specific protection to certain species of bird listed in Schedule 1 (birds protected by special penalties). It is an offence (subject to exceptions) to:

- kill, injure, or take any wild bird;
- take, damage, or destroy the nest of any wild bird while that nest is in use or being built;
- take or destroy an egg of any wild bird; and
- disturb any wild bird listed on Schedule 1 of the WCA while nesting or disturb the dependent young of such a bird.

13.2.5 The WCA requires the prosecuting authority to prove that an offence was intentional, however, the CRoW Act 2000 strengthens the provisions of the WCA by introducing an additional offence of "reckless" disturbance, which means that ignorance of the presence of a protected species cannot be used as a reliable defence should a breach of the WCA be committed. The NERC Act 2006 strengthens the WCA further with respect to the protection of the nests of certain birds listed on Schedule Z1A, even when they are not in use.

[1] This transposes into UK law, post-Brexit, the provisions of the European Habitats and Wild Birds Directives and their respective Annexes of species and habitats that are qualifying features of the European network of Special Areas of Conservation (SAC) and Special Protection Areas (SPA). The EU Directives are directly incorporated into Regulation 9 of the domestic legislation.

Planning Policy Context

National Planning Policy

13.2.6 The overarching National Planning Policy Statement (NPS) for Energy (EN-1) (Department for Energy and Climate Change, 2011a) sets out national policy for energy infrastructure and is part of a suite of NPSs issued by the Secretary of State (SoS) for Energy and Climate Change.

Overarching National Planning Policy Statement for Energy EN-1 (2011)

13.2.7 Paragraph 5.3.3 states that *"Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. The applicant should provide environmental information proportionate to the infrastructure where EIA is not required to help the IPC consider thoroughly the potential effects of a proposed project."*

13.2.8 Paragraph 5.3.4 states that "*The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests".*

National Policy Statement for Gas Supply and Infrastructure and Gas and Oil Pipelines (EN-4) 2011

13.2.9 NPS EN-4 (Department for Energy and Climate Change, 2011b) is relevant for this Proposed Development, as although this NPS only covers those nationally significant infrastructure pipelines which transport natural gas or oil, the information is useful in identifying impacts to be considered in applications for pipelines intended to transport other substances.

13.2.10 Paragraph 2.21.3 states that "*The ES should include an assessment of the biodiversity and landscape and visual effects of the proposed route and of the main alternative routes considered (see Section 5.9 of EN-1). The application should also include proposals for reinstatement of the pipeline route as close to its original state as possible and take into account any requirements for agreements with the landowner to access areas for aftercare and management work. Where it is unlikely to be possible to restore landscape to its original state, the applicant should set out measures to avoid, mitigate, or employ other landscape measures to compensate for, any adverse effect on the landscape."*

13.2.11 Paragraph 2.21.5 states: *"Mitigation measures to protect the landscape and ecology could include reducing the working width required for the installation of the pipeline in order to reduce the impact on the landscape where it will not be possible to fully reinstate the route."*

13.2.12 Paragraph 2.21.6 states: *"In circumstances where the habitat to be crossed contains ancient woodland, trees subject to a Tree Preservation Order, or hedgerows subject to the Hedgerows Regulations 1997, the applicant should consider whether it would be feasible to use horizontal direct drilling under the ancient woodland or thrust bore*

under the protected tree or hedgerow and the IPC should consider requiring this, where not included in the proposal."

National Policy Statement (NPS) for Electrical Networks Infrastructure (EN-5) (2011)

13.2.13 Paragraph 2.7.1 states: "Generic biodiversity effects are covered in Section 5.3 of EN-1. However, large birds such as swans and geese may collide with overhead lines associated with power infrastructure, particularly in poor visibility. Large birds in particular may also be electrocuted when landing or taking off by completing an electric circuit between live and ground wires. Even perching birds can be killed as soon as their wings touch energised parts."

13.2.14 Paragraph 2.7.2 states: "The applicant will need to consider whether the proposed line will cause such problems at any point along its length and take this into consideration in the preparation of the Environmental Impact Assessment (EIA) and ES (see Section 4.2 of EN-1). Particular consideration should be given to feeding and hunting grounds, migration corridors and breeding grounds."

13.2.15 The UK Government is currently reviewing and updating the energy NPSs. It is doing this to reflect its policies and strategic approach for the energy system that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions. As part of the NPS review process, the government published a suite of revised draft NPSs for new energy infrastructure on 6 September 2021. A further update was published in March 2023 by the Department for Energy Security & Net Zero (DESNZ). Draft NPSs of relevance include:

Draft Overarching National Policy Statement for Energy (EN-1) (DESNZ, 2023)

13.2.16 Section 5.4 of Draft EN-1 relates to biodiversity and geological conservation. Relevant extracts from Draft NPSs EN-1 and EN-4 are provided in Table 13-1. The detail of these provisions are however, subject to consultation and thereafter implementation. The timetable for adoption of the updated NPSs is not known, however it is expected that these will be finalised and shall replace the current NPSs by the time the DCO Application for the Proposed Development is submitted.

13.2.17 Paragraph 5.4.3 states *"Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally, and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. The applicant should provide environmental information proportionate to the infrastructure where EIA is not required to help the Secretary of State consider thoroughly the potential effects of a proposed project."*

13.2.18 Paragraph 5.4.4 states that *"The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests. As set out in Section 4.6, the design process should embed opportunities for nature inclusive design. The applicant is encouraged to consider how their proposal can contribute towards Biodiversity Net Gain in line with the ambition set out in the 25 Year Environment Plan. Energy infrastructure projects have*

the potential to deliver significant benefits and enhancements beyond Biodiversity Net Gain, which result in wider environmental gains. The scope of potential gains will be dependent on the type, scale, and location of each project."

Draft NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (DESNZ, 2023)

13.2.19 Paragraph 2.21.1 states: *"Sections 4.3 and 5.9 of EN-1 sets out the general principles that should be applied in the assessment of biodiversity and landscape and visual impacts. Additional considerations apply during the construction of a pipeline (which, without mitigation, can affect both landscape and ecology). These comprise the effect upon specific landscape elements within and adjacent to the pipeline route, such as grasslands, field boundaries (hedgerows, hedgebanks, drystone walls, fences), trees, woodlands, and watercourses. There will also be temporary visual impacts caused by the need to access the working corridor and to remove flora and soil. The working width of the pipeline will vary depending on the surrounding terrain. Temporary impacts could include large excavations where deep pits are needed for boring beneath rivers, roads, and sensitive features."*

13.2.20 Paragraph 2.21.2 states that "*Long term impacts upon the landscape for pipelines are likely to be limited, as once operational the main infrastructure is usually buried. They are likely to include:*

- *limitations on the ability to replant landscape features such as hedgerows or deep-rooted trees over or adjacent to the pipeline; and*
- *structures and indication points necessary to identify the pipeline route and provide it with service access."*

13.2.21 Paragraph 2.21.1 states that "*The ES should include an assessment of the biodiversity and landscape and visual effects of the proposed route and of the main alternative routes considered (see Section 5.10 of EN-1). The application should also include proposals for reinstatement of the pipeline route as close to its original state as possible and take into account any requirements for agreements with the landowner to access areas for aftercare and management work. Where it is unlikely to be possible to restore landscape to its original state, the applicant should set out measures to avoid, mitigate, or employ other landscape measures to compensate for, any adverse effect on the landscape."*

Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (DESNZ, 2023)

13.2.22 Paragraph 1.7.1 states: "All the NPSs have been subject to an Appraisal of Sustainability (AoS) required by the 2008 Act and the Environmental Assessment of Plans and Programmes Regulations 2004. A Habitats Regulations Assessment (HRA) has also been prepared in accordance with the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017."

13.2.23 Paragraph 2.51 states: "When planning and evaluating the proposed development's contribution to environmental and biodiversity net gain, it will be important – for

both the applicant and the Secretary of State – to supplement the generic guidance set out in EN-1 (Section 4.5) with recognition that the linear nature of electricity networks infrastructure can allow for excellent opportunities to:

i. reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows; and/or

ii. connect people to the environment, for instance via footpaths and cycleways constructed in tandem with environmental enhancements."

National Planning Policy Framework

13.2.24 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2021) sets out the UK Government's planning policies for England and how these are expected to be applied by local authorities within their Local Development Frameworks (LDF). Chapter 15 of the NPPF 'Conserving and enhancing the natural environment' sets out the requirements to consider biodiversity in planning decisions. The policies as outlined in Chapter 15 and relevant to this assessment are outlined below.

"To protect and enhance biodiversity and geodiversity, plans should:

a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and steppingstones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and,

b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around

developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

The following should be given the same protection as habitats sites:

a) potential Special Protection Areas and possible Special Areas of Conservation;

b) listed or proposed Ramsar sites; and

c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site."

Local Planning Policy

The Redcar and Cleveland Local Plan

13.2.25 The Redcar and Cleveland Local Plan (Redcar and Cleveland Borough Council (RCBC), 2018) was adopted in 2018 and sets out the vision and overall development strategy for the council's area and how it will be achieved for the period until 2032. Policies relevant to the Proposed Development are outlined below.

Policy N4 – Biodiversity and Geological Conservation

"We will protect and enhance the borough's biodiversity and geological resources. Support will be given to high quality schemes that enhance nature conservation and management, preserve the character of the natural environment and maximise opportunities for biodiversity and geological conservation, particularly in or adjacent to, Biodiversity Opportunity Areas in the wider Tees Corridor, Teesmouth, East Cleveland and Middlesbrough Beck Valleys areas. We will protect and preserve local, national and international priority species and habitats and promote their restoration, re-creation and recovery.

Biodiversity and geodiversity should be considered at an early stage in the development process, with appropriate protection and enhancement measures incorporated into the design of development proposals, recognising wider ecosystem services and providing net gains wherever possible. Detrimental impacts of development on biodiversity and geodiversity, whether individual or cumulative, should be avoided. Where this is not possible mitigation, or lastly compensation, must be provided as appropriate. Proposals will be considered in accordance with the status of biodiversity and geodiversity sites within the hierarchy.

Internationally important sites

Priority will be given to protecting our internationally important sites, including the Teesmouth and Cleveland Coast Special Protection Area/Ramsar and European

Marine Site, and the North York Moors Special Protection Area and Special Area of Conservation. Development that is not directly related to the management of the site, but which is likely to have a significant effect on any internationally designated site, irrespective of its location and when considered both alone and in combination with other plans and projects, will be subject to an Appropriate Assessment.

Development requiring Appropriate Assessment will only be allowed where:

a. it can be determined through Appropriate Assessment at the design stage that, taking into account mitigation, the proposal would not result in adverse effects on the site's integrity, either alone or in combination with other plans or projects. Within 6 km of the Teesmouth and Cleveland Coast SPA and Ramsar Site, as illustrated on the Policies Map, proposals that would result in a net increase in residential units, or other development that would lead to increased recreational disturbance of the site's interest features, will be expected to contribute towards strategic mitigation measures identified in the Recreation Management Plan. This is to ensure that adverse effects on the site's integrity can be avoided. Any alternative suitable mitigation would need to be proven effective and agreed with the Council, in consultation with relevant statutory consultees or

b. as a last resort, Appropriate Assessment proves that there are no alternatives and that the development is of overriding public interest and appropriate compensatory measures are provided.

Nationally important sites

Development that is likely to have an adverse impact on nationally important SSSI sites, including broader impacts on the national network and combined effects with other development, will not normally be allowed. Where an adverse effect on the site's notified interest features is likely, an exception will only be made where:

c. the benefits of the development, at this site, clearly outweigh both any adverse impact on the features of the site that makes it of special scientific interest, and any broader impacts on the network of SSSIs;

d. no reasonable alternatives are available; and e. mitigation, or where necessary compensation, is provided for the impact.

Locally important sites

Development that is likely to have an adverse impact on Local Sites (Local Wildlife Sites and Local Geological Sites) or Local Nature Reserves will only be approved where:

f. the benefits clearly outweigh any adverse impact on the site;

g. no reasonable alternatives are available; and h. mitigation, or where necessary compensation, is provided for the impact. Wildlife corridors and other habitat networks will be protected and enhanced, particularly hedgerows, watercourses and linking habitat features. Opportunities to deculvert watercourses will be encouraged.

We will continue to protect our ancient woodland and ancient and veteran trees, including our tree-lined becks. Development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and aged or veteran trees, will only be allowed in very exceptional circumstances where the need for, and benefits of, the development in that location clearly outweigh the loss and the development cannot be located elsewhere."

The Stockton-on-Tees Local Plan

13.2.26 The Stockton on Tees Local Plan (Stockton on Tees Borough Council (STBC), 2019) was adopted in 2019 and sets out policies and proposals to guide planning decisions and establishes a framework for sustainable economic growth and development in the borough up until 2032. Policies relevant to the Proposed Development are summarised below.

SD8 - Sustainable Design Principles

"1. The Council will seek new development to be designed to the highest possible standard, taking into consideration the context of the surrounding area and the need to respond positively to the:

a. Quality, character and sensitivity of the surrounding public realm, heritage assets, and nearby buildings, in particular at prominent junctions, main roads and town centre gateways;

b. Landscape character of the area, including the contribution made by existing trees and landscaping;

c. Need to protect and enhance ecological and green infrastructure networks and assets…

Policy EG4 – Seal Sands, North Tees and Billingham

"Development proposals for hazardous installations, uses related to the process industries, or emerging specialist sectors will be directed to available sites and expansion land in the following locations:

a. Billingham Chemical Complex including 45 ha of available land.

b. North Tees including 46 ha of available land. c. Seal Sands including 144 ha of available land.

2. Development proposals in the North Tees and Seal Sands area will recognise the cumulative importance for bird species associated with the Teesmouth and Cleveland Coast SPA and Ramsar site. Appropriate development proposals will be encouraged at locations within the limits to development where:

a. If necessary, land has been identified to provide appropriate strategic mitigation; or

b. The applicant can demonstrate that the proposed development, in-combination with other proposals, will not adversely impact the Teesmouth & Cleveland Coast SPA and Ramsar site.

3. Should it become apparent that proposals for strategic mitigation cannot be identified, the Council will work with the Tees Estuary Partnership and relevant stakeholders to take appropriate action."

ENV5 - Preserve, Protect and Enhance Ecological Networks, Biodiversity and Geodiversity

"1. The Council will protect and enhance the biodiversity and geological resources within the Borough. Development proposals will be supported where they enhance nature conservation and management, preserve the character of the natural environment and maximise opportunities for biodiversity and geological conservation particularly in or adjacent to Biodiversity Opportunity Areas in the River Tees Corridor, Teesmouth and Central Farmland Landscape Areas.

2. The Council will preserve, restore and re-create priority habitats alongside the protection and recovery of priority species.

3. Ecological networks and wildlife corridors will be protected, enhanced and extended. A principal aim will be to link sites of biodiversity importance by avoiding or repairing the fragmentation and isolation of natural habitats.

4. Sites designated for nature or geological conservation will be protected and, where appropriate enhanced, taking into account the following hierarchy and considerations:

a. Internationally designated sites – Development that is not directly connected with or necessary to the management of the site, but which is likely to have a significant effect on any internationally designated site, irrespective of its location and when considered both alone and in combination with other plans and projects, will be subject to an Appropriate Assessment. Development requiring Appropriate Assessment will only be allowed where:

i. It can be determined through Appropriate Assessment, taking into account mitigation, the proposal would not result in adverse effects on the site's integrity, either alone or in combination with other plans or projects; or

ii. as a last resort, where, in light of negative Appropriate Assessment there are no alternatives and the development is of overriding public interest, appropriate compensatory measures must be secured.

b. Nationally designated sites - Development that is likely to have an adverse effect on a site, including broader impacts on the national network of Sites of Special Scientific Interest (SSSI) and combined effects with other development, will not normally be allowed. Where an adverse effect on the site's notified interest features is likely, a development will only be allowed where:

i. the benefits of the development, at this site, clearly outweigh both any adverse impact on the sites notified interest features, and any broader impacts on the national network of SSSI's;

ii. no reasonable alternatives are available; and iii. mitigation, or where necessary compensation, is provided for the impact. c. Locally designated

sites: Development that would have an adverse effect on a site(s) will not be permitted unless the benefits of the development clearly outweigh the harm to the conservation interest of the site and no reasonable alternatives are available.

All options should be explored for retaining the most valuable parts of the sites interest as part of the development proposal with particular consideration given to conserving irreplaceable features or habitats, and those that cannot readily be recreated within a reasonably short timescale, for example ancient woodland and geological formations. Where development on a site is approved, mitigation or where necessary, compensatory measures, will be required in order to make development acceptable in planning terms.

5. Development proposals should seek to achieve net gains in biodiversity wherever possible. It will be important for biodiversity and geodiversity to be considered at an early stage in the design process so that harm can be avoided and wherever possible enhancement achieved (this will be of particular importance in the redevelopment of previously developed land where areas of biodiversity should be retained and recreated alongside any remediation of any identified contamination). Detrimental impacts of development on biodiversity and geodiversity, whether individual or cumulative should be avoided. Where this is not possible, mitigation and lastly compensation, must be provided as appropriate. The Council will consider the potential for a strategic approach to biodiversity offsetting in conjunction with the Tees Valley Local Nature Partnership and in line with the above hierarchy.

6. When proposing habitat creation, it will be important to consider existing habitats and species as well as opportunities identified in the relevant Biodiversity Opportunity Areas. This will assist in ensuring proposals accord with the 'landscape scale' approach and support ecological networks.

7. Existing trees, woodlands and hedgerows which are important to the character and appearance of the local area or are of nature conservation value will be protected wherever possible. Where loss is unavoidable, replacement of appropriate scale and species will be sought on site, where practicable."

Policy ENV6 - Green Infrastructure, Open Space, Green Wedges and Agricultural Land

"1. Through partnership working, the Council will protect and support the enhancement, creation and management of all green infrastructure to improve its quality, value, multi-functionality and accessibility in accordance with the Stockton-on-Tees Green Infrastructure Strategy and Delivery Plan.

2. Where appropriate, development proposals will be required to make contributions towards green infrastructure having regard to standards and guidance provided within the Open Space, Recreation and Landscaping SPD or any successor. Green infrastructure should be integrated, where practicable, into new developments. This includes new hard and soft landscaping, and other types

of green infrastructure. Proposals should illustrate how the proposed development will be satisfactorily integrated into the surrounding area in a manner appropriate to the surrounding townscape and landscape setting and enhances the wider green infrastructure network.

3. The Council will protect and enhance open space throughout the Borough to meet community needs and enable healthy lifestyles. The loss of open space as shown on the Policies Map, and any amenity open space, will not be supported unless:

a. it has been demonstrated to be surplus to requirements; or

b. the loss would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location; or

c. the proposal is for another sports or recreational provision, the needs for which, clearly outweigh the loss; or d. the proposal is ancillary to the use of the open space; and e. in all cases there would be no significant harm to the character and appearance of the area or nature conservation interests.

4. Development within green wedges will only be supported where:

a. it would not result in physical or visual coalescence of built-up areas;

b. it would not adversely impact on local character or the separate identity of communities;

c. it would not adversely impact on recreational opportunities; and

d. it would not adversely impact on biodiversity.

5. Development proposals will be expected to demonstrate that they avoid the 'best and most versatile' agricultural land unless the benefits of the proposal outweigh the need to protect such land for agricultural purposes. Where significant development of agricultural land is demonstrated to be necessary, proposals will be expected to demonstrate that they have sought to use areas of lower quality land in preference to that of a higher quality."

Policy ENV7 – Ground, Air, Water, Noise and Light Pollution

"1. All development proposals that may cause groundwater, surface water, air (including odour), noise or light pollution either individually or cumulatively will be required to incorporate measures as appropriate to prevent or reduce their pollution so as not to cause unacceptable impacts on the living conditions of all existing and potential future occupants of land and buildings, the character and appearance of the surrounding area and the environment.

2. Development that may be sensitive to existing or potentially polluting sources will not be sited in proximity to such sources. Potentially polluting development will not be sited near to sensitive developments or areas unless satisfactory mitigation measures can be demonstrated.

3. Where development has the potential to lead to significant pollution either individually or cumulatively, proposals should be accompanied by a full and

detailed assessment of the likely impacts. Development will not be permitted when it is considered that unacceptable effects will be imposed on human health, or the environment, taking into account the cumulative effects of other proposed or existing sources of pollution in the vicinity. Development will only be approved where suitable mitigation can be achieved that would bring pollution within acceptable levels.

4. Where future users or occupiers of a development would be affected by contamination or stability issues, or where contamination may present a risk to the water environment, proposals must demonstrate via site investigation/assessment that:

a. Any issues will be satisfactorily addressed by appropriate mitigation measures to ensure that the site is suitable for the proposed use, and does not result in unacceptable risks which would adversely impact upon human health and the environment; and

b. Demonstrate that development will not cause the site or the surrounding environment to become contaminated and/or unstable.

5. Groundwater and surface water quality will be improved in line with the requirements of the European Water Framework Directive and its associated legislation and the Northumbria River Basin Management Plan. Development that would adversely affect the quality or quantity of surface or groundwater, flow of groundwater or ability to abstract water will not be permitted unless it can be demonstrated that no significant adverse impact would occur, or mitigation can be put in place to minimise this impact within acceptable levels.

To improve the quality of the water environment the Council will:

a. Support ecological improvements along riparian corridors including the retention and creation of river frontage habitats;

b. Avoid net loss of sensitive inter-tidal or sub-tidal habitats and support the creation of new habitats; and

c. Protect natural water bodies from modification and support the improvement and naturalisation of heavily modified water bodies (including de-culverting and the removal of barriers to fish migration).”

The Hartlepool Local Plan.

13.2.27 The Hartlepool Local Plan (Hartlepool Borough Council (HBC), 2018) was adopted in May 2018. Policies relevant to the Proposed Development are outlined below.

Policy NE1- Natural Environment

“The Borough Council will protect, manage and enhance Hartlepool’s natural environment and will ensure that:

1) Development proposals are in accordance with the locational strategy outlined in policy LS1.

2) Sites designated for nature conservation as shown on the Policies Map will be protected and, where appropriate, enhanced, taking into account the following hierarchy:

a) Internationally designated sites: these sites receive statutory protection. Development not connected to or necessary for the enhancement and/or management of the site will not be permitted unless it meets relevant legal requirements; A precautionary approach will be taken towards developments that may have indirect impacts on internationally designated sites and appropriate mitigation measures or contributions to avoid detrimental impacts will be sought and delivered via the Hartlepool Mitigation Strategy and Delivery Plan and other mechanisms.

b) Nationally designated sites: these sites also receive statutory protection. Development that would have an adverse aeffect on these sites will not be permitted unless it meets the relevant legal requirements; A precautionary approach will be taken towards developments that may have indirect impacts on nationally designated sites and appropriate mitigation measures or contributions to avoid detrimental impacts will be sought.

c) Locally designated sites: development which would adversely affect a locally designated site, which is not also allocated for another use in the Local Plan, will not be permitted unless the reasons for the development clearly outweigh the harm to the conservation interest of the site. Where development on a locally designated site is approved, including sites that are also allocated for other uses, compensatory measures may be required in order to make development acceptable in planning terms and to mitigate against potential loss of interest.

Biodiversity accounting/offsetting may be considered as part of compensatory measures where on-site compensation is not possible.

3) Designated Local Nature Reserves are protected, managed and enhanced as sites with geological and/or wildlife features that are of special local interest. Where appropriate the Borough Council will support the designation of further sites as Local Nature Reserves.

4) Where appropriate an ecosystems services approach will be used to assess the impact of development proposals on the natural environment and the benefits it provides, including resource use, health and well-being, protection from the affects of climate change, economic growth, and culture

5) Ecological networks are enhanced and green infrastructure is protected and enhanced

6) Development avoids harm to and, where appropriate, enhances the natural environment. This could include, for example, creating and/or enhancing habitats to meet the objectives of the Tees Valley Biodiversity Action Plan. In seeking to avoid harm, development should follow the sequence of avoidance, mitigation, compensation. Where sufficient on-site mitigation and/or compensation are demonstrably not possible, then off-site compensation will be considered. Where significant harm from a development cannot be avoided (through locating on an

alternative site), adequately mitigated or, as a last resort compensated for, the Borough Council will refuse planning permission. The Borough Council will consider the potential for a strategic approach to biodiversity accounting in conjunction with the Tees Valley Local Nature Partnership and in line with the above hierarchy.

7) Existing woodland and trees of amenity value and nature conservation value are protected, and an increase in tree cover will be sought in appropriate locations in line with the Borough Council's Tree Strategy. Areas of ancient woodland, including ancient semi-natural woodland (ASNW), plantations on ancient woodland sites (PAWS), and ancient or veteran trees outside ancient woodland, will be protected unless there are exceptional circumstances. The Borough Council will also ensure that development does not result in the loss of or damage to ancient woodland (including ASNW and PAWS) by requiring the implementation of a buffer of at least 15 metres between development and the ancient woodland site (depending on the size of the site). For ancient or veteran trees, a buffer 15 times the stem diameter or 5 metres beyond the drip line of the leaf canopy should be maintained, whichever is the greater.

8) Where appropriate Tree Preservation Orders will be used to protect trees under threat from development proposals. Where the loss of significant trees/hedgerows cannot be avoided their replacement by trees/shrubs/hedgerows of an appropriate scale and species for the area will be sought where practical.

9) Development avoids the best and most versatile agricultural land – identified as grades 1, 2 and 3a in the National Agricultural Land Classification – unless it can be demonstrated that there will be no impact on the agricultural land and its quality and there are no material consideration that outweigh the loss of such land.

10) In prioritising the re-development of brownfield land, areas that are important for biodiversity will be retained or recreated within the site, and remediation of contaminated land will be pursued.

11) The major/principal aquifers underlying Hartlepool along with watercourses and other surface and coastal waters will be protected from over abstraction and contamination from pollutants and saline intrusion resulting from development. Developments will be required to demonstrate that they do not impact on the major/principal aquifer underlying Hartlepool, along with watercourses and other surface and coastal waters and they can achieve access to a sustainable water supply prior to approval.

12) Opportunities are taken to retain, restore and de-culvert watercourses to improve their role and value as wildlife corridors and habitats.

13) All development proposals, through the careful, sensitive management and design of development will ensure that the character, distinctiveness and quality of the Borough's landscape is protected and, where appropriate, enhanced. Any development within the Special Landscape Areas as defined on the Policies Map or which will have a visual impact on those areas will be required to demonstrate that they are in keeping with the area and will not have an adverse impact on the area's landscape character.

14) Development has regard to coastal change, bathing water quality, and coastal processes over time, and in particular the need to avoid exacerbating coastal squeeze and incorporate measures to mitigate this where appropriate.

Where appropriate Supplementary Planning Documents will be prepared to provide more detailed guidance on safeguarding and enhancing Hartlepool's natural environment and biodiversity."

Policy NE4 – Ecological Networks

"The Borough Council will seek to maintain and enhance ecological networks throughout the Borough. Priority sections of the network are:

1) Coastal fringe

2) Tees Road/Brenda Road brownfield land

3) Dalton Beck/Greatham Beck riparian corridor

4) Rural west from Wynyard to Thorpe Bulmer and Crimdon Denes

The Borough Council will also work with the Tees Valley Local Nature Partnership and adjoining Local Nature Partnerships to maintain and enhance ecological networks at a landscape scale across the Borough boundary. Where appropriate all developments will be required to maintain and enhance ecological networks in the vicinity of the proposal, complying with policy QP5. Where enhancements cannot be incorporated within the site then an off-site contribution may be sought, in accordance with policy NE2 and policy QP1."

Local Biodiversity Action Plans

13.2.28 The UK Biodiversity Action Plan (BAP) was withdrawn in March 2011 with the lists of Priority Species and Habitats being superseded by those within Section 41 of the NERC Act (2006). Local Biodiversity Action Plans (LBAPs) are no longer used as a formal expression of delivery of biodiversity targets but identify sub-regional priorities for nature conservation and propose agreed actions to conserve, maintain, enhance and increase local Priority Species and Habitats.

13.2.29 The Tees Valley Biodiversity Action Plan (Tees Valley Nature Partnership, 2012) is the relevant LBAP for the defined Study Area (refer to Section 13.3) and was updated in 2012. The LBAP outlines biodiversity conservation objectives within the region and identifies priorities for action for priority habitats, species, locally important wildlife, and sites.

13.2.30 Tees Valley Biodiversity Partnership (2012) identify 10 bird species that can be regarded as LBAP Priority Species on this basis. These are: barn owl (*Tyto alba*), ringed plover (*Charadrius hiaticula*), grey partridge (*Perdix perdix*), tree sparrow (*Passer montanus*), corn bunting (*Emberiza calandra*), shelduck (*Tadorna tadorna*), little tern (*Sternula albifrons*), bittern (*Botaurus stellaris*), swift (*Apus apus*) and yellow wagtail (*Motacilla flava*).

Guidance

13.2.31 This preliminary ornithological assessment has been carried out with regard to the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2022).

13.2.32 Specific guidance used to inform this ornithological assessment is referenced throughout the chapter and includes:

- The CIEEM guidelines for Preliminary Ecological Appraisal (CIEEM, 2017);
- Natural England's Standing Advice for Protected Species (Natural England, 2023a); and
- Bird Survey Guidance published in Marchant (1983), Bibby *et al.* (2000) Gilbert *et al.* (1998).

13.2.33 Stanbury *et al*. (2021) have published lists of Birds of Conservation Concern (BoCC). Red List species are those whose breeding population or range is rapidly declining (50% or more in the last 25 years), recently or historically, and those of global conservation concern. Amber List species are those whose breeding population is in moderate decline (25 - 49% in the last 25 years), rare breeders, internationally important and localised species and those of unfavourable conservation status in Europe. Green List species are those not of immediate conservation concern. Non-native species are classified as Not Assessed. These lists confer no legal status; however, they are useful when assessing the significance of predicted impacts and determining the level of mitigation that may be required when birds are affected by development or any other activity. Furthermore, inclusion on the Red List was a factor in determining the species for which BAPs were developed.

13.3 Assessment Methodology and Significance Criteria

Study Area

13.3.1 The Study Areas used in this assessment have been defined with reference to the likely Zone of Influence (ZoI) over which the Proposed Development may have potential to result in significant effects on relevant ornithological features.

13.3.2 The potential ZoI of the Proposed Development may vary over time (e.g., the construction ZoI may differ from the operational ZoI) and/or depending on the individual sensitivities of different ornithological features.

13.3.3 The extents of the Study Areas applied during the desk study and field surveys are detailed within Table 13-1 and Table 13-2 and illustrated in Figure 13-1: Study Areas and Figure 13-2: Survey Areas (PEI Report, Volume II). The Study Areas and Survey Areas are considered sufficient to address the potential worst-case ZoI of the Proposed Development on the relevant ornithological features concerned.

13.4 Impact Assessment Methodology

Sources of Information

13.4.1 The ornithological baseline has been determined through a combination of desk study and field survey, as summarised below.

Desk Study

13.4.2 A desk study was undertaken to identify ecological designations specifically for their ornithological interest, as well as contemporary records of protected and notable species of potential relevance to the Proposed Development and locations of ornithological interest or sensitivity (such as habitats regularly used by roosting birds for which designated sites are notified).

13.4.3 The desk study was carried out using the data sources detailed in Table 13-1. Protected and notable habitats and species include those listed under Schedules 1, 5, and 8 of the WCA; Schedules 2 and 4 of The Habitats Regulations; qualifying species listed on SPA/Special Area of Conservation (SAC)/ Site of Special Scientific Interest (SSSI) citations; and species and habitats of principal importance for nature conservation in England listed under Section 41 of the NERC Act, 2006.

13.4.4 The majority of bird data acquired from third parties is spatially relevant to the Proposed Development design. Further third-party data will be acquired to update the baseline that will be presented in the ES. British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS) core count data are updated on a rolling basis in July each year – therefore, these data will be acquired for all spatially relevant count sectors after July 2023 to ensure that the data are as contemporary as possible. Data from other sources listed in Table 13-1 will be updated as required to meet the conditions of use stipulated by suppliers and to ensure the data are contemporary and spatially relevant.

13.4.5 In addition to the area-specific requests for data as set out in Table 13-1, Natural England has been consulted on the scope of the initial surveys and assessment, at which time they supplied some additional information.

13.4.6 Other notable habitats and species have also been considered and assessed on a case-by-case basis (e.g., those within the LBAP and/or those listed on BoCC red/amber lists, but not protected by legislation). This is consistent with the requirements of relevant planning policy.

13.4.7 Baseline data gathered for the Net Zero Teesside (NZT) project has been utilised to inform the baseline. Relevant baseline data gathered by AECOM and reported for NZT is included in Table 13-1. The NZT data include locations at which breeding bird surveys were undertaken and breeding bird assemblages were identified, as well as a number of species-specific records that are not currently provided by the data gathered specifically for the Proposed Development. The NZT survey locations are shown in Figure 13-3 (PEI Report, Volume II).

Table 13-1: Desk Study Area and Data Sources

ORNITHOLOGICAL FEATURE	STUDY AREA	DATA SOURCES	DATE ACCESSED
International statutory nature conservation designations e.g., Special Protection Area (SPA), Ramsar site	Up to 15 km	Multi-Agency Geographic Information for the Countryside (MAGIC) website. (DEFRA, 2023) Joint Nature Conservation Committee website (JNCC, 2023)	November 2022
National statutory nature conservation designations e.g. SSSI, National Nature Reserve (NNR) Local Nature Reserve (LNR)	Up to 15 km	MAGIC website (DEFRA, 2023) Natural England, Designated Sites view (Natural England, 2023b)	November 2022
Local non-statutory nature conservation designations e.g. Local Wildlife Sites (LWS)	2 km	The Environmental Records Information Centre for the North East (ERIC NE)	November 2022
Protected and Notable Species	2 km	ERIC NE Industry Nature Conservation Association (INCA) Ecology surveys completed to inform the Net Zero Teesside project (AECOM, 2021)	August 2021/ November 2022
Roost and breeding site locations	Data specific	INCA	March 2022
Count data for wetland birds in selected habitats across Teesside[2]	Data specific	British Trust for Ornithology (BTO) Wetland Bird Surveys (WeBS)	May 2022

[2] Data were obtained to inform early design-phase baseline gathering and will be updated to include all habitats and areas within the ZoI of the current Proposed Development. The updated data set will be included in the baseline underpinning the assessments presented in the final DCO application.

ORNITHOLOGICAL FEATURE	STUDY AREA	DATA SOURCES	DATE ACCESSED
Species records including breeding and non-breeding birds, gathered between 2018 and 2022.	Data Specific	Net Zero Teesside baseline reports and Environmental Statement Report (AECOM, 2021)	May 2023

Field Surveys

13.4.1 The scope of ornithological survey work considered necessary to inform the assessment is summarised in Table 13-2.

Table 13-2: Scope and Methods of Ornithological Surveys

SURVEY	SCOPE OF SURVEY	SURVEY PERIOD	SURVEY AREA EXTENT	JUSTIFICATION
Wetland Bird Survey (WeBS) Counts	Counts of wetland bird species (cormorants and shags, waders, terns, skuas, auks, gulls, sawbills, grebes, divers, herons, wildfowl (including all ducks, geese, and swans), and kingfisher) at high and low tide each month across multiple pre-defined sectors at three discrete sites (The Foundry, Seal Sands and North Tees Marshes). Survey method derived from BTO standards (BTO, n.d) utilised 'look-see' methodology where the whole of a pre-defined area was surveyed. Disturbance and general behaviour for each species also recorded. Assessment of peak and, where possible, mean counts[3] of species by site and count sector to determine presence of protected, priority[4] or	Initial surveys commenced at two broad survey areas (The Foundry and Seal Sands) in January 2022, continuing to March 2022. Surveys at The Foundry and Seal Sands recommenced September 2022 and are ongoing.[5] Surveys across an additional broad survey area (the North Tees Marshes) commenced September 2022 and are ongoing. Surveys are expected to continue from September 2023 to March 2024 in certain areas where	The Foundry: 24 count sectors extending from the Tees Estuary and the coast to the north to Dabholm Gut and Coatham Marshes in the south and east. Seal Sands: 43 count sectors covering the Seal Sands industrial area, the intertidal habitat to the north and extending west to the A178. North Tees Marshes: 37 count sectors bordered to the east by the A178 and extending west to Cowpen Bewley Road and north to Greatham. Some individual count sectors were excluded from further surveys due to disturbance levels, topographical and habitat conditions unsuitable for wetland birds, access constraints or distance to the Proposed Development[6].	The count data suggests usage of the habitats within and adjacent to the Proposed Development Site by waterbirds and indicates the level of importance of certain spatial zones by different species, which in turn allows the relevant importance to be ascertained. The recording of behaviour and locations of flocks suggests habituation of different species to disturbance in those areas and provided spatial context to the counts such that habitats/locations visited regularly by waterbirds could be identified.

[3] Mean counts are usually only possible for surveys spanning multiple years because bird presence is seasonal for most species, therefore it may not be possible to provide this metric for the first hand survey data collected over approximately one calendar year. Mean counts are provided as part of the package of survey data supplied by BTO WeBS.
[4] These are also referred to as "protected and notable species/habitats".
[5] Data up to and including the end of March 2023 are included in the baseline presented herein. This excludes any breeding bird field surveys commissioned for the Proposed Development which will be reported in the ES.
[6] The count sectors excluded are highlighted on Figure 13-2 (PEI Report, Volume II).

SURVEY	SCOPE OF SURVEY	SURVEY PERIOD	SURVEY AREA EXTENT	JUSTIFICATION
	otherwise notable species and to identify the location and likely importance of habitat features for such species.	access was late to be approved.	All count sectors and sites are shown on Figure 13A-2 (refer to Appendix 13A: Ornithology Baseline, PEI Report, Volume III).	
Common Bird Census (CBC) surveys	Mapping of sightings of bird species and recording of their breeding status at five sites (Cowpen Bewley Wood, Navigator, The Foundry North-west, The Foundry and The Foundry East) relevant to the Proposed Development. Assessment of number of breeding pairs and breeding status of species by site to determine presence of protected, priority or otherwise notable species and to identify the location of breeding territories and likely importance of habitat features for such species. Surveys follow the accepted methodology (Marchant, 1983; Bibby *et al.*, 2000)[7].	One visit to each site a minimum of three times and a maximum of five times between late March[8] and July 2023.	The sites are focussed on those areas of the Proposed Development which offer the most suitable habitat for breeding bird species, including The Foundry and Cowpen Bewley Wood, and or those where potential long term or permanent habitat losses might occur. The surveys are ongoing, and the results are not presented herein. A figure showing survey locations will be provided with the DCO Application.	Information collated on the location of breeding individuals for each species and site will allow territories to be mapped and therefore will inform design and offset buffers to avoid direct effects upon suitable habitat within territories and prevent severance of these territories. Furthermore, the information will form the basis of mitigation recommendations to minimise loss of suitable habitats within each territory.

[7] The CBC was originally developed for the long-term monitoring of bird populations in the UK, from which an annual index of breeding bird abundance was derived. For this purpose 10 repeat survey visits are required to provide sufficient temporal and spatial resolution to the data for the indices to be accurate enough to detect even subtle population changes from year to year. However, in order to quantify a breeding bird assemblage for the purposes of assessment, 5-6 repeat visits are regarded as sufficient, in accordance with the recommendations of the Bird Survey and Assessment Steering Group (2022).
[8] The commencement date of these surveys is dependent to a large extent on the availability of access to private land. Surveys might start later than March in some cases. A reduced number of survey visits may be considered appropriate for sites in suboptimal locations, or that support suboptimal habitats, or where ongoing project design changes result in requirement for surveys that are not aligned to the bird breeding season. Breeding bird surveys are ongoing and are not included in this PEI Report.

Value/Importance of Ornithological Features

13.4.2 To support focussed assessment, there is a need to determine the scale at which the ornithological features identified through the desk studies and field surveys are of value. The value of each ornithological feature has been defined with reference to the geographical level at which it matters, and the results of this assessment are used to identify the relevant features requiring impact assessment. The frames of reference that used for this assessment, based on CIEEM guidance, are:

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain ornithological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (e.g. north-east);
- District (Hartlepool, Stockton-on-Tees or Redcar and Cleveland);
- Local (ornithological features that do not meet criteria for valuation at a District or higher level, but that have sufficient value to merit retention or mitigation); and
- Negligible (common and widespread ornithological features of such low priority that they do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status).

13.4.3 All ornithological features of Local value and above, where there is the potential for the Proposed Development to impact them directly or indirectly, will be taken forward to impact assessment and will be the 'relevant ornithological features' for the purposes of ecological impact assessment. In line with the CIEEM guidelines, the terminology used within the assessment will draw a clear distinction between the terms 'impact' and 'effect'. For the purposes of the assessment, these terms are defined as follows:

- impact – actions resulting in changes to an ornithological feature; for example, site clearance activities leading to the loss of foraging habitat for a particular bird species; and
- effect - outcome resulting from an impact, acting upon the conservation status or structure and function of an ornithological feature; for example, reducing the availability of suitable foraging habitat and therefore increasing feeding pressures may lead to an adverse effect on the conservation status of the population concerned.

Assessment of Significance

13.4.4 Potential impacts on important ornithological features have been assessed in accordance with CIEEM best practice guidance (CIEEM, 2021). As bird surveys were ongoing at the time of writing, this preliminary assessment follows the precautionary principle and will be reassessed within the ES when full datasets are available.

13.4.5 Magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms, for example, the amount of habitat lost, percentage change to habitat area, percentage decline in a species population. However, at this stage of the design of the Proposed Development and with the existing gaps in the baseline ecological data (due to ongoing ecological surveys), quantifying the magnitude of impact at this stage is indicative only.

13.4.6 The potential magnitude of change on an ecological feature arising from activities occurring as part of the Proposed Development is determined in consideration of their beneficial or adverse nature; extent; duration; timing; frequency; and reversibility of the impact.

13.4.7 It is not necessary in the assessment to address all habitats and species with potential to occur in the zone of influence of a project. Instead, the focus has been on those that are 'relevant'. CIEEM guidance makes it clear that there is no need to "*carry out detailed assessment of ornithological features that are sufficiently widespread, unthreatened and resilient to Proposed Development impacts and will remain viable and sustainable*". This does not mean that efforts should not be made to safeguard wider biodiversity, and requirements for this have been considered. National policy documents emphasise the need to achieve no net loss of biodiversity and enhancement of biodiversity.

Significance Criteria

13.4.8 For each ornithological feature only those characteristics relevant to understanding the ecological effect and determining the effect significance are described. The determination of the significance of effects is made based on the predicted effect on the structure and function, or conservation status, of relevant ornithological features, as follows:

- Not significant – no, negligible or minor effect on structure and function, or conservation status; and
- Significan*t* - structure and function, or conservation status subject to a major or moderate effect.

13.4.9 For significant effects (both adverse and beneficial) this will be qualified with reference to the geographic scale at which the effect is significant (e.g., an adverse effect significant at a national level).

13.4.10 The CIEEM approach described above broadly accords with the EIA methodology described in Chapter 2: Assessment Methodology (PEI Report, Volume I). However, a matrix approach will not be used to classify effects, as this deviates from CIEEM guidance. To provide consistency of terminology in the final assessment with other chapters of the PEI Report, the findings of the CIEEM assessment have been translated into the classification of effects scale as outlined in Table 13-3.

Table 13-3: Relationship Between CIEEM Assessment Terms and those used in other PEI Report Chapters

EFFECT CLASSIFICATION	TERMINOLOGY USED IN OTHER PEI REPORT CHAPTERS	EQUIVALENT CIEEM ASSESSMENT
Significant (beneficial)	Major Beneficial	Beneficial effect on structure/function or conservation status at regional, national or international level.
	Moderate Beneficial	Beneficial effect on structure/function or conservation status at District or County level.
Not significant	Minor Beneficial	Beneficial effect on structure/function or conservation status at Site or Local level.
	Negligible	No effect on structure/function or conservation status.
Significant (adverse)	Moderate Adverse	Adverse effect on structure/function or conservation status at District or County level.
	Major Adverse	Adverse effect on structure/function or conservation status at Regional, National or International level.

13.4.11 Any significant adverse effects should be mitigated or compensated for, whilst further ecological enhancements may be recommended where appropriate to help meet planning policy objectives. Following the implementation of any mitigation and compensation measures, as appropriate, residual effects on ornithological features have been identified.

Rochdale Envelope

13.4.12 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with the Inspectorate's Advice Note 9 (The Planning Inspectorate, 2018). This involves assessing the maximum (or where relevant, minimum)/worst case parameters for the elements where flexibility needs to be retained (for example, building footprints/dimensions and/or associated activities during their operation).

Consultation

13.4.13 An EIA Scoping Opinion was requested from the Planning Inspectorate (the Inspectorate) in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to ornithology are outlined in Table 13-4.

Table 13-4: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	The ES should give a full description of how areas of Functionally Linked Land have been identified for survey, the levels of precaution applied to this process, and the outcomes of consultation and degree of agreement reached with key stakeholders. It is also advised that the scope and methodology of the ornithological surveys is discussed with the relevant consultees and agreed where possible.	Justification for the areas surveyed will be set out in the ES and supporting appendices. A selection of shortlisted sites for the proposed hydrogen generating infrastructure was identified in 2021. Based on the Proposed Development design iterations at that time, and ongoing design development since then, three broad survey areas were identified. These survey areas are functionally linked to sites designated for their ornithological interest.
The Inspectorate	Scoping Opinion 17th May 2023	In addition to the impact pathways identified in the Scoping Report, the Inspectorate advises that consideration should be given to the potential for operational discharges to water to result in likely significant effects to bird qualifying features of the Teesmouth and Cleveland Coast Special Protection Area and Ramsar. The ES should include an assessment of these matters where significant effects are likely, or otherwise provide evidence to demonstrate why significant effects are not likely.	This recommendation will be followed for the ES, which will include a full assessment of the potential effects on birds due to operational discharges to water.
The Inspectorate	Scoping Opinion 17th May 2023	Public bodies have a responsibility to avoid releasing environmental information that could bring about harm to sensitive or vulnerable ornithological features. Specific survey and assessment data relating to the presence and locations of	Information on sensitive ornithological features will be provided in a confidential annex to the ES as requested.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		species such as badgers, rare birds and plants that could be subject to disturbance, damage, persecution, or commercial exploitation resulting from publication of the information, should be provided in the ES as a confidential annex. All other assessment information should be included in the ES chapter, as normal, with a placeholder explaining that a confidential annex has been submitted to the Inspectorate and may be made available subject to request.	
Natural England	Scoping Opinion 17th May 2023	Cumulative and in-combination effects. Natural England acknowledges the applicant's description of projects needing to be assessed for cumulative and in combination effects alongside the proposal. We are not aware of additional projects needing assessment. We draw the examining authority's attention to the need for and benefits of an early consideration of the proposal's relationship with wider environmental issues in the Tees estuary e.g. the nutrient neutrality theme and the wider need to restore water quality in the Tees catchment to achieve favourable condition of relevant water dependent designated sites such as the Teesmouth & Cleveland Coast Special Protection Area (SPA). For further information please see our comments under Section 9 Water Quality. Further relevant references are made within section 4 (Biodiversity & Geodiversity), with respect to ecological impact pathways for	The potential for cumulative and in-combination effects will be assessed. Nutrient neutrality is currently screened in for likely significant effects and will be considered within the ES and AA. Further information is provided in the Appendix 9B: Nutrient Neutrality Screening Assessment (PEI Report, Volume III).

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		designated sites and Section 10 Climate Change – delivering mitigation and building resilience.	
Natural England	Scoping Opinion 17th May 2023	Environmental Data. At the time of writing Natural England is arranging to provide the applicant with wild bird survey data for the 'Seal Sands' part of the Teesmouth & Cleveland Coast Special Protection Area (SPA).	Survey data was received from Natural England on 7th September 2023 and will be used in the assessments of effects on birds to be reported in the ES.
Natural England	Scoping Opinion 17th May 2023	The assessment will need to include potential impacts of the proposal upon sites and features of nature conservation interest. We welcome the applicant's approach to gathering relevant data so far and for their reference to including opportunities for nature recovery through biodiversity net gain (BNG).	Potential impacts on sites and features or ornithological importance will be identified and assessed within the ES. Opportunities for habitat enhancement to benefit ornithological features will be explored and presented in the ES. A BNG assessment will be completed to supplement the ES and the DCO Application.
Natural England	Scoping Opinion 17th May 2023	The development site is within or may impact on European/internationally designated nature conservation sites. Aside from the Teesmouth & Cleveland Coast SPA and Ramsar Site the proposal would not appear likely to cause direct impacts upon Habitats Sites within 15km of the application site. Nevertheless, based on the information available so far uncertainty exists over the scope for impacts on sites within this distance threshold. The Habitats Sites listed below fall	The ES will assess the potential for the Proposed Development to affect internationally designated sites of nature conservation importance/ European sites, including marine sites where relevant. A HRA screening report prepared to inform the Appropriate Assessment (Stage 2 of the HRA) has been prepared to assess the potential for likely significant effects both

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		within 15km of the proposal and have been listed accordingly to allow consideration of indirect effects from the proposal. We welcome inclusion of the listed Habitats Sites within paragraph 6.6.6 accordingly. Figure 13 of EIA scoping report shows these sites' geographical distribution. The ES should thoroughly assess the potential for the proposal to affect internationally designated sites of nature conservation importance / European sites, including marine sites where relevant. This includes Special Protection Areas (SPA), Special Areas of Conservation (SAC), listed Ramsar sites, candidate SAC and proposed SPA. Article 6 (3) of the Habitats Directive requires an appropriate assessment where a plan or project is likely to have a significant effect upon a European Site, either individually or in combination with other plans or projects.	alone and in-combination with other plans or projects.
Natural England	Scoping Opinion 17th May 2023	Natural England welcomes the applicant's approach to scoping whereby the hierarchy of designated and local wildlife sites has been considered holistically using a 15Km area of search. The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within the SSSIs and identify appropriate mitigation measures to avoid, minimise or reduce any adverse significant effects.	Comments noted. The ES will include an assessment of direct and indirect effects upon statutory designated sites.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		We welcome the applicant's proposal to include consideration of these effects within the Ecological impact assessment (EcIA).	
Natural England	Scoping Opinion 17th May 2023	The ES should assess the impact of all phases of the proposal on protected species (including, for example, great crested newt, reptiles, birds, otter, water vole, badger and bats - paragraph 6.6.14 refers). Natural England does not hold comprehensive information regarding the locations of species protected by law. Records of protected species should be obtained from appropriate local biological record centres, nature conservation organisations and local groups. The applicant should consider the wider context of the site, for example in terms of habitat linkages and protected species populations in the wider area. The area likely to be affected by the development should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES. Surveys should always be carried out in optimal survey time periods and to current guidance by suitably qualified and, where necessary, licensed, consultants.	Comments noted. The ES will assess the potential impacts of all phases of the project. Surveys are being undertaken and have been done at an appropriate time by experienced and appropriately licensed ecologists (where relevant).
Natural England	Scoping Opinion 17th May 2023	Priority Habitats and Species are of particular importance for nature conservation and included in the England Biodiversity List published under section 41 of the Natural Environment	Potential effects upon bird Species of Principal Importance will be considered in the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		and Rural Communities Act 2006. Consideration should also be given to the potential environmental value of brownfield sites, often found in urban areas and former industrial land. This is of special relevance to the application site, whose red line boundary contains a significant resource of 'open mosaic habitat' associated with the area's industrial land use.	
Natural England	Scoping Opinion 17th May 2023	We welcome detailed assessment of road traffic emissions and refer the applicant to our guidance for public bodies to help assess the impacts of road traffic emissions to air quality capable of affecting European Sites.	The potential for changes in air quality to affect European designated sites will be assessed in the ES.
Natural England	Scoping Opinion 17th May 2023	The Teesmouth & Cleveland Coast SPA and Ramsar site includes areas of the River Tees channel, the Tees Estuary, and the Tees Bay. Natural England's advice is that qualifying bird species are being negatively affected by the growth of algal mats on their key foraging habitats within the Tees Estuary, particularly at Seal Sands. As such, Natural England's Nutrient Neutrality advice is that new developments should not result in additional nitrogen entering the catchment of the River Tees upstream of the SPA and Ramsar site (i.e. they are nutrient neutral). The Habitats Regulations Assessment (HRA) process provides the means to assess the proposal and we acknowledge paragraphs 6.6.27-31 accordingly. Natural England looks forward to continued dialogue with the applicant to progress this element of the proposal.	A preliminary Nutrient Neutrality Screening has been prepared to accompany this PEI Report for likely significant effects and will be revised to inform the Appropriate Assessment (Stage 2 of the HRA) and submitted with the DCO Application.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
Natural England	Scoping Opinion 17th May 2023	Natural England notes and acknowledges the proposal's primary purpose i.e., to produce low carbon hydrogen and capture and store carbon. In terms of climate change mitigation over and above the scheme's primary purpose the proposal also offers scope to: (i) Deliver nature recovery/enhancement (ii) Build ecosystem resilience through careful planning and implementation e.g., with reference to consideration of ongoing wider efforts to restore water quality in the Tees estuary. These include but are not restricted to the provisions of the Levelling up and Regeneration Bill which requires relevant water companies to upgrade the performance of wastewater treatment works to 'technically achievable limits' by 2030. The applicant should explore opportunities to achieve a design solution that optimises the scope to deliver relevant technological advances and land management in the local area over the development's lifetime.	The potential to deliver wider ecological and environmental benefits will be sought through ongoing consultation and through the iterative design process. This will be demonstrated through the Landscape and Biodiversity Management Plan (LBMP) to be submitted with the DCO Application.

13.5 Baseline Conditions

Existing Baseline

13.5.1 The ornithological features relevant to the Proposed Development are summarised in this section, in Tables 13-5 and 13-6 which, respectively, summarise the sites designated specifically for qualifying ornithological features or that are described as supporting bird populations, and the relevant ornithological species.

13.5.2 A precautionary approach has been taken when defining the baseline conditions, given not all surveys have been completed. The baseline will be subject to review and update as further information becomes available. Full baseline details will be presented in the ES.

Designated Sites

13.5.3 Table 13 summarises the reasons for notification of the designated sites within the Study Area (see Table 13-1 for the search areas applied to different designations) and their spatial relationship to the Proposed Development Site. The designated sites are shown on Figure 13-4 and Figure 13-5 (PEI Report, Volume II).

13.5.4 There are three SPAs, two Ramsar sites, three Sites of Special Scientific Interest (SSSIs) and two National Nature Reserves (NNRs) within 15 km of the Proposed Development Site which are of importance to birds. There are four Local Nature Reserves (LNRs), 11 Local Wildlife Sites (LWSs) and one Royal Society for the Protection of Birds (RSPB) Reserve within 2 km of the Proposed Development Site which also are of importance to birds.

Table 13-5: Designated Sites (Notified for Ornithological Features) Within the Study Area

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
Statutory				
Teesmouth and Cleveland Coast SPA	Internationally important numbers of marine and shore birds, including: • Avocet (*Recurvirostra avosetta*) (Breeding); • Knot (*Calidris canutus*)(Non-breeding); • Ruff (*Calidris pugnax*) (Non-breeding); • Redshank (*Tringa totanus*) (Non-breeding); • Sandwich tern (*Thalasseus sandvicensis*) (Non-breeding); • Common tern (*Sterna hirundo*) (Breeding); • little tern (*Sternula albifrons*) (Breeding); • Waterbird assemblage of 26,014 individual waterfowl including sanderling (*Calidris alba*), knot, shelduck, cormorant (*Phalacrocorax carbo*), shoveler (*Spatula clypeata*), and teal (*Anas crecca*). Other major components of the assemblage feature include wigeon (*Mareca penelope*), lapwing (*Vanellus vanellus*), herring gull (*Larus argentatus*) and black-headed gull (*Chroicocephalus ridibundus*). In addition to breeding sites, the SPA includes areas designated for marine foraging habitats for little tern and common tern that extend several kilometres out to sea and along the tidal River Tees; and terrestrial and intertidal foraging areas for avocet and ruff.	International	10 m north at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
	common tern that extend several kilometres out to sea and along the tidal River Tees; and terrestrial and intertidal foraging areas for avocet and ruff.			
North York Moors SPA	Designated for internationally important numbers of breeding birds including: • Golden plover (*Pluvialis apricaria*); and • Merlin (*Falco columbarius*).	International	12.1 km south-east at closest point	8 km south-east at closest point
Northumbria Coast SPA	Designated for internationally important numbers of marine and shorebirds including: • Turnstone (*Arenaria interpres*); • Purple sandpiper(Calidris maritima) (wintering); • Little tern (breeding); and • Arctic tern (*Sterna paradisaea*) (breeding).	International	13.7 km north at closest point	11 km north at closest point
Teesmouth and Cleveland Coast Ramsar	The site qualifies as a Ramsar for the following Ramsar criteria (Natural England, 2020): • Criterion 5 - Assemblages of international importance; • Species with peak counts in winter; – 26,786 waterfowl (5 year peak mean 2011/12-2015/16).	International	173 m at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
	• Criterion 6 - Species/populations occurring at levels of international importance; • Qualifying Species/populations (as identified at designation): – Species with peak counts in spring/autumn: ▪ Redshank; 1,648 individuals representing an average of 1.1% of the East Atlantic population (1987-91). – Species with peak counts in winter: ▪ Knot; 5,509 individuals representing an average of 1.6% of the NE Canada/Greenland/Iceland/UK population (5 year peak mean 1991/92-1995/96); Sandwich tern 1,900 individuals representing an average of 4.3% of the GB population (1988-1992).			
Northumbria Coast Ramsar	The site qualifies as a Ramsar for the following Ramsar criteria (JNCC, 2000): Criterion 6 – Species/populations occurring at levels of international importance:	International	13.7 km north at closest point	10.97 km north at closest point

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
	• Qualifying Species/populations (as identified at designation): – Species with peak counts in winter: ▪ Purple sandpiper 787 individuals representing an average of 1.6% of the population (5 year peak mean for 1992/93 to 1996/97); ▪ Turnstone; 1,739 individuals representing an average of 2.6% of the population (5 year peak mean for 1992/93 to 1996/97); - Species with peak counts during the breeding season; Little tern; 40 pairs representing an average of 1.7% of the GB population (5 year mean for 1993 to 1997).			
Teesmouth and Cleveland Coast SSSI	Nationally important features supported by a mosaic of coastal and freshwater habitats: • >20,000 non-breeding waterbirds; • Aggregations of breeding birds – avocet, common tern, little tern.	National	5 m west at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
	plover (*Charadrius hiaticula*), ruff, sanderling, Sandwich tern, shelduck, shoveler; and • Assemblages of breeding birds - Mixed: sand-dunes and saltmarsh, lowland open waters and their margins.			
Durham Coast SSSI	Designated for: • Aggregations of breeding birds – cormorant, fulmar (*Fulmarus glacialis*), kittiwake (*Rissa tridactyla*), little tern; and • Aggregations of non-breeding birds – purple sandpiper, sanderling.	National	11.2 km north at closest point	9.4 km north at closest point
North York Moors SSSI	Designated for: • Aggregations of breeding birds – golden plover and merlin.	National	12.1 km south-east at closest point	8 km south-east at closest point
Teesmouth NNR	Designated for the following ornithological interest features: • >20,000 waterbird assemblage; • BAP breeding birds; waders, grey partridge, skylark (*Alauda arvensis*), linnet (*Linaria cannabina*), reed bunting (*Emberiza schoeniclus*); • Knot, redshank and shelduck (non-breeding); • Little tern (breeding); • Ringed plover (in spring); and • Sandwich tern (post-breeding).	National	1.8 km west at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
	• Sandwich tern (post-breeding).			
Castle Eden Dene NNR	The NNR is Designated for habitats and species groups including birds[9].	National	>15 km north-west	14.4 km north-west at closest point
Seaton Dunes and Common LNR	Aggregations of non-breeding birds - knot, ringed plover, sanderling and turnstone.	District	2.9 km at closest point	1.3 km at closest point
Cowpen Bewley Woodland Country Park LNR	Variety of habitats and 80 species of bird.	District	7.5 km west at closest point	Overlapping
Charlton's Pond LNR	Charlton's Pond consists of wetlands, amenity grassland and woodland with suitable habitat for wildfowl.	District	8.9 km south at closest point	513 m west at closest point
Billingham Beck Valley Country Park LNR	Colourful meadows, ponds, marsh and woodland. This wetland provides a home for plants and animals, including bird species[10].	District	10.5 km south-west at closest point	1.4 km west at closest point
Non-Statutory				

[9] There is no formal list of species for which the site is notified.
[10] No specific details are provided for this site regarding species of bird present.

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE		PROXIMITY TO PROPOSED DEVELOPMENT SITE
	Regularly holds more than 0.1% of the national population of any wintering or passage species and the site regularly holds more than 5% of the cited bird interest of the Teesmouth and Cleveland Coast SPA (this to include 5% of a cited individual bird population or of the combined water bird population, currently stated as 21,406).			closest point	
Saltholme RSPB reserve	The site is one of the largest breeding colonies of common terns in the UK and breeding lapwing are present, as well as being used by foraging peregrine (*Falco peregrinus*) and breeding species such as marsh harrier (*Circus aeruginosus*), Cetti's warbler (*Cettia cetti*) and little ringed plover (*Charadrius dubius*). Much of the reserve lies within the Teesmouth and Cleveland Coast SPA and SSSI.	District	5.3 km south-west at closest point	Overlapping	
Greenabella Marsh LWS	Rough grassland with wetland areas. Significant bird populations.	District		3.5 km west at closest point	Overlapping
Greatham Creek North Bank Saltmarsh LWS	Designated mainly for saltmarsh vegetation. Some ornithological interest but not sufficient to merit LWS status on its own.	District	4 km west at closest point		Overlapping
Cowpen Bewley Woodland	Variety of habitats and 80 species of bird.	District		6.8 km west at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
Cowpen Bewley Woodland Country Park LWS	Variety of habitats and 80 species of bird.	District	6.8 km west at closest point	Overlapping
Coatham Marsh LWS	Designated for a range of wetland habitats, and of interest for a range of breeding and non-breeding birds.	District	1.3 km east at closest point	Adjacent
Saltern Saltmarsh LWS	The area supports c3.7% of total SPA bird numbers and important site for breeding lapwing.	Regional	4.7 km west at closest point	78 m north-west at closest point
Power Station Grassland and Wetland LWS	Ungrazed grassland with pools and large areas of scrub. The breeding bird community includes stonechat (*Saxicola rubicola*), sedge warbler (*Acrocephalus schoenobaenus*), and grasshopper warbler (*Locustella naevia*).	District	3.3 km north-west at closest point	877 m north at closest point
Seaton Common LWS	The site is a wet grassland which attracts large numbers of passage migrants over winter and is a breeding ground for birds in the summer months. Please refer to the Teesmouth and Cleveland Coast SPA for cited birds of interest.	District	2.5 km north-west at closest point	1.3 km north at closest point
Portrack Marsh LWS	The site regularly holds more than 0.1% of the national population of any wintering or passage species of the cited bird interest of the Teesmouth and Cleveland Coast SPA and the site regularly holds more than 5% of the cited gadwall, shoveler, and redshank population.	District	10.3 km south-west at closest point	1.9 km south-west at closest point

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
Billingham Beck Valley LWS	Wetland providing es a home for plants and animals, including bird species[11].	District	10.5 km south-west at closest point	1.4 km west at closest point

[11] The site description does not specify species of birds present or their numbers.

Species Records

13.5.5 This section summarises the relevant species identified to date. Detailed descriptions of the species records from the sources listed are provided in Appendix 13A: Ornithology Baseline Report (PEI Report, Volume III). Baseline data gathering is ongoing, and baseline established after publication of this PEI Report will be included in an updated baseline report and the ornithology chapter of the ES.

13.5.6 A description of the key areas or locations for birds is provided below followed by Table 136, which summarises the relevant bird species features identified to date and their spatial relationship to the Proposed Development Site.

Summary of Key Locations for Birds

13.5.7 Irrespective of the presence of any designated sites, the entirety of the Teesside coast can be considered to support significant populations of non-breeding birds during the autumn and spring migratory periods and over winter. The baseline data presented in Appendix 13A: Ornithology Baseline Report (PEI Report, Volume III) identifies some locations or broad areas that are of potentially greater sensitivity due to their proximity to the Proposed Development Site and reliance on habitats close to it by feeding and/or roosting birds either during potentially adverse tide and/or weather conditions, or on a regular basis irrespective of the conditions. Appendix 13A: Ornithology Baseline Report (PEI Report, Volume III) also defines the three survey areas.

13.5.8 Within the Foundry Survey Area these include:

- Dabholm Gut;
- Bran Sands Lagoon;
- Bran Sands Bay; and,
- the northern edge of Coatham Dunes and the wider coastline of Coatham Sands.

13.5.9 Within the Seal Sands survey area these include:

- the entirety of Seal Sands Bay and its periphery, including the sea wall and the promontory/spit of land at its eastern extent;
- Greenabella Marsh;
- Greatham Creek channel; and,
- the Brinefields, channels and saline lagoons south of Greatham Creek channel and east of the A178.

13.5.10 Within and adjacent to the North Tees Marshes survey area these include:

- all the saltmarsh and inundated/wet grassland between the A178 to the east and the railway line to the north-west and either side of the A1185 to the south; and,
- the ponds and lagoons at Cowpen Landfill.

13.5.11 The terrestrial habitats within the industrialised land around Wilton International, around Teesport estate and North Tees, through which various Connection Corridors

are proposed, are of relatively low risk in terms of the potential for wetland birds associated with the various designated sites across Teesside, and for other species at any time of year by virtue of the relatively high disturbance levels, the presence of active industry, and the limited availability of suitable habitats in these areas.

Summary of Species Receptors

13.5.12 Table 136 summarises the species identified to date, including records obtained specifically through baseline gathering activities completed to inform the baseline for the Proposed Development and, where appropriate, baseline gathered for the NZT project. The list is subject to ongoing refinement and will be confirmed in the ES as part of the DCO Application (i.e., it may include more (or less) ornithological features as more baseline data are gathered and the Proposed Development design is refined alongside ongoing consultation with key stakeholders[12]).

13.5.13 All relevant species and species assemblages are included. Species that are qualifying features of a designated site are considered separately from the designations only where there is merit in doing this. An example of this would be breeding avocet, which in addition to being a qualifying feature of Teesmouth and Cleveland Coast SPA, is also a rare breeding species in the UK[13] and is offered enhanced protection under Schedule 1 of the WCA regardless of the reasons for inclusion as a qualifying feature of the designated site.

Based on data gathered to date, a provisional ecological value of the ornithological features identified is provided in Table 13 in accordance with CIEEM guidance. Further assessment of this value will be included in the ES, after completion of baseline surveys (Rare Breeding Birds Panel (RBBP), 2023).

[12] Including but not necessarily limited to Natural England, RSPB and Local Planning Authorities
[13] Avocet are included on the list of native species monitored and reported on by the Rare Breeding Birds Panel (RBBP)

Table 13-6: Relevant Ornithological Species Receptors Identified to Date[14]

ORNITHOLOGICAL FEATURES	DETAILS AND APPROXIMATE LOCATION(S)	SOURCE	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
Little tern (breeding)	Crimdon Dene and Seaton Carew. Forages over coastal near-shore waters predominantly north of the River Tees and occasionally present at Coatham Sands.	Desk study NZT[15]	National	4.5 km north-west	2.8 km north
Avocet (breeding)	Several locations across the North Tees Marshes.	Field surveys Desk study	National	4.8 km west	27 m west
Little ringed plover (breeding)	Within Teesworks. Has bred at Saltholme RSPB reserve. Regular breeding at locations across the North Tees Marshes and North Gare.	Desk Study NZT	District	211 m east	112 m east
Ringed plover (breeding)	Seaton Carew and former breeding within Teesworks.	Desk Study NZT	District	172 m east	68 m east
Common tern (breeding)	Saltholme RSPB reserve, Cowpen Marsh, Portrack Marsh, Brinefields Saline Lagoon	Desk Study NZT	District	4.8 km west	27 m west
Lapwing (breeding)	North Tees Marshes including Saltholme RSPB reserve. Formerly bred within Teesworks and Coatham Dunes.	NZT	Local	174 m east	65 m east

[14] Multiple locations and/or multiple years of occurrence are available for some species, in which case the distance is measured to the closest last known or last recorded occupied location. Breeding locations used are those where breeding was confirmed. Approximate distances are provided for receptors represented only by third party records that do not confirm precise locations.
[15] "NZT" indicates use of baseline gathered for the Net Zero Teesside project. All other data sources are those specific to baseline data gathering for H2 Teesside from desk study and field surveys.

ORNITHOLOGICAL FEATURES	DETAILS AND APPROXIMATE LOCATION(S)	SOURCE	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
Cetti's warbler (breeding)	Has bred at Saltholme RSPB reserve.	NZT	District	Approx. 6.9 km south-west	Approx. 460 m south
Barn owl (breeding)	One breeding and roosting location within Teesworks. Pole mounted barn owl boxes at Saltholme RSPB and Greenabella Marsh. Two roosts within the North Tees Marshes survey area. Forages over Coatham Dunes, adjacent grasslands and Coatham Marsh and likely to forage widely across the North Tees Marshes.	Field surveys Desk Study NZT	District	840 m south-east	Overlapping
Marsh harrier (breeding)	Has bred within Saltholme RSPB reserve.	NZT	National	Approx. 6.6 km south-west	Approx. 125 m south
Bittern (breeding)	Has bred at Saltholme RSPB reserve.	Desk Study	National	Approx. 6.5 km south-west	Approx. 125 m south
Non-breeding water bird assemblage (across the entire Teesside area)	Including at least 57 water bird species (other than qualifying features of designated sites[16]).	Field surveys, desk study	Regional	Overlapping	Overlapping

[16] Qualifying features of designated sites are excluded from the wider water bird assemblage features as they are assessed separately as part of the relevant designated site(s).

ORNITHOLOGICAL FEATURES	DETAILS AND APPROXIMATE LOCATION(S)	SOURCE	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
Breeding bird assemblage (Teesworks)	Teesworks: breeding on open and sparsely vegetated ground, ephemeral/short perennial vegetation, in scrub and on/close to water courses. Nine non-breeding species. Fourteen breeding species including two Red List, eight Amber List and four S41 species.	NZT[17]	Local	Immediately east	Overlapping
Breeding bird assemblage (Coatham Dunes)	Predominantly ground- nesting birds breeding among the dunes, dune slacks and ponds. Twenty breeding species including three Red List, six Amber List and one Tees BAP and NERC S41 species. Includes 17 pairs of skylark and a range of dabbling ducks and passerines.	NZT (2018 surveys)	District	Immediately north	Immediately north
Breeding bird assemblage (Navigator Terminals)	Birds breeding within open rank grassland and small areas of scrub. Twenty non-breeding species. Five breeding species including three Red List species, one Amber List species and four NERC Section 41 species.	NZT (2022 surveys)	Local	1.2 km west	Overlapping

[17] Multiple surveys were carried out across different overlapping areas between 2018 and 2022. The summary results provided are from the most recent survey in 2022.

ORNITHOLOGICAL FEATURES	DETAILS AND APPROXIMATE LOCATION(S)	SOURCE	ECOLOGICAL VALUE	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT SITE
Breeding bird assemblage (Saltholme laydown)	Birds breeding within open grassland and broadleaved woodland adjacent to Saltholme Substation: Eight breeding species recorded (one Red List).	NZT (2022 surveys)	Local	6.2 km south-west	Overlapping
Breeding bird assemblage (Saltholme substation)	Birds breeding within open grassland, broadleaved plantation woodland and scattered scrub. Six non-breeding species. 17 breeding species including two Red List species, six Amber List species and five NERC Section 41 species	NZT (2018 surveys)	Local	6.3 km south-west	Overlapping
Breeding bird assemblage (compounds and laydown around Haverton Hill)	Birds nesting on ground, in trees/scrub and in wet ditches. Nine breeding species including two Amber List species.	NZT (2020 surveys)	Local	7.4 km south-west	Overlapping
Breeding bird assemblage (Haverton Hill laydown)	Birds nesting in trees, scrub, and hedgerows on periphery of laydown area. 15 non-breeding species. 15 breeding species including six Amber List species and two NERC Section 41 species.	NZT (2022 surveys)	Local	7.8 km south-west	Overlapping

Scoping of Ornithological Receptors

13.5.14 The design of the Proposed Development is subject to ongoing refinement and thus the spatial scale and severity of the potential impacts arising from the construction, operation and decommissioning of the Proposed Development is subject to change. Furthermore, the baseline presented in this chapter and associated appendices is incomplete. Therefore, all the designated sites and species receptors identified in Tables 13-5 and 13-6 (respectively) are taken forward for assessment in Section 13.6.

Future Baseline

Construction

13.5.15 Demolition and site remediation works are taking place within the footprint of the Main Site. Bare ground is present where buildings and structures have been removed, and in the absence of development, these areas would become colonised with vegetation. During this period such areas will be characterised by a combination of bare ground and short vegetation that will be expected to attract ground-nesting birds, including some waders, potentially including species that are qualifying features of designated sites. Such areas might also attract non-breeding SPA and SSSI birds to roost or feed.

13.5.16 Semi-natural habitats within the Proposed Development Site are unlikely to change over the short term. All existing habitats are likely to remain, although some minor changes in habitat extent, composition and structure are expected to occur as a result of ecological succession e.g., the gradual establishment of tree and shrub seedlings within open habitats, and minor changes in the extent and distribution of ruderal vegetation as natural processes move towards grassland. Therefore, the habitats and species present are considered very unlikely to undergo significant change prior to construction of the Proposed Development.

13.5.17 It is anticipated that managed habitats within the Proposed Development Site will continue to be subject to management and there will be no significant changes in habitat extent, type or species composition. Semi-natural and natural habitats are also unlikely to change significantly. Changes in the distribution of some species will likely occur as habitats develop in line with changes in habitats as a result of ecological succession or other natural processes, but over the short term any such changes will be relatively minor.

Operation

13.5.18 The future ecological baseline at the start of operation of the Proposed Development will not differ substantively from that described above for construction, but change is possible over the anticipated operational life of the Proposed Development to decommissioning.

13.5.19 Based on the available information and existing land uses, there are no grounds to expect that there will have been any marked change in local land management practices and the habitats by the time of the commencement of operations. The short-term baseline described above for construction is equally applicable to the start of Proposed Development operation.

13.5.20 There is a variety of nature conservation designations in the vicinity of the Proposed Development Site. It is difficult to state with certainty how the nature conservation value of these designations might change over the medium to long term operational period, and this will ultimately depend on long-term management regimes. However, for the purposes of this assessment, it has been assumed that the type, condition and ecological value of the designations will be broadly similar throughout the operational lifetime of the Proposed Development. Further assessment of the condition and ecological value of the designations will be made prior to the Proposed Development decommissioning phase.

13.5.21 The Teesmouth and Cleveland Coast SSSI is comprised of 33 units. The condition of 31 of those units has not been assessed by Natural England. Units 26 and 8 are assessed as unfavourable recovering (Natural England, 2023c). The condition of 23 features is monitored by Natural England, of which 15 are ornithology features. Of these, the condition of only one feature (>20,000 non-breeding waterbirds) is recorded as favourable; the condition of all other ornithology features is not recorded (Natural England, 2023c).

13.5.22 It is likely that current and former industrial land within Teesworks and the surrounding area will be released for new development e.g., in accordance with existing local plans and policies for the regeneration of the South Tees Area. The extent of ecologically valuable open mosaic habitat and grassland habitats may decrease as a result of such development and therefore the relative nature conservation value of remaining areas of semi-natural habitat may as a result increase over time.

13.5.23 Counter to this, implementation of planning policy and legal requirements (including anticipated legal requirements to deliver substantive biodiversity enhancement) may mean that future adjacent developments incorporate features of value for biodiversity, resulting in small to moderate improvements in the future baseline over the operational life of the Proposed Development e.g., certain species may colonise or increase in number as a result of such enhancements.

13.5.24 Changes in the distribution of some species will be likely to occur as habitats develop in line with changes expected as a result of ecological succession or other natural processes, but over the short term any such changes will be relatively minor.

Decommissioning

13.5.25 It is noted that sea level rise may have an influence on the sensitivity of habitat and species features present at Proposed Development decommissioning. For example, some coastal features may be adversely affected by increased inundation or erosion, which may increase the significance of any impacts and effects arising from decommissioning on ornithological ecological receptors. Implications for terrestrial ecology are considered minor given the scale of predicted sea level rise as outlined in Appendix 9A: Preliminary Flood Risk Assessment (PEI Report, Volume III) and within the context of other likely changes in the future baseline.

13.5.26 The decommissioning baseline will be strongly influenced by future land-use and nature conservation regimes affecting adjacent land. The balance between adverse

effects and beneficial habitat improvements is unknown. This limits the assumptions that can be made for the purposes of this assessment. However, it should also be noted that the likely zone of influence of decommissioning will be much smaller than operation and likely construction also. It is assumed that decommissioning activities will involve the removal of above ground infrastructure only and will primarily be located within the built footprint of the Proposed Development rather than within areas of vegetation. Relevant ornithological features will therefore be much reduced relative to those relevant at construction and operation.

13.5.27 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I) decommissioning activities will be conducted in accordance with the appropriate guidance and legislation at the time of the Proposed Developments closure. Ecological surveys will be commissioned as appropriate to inform the scope of the decommissioning works.

13.6 Design and Impact Avoidance

13.6.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development (also known as 'embedded measures').

13.6.2 The following impact avoidance measures have either been incorporated into the design or are standard construction or operational practices. These measures have, therefore, been taken into account during the impact assessment. Similarly, it has been assumed that all relevant protected species legislation will be complied with. As the ornithological assessment is ongoing, and surveys are continuing, further assessment will be carried out and defined mitigation measures presented within the ES.

Construction Phase

13.6.3 A Framework Construction Environmental Management Plan (CEMP) will be included within the ES which will accompany the DCO Application which will set out the key measures to be employed during the Proposed Development construction phase to control and minimise the impacts on the environment – including the minimisation of impacts upon ecology and nature conservation. A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

13.6.4 Where possible, routing of connection corridors will utilise existing infrastructure and established pipeline corridors north and south of the River Tees, to minimise excavations and construction activities required and therefore minimise disturbance to species and habitats present.

13.6.5 Where the Hydrogen Pipeline crosses major watercourses such as the River Tees and Greatham Creek, trenchless construction methods as outlined in Chapter 5: Construction Programme and Management (PEI Report, Volume I) will be used to avoid disturbance within the channel and harm to bankside habitats. Design work is

currently ongoing to further refine the design and identify the most appropriate methods for each crossing point - further details for all crossing options will be included within the ES.

13.6.6 Where the other Connection Corridors require crossings or new infrastructure the same approach will be applied. Trenchless technologies will be utilised where possible to minimise effects on habitats and species. Where trenchless technologies are not feasible, mitigation measures will be put in place to ensure to identity an appropriate habitat mitigation plan. Further information is provided in Chapter 4: Proposed Development; Chapter 5: Construction Programme and Management and Chapter 6: Need, Alternatives and Design Evolution (PEI Report, Volume I). Any details in relation to this will be included in the ES. Permanent habitat losses associated with pipelines will be minimised through compliance with the requirements of the NPS EN-4. This requires post-construction reinstatement of pipeline routes as close to its original state as possible. While this does not remove the construction impact, it does provide (except for irreplaceable habitats) certainty of reinstatement of habitats back to an appropriate end condition, as a well as a beneficial reduction in the duration and magnitude of the construction effect on habitats and species. The Framework CEMP will set out mitigation proposals required for relevant locations/habitats which will be included in the ES.

13.6.7 An Environmental or Ecological Clerk of Works (ECoW) will be present during Proposed Development construction as appropriate to supervise and instruct implementation of impact avoidance commitments as detailed in the Final CEMP.

Operational Phase

13.6.8 The Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. In addition, the Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

13.6.9 A number of mitigation features will be incorporated into the design of the Proposed Development design in order to avoid, minimise and reduce potential adverse impacts on ornithology.

13.6.10 As the Proposed Development design has progressed, the Applicant has sought to avoid nature conservation designations as far as reasonably practicable and will continue to do so. Further information is provided in Chapter 4: Proposed Development and Chapter 5: Construction Programme and Management (PEI Report, Volume I), where route options have been refined since the scoping stage to avoid or minimise adverse environmental effects, including those on ornithology features of importance including the areas within and around Greatham Creek. These areas include statutory and non-statutory designated sites and Habitats of Principal

Importance (HPI) that support birds. Habitats such as woodland and ponds have been avoided where possible to minimise ecological effects.

13.6.11 The final stack height for the Proposed Development will be determined at the detailed design stage and will be optimised with consideration given to the minimisation of ground-level air quality impacts on relevant ornithological features. This will be dependent on the final stack location and building heights for the Proposed Development. Preliminary dispersion modelling of emissions to air will help to determine the design of the Proposed Development, including stack heights accounting for other environmental considerations, through comparison of the maximum impacts at human health and relevant ornithological features. This will be done during the EIA and reported in the ES to ensure that potential impacts are minimised and avoided where feasible.

An Indicative Lighting Strategy will be prepared to accompany the DCO Application to demonstrate how lighting impacts on sensitive ornithological features, including birds, have been considered and addressed in the development design.

Decommissioning Phase

13.6.12 At the end of its design life decommissioning of the Proposed Development will see the removal of all above ground equipment down to ground level and the ground remediated to enable future re-use. It is assumed that all underground infrastructure will remain in-situ; however, all connection and access points will be sealed or grouted to ensure disconnection. At this stage it is assumed that decommissioning impacts are expected to be limited and will be the same/similar to the construction impacts, as discussed above.

13.6.13 A Decommissioning Environmental Management Plan (DEMP) will be produced pursuant to a DCO Requirement. The DEMP will consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed. This will include details of how ecology should be managed at the Proposed Development Site during decommissioning and demolition works.

13.7 Likely Impacts and Effects

13.7.1 This section describes the potential impacts and likely significant effects of the Proposed Development on relevant ornithology features in the absence of mitigation over and above that which is embedded in the design, or otherwise required for purposes of legislative compliance (as detailed in Section 13.5).

13.7.2 The potential impacts of the construction, operation and decommissioning of the Proposed Development are summarised in Tables 13-7, 13-8 and 13-9 respectively. Without mitigation these potential impacts are likely to result in significant effects. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

Table 13-7: Summary of Potential Impacts and Effects During Construction

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Statutory designated sites (SPA, Ramsar, SSSI, NNR, LNR). The following statutory designated sites are located closest to the Proposed Development Site are: Teesmouth and Cleveland Coast SPA; Teesmouth and Cleveland Coast Ramsar site; Teesmouth and Cleveland Coast SSSI; Teesmouth NNR; and, Cowpen Bewley Woodland Country Park LNR.	• Temporary habitat losses within designated sites and functionally linked land resulting in losses of breeding, roosting and/or feeding habitats. • Noise and visual disturbance of breeding birds. • Noise and visual disturbance of non-breeding birds. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES and the AA. Mitigation to be confirmed following completion of ecology/ornithology surveys and development the Proposed Development design. Further assessment work is required in relation to water quality, noise and air quality which will be provided in the ES.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used by birds.			
Non-statutory designated sites (LWS and RSPB Reserve). The following non-statutory designated sites that are located closest to the Proposed Development Site are: Saltholme RSPB reserve; Phillips Tank Farm Grassland LWS; Greenabella Marsh LWS; Greatham Creek North Bank Saltmarsh LWS; Cowpen Bewley Woodland Country Park LWS; Coatham Marsh LWS; and,	• Temporary habitat losses resulting in losses of breeding, roosting and/or feeding habitats. • Noise and visual disturbance of breeding birds. • Noise and visual disturbance of non-breeding birds. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design. Further assessment work is required in relation to water quality, noise and air quality which will be provided in the ES.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Saltern Saltmarsh LWS.	• Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used by birds.			
Little tern (breeding)	• Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design. Further assessment work is required in relation to water quality, noise and air quality which will be provided in the ES.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach atthis stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.
Avocet (breeding)	• Temporary loss of nesting habitat.	Short or medium term	Details of committed mitigation measures over and above those outlined in	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used for feeding.		Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Little ringed plover (breeding)	• Temporary loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used for feeding.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Ringed plover (breeding)	• Temporary loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used for feeding.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Lapwing (breeding)	• Temporary loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used for feeding.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Cetti's warbler (breeding)	• Noise and visual disturbance of breeding birds and their dependent young. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Barn owl	• Temporary loss of nesting and foraging habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of feeding habitats.		Proposed Development Project design.	England and other stakeholders, as required.
Marsh harrier (breeding)	• Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	in degradation of nesting and feeding habitats and/or loss of nests.			
Bittern (breeding)	• Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Non-breeding water bird assemblage (across the entire Teesside area)	• Temporary habitat losses within designated sites and functionally linked land resulting in losses of roosting and/or feeding habitats.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Noise and visual disturbance of roosting and feeding birds. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of feeding habitats and/or roosts. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used by birds.		Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	(an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Teesworks)	• Temporary loss of nesting habitat. • Destruction of nests, eggs and young.	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		ecology/ornithology surveys and development of full Proposed Development Project design.	stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Coatham Dunes)	• Noise and visual disturbance of foraging birds during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		Proposed Development Project design.	England and other stakeholders, as required.
Breeding bird assemblage (Navigator Terminals)	• Temporary loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging birds during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Changes in air quality resulting in changes to habitat structure, with	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at the PEI stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	resulting effects on nesting and feeding habitats. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.			
Breeding bird assemblage (Saltholme laydown)	• Temporary loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging birds during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	feeding habitats and/or loss of nests			
Breeding bird assemblage (Saltholme substation)	• Temporary loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging birds during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation (adverse) This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Breeding bird assemblage (Compounds and laydown around Haverton Hill)	• Temporary loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging birds during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests	Short or medium term	Details of committed mitigation measures over and above those outlined in Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at the PEI stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Haverton Hill laydown)	• Temporary loss of nesting habitat. • Destruction of nests, eggs and young.	Short or medium term	Details of committed mitigation measures over and above those outlined in	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into

ORNITHOLOGICAL FEATURE	POTENTIAL IMPACTS	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Noise and visual disturbance of foraging birds during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding and breeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		Section 13.5 will be provided within the ES. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development Project design.	consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

Table 13-8: Summary of Potential Impacts and Effects During Operation

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Statutory designated sites (SPA, Ramsar, SSSI, NNR, LNR). Statutory designated sites (SPA, Ramsar, SSSI, NNR, LNR). The following statutory designated sites are located closest to the Proposed Development Site are: Teesmouth and Cleveland Coast SPA; Teesmouth and Cleveland Coast Ramsar site; Teesmouth and Cleveland Coast SSSI; Teesmouth NNR; and,	• Permanent habitat losses within the designated site adversely affecting breeding, roosting and feeding species. • Permanent losses of functionally linked land adversely affecting breeding, roosting and feeding species. • Noise and visual disturbance of qualifying species causing displacement of birds. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding, feeding and roosting birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation will be provided within the ES and the report to inform an HRA. Mitigation to be confirmed following completion of bird surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Cowpen Bewley Woodland Country Park LNR.	• Chemical contamination of Tees Bay marine waters resulting from process wastewater discharges and effects on fish and other prey stocks used as a foraging resource by birds.			
Non-statutory designated sites (LWS and RSPB reserve). Non-statutory designated sites (LWS and RSPB Reserve). The following non-statutory designated sites that are located closest to the Proposed Development Site are: Saltholme RSPB reserve; Phillips Tank Farm Grassland LWS;	• Permanent habitat losses within the designated site adversely affecting breeding, roosting and feeding species. • Permanent losses of functionally linked land adversely affecting breeding, roosting and feeding species. • Noise and visual disturbance of qualifying species causing displacement of birds • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed hydrogen generating infrastructure causing degradation of habitats relied upon by breeding, feeding and roosting birds.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Greenabella Marsh LWS; Greatham Creek North Bank Saltmarsh LWS; Cowpen Bewley Woodland Country Park LWS; Coatham Marsh LWS; and, Saltern Saltmarsh LWS.	• Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Chemical contamination of Tees Bay marine waters resulting from process wastewater discharges and effects on fish and other prey stocks used as a foraging resource by birds.			
Little tern (breeding)	• Noise and visual disturbance of foraging birds causing displacement from feeding areas. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding, feeding and roosting birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	feeding habitats and/or loss of nests. • Chemical contamination of Tees Bay marine waters resulting from process wastewater discharges and effects on fish and other prey stocks used as a foraging resource by birds.			
Avocet (breeding)	• Noise and visual disturbance causing displacement of breeding and foraging birds and brood failures. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding, feeding and roosting birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Little ringed plover (breeding)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Ringed plover (breeding)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		and development of Proposed Development design.	developed in consultation with Natural England and other stakeholders, as required.
Lapwing (breeding)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Cetti's warbler (breeding)	• Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Barn owl	• Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by feeding birds.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Increased surface water runoff and flood risk resulting in degradation of feeding habitats and.			England and other stakeholders, as required.
Marsh harrier (breeding)	• Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Bittern (breeding)	• Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		ecology/ornithology surveys and development of Proposed Development design.	appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Non-breeding water bird assemblage (across the entire Teesside area)	• Temporary habitat losses within designated sites and functionally linked land resulting in losses of roosting and/or feeding habitats. • Chemical contamination of Tees Bay marine waters resulting from process wastewater discharges and effects on fish and other prey stocks used as a foraging resource by birds. • Noise and visual disturbance of roosting and feeding birds from operational H2 generating plant. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development_Project design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	infrastructure causing degradation of habitats relied upon by feeding birds. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of feeding habitats and/or roosts. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used by birds.			
Breeding bird assemblage (Teesworks)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this). Site-specific mitigation will be developed in

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		and development of Proposed Development design.	consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Coatham Dunes)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Breeding bird assemblage (Navigator Terminals)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Saltholme laydown)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		and development of Proposed Development design.	developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Saltholme substation)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Breeding bird assemblage (Compounds and laydown around Haverton Hill)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Haverton Hill laydown)	• Permanent habitat losses resulting in loss of breeding sites. • Noise and visual disturbance causing displacement of birds from feeding and breeding sites. • Changes in air quality as a result of point source process emissions and vehicular traffic to and from	Long term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	the proposed H2 generating infrastructure causing degradation of habitats relied upon by breeding and feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		and development of Proposed Development design.	developed in consultation with Natural England and other stakeholders, as required.

Table 13-9: Summary of Potential Impacts and Effects During Decommissioning

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Statutory designated sites (SPA, Ramsar, SSSI, NNR, LNR). Statutory designated sites (SPA, Ramsar, SSSI, NNR, LNR). The following statutory designated sites are located closest to the Proposed Development Site are: Teesmouth and Cleveland Coast SPA; Teesmouth and Cleveland Coast Ramsar site; Teesmouth and Cleveland Coast SSSI; Teesmouth NNR; and,	• Temporary habitat losses within designated sites and functionally linked land resulting in losses of breeding, roosting and/or feeding habitats. • Noise and visual disturbance of breeding birds. • Noise and visual disturbance of non-breeding birds. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water, resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used by birds.	Short or medium term	Details of committed mitigation will be provided within the ES and the report to inform an HRA. Mitigation to be confirmed following completion of bird surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Cowpen Bewley Woodland Country Park LNR.				
Non-statutory designated sites (LWS and RSPB reserve). Non-statutory designated sites (LWS and RSPB Reserve). The following non-statutory designated sites that are located closest to the Proposed Development Site are: Saltholme RSPB reserve; Phillips Tank Farm Grassland LWS; Greenabella Marsh LWS; Greatham Creek North Bank Saltmarsh	• Temporary habitat losses resulting in losses of breeding, roosting and/or feeding habitats. • Noise and visual disturbance of breeding birds • Noise and visual disturbance of non-breeding birds. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water, resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used by birds.	Short or medium term.	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
LWS; Cowpen Bewley Woodland Country Park LWS; Coatham Marsh LWS; and, Saltern Saltmarsh LWS.				
Little tern (breeding)	• Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Avocet (breeding)	• Loss of nesting habitat. • Destruction of nests, eggs and young.	Short or medium term	Details of committed mitigation measures will be	Potentially significant (adverse) without mitigation

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Noise and visual disturbance of foraging during the breeding season • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used for feeding.		provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Little ringed plover (breeding)	• Loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used for feeding.			England and other stakeholders, as required.
Ringed plover (breeding)	• Loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used for feeding.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Lapwing (breeding)	• Loss of nesting habitat. • Destruction of nests, eggs and young.	Short or medium term	Details of committed mitigation measures will be	Potentially significant (adverse) without mitigation

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Noise and visual disturbance of foraging during the breeding season • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used for feeding.		provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development design.	This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Cetti's warbler (breeding)	• Noise and visual disturbance of breeding birds and their dependent young. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
				England and other stakeholders, as required.
Barn owl	• Loss of foraging habitat. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of feeding habitats.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Marsh harrier (harrier)	• Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		and development of Proposed Development design.	stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Bittern (breeding)	• Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Non-breeding water bird assemblage (across the entire Teesside area)	• Temporary habitat losses within designated sites and functionally linked land resulting in losses of roosting and/or feeding habitats.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Noise and visual disturbance of roosting and feeding birds. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of feeding habitats and/or roosts. • Morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used by birds.		Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of full Proposed Development design.	specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Teesworks)	• Loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.			England and other stakeholders, as required.
Breeding bird assemblage (Coatham Dunes)	• Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ ornithology surveys and development of full Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Navigator Terminals)	• Loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests.		and development of Proposed Development design.	appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Saltholme laydown)	• Loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Saltholme substation)	• Loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season.	Short or medium term.	Details of committed mitigation measures will be provided within the ES and the report to inform HRA.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
	• Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests		Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.
Breeding bird assemblage (Compounds and laydown around Haverton Hill)	• Loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

RECEPTOR	POTENTIAL IMPACT	DURATION	EXAMPLE MITIGATION	LIKELY SIGNIFICANCE OF EFFECT
Breeding bird assemblage (Haverton Hill laydown)	• Loss of nesting habitat. • Destruction of nests, eggs and young. • Noise and visual disturbance of foraging during the breeding season. • Physical or chemical pollution from emissions of dust and/or particulates and chemical spills to ground and/or water resulting in degradation of habitats used by feeding birds. • Increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests	Short or medium term	Details of committed mitigation measures will be provided within the ES and the report to inform HRA. Mitigation to be confirmed following completion of all ecology/ornithology surveys and development of Proposed Development design.	Potentially significant (adverse) without mitigation This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at this stage). Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required.

13.8 Residual Effects and Conclusions

13.8.1 The preliminary ornithological assessment has identified that in the absence of additional mitigation the Proposed Development has the potential to result in a number of potentially significant adverse effects on ornithological features during construction, operation and decommissioning (refer to Table 13 to Table 13).

13.8.2 Potential significant effects upon international statutory designated sites will be assessed as part of the assessment and through the Habitats Regulations Assessment (HRA) process as detailed below.

13.8.3 There are potential impact pathways between the Proposed Development and designated sites. The potential for direct and indirect impacts on relevant designated sites will be considered further in the assessment. Where possible any secondary or indirect impacts upon qualifying features of the site will be avoided through the design development and, where required, the adoption of appropriate mitigation measures.

13.8.4 Where statutory or non-statutory designated sites will be affected by the Proposed Development, the ornithological assessment will examine whether there will be direct or indirect effects during construction or operation and confirm relevant avoidance/mitigation requirements. It is anticipated that predicted effects to be reported in the ES will be less than as presented within this preliminary assessment.

13.8.5 The Proposed Development will, wherever possible, seek to avoid direct impacts upon ponds and other waterbodies and, as such, the predicted effects upon birds that rely on such features will be limited to a level that is not significant at these locations.

13.8.6 Only minor watercourses and drains will be crossed using open cut techniques to reduce the potential direct impacts upon aquatic habitats and potential effects upon the birds that rely on them, to levels that are not significant. Similarly, woodland, trees, grasslands, reedbeds and saltmarsh with potential to support nesting, roosting and feeding birds will also be avoided as far as possible.

13.8.7 The Proposed Development has the potential to have significant adverse effects upon birds. Surveys to inform the ornithological baseline are ongoing and avoidance and mitigation measures will be developed as the Proposed Development design is further progressed. As such, it is anticipated that predicted effects to be reported in the ES will be less than as presented within this preliminary ornithological assessment.

13.9 Limitations and Difficulties

13.9.1 Baseline ecology surveys were in progress at the time of writing. All habitats and species have been valued in accordance with the precautionary principle i.e., the maximum likely nature conservation value has been applied based on the information available to inform decision-making.

13.9.2 This assessment has been undertaken using available data and Proposed Development design details at the time of writing (August 2023). However, at this

stage some details of the Proposed Development remain under development. As such, the assessment herein is a worst-case scenario, and actual effects may be less than those presented herein. Effects will be re-evaluated at the ES stage.

13.10 Information to Inform a Habitats Regulations Assessment

13.10.1 It is necessary to consider whether the Proposed Development is likely to have a significant effect on areas that have been designated for their international nature conservation value in respect of ornithology. Known as European sites, these include SACs, SPAs and, as a matter of government policy, Ramsar sites.

13.10.2 European sites are protected under the Conservation of Habitats and Species Regulations 2017. The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). However, the most recent amendments to the Habitats Regulations – the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 – make it clear that the need for HRA continues to apply.

13.10.3 The Proposed Development is located within 15 km of the following international sites with qualifying ornithological interest features:

- Teesmouth and Cleveland Coast SPA;
- Teesmouth and Cleveland Coast Ramsar;
- North York Moors SPA;
- Northumbria Coast SPA; and
- Northumbria Coast Ramsar

13.10.4 Stage 1 of the HRA process (Test of Likely Significant Effects) will consider the potential pathways of effect between the Proposed Development and the European designated sites within 15 km of the Proposed Development Site, and whether there is potential to have a significant adverse effect on the integrity of the European designated sites, either alone or in-combination with other plans or projects.

13.10.5 Potential pathways of impact currently include habitat loss, noise and visual disturbance during construction, pollution (via hydrological links to the designated sites) and dust emissions and loss/disturbance of functionally linked land used by qualifying species. Information used to support the HRA process will include desk study data and the suite of bird surveys outlined in Table 13-2Error! Reference source not found..

13.10.6 The North York Moors SPA and Northumbria Coast SPA/Ramsar will be considered in the context of any operational stack emissions from Proposed Development, which have the potential to affect European sites that lie relatively far from industrial developments.

13.10.7 Where there is potential for the Proposed Development to have Likely Significant Effects upon the qualifying features of the European designated sites, the pathway will be taken forward to Stage 2 - Appropriate Assessment. Baseline surveys are ongoing at the time of writing; however, it is anticipated that Appropriate Assessment

will be required for the Proposed Development. At Appropriate Assessment, the measures that will be implemented to either avoid the impact in the first place, or to mitigate the ecological effect to such an extent that it is no longer significant, will be set out.

13.10.8 The HRA will be prepared in line with the Inspectorate's Advice Note 10 (Planning Inspectorate, 2022) (Habitats Regulations Assessment). A version of the HRA Screening Report has been submitted with the PEIR, which will be developed further at DCO application stage.

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14.0 MARINE ECOLOGY

14.1 Introduction

14.1.1 This chapter of the Preliminary Environmental Information (PEI) Report provides an initial assessment of the potential impacts and effects as a result of the construction, operation (including maintenance) and decommissioning of the Proposed Development on marine ecology.

14.1.2 A detailed description of the Proposed Development can be found within Chapter 4: Proposed Development (PEI Report, Volume I).

14.1.3 For the purposes of this assessment, the marine environment is defined as any area seaward of the mean high-water springs (MHWS) mark of any tidally influenced water body. Terrestrial and aquatic designations, habitats, and species i.e., those above the MHWS are considered in Chapter 12: Ecology and Nature Conservation (including aquatics and saltmarsh habitats recorded in Greatham Creek above MHWS) (PEI Report, Volume I). Impact pathways to coastal seabirds and associated designated sites are considered in Chapter 13: Ornithology (PEI Report, Volume I), whilst marine water quality is considered within Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I).

14.1.4 This chapter describes the assessment methodology used, the datasets that have informed this preliminary assessment, baseline conditions, development design measures, mitigation measures and the preliminary determination of any likely significant effects on the marine environment that could result from the Proposed Development.

14.1.5 This chapter is supported by the following figures (PEI Report, Volume II) and appendix (PEI Report, Volume III):

- Figure 14-1: Study Area;
- Figure 14-2: Designated Sites with Marine Ecological Features;
- Figure 14-3: Important Intertidal and Subtidal Benthic Habitats;
- Figure 14-4: Harbour Seal Mean At-Sea Distribution; and
- Figure 14-5: Grey Seal Mean At-Sea Distribution.
- Appendix 14A: Net Zero Teesside Benthic EUNIS Biotopes in the River Tees and Tees Bay

14.2 Legislation and Planning Policy Context

14.2.1 This initial assessment has been undertaken within the context of relevant planning policies, at both national and local levels, guidance documents and legislative instruments. The background for this is detailed within Chapter 7: Legislative and Planning Policy Context (PEI Report, Volume I). A summary of the legislative background and policies relating to marine ecology is provided below.

Legislative Background

14.2.2 The following legislation is considered to be relevant to the Proposed Development in respect of marine ecology:

- The Marine and Coastal Access Act 2009 (HM Government, 2009a), which provides the legal mechanism to help ensure clean, healthy, safe, and productive and biologically diverse oceans and seas;
- The Conservation of Habitats and Species Regulations 2017 (HM Government, 2017a) (amended 2019 (HM Government, 2019)) (the Habitats Regulation), which transposes the Habitats Directive (92/43/EEC) into UK legislation out to the 12 nautical mile (NM) limit;
- The Wildlife and Countryside Act (WCA) 1981 (HM Government, 1981), which includes provisions relating to nature conservation;
- The Water Environment (Water Framework Directive (WFD)) (England and Wales) Regulations 2017 (HM Government, 2017b), which transposes the EU Water Framework Directive (2000/60/EC) into UK legislation;
- The Marine Strategy Regulations 2010 (HM Government, 2010), which transposes the Marine Strategy Framework Directive (2008/56/EC) into UK legislation;
- The Natural Environment and Rural Communities (NERC) Act 2006 (HM Government, 2006), which lists habitats and species of principal importance (SPI) for the purpose of conservation of biodiversity and requires public authorities to consider what actions can be taken to further the general biodiversity objection for the conservation and enhancement of biodiversity;
- The Environment Act 2021 (HM Government, 2021a), which sets clear statutory targets for the recovery of the natural world in four priority areas: air quality, biodiversity, water and waste, and includes the introduction of Biodiversity Net Gain (BNG);
- The Conservation of Seals Act 1970 (as amended) (HM Government, 1970), which provides protection and conservation for seals in England, Wales and Scotland, and adjacent territorial waters;
- The Salmon and Freshwater Fisheries Act 1975 (as amended) (HM Government, 1975), which relates to the protection of salmon and freshwater fisheries, as well as preventing the obstruction of fish migratory route;
- The Eels (England and Wales) Regulations 2009 (HM Government, 2009b), which implement Council Regulation (EC) No 1100/2007 (EC) No 1100/2007 establishing measures for the recovery of the stock of European eel including providing for the free passage of eels; and
- Local byelaws relating to fishing practices in coastal areas (0 NM to 6 NM) enforced through the North Eastern Inshore Fisheries and Conservation Authority (IFCA, 2023).

14.2.3 The following are international legislations and agreements in which the UK is a signatory concerning, which are concerned with the preservation of marine ecological receptors during the planning and execution of projects in UK waters:

- The Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas 1992 (ASCOBANS) (United Nations Environment Programme (UNEP), 1992).

Planning Policy Context

National Planning Policy

14.2.4 The key national planning policy related to the Proposed Development in relation to marine ecology are outlined below. There are no additional specific requirements in "National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011 and 2023)" for the marine ecology above that which is already provided on National Policy Statement for Energy (EN-1).

Overarching National Policy Statement for Energy (EN-1), 2011

14.2.5 The NPS for Energy (EN-1) (DECC, 2011a) sets out national policy for energy infrastructure. Part 5.3 relates to biodiversity and requires that the applicant shows how the project adheres to the Government's biodiversity strategy which aims to ensure:

> *"A halting, and if possible a reversal, of declines in priority habitats and species, with wild species and habitats as part of healthy, functioning ecosystems"*; and
>
> *The general acceptance of biodiversity's essential role in enhancing the quality of life, with its conservation becoming a natural consideration in all relevant public, private and non-governmental decisions and policies"* (paragraph 5.3.5 of NPS EN-1).

14.2.6 It also states the following in relation to the impact of a development on biodiversity:

> *"As a general principle, and subject to the specific policies below, development should aim to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives; where significant harm cannot be avoided, then appropriate compensation measures should be sought"* (NPS EN-1 paragraph 5.3.7); and
>
> *"In taking decisions, the IPC should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity; and to biodiversity and geological interests within the wider environment"* (NPS EN-1 paragraph 5.3.8).

14.2.7 Adherence to these policies must be demonstrated through robust application of the mitigation hierarchy (as set out in paragraph 5.3.18 of NPS EN-1) and can be achieved by the application of appropriate mitigation, to ensure that, verbatim of those outlined in NPS EN-1:

- during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;

- during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements;
- habitats will, where practicable, be restored after construction works have finished; and
- opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals.

14.2.8 Part 5.15 of NPS EN-1 is also of relevance to marine ecology, which relates to water quality and resources and requires applicants to consider impacts of development to water bodies and protected areas (e.g., shellfish waters) under the WFD. In particular, the assessment should demonstrate that appropriate measures will be put in place to avoid or minimise adverse impacts of abstraction and discharge of cooling water. In addition to the mitigation measures set out in NPS EN-1, the design of the cooling systems should include intake and outfall locations that avoid and minimise adverse impacts.

NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4), 2011

14.2.9 Paragraph 2.15.5 states *"As explained in Section 5.3 of EN-1, the ES should set out any effects on designated sites, protected species and on other biodiversity afforded conservation priority. Where relevant, applicants should undertake sediment transfer modelling to predict and understand impacts and help identify relevant mitigating or compensatory measures. The assessment should include the effects on water quality and resources, and on coastal change (see also Sections 5.15 and 5.5 respectively of EN-1 for further information on these)."*

14.2.10 Paragraph 2.15.7 *states "As explained in Section 5.3 of EN-1, the applicant should be careful to identify the effects on Marine Conservation Zones and designated protected areas. Applicants should consult the Marine Management Organisation (MMO) at an early stage about this."*

Draft Overarching National Policy Statement for Energy (EN-1), 2023

Marine Conservation Zones

14.2.11 Paragraph 5.4.9: Marine Conservation Zones (MCZs) (Marine Protected Areas in Scotland), introduced under the Marine and Coastal Access Act 2009, are areas that have been designated for the purpose of conserving marine flora or fauna, marine habitats or types of marine habitat or features of geological or geomorphological interest. The protected feature or features and the conservation objectives for the MCZ are stated in the designation order for the MCZ.

Marine Protected Areas

14.2.12 Paragraph 5.4.10: Marine Protected Area (MPA) is a term used to describe the network of HRA sites, SSSIs and MCZs in the English and Welsh marine environment.

14.2.13 Paragraph 5.4.11: It is important that relevant guidance on managing environmental impacts of infrastructure in marine protected areas is followed, and that equal consideration of the effect of proposals should be given to all MPAs regardless of the

legislation they were designated under. This is because all sites contribute to the network of MPAs and therefore to overall network integrity.

NPS for Renewable Energy Infrastructure (EN-3), 2023

14.2.14 Paragraph 3.316 states that *"Marine Licences are required for all the marine elements of a proposed offshore development (up to Mean High Water Springs), including associated development such as the cabling and any offshore substations that are required, and any other matters the MMO may consider relevant under s69 of the Marine and Coastal Access Act 2009."*

14.2.15 As part of marine licensing, impacts on marine protected areas (MPAs) will be considered. Further guidance on marine licensing is set out in Section 1.2 of EN-1.

Draft NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4), 2023

14.2.16 Paragraph 2.13.14 states *"LNG import facilities are located on coasts and estuaries. During the operation of an LNG import facility, LNG tanker deliveries by sea will be essential to the facility. This activity gives rise to the need for dredging in order for the deep-water channel and jetty to maintain declared depths and to deepen waters to accommodate the large tankers. Subsequently the dredge spoil must be deposited responsibly."*

14.2.17 2.13.15 Dredging and associated construction e.g., of deep-water jetties, may have specific impacts on the local marine, coastal and estuarine environments, and marine biodiversity.

14.2.18 2.13.16 These habitats are often of fundamental importance to biodiversity, particularly to bird and fish life. For example, dredging can result in the smothering of nearby habitats and benthic communities, and local increases in suspended sediment concentrations may have an effect on fisheries, leading to the migration of fish, whilst disturbed sediment could contain contaminated material.

National Planning Policy Framework (NPPF), 2021

14.2.19 Planning policy to support the halting of overall declines in biodiversity is set out in the NPPF (MHCLG, 2021) and the Governments' 25-Year Environment Plan (HM Government, 2018). Both policy documents include a commitment to promote opportunities to incorporate biodiversity improvements to achieve net gains for biodiversity.

14.2.20 Whilst the NPPF does not directly apply to Nationally Significant Infrastructure Projects (NSIPs) such as the Proposed Development, the Secretary of State (SoS) may have regard to policies in the NPPF if the SoS thinks that they are important and relevant.

Governments' 25-Year Environmental Plan, 2018

14.2.21 The Governments' 25-Year Environment Plan, which aligns with the Clean Growth Strategy, is relevant to the Proposed Development. The Environment Act was passed into law in 2021. It was created to achieve the commitments outlined in the Governments' 25-Year Environment Plan, and mandates BNG for development (housing and commercial), including for NSIPs. Government is currently consulting

on secondary legislation and a Biodiversity Statement applicable to NSIPs. Therefore, whilst the Environment Act 2021 is now law, the BNG measures applicable to NSIPs are not yet in force and are anticipated to come into effect in late 2025.

14.2.22 To fulfil the aims of the 25-Year Environment Plan and the Environment Bill, Natural England developed the 'Department for Environment, Food and Rural Affairs (Defra) Biodiversity Metric'; this is a tool for measuring and accounting for biodiversity losses and gains resulting from development. The latest version of this tool (Metric 4.0), which is expected to become statutory in November 2023, includes intertidal habitats (Natural England, 2021).

The UK Marine Policy Statement (2011)

14.2.23 The UK MPS (HM Government, 2011) was adopted in 2011. It provides the policy framework for the preparation of marine plans and establishes how decisions affecting the marine area should be made (HM Government, 2011). The UK is divided into a number of marine plan areas with associated plan authorities that are responsible for preparing marine plans. In England, the MMO is the plan authority. Marine plans are a material planning consideration.

The North East Inshore Marine Plan (2021)

14.2.24 The Proposed Development Site lies within the North East Inshore Marine Plan (HM Government, 2021b), which stretches from Flamborough Head in Yorkshire to the Scottish Border. The Plan Area includes three main tidal rivers, including the River Tees.

14.2.25 The North East Inshore Marine Plan (HM Government, 2021b) is intended to provide a strategic approach to decision-making, considering future use and providing a clear approach to managing resources, activities and interactions within the area. Policies in the plan which are of relevance to marine ecology are outlined in Table 14-1.

Table 14-1: Policies in the North East Inshore Marine Plan (HM Government, 2021b) which are Relevant to Marine Ecology

POLICY NUMBER	POLICIES TEXT	RELEVANCE TO PROPOSED DEVELOPMENT
NE-BIO-1	"*Proposals that enhance the distribution of priority habitats and priority species will be supported. Proposals that may have significant adverse impacts on the distribution of priority habitats and priority species must demonstrate that they will, in order of preference:* *a) avoid;* *b) minimise;* *c) mitigate adverse impacts so they are no longer significant;* *d) compensate for significant adverse impacts that cannot be mitigated*."	The Proposed Development may result in impacts to priority habitats and species. As such, a baseline review and assessment of likely effects have been conducted in this PEI Report.
NE-BIO-2	"*Proposals that enhance or facilitate native species or habitat adaptation or connectivity, or native species migration, will be supported. Proposals that may cause significant adverse impacts on native species or habitat adaptation or connectivity, or native species migration, must demonstrate that they will, in order of preference:* *a) avoid;* *b) minimise;* *c) mitigate adverse impacts so they are no longer significant;* *d) compensate for significant adverse impacts that cannot be mitigated*."	The Proposed Development may result in impacts to native species. As such, a baseline review and assessment of likely effects have been conducted in this PEI Report.
NE-BIO-3	"*Proposals that conserve, restore or enhance coastal habitats, where important in their own right and/or for ecosystem functioning and provision of ecosystem services, will be supported. Proposals must take account of the space required for coastal habitats, where important in*	This policy applies to intertidal habitats. The Proposed Development is not expected to result in adverse impacts to intertidal coastal habitats in the Study Area due to the use of trenchless

POLICY NUMBER	POLICIES TEXT	RELEVANCE TO PROPOSED DEVELOPMENT
	their own right and/or for ecosystem functioning and provision of ecosystem services, and demonstrate that they will, in order of preference: *a) avoid;* *b) minimise;* *c) mitigate;* *d) compensate for net habitat loss.*"	technologies such as Horizontal Directional Drilling (HDD).
NE-CC-1	"*Proposals that conserve, restore or enhance habitats that provide flood defence or carbon sequestration will be supported. Proposals that may have significant adverse impacts on habitats that provide a flood defence or carbon sequestration ecosystem service must demonstrate that they will, in order of preference:* *a) avoid;* *b) minimise;* *c) mitigate adverse impacts so they are no longer significant;* *d) compensate for significant adverse impacts that cannot be mitigated*."	The proposed location for the Hydrogen Pipeline Corridor is within coastal saltmarsh habitat which typically sequesters large amounts of carbon. However, the proposed construction methodology of trenchless technologies is not expected to cause adverse effects to the habitat. The saltmarsh above MHWS is considered as part of Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I). The saltmarsh designated as part of the Teesmouth and Cleveland Coast SPA is above MHWS.
NE-DIST-1	"*Proposals that may have significant adverse impacts on highly mobile species through disturbance or displacement must demonstrate that they will, in order of preference:* *a) avoid;* *b) minimise;* *c) mitigate adverse impacts so they are no longer significant*."	The Hydrogen Pipeline Corridor in Greatham Creek may have adverse impacts on highly mobile species including fish and pinnipeds. Therefore, an assessment of likely effects is included in this PEI Report.

POLICY NUMBER	POLICIES TEXT	RELEVANCE TO PROPOSED DEVELOPMENT
NE-FISH-3	"*Proposals that enhance essential fish habitat, including spawning, nursery and feeding grounds, and migratory routes, should be supported. Proposals that may have significant adverse impacts on essential fish habitat, including spawning, nursery and feeding grounds, and migratory routes, must demonstrate that they will, in order of preference:* *a) avoid;* *b) minimise;* *c) mitigate adverse impacts so they are no longer significant*."	The Hydrogen Pipeline Corridor in Greatham Creek is not considered to be located within fish habitats but may be located within a fish migratory route. However, the use of trenchless technologies is considered to be the most appropriate construction method to avoid any adverse impacts. New water abstraction points are not part of the Proposed Development. Therefore, no potential impact pathway to fish and shellfish from underwater sound or entrapment and entrainment is likely to occur.
NE-INNS-1	"*Proposals that reduce the risk of introduction and/or spread of invasive non-native species should be supported. Proposals must put in place appropriate measures to avoid or minimise significant adverse impacts that would arise through the introduction and transport of invasive non-native species, particularly when:* *1) moving equipment, boats or livestock (for example fish or shellfish) from one water body to another;* *2) introducing structures suitable for settlement of invasive non-native species, or the spread of invasive non-native species known to exist in the area*."	The Proposed Development is not expected to require vessels for the placement of the pipeline in Greatham Creek, or the movement of waterborne equipment or structures suitable for the settlement of invasive non-native species (INNS).
NE-INNS-2	"*Public authorities with functions to manage activities that could potentially introduce, transport or spread invasive non-native species should implement adequate biosecurity measures to avoid or minimise the risk of introducing, transporting or spreading invasive non-native species*."	The proposed activities in Greatham Creek are not expected to result in the introduction, transportation or spread of INNS.

Local Planning Policy

14.2.26 The land considered for the Proposed Development is located within the administrative boundaries of Stockton on Tees Borough Council (STBC), the Redcar & Cleveland Borough Council (RCBC) and Hartlepool Borough Council (HBC).

14.2.27 Local planning policy relevant to the marine ecology assessment includes:

- Redcar and Cleveland Local Plan (adopted in May 2018) (RCBC, 2018);
- Stockton-on-Tees Local Plan (adopted in January 2019) (STBC, 2019); and
- Hartlepool Local Plan (HBC, 2018).

14.2.28 Policies N1 (Landscape) and N4 (Biodiversity and Geological Conservation) of the Redcar and Cleveland Local Plan relate to the protection of the marine environment and important sites for biodiversity including Special Protection Areas (SPAs), Ramsar, Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSI) and local nature reserves (RCBC, 2018). Similar themes are covered by the Stockton on Tees Local Plan Policy ENV5 which aims to preserve, protect and enhance ecological networks, biodiversity and geodiversity (STBC, 2019), whilst the Hartlepool Local Plan policy NE1 aims to protect, manage and enhance Hartlepool's natural environment, including coastal environments (HBC, 2018).

14.2.29 The Stockton-on-Tees Local Plan also seeks to ensure, as part of policies SD5 and ENV7, that development proposals do not contribute to unacceptable levels of pollution, including noise pollution, and that any adverse effects are prevented or reduced by incorporating mitigation measures (STBC, 2019). This includes measures to prevent or reduce noise pollution in designated sites including Seal Sands SSSI where seals may be sensitive to any increases in noise pollution resulting from proposed developments.

14.2.30 All three local plans make specific mention of the then proposed extension of the Teesmouth and Cleveland Coast SPA into the marine environment to protect breeding colonies of common tern (*Sterna hirundo*) and avocet (*Recurvirostra* spp.) as well as non-breeding waterbirds. The policies outlined above provide the necessary safeguards to protect both designated and proposed nature conservation sites.

14.2.31 Local Priority Species for the Tees Valley which are relevant to the assessment of marine ecology include salmon (*Salmo salar*), sea trout (*Salmo trutta*), European eel (*Anguilla Anguilla*), river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*) (Tees Valley Nature Partnership, 2012).

14.2.32 Local Priority Habitats for the Tees Valley which are relevant to the assessment of marine ecology (with some overlap with terrestrial and aquatic ecology) include maritime cliffs and slopes, mudflats and saltmarsh, sand dunes and saline lagoons (Tees Valley Nature Partnership, 2012).

14.2.33 The Tees is recognised as one of the main salmon rivers in England and Wales, and as such there is currently a Salmon Action Plan (SAP) enforced by the Environment Agency (EA) (EA, 2009). The actions of high priority within the SAP include:

- improving water quality in the lower river and estuary;

- free fish passage past the Tees Barrage;
- improving evaluation of compliance against spawning targets;
- maintaining liaison with developers to ensure impacts of new developments are minimised; and
- promoting new regional byelaws relating to fishing near obstructions.

14.3 Assessment Methodology and Significance Criteria

Study Area

14.3.1 The Study Area is shown in Figure 14-1: Study Area (PEI Report, Volume II). For the assessment, the Study Area has been defined to include the predicted likely Zones of Influence (ZoI) where potential impacts and significant effects may arise from the Proposed Development. The largest predicted ZoI for marine ecology is considered to be 10 km (for designated sites), although this will be refined as part of the ES when further information is available and more detailed assessments are undertaken. The Rochdale Envelope has been applied to ensure that the baseline characterisation data is sufficient to underpin a reasonable worst-case assessment of impact pathways. Further details regarding the Rochdale Envelope approach are included in Section 14.3.

14.3.2 The ZoI, and therefore the Study Area, is specific to each marine ecological feature, recognising both the mobility of each feature and the likely impact pathways to that feature. A summary of the Study Area for each receptor is defined below:

- Designated Sites: the Study Area for the search for relevant nature conservation sites for marine ecology include a 10 km radius of the Proposed Development Site within the marine environment. This spatial extent was chosen on the basis that it provides geographical context and encompasses the relevant functional habitats and range of movement of most species found within the predicted ZoIs of the Proposed Development.
- Benthic ecology: the Study Area covers the River Tees and Tees Estuary, as well as Seal Sands, Seaton Channel and Greatham Creek. The Study Area also extends from the south bank of the Tees Estuary to Redcar in Tees Bay, encompassing South Gare Breakwater and Coatham Sands.
- Fish and shellfish: the Study Area for these receptors is defined as the area comprising the River Tees and Tees Estuary, Seaton Channel, and Greatham Creek. The wider coastal area which falls within The International Council for the Exploration of the Sea (ICES) statistical rectangle 38E8 (ICES StatRecs), including Tees Bay, has also been considered.
- Marine mammals: the Study Area for marine mammals includes the Greater North Sea Ecoregion (North Sea, English Channel, Skagerrak and Kattegat), recognising the highly mobile and transient nature of this receptor. However, it is considered unlikely that most cetacean species will occur in the River Tees itself, although consideration has been given to the nearby coastal area. The particular focus within the Study Area for seals are Seal Sands and Greatham Creek.

Impact Assessment Methodology

14.3.3 The impacts and likely significant effects on marine ecology outlined in this chapter as part of project specific ecological impact assessments (EcIAs), have been undertaken in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM's) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2019), tailored to consider the interconnectivity of marine ecology and the small number of impacts likely to occur. A detailed assessment methodology is outlined in Chapter 2: Assessment Methodology (PEI Report, Volume I).

14.3.4 The aims of the EcIA are to:

- identify important ecological features (e.g., designated sites, habitats or species) which have the potential to be impacted by the Proposed Development;
- provide a robust assessment of the ecological impacts and resultant likely significant effects of the Proposed Development, which may be beneficial (i.e., positive) or adverse (i.e., negative);
- facilitate determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its impact pathways;
- identify appropriate mitigation to reduce any likely significant effects; and
- set out the steps to be taken to adhere to legal requirements relating to the relevant ecological features concerned.

Value/Importance of Marine Ecology Features

14.3.5 The assessment has determined the worst-case scenario for impact pathways to marine ecology and has focused on those features considered to be 'important'. The importance of an ecological feature has been defined with reference to a specific geographical context and the scale of protection, ensuring consistency with CIEEM (2019) guidance.

14.3.6 Marine features are highly connected with few boundaries and therefore the levels of geographical importance must recognise this. The levels presented below are based on the level to which the marine ecological receptor may qualify as a legislative or policy designating feature. Therefore, the approach adopts the level of legislative designation as a proxy for the geographical importance of a marine species receptor:

- international (designated National Site Network sites in accordance with the Habitats Regulations– Special Areas of Conservation (SACs), Special Protected Areas (SPAs), as well as Ramsar Sites);
- national (UK protected areas – Sites of Special Scientific Interest (SSSI), Marine Protected Areas (MPAs), and Marine Conservation Zones (MCZs));
- regional or local (ecological features that do not meet criteria for valuation at an international or national level, but that have sufficient value to merit retention or mitigation e.g., for the purpose of ensuring no net loss of biodiversity).

The value of sites, habitats and potential for protected and notable species are evaluated with reference to both their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations) and their legal status.

14.3.7 The importance criteria for marine ecological features are shown in Table 14-2.

Table 14-2: Importance Criteria for Marine Ecology Features

IMPORTANCE	DESCRIPTION*
Very High	Designated sites and qualifying/supporting features of international importance. Species which are legally protected and/or in significant decline (i.e., classified as 'endangered' or 'critically endangered' according to the International Union for Conservation of Nature (IUCN) Red List (IUCN, 2023)). High quality examples of rare habitats which are threatened throughout their range.
High	Designated sites and qualifying/supporting features of national conservational importance. Priority habitats and species or those considered to be of principal importance for the conservation of biodiversity in England and those species considered vulnerable to decline (i.e. classified as 'vulnerable' or 'near threatened' according to the IUCN Red List). High quality examples of uncommon habitats which are vulnerable throughout their range.
Medium	Habitats and species of regional or local importance (i.e., Annex 1 habitats, in accordance with the Habitats Regulations, which are not a qualifying feature of a nearby designated site). Those species considered to be of 'least concern' (according to the IUCN Red List or listed in the OSPAR list of threatened and/or declining species for the North-East Atlantic). Poor quality examples of rare or uncommon habitats which are threatened or vulnerable throughout their range.
Low	Habitats and species of low conservation importance, such as those generally abundant and widespread around the UK with no specific local value.

*Should there be any overlap in the description of a particular feature/receptor, the worst-case importance criteria are adopted.

Magnitude of Impacts

14.3.1 The potential magnitude of change on marine ecological features arising from activities occurring as part of the Proposed Development is determined in consideration of their beneficial or adverse nature; extent; duration; timing; frequency; and reversibility of the impact.

14.3.2 Temporary, permanent, direct and indirect impacts have been considered during the construction, operation and decommissioning phases of the Proposed Development, and any mitigation measures necessary have been identified. To ensure compliance with National and European policy, consideration is still given to the need to maintain and enhance biodiversity.

Significance Criteria

14.3.3 To determine the likely significance of effect, the following parameters have been considered:

- impact type – direct or indirect, positive or negative, temporary or permanent;
- magnitude of impact – the 'amount' or intensity of an impact. This may sometimes be synonymous with 'extent' (see below) for certain receptors, such as habitats loss. For mortality it may be the number of individuals killed;
- spatial extent of impact – the area over which the impact will occur; and
- temporal nature of impact – timing, frequency and duration.

14.3.4 The assessment has also given regard to the sensitivity of an ecological feature to an impact which is determined by its:

- adaptability i.e., the capacity, or lack thereof, of a feature to avoid or adapt to a change; and
- tolerance/resilience i.e., capacity, or lack thereof, of a feature to accommodate temporary or permanent change or recover to pre-existing state following exposure to a change.

14.3.5 By combining the characteristics of an impact pathway with the importance and sensitivity of ecological features or receptors, a measure of the significance of effects on marine ecology can be derived.

14.3.6 For each marine ecological receptor, only those characteristics relevant to understanding the ecological effect and determining the effect significance are described. The determination of the significance of effects has been made based on the predicted impacts as outlined in paragraph 14.3.9 to designated sites, ecosystems, habitats, and species.

14.3.7 Conclusions on the significance of effects are assessed as being either:

- Not Significant – no effect to one or more of the features described above; or
- Significant – one or more features described above are affected.

14.3.8 CIEEM does not advocate a matrix approach for determining the significance of effects on ecological receptors (CIEEM, 2018). However, maintaining consistency with other disciplines/the wider PEI Report, where a matrix approach is suitable, should be considered. As such, the assessment conclusions presented within this chapter have been translated into the significance terminology used within the wider PEI Report, as outlined in Table 14-3.

Table 14-3: Description of Significance Terminology

CLASSIFICATION OF EFFECT BASED ON CIEEM GUIDANCE	TERMINOLOGY USED ELSEWHERE	DESCRIPTION IN ACCORDANCE WITH CIEEM GUIDANCE
Significant (Beneficial)	Major Beneficial	Beneficial effect on designated sites, ecosystems, habitat and species at the international level.
	Moderate Beneficial	Beneficial effect on designated sites, ecosystems, habitat and species at the national level.
Non-significant	Minor Beneficial	Beneficial effect on designated sites, ecosystems, habitat and species at a local level or regional level.
	Negligible	No effect on designated sites, ecosystems, habitat and species.
	Minor Adverse	Adverse effect on designated sites, ecosystems, habitat and species at the local level or regional level.
Significant (Adverse)	Moderate Adverse	Adverse effect on designated sites, ecosystems, habitat and species at the national level.
	Major Adverse	Adverse effect on designated sites, ecosystems, habitat and species at the international level.

Sources of Information/Data

14.3.9 Baseline conditions for marine ecology have been determined using findings from a desk-based study. The study area shown in Figure 14-1: Study Area (PEI Report, Volume II) were used to define the area of search for the desk-based study.

14.3.10 The desk-based study identified several publicly available data sources relevant to the Study Area for each marine receptor. The desk-based study determined the nature conservation designated sites and protected species and habitats considered within this assessment of impact pathways from the Proposed Development. Furthermore, the data sources were used to provide the relative importance,

functionality and geographical context of each receptor. Data sources identified include:

- The Marine Life Information Network (MarLIN, 2023);
- EA TraC data 1987 – 2019 (EA, 2021a);
- EA River Tees Fish Counts for salmon and brown trout taken at the Tees Barrage 2011 – 2022 (EA, 2023a);
- habitat mapping undertaken by the Joint Nature Conservation Committee (JNCC) (2019a) – Marine Nature Conservation Review (MNCR) area summaries and the EA (2023b) – saltmarsh zonation and extent in England;
- European Marine Observation Data Network (EMODnet) (EMODnet, 2021) Seabed Habitats Project for broad-scale habitat maps of the Study Area;
- European University Information Systems organisation (EUNIS) (European Environment Agency (EEA), 2021) for classifying benthic habitats;
- EA ecology and fish data explorer (EA, 2021b);
- Spawning and nursery grounds for UK waters (Coull *et al.,* 1998; Ellis *et al.,* 2012);
- Salmon Stocks and Fisheries in England and Wales (Cefas, 2019 and 2022);
- Salmonid and fisheries statistics for England and Wales (EA, 2022e);
- UK fleet landings by rectangle stock and estimated EEZ 2016-2020 (updated) (MMO, 2021);
- ICES publications and data (ICES, 2022);
- SCANS (Small Cetacean Abundance in the European Atlantic and North Sea) data (Hammond *et al.*, 2021);
- Inter-Agency Marine Mammal Working Group (IAMMWG) publications (IAMMWG, 2022);
- Sea Mammal Research Unit (SMRU) and Special Committee on Seals research reports (SCOS) (SMRU & SCOS, 2021);
- Habitat-based predictions of at-sea distributions for grey and harbour seals in the British Isles (Carter *et al*., 2020);
- INCA Tees Seals Research Programme publications (INCA, 2022);
- academic papers and online reports as available for the Study Area;
- designated sites condition assessments as available; and
- existing reference baseline data (where available and relevant) from other developments in the area e.g., the Net Zero Teesside (NZT) Project.

14.3.11 Following a review of available data, with consideration of the potential impact pathways associated with the Proposed Development, no project specific marine ecology surveys are proposed, as detailed in Table 14-4.

14.3.12 The presence of harbour and grey seals in the Study Area is well known, including abundances, seasonality, and the known haul-out locations for these species. Therefore, no effort-based surveys for marine mammals have been proposed. However, incidental sightings of seals at Seal Sands and Greatham Creek have been recorded as part of the breeding and non-breeding bird surveys for the Proposed Development and will continue to be observed and recorded. This includes information on the species, their location, abundance, the presence of pups, and if seals are moulting.

14.3.13 Benthic ecology within the Study Area is well understood, through existing surveys undertaken by the JNCC (2019) and the EA (2022c), and the subtidal and intertidal benthic surveys completed for the NZT Project in the River Tees and Tees Bay. Trenchless technologies in the marine environment and existing pipeline bridges are proposed for the Hydrogen Pipeline Corridor at Greatham Creek. The use of trenchless technologies will result in the avoidance of most impact pathways to benthic habitats and species and negate the requirement for further surveys. This will continue to be reviewed as the Proposed Development design progresses and following any input or requirements from statutory consultees such as Natural England.

14.3.14 Fish and shellfish surveys are not considered necessary. The proposed Hhydrogen Ppipeline Ccorridor in the vicinity of Greatham Creek is not considered to be located within fish habitats but may be located within a fish migratory route. However, the use of trenchless technologies is considered to be the most appropriate construction method to avoid any adverse impacts to this receptor. Furthermore, new water abstraction points are not part of the Proposed Development, meaning that there are no potential impact pathways to fish and shellfish from underwater sound or entrapment and entrainment.

Consultation

14.3.15 An EIA Scoping Opinion was requested from the Planning Inspectorate (the Inspectorate) in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to marine ecology outlined in Table 14-4.

Table 14-4: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping opinion – 17/05/2023	The inspectorate agrees that effects to the Southern North Sea SAC can be scoped out of the ES on the basis that the site is over 100km from the Proposed Development and there are no impact pathways from underwater sound.	This comment is acknowledged. This SAC is scoped out from further assessment as outlined in Section 14.4 of this PEI Report chapter.
The Inspectorate	Scoping opinion – 17/05/2023	The Inspectorate agrees that marine mammal and benthic ecology surveys can be scoped out on the basis set out in the Scoping Report. With regard to fish surveys, the Inspectorate notes that potential impact pathways from underwater sound, and possibly entrapment and entrainment have been identified.	This comment is acknowledged. Fish and shellfish surveys are not considered necessary. The proposed Hydrogen Pipeline Corridor in the vicinity of Greatham Creek is not considered to be located within fish habitats but may be located within a fish migratory route. However, the use of trenchless technologies is considered to be the most appropriate construction method to avoid any adverse impacts to this receptor. Furthermore, new water abstraction points are not part of the Proposed Development, meaning that there are no potential impact pathways to fish and shellfish from underwater sound or entrapment and entrainment. If the scope of the Proposed Development changes, the need for surveys will be discussed with the relevant consultation bodies.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping opinion – 17/05/2023	The Scoping Report does not include any information about the predicted noise and vibration levels from the proposed works or sensitivity of ecological receptors. The Inspectorate therefore does not have sufficient information to reasonably conclude that there will be no likely significant effects.	Airborne sound disturbance is assessed in Section 14.6. A list of potential construction activities near Greatham Creek and predicted sound pressure levels are provided in Table 14-10.
The Inspectorate	Scoping opinion – 17/05/2023	The Scoping Report seeks to scope out effects from underwater sound. The Inspectorate notes that the proposed hydrogen pipeline would cross the tidal River Tees and that there is potential for noise and vibration impacts arising from construction of the pipeline to migratory fish. This matter should be assessed in the ES.	It is assumed at this stage that the depths of the trenchless technologies (such as HDD) will be such that there is no pathway for effects to marine ecological receptors. It is also assumed that the works will be through bedrock below marine sediment and at a sufficient depth where underwater sound effects to migratory fish are likely to be negligible. This is in line with the current tunnelling methodology which states a tunnelling depth of 10 – 15 m below the riverbed will be achieved. Therefore, it is considered that underwater sound effects as a result of trenchless technologies (such as HDD) will not result in likely significant effects and can be scoped out from further assessment. This will be reviewed as the EIA progresses and confirmed in the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping opinion – 17/05/2023	The Inspectorate notes that permanent loss of habitat in the intertidal area is not proposed but if the approach changes, consideration would be given to the 'requirements of the Environment Act 2021' including a BNG assessment.	This comment is acknowledged. This will be reviewed if there are any Proposed Development design changes.
The Inspectorate	Scoping opinion – 17/05/2023	The Inspectorate draw the Applicant's attention to the EA's comments regarding the presence of coastal saltmarsh habitat adjacent to Greatham Creek. The baseline habitat should be correctly described in the ES and supporting figures. The assessment of impacts arising from installation of the proposed pipelines should include consideration of this habitat and identify any mitigation required for likely significant effects, and how this would be secured in the DCO.	This habitat is located above the MHWS and is considered to be coastal/terrestrial. The characterisation of habitats of this characterisation and any potential effects are considered in Chapter 12: Ecology and Nature Conservation (including aquatics) (PEI Report, Volume I).
The Inspectorate	Scoping opinion – 17/05/2023	The ES should include an assessment of effects arising from the risk of fish entrapment and entrainment associated with abstraction of water from WFD waterbodies and/or cooling water systems required for the Proposed Development. The ES should identify any mitigation required, and how this would be secured in the DCO.	The Proposed Development will use water from existing sources; either raw water supply to the Teesworks site; or a new connection to the existing NWL supply either via tie in to NZT infrastructure or the installation of a new connection. Therefore, there is considered to be no impact pathway to fish and shellfish from entrapment and entrainment, and this will not be considered further.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping opinion – 17/05/2023	If cooling water is proposed to be discharged to the Tees Estuary or other WFD waterbodies, the ES should include an assessment of likely significant effects arising from thermal properties of the discharge of the cooling water.	Discharge of cooling water to the Tees Estuary or other WFD waterbodies is not proposed as part of the Proposed Development.
The Inspectorate	Scoping opinion – 17/05/2023	If any hard structures (e.g. pipe outflow, rock armouring or equivalent) are proposed then the assessment of habitat loss and disturbance should also consider potential changes in coastal processes and introduction of invasive non-native species (INNS).	No hard structures are being placed in the marine environment. No pathway for the introduction of INNS has been identified at this stage.
Environment Agency	Scoping Opinion – 09/05/2023	The applicant should be aware that large areas adjacent to Greatham Creek, which have been classified as 'Coastal and floodplain grazing marsh', are in fact coastal saltmarsh habitat as a result of the EA's managed realignment projects of 2014 and 2018 respectively.	This habitat is located above the MHWS and is considered to be coastal/terrestrial. The characterisation of habitats of this characterisation and any potential effects are considered in Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I).
Environment Agency	Scoping Opinion – 09/05/2023	It is preferred that the abstraction from WFD waterbodies is avoided where practicable to avoid the risk of fish entrainment. If abstraction from WFD waterbodies is proposed, the impact of fish entrainment should be assessed, and appropriate mitigation proposed to prevent entrainment.	The Proposed Development will use water from the existing NWL raw water feed or alternatively demineralised water from Wilton International. Therefore, there is considered no impact pathway to fish and shellfish from entrainment and mitigation measures will not be considered further.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
Environment Agency	Scoping Opinion – 09/05/2023	If cooling waters is discharged to the Tees estuary or other WFD waterbodies, the implications of this in relation to WFD status will need to be fully considered. Thermal modelling will be required to assess the range of the thermal discharge.	There will be no direct discharge of cooling water from the Main Site or via the NZT effluent outfall into the River Tees and Tees Bay. Therefore, there is considered no impact pathway from cooling water discharge, and this will not be considered further.
Environment Agency	Scoping Opinion – 09/05/2023	It is unclear from the Scoping Report whether there is a potential for noise and / or vibration to occur during the creation of the hydrogen pipeline corridors. Therefore, the applicant should consider potential effects from noise and vibration on migratory fish.	It is assumed at this stage that the depths of the trenchless techniques (such as HDD) (10-15 m) will be such that there is no pathway for effect to marine ecological receptors. It is also assumed that the works will be through bedrock below marine sediment and at a sufficient depth where underwater sound effects to migratory fish are unlikely. Therefore, underwater sound effects as a result of trenchless techniques have been scoped out from further assessment. There are no other known pathways for underwater sound disturbance at this stage for example, Unexploded Ordnance (UXO) clearance, vessel movements, or piling/ drilling in the marine environment.
Natural England	09/05/2023	With all HDD there is a risk of 'frac-out'. Natural England recommend that the Construction and Environmental Management Plan (CEMP) or equivalent should include a frac-out contingency plan and a pollution incident	The potential for 'frac-out' risk as a result of HDD activities will be considered further as part of the ES. Any requirement for a frac-out contingency plan and a pollution incident response plan will be outlined within the Framework Construction Environmental

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		response plan. These should detail the clean-up operation. We would expect to be consulted on the CEMP later in the DCO process.	Management Plan (CEMP) to be submitted with the ES. A Hydraulic Fracture Risk Assessment will also be developed prior to construction of the Proposed Development.
Natural England	09/05/2023	The EIA scoping report is contradictory. Paragraph 6.8.27 suggests that UXO clearance measures are unlikely but Table B1 includes relevant screening measures. We would recommend that such measures are included. If not an explanation of the reasoning for omitting these measures should be provided.	It is not envisaged that there will be any planned UXO clearance within the marine environment as part of the Proposed Development. Any impact pathways associated with UXO are scoped out from further assessment.
Natural England	09/05/2023	Entrapment and entrainment within the water cooling system poses a risk to fish. Uptake of water for the water cooling system should consider all life stages of fish species and reduce fish entrainment.	The Proposed Development will use water from the existing NWL raw water supply to the Teesworks site; or a new connection to the existing NWL supply either via tie in to NZT infrastructure or the installation of a new connection. Therefore, there is considered no impact pathway to fish and shellfish from entrapment and entrainment, and this will not be considered further.
Natural England	09/05/2023	Hard structures (pipe outflow, rock armouring or equivalent) need to be assessed in the context not only of loss of habitat, but also potential changes in coastal processes and introduction of INNS.	No hard structures are being placed in the marine environment. At this stage, no pathway for the introduction of INNS has been identified. Therefore, a biosecurity plan for INNS in the marine

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		We note the applicant's reference to INNS and would advise a biosecurity plan, making sure everything brought to site (material/ gear/ water) has been assessed for INNS.	environment is not required and will not be produced.
Natural England	09/05/2023	The ES should use an appropriate biodiversity metric such as Biodiversity Metric 4.0 together with ecological advice to calculate the change in biodiversity resulting from proposed development and demonstrate how proposals can achieve a net gain.	Permanent loss of habitat in the intertidal area is not proposed. However, BNG requirements will be reviewed if there are any Proposed Development design changes.

Use of the Rochdale Envelope

14.3.16 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with The Inspectorate's Advice Note 9 (The Planning Inspectorate, 2018). This involves assessing the maximum/minimum reasonable worst-case parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example).

14.3.17 As outlined in Chapter 4: The Proposed Development (PEI Report, Volume I), the Proposed Development will include the installation of a hydrogen pipeline for the transportation of hydrogen (H_2) produced at the Production Facility, to off-takers in Teesside. The pipeline will be required to cross Greatham Creek to reach some of these off-takers.

14.3.18 As described in Chapter 5: Construction Programme and Management (PEI Report, Volume I), various pipeline routings and construction methodologies are currently being considered. These include options such as trenchless crossings (likely HDD), installation on existing above ground pipe racks, and repurposing and reuse of existing pipelines (where practicable). This is subject to ongoing design work, discussions with landowners and statutory consultees, as well as being informed by environmental surveys. At the north-western extent of the Hydrogen Pipeline Corridor, various options are still being considered and assessed, having regard to engineering constraints and environmental sensitivities, particularly around the Greatham Creek area.

14.3.19 The current preferred route for the Hydrogen Pipeline Corridor at Greatham Creek is between the mouth of Greatham Creek and the A178 Seaton Carew/Tees Road, by creating a new trenchless crossing to the west of the existing bridge.

14.3.20 The use of trenchless techniques (likely a micro-bored tunnel (MBT)) is also proposed for the proposed pipeline crossing options under the River Tees. The Applicant is not considering any scenario other than trenchless options for the crossing of the River Tees.

14.3.21 The routes have been selected to avoid environmentally sensitive areas where practicable. It is assumed that there will be no vessels required as part of the installation of the hydrogen pipeline crossings as all works will be undertaken from adjacent land.

14.3.22 For further detail regarding the proposed pipeline routings and construction methodologies, refer to Chapter 4: Proposed Development (PEI Report, Volume I), Chapter 5: Construction Programme and Management (PEI Report, Volume I) and Chapter 6: Need, Alternatives and Design Evolution (PEI Report, Volume I).

14.4 Baseline Conditions

14.4.1 The marine ecological baseline relevant to the Proposed Development is summarised below.

Existing Baseline

Designated Sites

14.4.2 The Proposed Development Site is situated within the Teesmouth and Cleveland Coast SPA/Ramsar/SSSI and Teesmouth National Nature Reserve (NNR). These sites, shown on Figure 14-2: Designated Sites with Marine Ecological Features (PEI Report, Volume II) and listed in Table 14-5, are in place for the protection of seals, and providing refuge at important haul-out sites. These sites are also designated for the protection of habitats and birds.

14.4.3 There are also several European designated sites within the Study Area and the wider North Sea which are designated for mobile marine mammals, listed in Table 14-5. These sites will be considered as part of the Habitats Regulations Assessment (HRA) which will be submitted as part of the DCO Application.

Table 14-5: National and European Designated Sites of Relevance to Marine Receptors

DESIGNATED/ PROTECTED SITE	APPROX. DISTANCE FROM STUDY AREA	DESIGNATED FEATURES RELEVANT TO THIS ASSESSMENT
NATIONAL SITES		
Teesmouth and Cleveland Coast SSSI	0 km	Breeding population of harbour seals
Teesmouth National Nature Reserve (NNR)	0 km	Protects habitats, birds and seals
EUROPEAN SITES		
Teesmouth and Cleveland Coast SPA/RAMSAR	0 km	Breeding and non-breeding wetland birds and supporting habitats (intertidal sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes)
Berwickshire and North Northumberland Coast SAC	85.6 km	Grey seal
Southern North Sea SAC	100.5 km	Harbour porpoise

14.4.4 The Southern North Sea SAC, which is designated for harbour porpoise, is located over 100 km away from the Proposed Development Site. This SAC has been scoped out from further assessment, as there is considered to be no pathway for effect to this designated site.

14.4.5 There are no sites within the Study Area designated for the protection of fish species. The fish species present in the Teesmouth and Cleveland Coast SPA/Ramsar site and

Teesmouth and Cleveland Coast SSSI provide an important food source to the protected features of the sites.

Benthic Habitats and Species

14.4.6 The information provided below on benthic habitats and species is derived from the following sources:

- Habitat mapping undertaken by the JNCC – Marine Nature Conservation Review (MNCR) area summaries (JNCC, 2019a);
- EA saltmarsh zonation and extent in England (EA, 2023b);
- Teesmouth and Cleveland Coast European Marine Site (EMS) Rocky Shore Survey 2010 (Natural England, 2015a);
- The intertidal mudflats GIS layer (Natural England, 2015b); and
- The UK Sea Map (JNCC, 2018).

Greatham Creek and Seal Sands

14.4.7 The marine habitats around Greatham Creek and Seal Sands consist of extensive areas of soft sediment including mud and sandflats. There is also coastal saltmarsh present in the intertidal zone of both areas (a designating feature of the Teesmouth and Cleveland Coast SSSI) and on Seal Sands a small patchy area of boulders (as outlined in Appendix 14A: Net Zero Teesside Benthic EUNIS Biotopes in the River Tees and Tees Bay (PEI Report, Volume III)).

14.4.8 The subtidal extent of Seaton Channel, Greatham Creek, and Seal Sands is also characterised by soft sediments, mud in particular (JNCC, 2019a). These habitats support several invertebrate species, including polychaetes ragworm (*Hediste diversicolor)* and the bristleworm (*Pygospio elegans),* as well as bivalves including the common cockle (*Cerastoderma edule)*.

14.4.9 Survey data is not available for Greatham Creek and Seals Sands specifically, but mapping data from magic.gov.uk indicates the EUNIS habitats present are as follows (as shown by Figure 14-3: Important Intertidal and Subtidal Benthic Habitats (PEI Report, Volume II)):

- Infralittoral/circalittoral soft sediments including sand and muddy sand (EUNIS A2.2), mud (EUNIS, A2.3) and mixed sediments (EUNIS, A2.4);
- 'Coastal saltmarsh and reed beds' (EUNIS A2.5); and
- 'Sublittoral sand' (EUNIS A5.2).

River Tees

14.4.10 The mouth of the River Tees is primarily comprised of estuarine soft sediment, with the muddy habitat becoming more dominant as mud content increases further into the estuary and river (JNCC, 2019a).

14.4.11 Intertidal rocky shore with areas of loose cobbles and boulders is also present along the eastern coastline of the river mouth to the left of the South Gare Breakwater (as

outlined in Appendix 14A: Net Zero Teesside Benthic EUNIS Biotopes in the River Tees and Tees Bay (PEI Report, Volume III)). These areas are highly exposed to wave action (JNCC, 2019a).

14.4.12 Bran Sands is located to the west of Coatham Sands on the other side of the dune system, within the mouth of the Tees Estuary. This is characterised as homogenous intertidal muddy sandflats (JNCC, 2019a). The location of Bran Sands means that it is comparatively sheltered from wave exposure, thereby allowing silt deposition and the formation of more muddy substrates. This muddy and sheltered habitat has allowed a more productive community of polychaetes and shellfish to develop compared to Coatham Sands. In particular, the intertidal Phase I survey identified higher abundances of the common cockle (*Cerastoderma edule*) and the lugworm (*Arenicola marina*).

14.4.13 Further upstream in the river, the mud content of the sediments increases. Littoral mud is common along estuarine shorelines and is composed of fine particulate sediment, such as clay and silt (EEA, 2019). These habitats often form extensive mudflats. Little oxygen penetrates these sediments; however, they still support communities of bivalves, oligochaetes and polychaetes (EEA, 2019). This is part of the habitat which qualifies as an Annex I priority habitat 'Mudflats and Sandflats not covered by seawater at low tide' (1140).

14.4.14 Biotopes present in the intertidal zones of the River Tees are:

- 'Amphipods and *Scolelepis* spp. In littoral medium-fine sand' (EUNIS A2.223);
- '*Hediste diversicolor* and *Macoma balthica* in littoral sandy mud' (EUNIS A2.312);
- 'Pontic association with *Enteromorpha intestinalis'* (EUNIS A1.241);
- 'Barnacles and *Littorina* spp. On unstable eulittoral mixed substrata' (EUNIS A2.431)
- *'Fucus serratus* on full salinity sheltered lower eulittoral rock' (EUNIS A1.3151);
- *'Semibalanus balanoides* on exposed to moderately exposed or vertical sheltered eulittoral rock' (EUNIS A1.113);
- *'Fucus vesiculosus* on moderately exposed to sheltered mid eulittoral rock' (EUNIS A1.313);
- *'Enteromorpha* spp. On freshwater-influenced and/or unstable upper eulittoral rock' (EUNIS A1.451);
- *'Ascophyllum nodosum* on very sheltered mid eulittoral rock' (EUNIS A1.314);
- '*Cerastoderma edule* and polychaetes in littoral muddy sand' (EUNIS A2.242) (represent of Annex I priority habitat and representative of UK habitats of principal importance (HPI) under Section 41 of the NERC Act 2006 (HM Government, 2006), although is not a qualifying feature of any nearby designated site);
- 'Littoral mud' (EUNIS A2.3); and

- *'Fucus vesiculosus* and barnacle mosaics on moderately exposed mid eulittoral rock' (EUNIS A1.213).

Tees Bay

14.4.15 The intertidal zone of Tees Bay consists of Coatham Sands, which is an exposed intertidal sandflat running from Redcar to South Gare Breakwater, approximately 4 km in length (as outlined in Appendix 14A: Net Zero Teesside Benthic EUNIS Biotopes in the River Tees and Tees Bay (PEI Report, Volume III)).

14.4.16 A Phase I and II intertidal benthic survey was undertaken in September 2019 by AECOM as part of the NZT Carbon Capture, Usage and Storage (CCUS) Project (The Inspectorate, Ref: EN010103) to characterise the intertidal habitats and species present within the vicinity of the Proposed Development Site (AECOM, 2021). Faunal communities exhibited low abundance, biomass, species richness and diversity, and except lugworm casts (*Arenicola* sp.), identified towards the northern end, very little evidence of benthic faunal activity was observed across Coatham Sands. The following biotopes were identified:

- Littoral sand and muddy sand (EUNIS A2.2) which included the following communities:
  - 'Talitrids on the upper shore and strandline' (EUNIS A2.211);
  - 'Polychaetes in littoral fine sand' (EUNIS A2.231), which also falls within the Annex I habitat 'mudflats and sandflats not covered by seawater at low tide';
  - 'Barren or amphipod-dominated mobile sand shores' (EUNIS A2.22), which qualifies as the Annex I habitat type 'mudflats and sandflats not covered by seawater at low tide';
  - *Cerastoderma edule* and polychaetes in littoral muddy sand (A2.242), which is present at Bran Sands; and
- '*Fucus vesiculosus* on variable salinity mid eulittoral boulders and stable mixed substrata' (EUNIS A1.323) (around the eastern edge of South Gare breakwater).

Subtidal Benthic Ecology

River Tees

14.4.17 Habitat mapping undertaken by the JNCC (JNCC, 2019) identified the habitat in the River Tees mouth to consist of extensive subtidal estuarine soft sediment (EUNIS A5.2, A5.3 and A5.4), with the mud content of the sediment quickly increasing with distance upstream with changes in salinity between North Gare Sands and Bran Sands and around the mouth of Seaton Channel.

14.4.18 Subtidal benthic surveys conducted in the Study Area by AECOM in 2019 as part of the NZT Project (AECOM, 2021) identified the following biotope in the area of the river sampled:

- *Nephtys hombergii* and *Macoma baltica* in infralittoral sandy mud (A5.331) (as outlined at Appendix 14A: Net Zero Teesside Benthic EUNIS Biotopes in the River Tees and Tees Bay (PEI Report, Volume III)).

Tees Bay

14.4.19 The subtidal benthic habitat in Tees Bay is characterised by soft sediments (JNCC, 2019a). A subtidal benthic survey conducted in Tees Bay in December 2019 as part of the NZT Project (AECOM, 2021) recorded two biotopes in the bay:

- '*Nephtys 32runcat* and *Bathyporeia* spp. In infralittoral sand' (EUNIS A5.233); and
- '*Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand' (EUNIS A5.242).

14.4.20 The former biotope was found in the shallow inshore area which is characterised by moderate to high exposure and sediments possessing a low clay/silt content, while the latter characterised stations which were located, in most cases, in slightly deeper, less exposed waters with a higher percentage of silt/clay (as outlined in Appendix 14A: Net Zero Teesside Benthic EUNIS Biotopes in the River Tees and Tees Bay (PEI Report, Volume III)). These two biotopes qualify as HPI as they are listed under Section 41 of the NERC Act (HM Government, 2006) and belong to the UK BAP priority habitat type, 'subtidal sands and gravels.'

Protected Habitats and Species

14.4.21 The saltmarsh habitat that exists in Greatham Creek and Seal Sands is a designating feature of the Teesmouth and Cleveland Coast SSSI. There are no benthic species that are specifically protected.

Invasive Non-Native Species

14.4.22 During intertidal and subtidal benthic surveys conducted in the Study Area by AECOM in 2019 (AECOM, 2021), one INNS of seaweed was found, namely wakame (*Undaria pinnatifida*), which was observed in intertidal habitat around South Gare breakwater with a sporadic distribution. There were no INNS observed in the subtidal habitat.

Fish and Shellfish

Summary of Species

14.4.23 Fish communities in the Teesside Region (including the River Tees, Tees Estuary, and Greatham Creek) are characterised by a diverse range of pelagic and demersal fish species, with assemblages typically including herring (*Clupea harengus*), mackerel (*Scomber scombrus*), cod (*Gadus morhua*), whiting (*Merlangius merlangus*), haddock (*Melanogrammus aeglefinus*), plaice (*Pleuronectes platessa*) and dab (*Limanda limanda*), (Teal, 2011; Callaway *et al*., 2002; EA, 2021a) (see Plate 14-1).

14.4.24 Within Greatham Creek, 3-spined stickleback (*Gasterosteus aculeatus*), common goby (*Pomatoschistus microps*), European flounder (*Platichthys flesus*) and European eel (*Anguilla 32runcate*) are present (Sun *et al*., 2021), and are therefore also likely to be present in the River Tees.

14.4.25 The river is an important waterbody for diadromous (i.e., migratory) fish species including salmon (*Salmo salar*), brown trout (*Salmo trutta*), European eel, river lamprey (*Lampetra fluvialis*) and sea lamprey (*Petromyzon marinus*). Shellfish species found in the Study Area include the Norway lobster, *Nephrops* sp., edible crab (*Cancer pagurus*) and European lobster (*Homarus gammurus*).

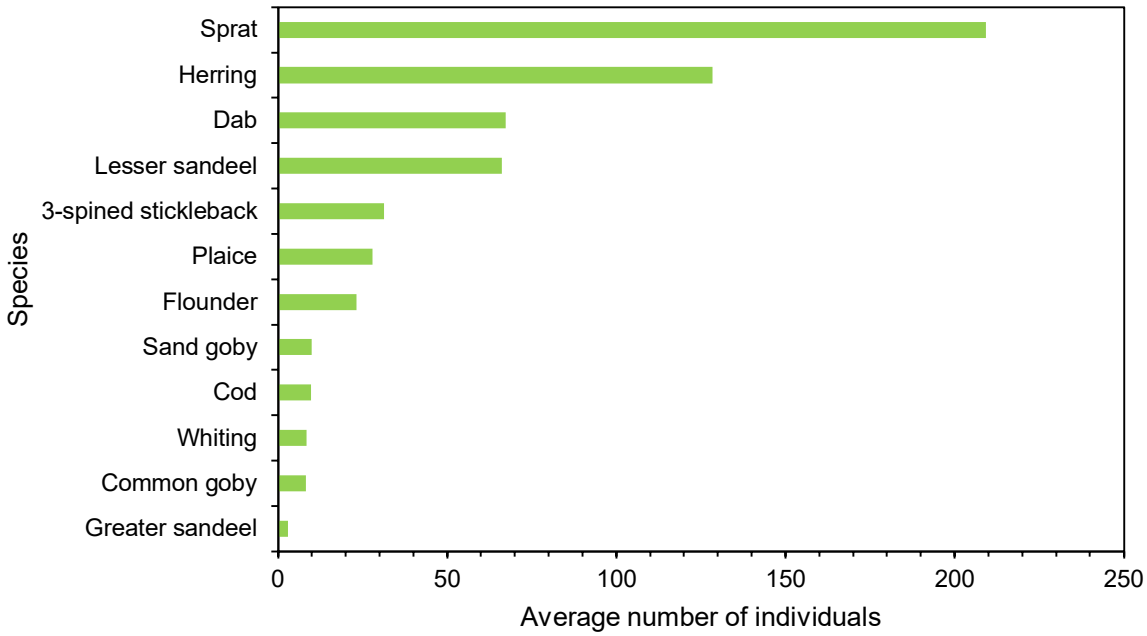

Plate 14-1: Average TraC Fish Counts for the top 10 Species Recorded in the Tees Estuary from 2010 to 2019 (EA TraC data, 2021a)

Spawning and Nursery Grounds

14.4.26 Broadscale fish sensitivity maps (Coull *et al*., 1998; Ellis *et al.,* 2012) indicate that spawning areas for lemon sole (*Microstomus kitt*) and Nephrops (Table 14-6) are found in Tees Bay. Haddock spawning grounds are also considered to occur in low abundance (González-Irusta and Wright, 2016). Lemon sole prefer deep sandy and gravelly habitats (Hinz *et al*., 2006), whereas Nephrops are more commonly found in marine environments with muddy substrates (Johnson *et al*., 2013).

14.4.27 The Study Area falls within nursery grounds for the following species: herring, anglerfish (*Lophius piscatorius*), plaice, cod, whiting, spurdog (*Squalus acanthias*), sprat (*Sprattus sprattus*), Nephrops and lemon sole (Coull *et al*., 1998; Ellis *et al.,* 2012).

14.4.28 These spawning and nursery grounds are considered to be present mostly in the surrounding coastal areas, although some species may occur in the estuary. For example, plaice have life history stages which occur within estuaries. Plaice larvae enter estuarine nursery areas during the flood tide where they stay whilst metamorphosing into adults, at which point they start to prefer sandy sediments (Heessen *et al*., 2015).

14.4.29 The nursery grounds for herring located in Tees Bay (Coull *et al*., 1998) are of high intensity (Ellis *et al*., 2012). Spawning and nursery grounds for sand eel are not located in Tees Bay but cover much of the North Sea (Coull *et al*., 1998; Ellis *et al*., 2012). Adults of both species are found in the River Tees and estuary in small numbers. The highest concentrations of sand eel are found in the lower reaches of the River Tees, whereas herring are found throughout the river, including Greatham Creek (EA, 2021a).

14.4.30 Both salmon and brown trout are also known to spawn in the upper reaches of the River Tees (Table 14-6). Brown trout is also known to occur in small numbers within Greatham Creek (Sun *et al*., 2021).

Table 14-6: Peak Spawning Times of Species for which Spawning Grounds Occur in the Study Area (Coull *et al*., 1998; Ellis *et al*., 2012)

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lemon Sole												
Nephrops				*	*	*						
Salmon												
Brown Trout												
Herring (Banks/Dogger stock)												
Sandeel *Ammodytes* spp.												
*peak spawning												

Migratory Fish

14.4.31 Diadromous fish species migrate between bodies of freshwater and seawater during different life phases. Major physiological changes associated with these movements occur to adapt to altered salinity and during such periods, sensitivity to environmental stressors increases (Shrimpton, 2012). Owing to their conservation importance, it is necessary to understand the migration patterns of the diadromous species known, or likely, to be present within the Study Area.

14.4.32 Several studies to observe migratory fish behaviour have occurred within the River Tees. Salmon and brown trout specifically have been heavily recorded migrating upstream. A three-year (2008, 2009 and 2013) tracking study of fish passage at the River Tees Barrage conducted by Moore and Potter (2014) observed a total of 237 fish species, 84% of which were salmon.

Salmon and Brown Trout

14.4.33 Salmon are an anadromous[1] migratory species, which during their lifetime utilise both marine and freshwater habitats. Spawning of salmon typically occurs in November or December, in the upper reaches of rivers where eggs are deposited into nests known as 'redds' cut into gravelly substrate (Heessen *et al.,* 2015; NASCO, 2010).

14.4.34 In the River Tees, the greatest numbers of redds are located upstream of Eggleston, with a relatively high density between Stapleton and Whorlton (EA, 2009). Once hatched, the larvae remain within the interstitial gravels (Heessen *et al*., 2015), before developing into fry, and from then to a 'parr' and a 'smolt' stage (McCormick *et al*., 1998). The migration of smolt down-river to the ocean usually occurs from spring to early summer, generally occurring earlier in the season for larger smolt (Thorstad *et al*., 2012; Heessen *et al*., 2015).

14.4.35 Brown trout life history traits include individuals that complete their lifecycle in freshwater, and those that predominately inhabit estuarine waters (Harris *et al*., 2017). Sea trout are therefore anadromous brown trout. Brown trout exhibit a similar life cycle to Atlantic salmon. However, some immature smolt migrate back to freshwater environments after only a very short time feeding at sea (usually in the first winter in the ocean) (Gargan *et al*., 2006). Adult brown trout returning to freshwater to spawn are more likely to stray from natal rivers (Degerman *et al*., 2012; Gauld *et al*., 2013; King *et al*., 2016). Spawning usually takes place in autumn or winter, on stone and gravel bottoms (Heessen *et al*., 2015).

14.4.36 The results of the monthly upstream fish count from 2011 to 2022 show that salmon and brown trout were recorded to occur in the months of June to October (refer to Plate 14-2). Typically, peak numbers of fish were recorded in July and August though in 2015 the peak occurred in September. An average of the counts over this period shows the peak value occurred in August (mean = 180.2; std. = 219.5). Particularly high numbers of salmon and brown trout were reported in 2012 (1,661 individuals) and 2013 (1,161 individuals) however, in recent years numbers have declined, with only 266 individuals recorded in 2022. Counts only include the upstream migration of salmon and brown trout through the fish pass.

14.4.37 Brown trout were observed in the autumn breeding season downstream of Cloff Bridge Weir in Claxton Beck stream which flowed into Greatham Creek before the removal of the weir (Sun *et al*., 2021). Since the removal of the weir in 2018, the presence of brown trout has declined.

[1] Anadromous fish are fish that migrate from the sea into freshwater for spawning. This distinguishes them from catadromous fish, such as eels which migrate in the opposite direction, moving from freshwater to spawn in the sea.

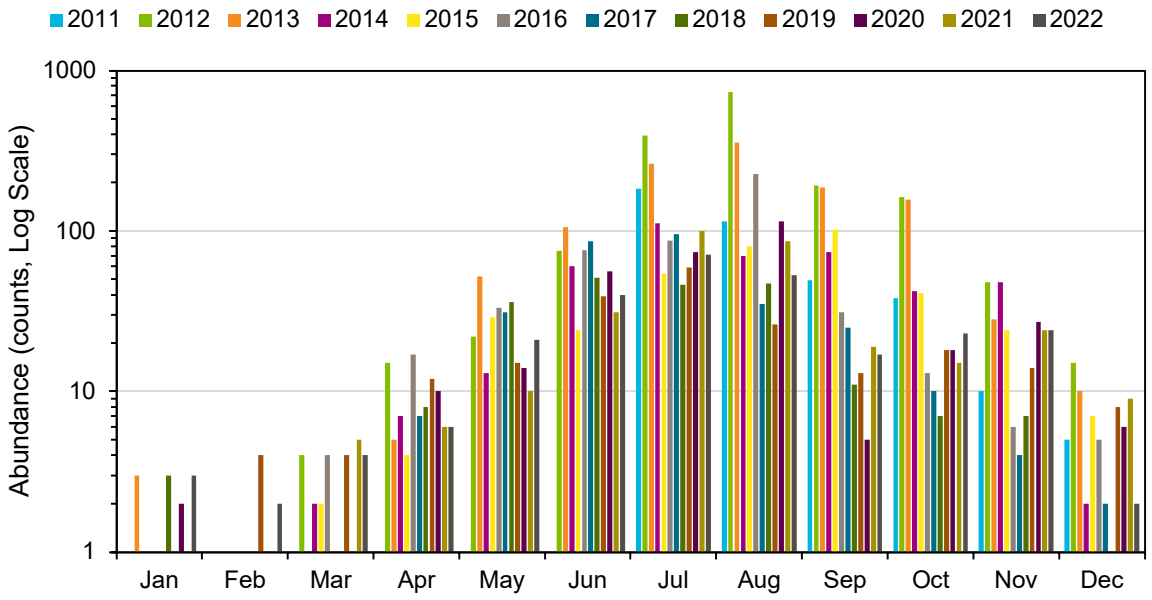

Plate 14-2: Monthly Combined Upstream Counts for Salmon and Brown Trout from 2011 to 2022 at the Tees Barrage on the Lower Tees, Reported by the EA (EA, 2023a).

Note: No data were reported for January to June 2011.

European eel

14.4.38 European eel is a catadromous migratory species, whose spawning occurs in the Sargasso Sea where the adults subsequently die. Spawning occurs mainly in spring (Righton *et al*., 2016). Newly hatched larvae metamorphose into glass eels which then travel across shelf seas, using tidal stream transport. Glass eels migrate upstream into freshwater, predominately during spring but may continue to do so until early Autumn (Heessen *et al*., 2015; ICES, 2010). Once within freshwater habitats, eels remain for five to 15 years, transforming into yellow eels and then finally to silver eels when they begin their downstream migration through rivers and estuaries towards spawning grounds, predominately between August and December (Behrmann-Godel and Eckmann, 2003; Tesch, 2003; Chadwick *et al.,* 2007).

14.4.39 Throughout England, European eels are present in almost all rivers, although in recent years their numbers have dramatically declined. This has resulted in European eels being listed as 'critically endangered' on the IUCN Red List since 2008. Reasons for the decline in numbers include barriers to migration, hydropower turbines, loss of wetland, and the introduction of the parasitic nematode *Anguillicola crassus* (UK BAP, 2012). The River Tees Barrage has the potential to act as a barrier but has built opportunities for the migration of glass eels into its design, though the escapement of adult silver eels around the barrage is unknown.

14.4.40 The current population size and distribution of European eels in the River Tees is unknown. However, they have been reported in the EA TraC surveys in the River Tees (see Plate 14-3), with a total of 178 individuals found in total across all surveys. TraC surveys included counts taken from Greatham Creek, though no European eels were

recorded from this site. The majority of European eel were recorded in the upper reaches of the River Tees.

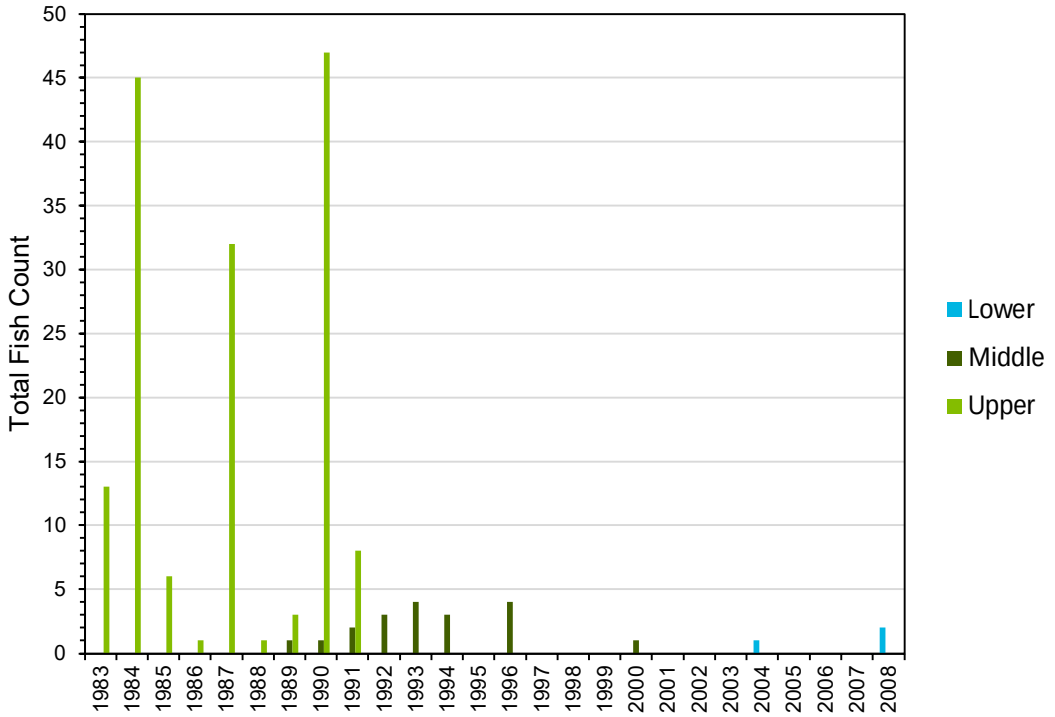

Plate 14-3: Total Fish Counts for European eel, in EA (2021a) TraC Surveys in the Three Reaches of the River Tees

14.4.41 However, European eel are known from other studies to be present in Greatham Creek, with recorded density increasing after the removal of Cloff Bridge Weir by the Tees Rivers Trust in 2018 (Sun et al., 2021). The colonisation of juvenile eels also occurred rapidly following the removal of the barrier.

River and Sea Lamprey

14.4.42 Sea lamprey and river lamprey are both anadromous migratory species, spawning in freshwater. Adults return to freshwater once they have spent several years in the marine environment (Laughton and Burns, 2003). Both species spawn in spring and early summer (Laughton and Burns, 2003).

14.4.43 Sea lamprey are widely dispersed in the open sea as they are solitary feeders, and rarely found in coastal and estuarine waters (Moore *et al*., 2003; Heessen *et al*., 2015). The distribution of sea lamprey is chiefly defined by their fish host which includes salmon (Waldman *et al*., 2008) and they are often found at considerable depths in deeper offshore waters (Moore *et al*., 2003). When returning to freshwater, sea lamprey generally chooses larger rivers compared to river lamprey, although they can be found in tributaries of all sizes (Heessen *et al*., 2015).

14.4.44 River lamprey generally spend one to two years in estuaries and in the autumn, between October and December, stop feeding and move upstream (Natural England, 2010). Sea lamprey normally migrate into freshwater in April and May as adults,

whilst the migration to sea can vary from river to river, although the metamorphosis of larvae into adults occurs in July and September (Maitland, 2003).

14.4.45 The UK distribution of river lamprey and sea lamprey, presented in Plate 14-4, shows that both species have been recorded in the River Tees. River lamprey were also recorded in the EA TraC surveys of the River Tees, with three individuals observed in the middle reaches in 1992. Although this suggests that sea lamprey is present in the River Tees, this species has not been recorded during the EA TraC surveys to date.

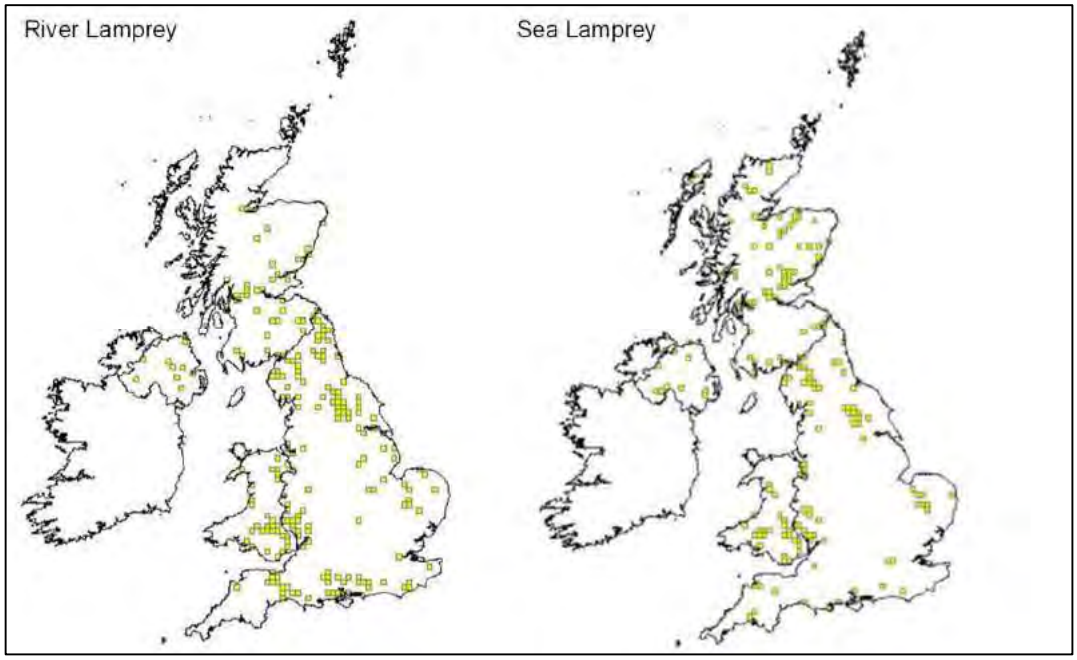

Plate 14-4: UK Distribution of River Lamprey (left) and Sea Lamprey (right) (JNCC, 2013a and 2013b)

Protected Fish Species

14.4.46 Table 14-7 lists all the fish species known to be present in the Study Area which are protected under national and international conservation legislation. With the exceptions of sand eel and the diadromous fish, all the species listed are also considered to be of commercial importance within the Study Area.

14.4.47 There are no shellfish species which are afforded conservation protection known to be present in the Study Area.

Table 14-7: Summary of Relevant Fish Species Protected by National and International Legislation or Policy

COMMON NAMES	LATIN NAMES	HABITATS DIRECTIVE ANNEX II AND IV SPECIES	OSPAR LIST OF THREATENED AND/OR DECLINING SPECIES	BONN CONVENTION APPENDIX I AND II SPECIES	BERN CONVENTION APPENDIX II AND III SPECIES	NERC 2006 SPECIES OF PRINCIPAL	FEATURES OF CONSERVATION INTEREST	IUCN RED LIST*
Herring	*Clupea harengus*					✓	✓	LC (↑)
Mackerel	*Scomber scombrus*					✓	✓	LC (↓)
Cod	*Gadus morhua*		✓			✓	✓	VU (-)
Whiting	*Merlangius merlangus*					✓	✓	LC (?)
Haddock	*Melanogrammus aeglefinus*							VU (-)
Plaice	*Pleuronectes platessa*					✓	✓	LC (↑)
Dab	*Limanda limanda*							LC (↑)
Sandeel	*Ammodytidae*					✓[1]	✓[1]	LC (?)[1]
Atlantic salmon	*Salmo salar*	✓	✓			✓	✓	LC (-)

COMMON NAMES	LATIN NAMES	HABITATS DIRECTIVE ANNEX II AND IV SPECIES	OSPAR LIST OF THREATENED AND/OR DECLINING SPECIES	BONN CONVENTION APPENDIX I AND II SPECIES	BERN CONVENTION APPENDIX II AND III SPECIES	NERC 2006 SPECIES OF PRINCIPAL	FEATURES OF CONSERVATIO N INTEREST	IUCN RED LIST*
Brown trout	*Salmo trutta*					✓		LC (?)
European eel	*Anguilla anguilla*		✓	✓		✓	✓	CR (↓)
Sea lamprey	*Petromyzon marinus*	✓	✓		✓	✓	✓	LC (↔)
River lamprey	*Lampetra fluviatilis*	✓				✓	✓	LC (?)

* IUCN Red List Status defined as 'CR' = Critically Endangered, 'EN' = Endangered, 'VU' = Vulnerable, 'NT' = Near Threatened, 'LC' = Least Concern and 'DD' = Data Deficient.
Population trends are also shown in brackets ('↑' = increasing, '↓' = decreasing, '↔' = stable, '?' = unknown and '-' = unspecified).

Marine Mammals

Cetaceans

14.4.48 The Proposed Development Site is located within the International Council for the Exploration of the Sea (ICES) Greater North Sea Ecoregion, which in part forms the boundaries for the Inter-Agency Marine Mammal Working Group (IAMMWG) Marine Mammal Management Units (Mus) for the North Sea (ICES, 2021; IAMMWG, 2022).

14.4.49 Within the Greater North Sea Ecoregion, there are four commonly occurring or resident cetacean species: harbour porpoise (*Phocoena phocoena)*, bottlenose dolphin (*Tursiops 41runcates*), white-beaked dolphin (*Lagenorhynchus albirostris*) and minke whale (*Balaenoptera acutorostrata*) (ICES, 2023). There are a further six cetacean species which are considered to occur regularly, but are less common than those mentioned above, namely: common dolphin (*Delphinus delphis*), Atlantic white-sided dolphin (*Lagenorhynchus acutus*), Risso's dolphin (*Grampus griseus*), long-finned pilot whale *Globicephala mela*, killer whale (*Orcinus orca*) and humpback whale (*Megaptera novaeangliae*).

14.4.50 However, it is considered unlikely that these species will occur in the River Tees itself, although harbour porpoise could occur in the surrounding coastal waters, such as in Tees Bay. Harbour porpoise are present in the North Sea throughout the year, with numbers peaking from July – September (Hague, *et al*., 2020) coinciding with mating/calving periods (May – August) (Learmonth *et al*., 2014). No designated sites for harbour porpoise are located within the Study Area. However, the Southern North Sea SAC, for which harbour porpoise is a qualifying feature, is located approximately 100.5 km to the south.

14.4.51 All cetacean species are protected in the UK by the WCA (1981) and are European Protected Species (EPS) under the European Commission Habitats Directive (Annex II and IV). They are also protected internationally by the Bern Convention Appendix II (Council of Europe, 1979). Furthermore, all but the minke whale are also protected internationally by the Bonn Convention Appendix II (Conservation of Migratory Species (CMS), 2020) and the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS, 1991).

Pinnipeds

14.4.52 The immediate area around the Proposed Development Site is of local importance for harbour seal *Phoca vitulina* and grey seal *Halichoerus grypus* due to the presence of a breeding colony and haul-out sites at Seal Sands and along Greatham Creek. Harbour seals are the most abundant (INCA, 2022).

Harbour Seal

14.4.53 Seal Sands is a known haul-out site for a breeding colony of harbour seal, which use the intertidal mudflat in this area. Greatham Creek is also known to be frequented by small numbers of individuals, which haul-out at multiple locations along the creek, particularly at Bailey Bridge. Seal Sands is designated for harbour seal as part of the Teesmouth and Cleveland Coast SSSI and Teesmouth NNR.

14.4.54 Seals Sands and its population in the River Tees, is the only significant haul-out site within the Northeast England MU (SCOS, 2021), which also includes harbour seals found at Holy Island, situated off the north-east coast of England, south of Berwick-upon-Tweed.

14.4.55 Seals 'haul-out' at shore sites for breeding, nursing, moulting and resting (SCOS, 2021). Harbour seals haul-out patterns tend to be strongly influenced by tidal cycles and many seals haul-out on the falling tide in areas below the high tide mark. The highest numbers of seals are usually hauled-out during the breeding season and subsequent moult, although numbers may remain high year-round in areas with suitable foraging grounds available locally (Härkönen, 1987; Wilson, 2001). Foraging areas for harbour seal are thought to extend 40 – 50 km from haul-out sites (SCOS, 2021). They typically consume 3-5 kg of food per day depending on the availability of prey species (SCOS, 2021).

14.4.56 Plate 14-5 shows the maximum number of harbour seal recorded in Greatham Creek and Seal Sands, including the haul-out site at Bailey Bridge, between 1989 and 2022 (INCA, 2022). The annual estimate represents the maximum number of seals hauled-out at any one time over the entire survey period. Surveying was carried out on an annual basis between June and September and generally encompassed the pupping period and a proportion of the moulting period.

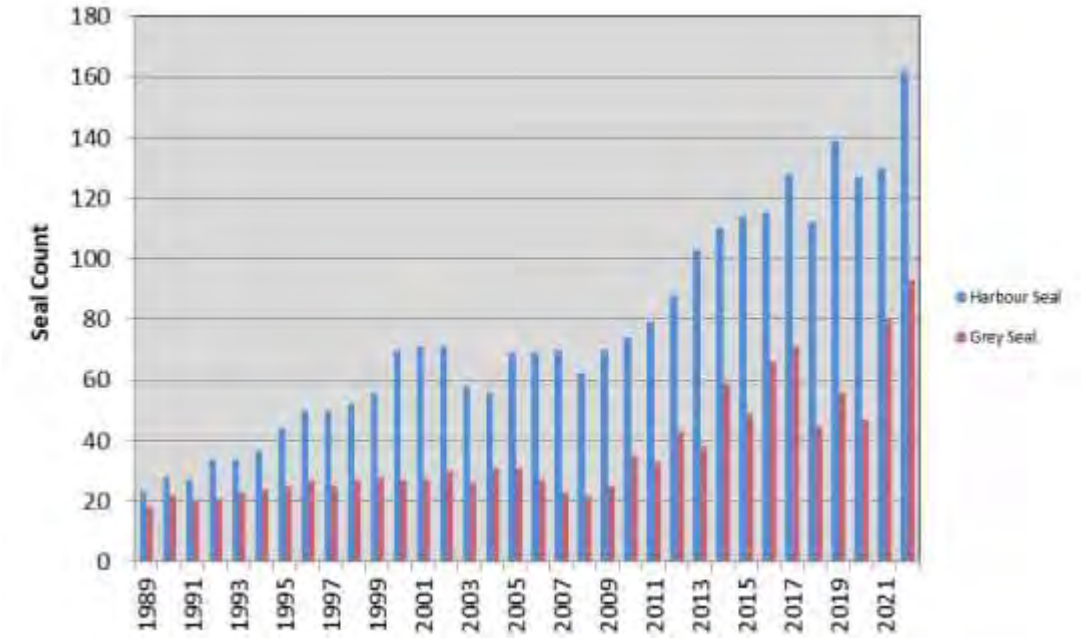

Plate 14-5: Maximum Number of Harbour Seals and Grey Seals Recorded at Greatham Creek and Seal Sands (INCA, 2022)

14.4.57 Incidental sightings of harbour seal were recorded on Seal Sands while undertaking other surveys for the Proposed Development on nine different days between October 2022 and March 2023. A total of 144 were recorded across this period and all were considered to be adults. The seals were observed hauled-out at scattered locations on Seal Sands and in Greatham Creek.

14.4.58 The maximum number of harbour seal in the Tees Estuary has increased overall since 2010, with the highest estimate recorded to date observed in August 2022 with 162 individuals (INCA, 2022). This included 36 pups, the highest number and increase recorded. There were also no pup deaths reported during weaning in 2022, being the highest survivability rate recorded since 1989. Within the Tees Estuary, pupping is known to take place mostly at Seal Sands, with some also at Bailey Bridge.

14.4.59 The pupping season at the Tees typically occurs during late June and lasts for about three weeks into late July, typical of other populations in the north-east Atlantic (INCA, 2022). The moulting season follows, typically from mid-August until early September, when seals spend a considerable amount of time out of the water to rest and conserve heat.

14.4.60 Although harbour seals are present within the vicinity of the Proposed Development Site and are likely to use the adjacent sea area for foraging, in the context of wider populations in the North Sea, the immediate Study Area is not considered to be heavily used by this species compared to other areas around the UK coast (as shown by Figure 14-4: Harbour Seal Mean At-Sea Distribution (PEI Report, Volume II)).

14.4.61 Populations along the eastern English coast, from Kent to the Scottish border, have generally increased in recent decades, including in the Tees. However, since 2019, there has been a decrease in the numbers of harbour seal in other parts of the UK, particularly in Scotland, attributed in part to outbreaks in phocine distemper virus (PDV) (SCOS, 2021). Whilst the range of this species is at a 'favourable' conservation status, its overall conservation status is considered to be 'unfavourable – inadequate'. However, this is a positive change from 'unfavourable – bad' since the last reporting in 2013, due to an overall increase in the abundance of harbour seal in the UK (JNCC, 2019b). The global conservation status of harbour seal is of 'least concern' (IUCN, 2023).

Grey Seal

14.4.62 The Proposed Development Site and the wider Tees area fall within the Northeast England Seal Management Unit. Within this management unit there are major colonies of grey seal, in both the north (Isle of May, Fast Castle, Farne Islands) and south (Donna Nook, Blakeney Point and Horsey/Winterton), either side of the Tees area (as shown by to Plate 14-6). On Plate 14-6, blue ovals indicate groups of colonies within each region, whilst red stars denote less frequently surveyed colonies in England, Northern Ireland and the Isle of Man.

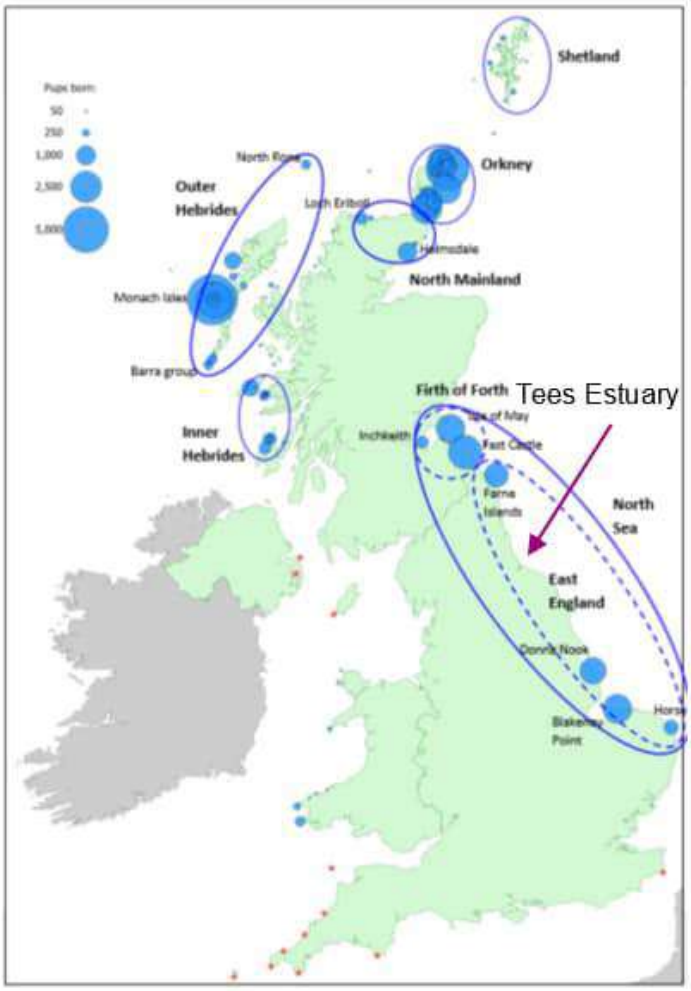

Plate 14-6: Distribution and Size of the Main Grey Seal Breeding Colonies in the UK (SCOS, 2021)

14.4.63 The latest count of grey seals in the North Sea, which included the Northeast England MU, as well as East Scotland and Southeast England MUs, took place in between 2016-2018 and was estimated at 19,160 individuals (SCOS, 2021). Pup production in Northeast England has continued to increase rapidly with a mean increase of 53% between 2014 and 2019. Most of the increase in the North Sea has been due to the continued rapid expansion of newer colonies on the mainland coasts in Berkwickshire, Lincolnshire, Norfolk and Suffolk.

14.4.64 Grey seals forage in the open sea in depths up to 100 m and, like harbour seals, they return regularly to haul-out on land where they rest, moult and breed. They may range widely to forage, with foraging trips lasting between 1 to 30 days (SCOS, 2021). Modelling has shown that grey seals typically spend 43% of their foraging time within 10 km of a haul-out site (McConnell *et al*., 1999), with maximum foraging range believed to be up to 135 km (SCOS, 2020).

14.4.65 Seal Sands on the River Tees is an important haul-out site for this species, although the grey seal population here is smaller than that for harbour seals (Plate 14-5; INCA, 2022). However, there has been an overall increase in the grey seal population since

2010. Maximum recordings of individuals on Seal Sands were down between 2018 and 2020. However, a peak count of 96 individuals was recorded in August 2022, when all grey seals counted were hauled-out on Seal Sands, suggesting that population size is increasing.

14.4.66 Incidental sightings recorded during other related surveys on nine different days between October 2022 and March 2023 observed 94 adult grey seals, all haul-out on Seal Sands.

14.4.67 In December 2022, a grey seal pup at Seal Sands was recorded alongside an adult female, which is thought to be the first observation of a grey seal born in the Tees (INCA, 2022). Grey seals are also known to use Greatham Creek but are only occasionally recorded here in small numbers.

14.4.68 Although grey seals are present within the Study Area and are likely to use the adjacent sea area for foraging, in the context of the populations in the wider North Sea, the Study Area is not considered to be heavily used by this species (Figure 14-5: Grey seal mean at-sea distribution (Carter *et al*., 2020), PEI Report, Volume II). This is supported by historical boat-based surveys in the vicinity of the Dogger Bank Teesside A & B Wind Farm which recorded relatively few sightings of grey seal (<20 per sampling month) (January 2010 to June 2012) (Gardline Environmental, 2012). The average absolute density estimated for the survey period was 0.02131 (95% CI = 0.016 – 0.033) with a peak density of 0.5 seals per km^2.

14.4.69 The UK grey seal population is considered to be stable and increasing, particularly within the eastern England colonies which is supported by local observations in Teesmouth (SCOS, 2021; INCA, 2022). Overall, this species is at 'favourable' conservation status in the UK (JNCC, 2019b). Globally, populations are also considered to be increasing and therefore the conservation status of this species is of 'least concern' (IUCN, 2023).

Future Baseline

14.4.70 The River Tees and Estuary has had a long industrial and urbanised history during which time disturbance to the marine environment has been high. Historically, human activities have led to range of impacts including increased water pollution and reduced access to upstream environments which have resulted in several well documented ecological effects, including a decline in the abundance of migratory fish species and seals within the Tees Estuary (Cefas *et al*., 2019; INCA, 2019).

14.4.71 In recent years, conservation and management efforts have seen an improvement in environmental conditions and a recovery in some species' populations. Trends for several species, such as harbour seal, are generally increasing (INCA, 2019), whilst for others such as Atlantic salmon, populations remain at risk (Cefas *et al*., 2019). Future management measures (e.g., continued improvements in water quality, removal of instream barriers and the installation of fish passes and screening at intakes) can be expected to facilitate improvements in species populations, although it is not possible to quantify the future benefits of such measures.

14.4.72 However, starting in October 2021 and continuing periodically through 2022, large numbers of dead and dying crustaceans were washed up on the north-east England

coastline, including Teesside (Defra, 2023). Some crustaceans were observed displaying unusual twitching behaviour. The exact cause of death has been highly disputed. However, several explanations have been proposed, including disease, harmful algal blooms, chemical toxicity resulting from historical industrial activity in Teesside, and dredging in the Tees area, including Tees Estuary. The most likely cause of death is a novel pathogen. However, the mortality event is still largely unexplained, suggesting similar events could continue to occur into the future without an identifiable cause and therefore focused mitigation.

14.4.73 Other factors which pose a risk to marine ecological receptors include the prevalence of disease and climate change. Outbreaks of PDV can lead to mass mortality of seals. In 2019, unprecedented levels of seal pup mortality were observed in the Study Area and although no specific cause was identified, individuals displayed symptoms which indicated some type of infection (INCA, 2019).

14.4.74 Climate change is not expected to have an impact on the future baseline of the Study Area within the relatively short timeframe of the Proposed Development. Changes in sea temperature may have a small effect on the abundance and distribution of certain species. However, these changes are unlikely to be detectable in the short term of the construction phase of the Proposed Development. Changes due to sea temperature increase are more likely to occur during the operational or decommissioning phases. Impacts during decommissioning are thought to be similar to those during construction and changes in the baseline are not likely to be significant.

14.5 Proposed Design and Impact Avoidance Measures

14.5.1 The following design and impact avoidance measures are those that are inherent to the design of the Proposed Development. The measures proposed have considered the reasonable worst-case scenarios.

14.5.2 A Framework CEMP will be included within the ES which will accompany the DCO Application. It will set out the key measures to be employed during the construction phase of the Proposed Development to control and minimise the impacts on the environment. The CEMP will set out how impacts upon the marine environment will be managed during construction. A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO. The Framework CEMP will include the requirement for a Water Management Plan (WMP). These documents are intended to secure all good practice and mitigation measures to be executed during the construction phase to control and minimise impacts on the environment.

Table 14-8: Summary of Design and Impact Avoidance Measures

DESIGN AND IMPACT AVOIDANCE MEASURE	DESCRIPTION
Use of trenchless ('no dig') construction technologies (HDD/ MBT) for pipeline installation	Trenchless technologies (such as HDD) will be utilised for the Hydrogen Pipeline Corridor crossing of Greatham Creek, to minimise disturbance to the marine environment and other sensitive receptors. The Applicant is not considering any scenario other than trenchless techniques (most likely MBT) for the crossing of the River Tees. Trenchless technologies are also proposed in other environmentally sensitive areas.
Vessels	It is assumed that there will be no vessels required as part of the installation of all trenchless crossings as all works will be undertaken from adjacent land. However, if vessels are required, it is assumed that all vessels associated with the Proposed Development adhere to the following: – Harbour Authority approvals; – International Convention for the Control and Management of Ships' Ballast Water and Sediments with the aim of preventing the spread of marine INNS (IMO, 2017); – International Maritime Organisation (IMO) Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (Biofouling Guidelines) (IMO, 2011); – International Regulations for Preventing Collisions at Sea (IMO, 1972) and regulations relating to International Convention for the Prevention of Pollution from Ships (the MARPOL Convention 73/78) (IMO, 2021) with the aim of preventing and minimising pollution from ships; and – The Shipboard Oil Pollution Emergency Plan (IMO, 2019); all vessels shall have a contingency plan for marine oil pollution.
Specified construction hours	Construction working hours will generally be Monday to Friday 07:00 to 19:00 and Saturday 07:00 to 16:00 plus, up to one hour before and/or after for mobilisation (start-up and close down) procedures, thereby offering marine ecological receptors respite from any disturbance. However, some construction activities that cannot be interrupted, such as certain specialist crossing activities

DESIGN AND IMPACT AVOIDANCE MEASURE	DESCRIPTION
	such as HDD (which produce continuous sound sources only), are likely to continue outside the general core working hours and may operate 24 hours a day at certain times.
Controlled use of construction and operational lighting	Construction and operational lighting will be arranged so that glare and light spill outside the construction site is minimised to avoid impacts to sensitive ecological features. An Outline Lighting Design will be prepared to accompany the DCO application to demonstrate how lighting impacts on sensitive ecological features will be reduced.
Water Management Plan	Within the Final CEMP prepared by the contractor there will be a Water Management Plan (WMP) that sets out the principles that will be adhered to manage the risk of water pollution. The overriding principles of the WMP and the range of measures to be adopted, are outlined in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I). These include measures in relation to: – drainage and run-off strategies during construction and operation phases; – bunding of certain materials; – pollution prevention plan; and – emergency response plan.
Drainage Strategy	A formal Surface Water Drainage Strategy will be developed for the operational phase of the Proposed Development. A Surface Water Maintenance and Management Plan will also be developed prior to construction, detailing information relating to access, and maintenance of the different Sustainable Drainage Systems (SuDS) and surface water features proposed on the Proposed Development Site. A site Emergency Response Plan will be produced for the operational phase to deal with emergency situations involving loss of containment of any hazardous substances. Key actions which will be included within this plan are outlined in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I).

DESIGN AND IMPACT AVOIDANCE MEASURE	DESCRIPTION
Decommissioning Environmental Management Plan (DEMP)	A DEMP will be produced and agreed with the relevant statutory consultees as part of the Environmental Permitting and site surrender process. The DEMP will consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how these risks can be removed or mitigated. Decommissioning activities will be conducted in accordance with the appropriate guidance and legislation.

14.6 Impacts and Likely Significant Effects

14.6.1 This section presents a preliminary assessment of impacts and likely significant effects associated with construction, operation (including maintenance) and decommissioning of the Proposed Development on marine ecological receptors in the absence of any mitigation, over and above that which is inherent to the design and good practice as detailed in Section 14.5.

14.6.2 The proposed use of trenchless technologies for the Hydrogen Pipeline Corridor crossings of Greatham Creek and the River Tees are considered unlikely to result in any impacts to marine ecology.

14.6.3 Visual disturbance to fish and marine mammals from the use of artificial lighting has also been scoped out. Construction and operational lighting will be arranged so that glare and light spill outside the construction site is minimised to avoid impacts to sensitive ecological features. An Indicative Lighting Strategy will be prepared to demonstrate how lighting impacts on sensitive ecological features (as detailed in Table 14-8).

14.6.4 Underwater sound has been scoped out from further assessment, as the use of vessels is not proposed; any drilling or piling in the marine environment is not likely to be required; and planned UXO clearance is considered unlikely. Trenchless technologies such as HDD will be at a depth of approximately 10-15 m and will be such that there is no pathway for planned activities for effect to marine ecological receptors, as the works will be through bedrock below marine sediment. This is assumed to occur at a sufficient depth where underwater sound effects to migratory fish are unlikely.

14.6.5 It is also considered that there is no pathway for introduction of marine INNS.

14.6.6 It is not yet fully understood how net nutrient neutrality associated with the Proposed Development may impact marine ecological features. Process water effluent discharge is currently considered to be the only pathway through which a change from existing conditions could occur. As a result, hydrodynamic dispersion modelling for the discharge of a nitrogen load associated with the Proposed

Development into Tees Bay is due to be undertaken. Once the modelling has been conducted, further assessment will be required to assess any impacts that may occur which will be completed in detail during the EIA and reported in the Habitats Regulations Assessment. Surface water runoff impacts from foul effluent and impact from atmospheric deposition are proposed to be screened out of the nutrient neutrality assessment. However, impacts from these pathways (except atmospheric deposition) will be considered further in relation to the operational phase of the Proposed Development and will be included in the ES. Atmospheric deposition of nitrogen is not considered further for EIA purposes on the basis that tidal washing will remove any nitrogen from the Proposed Development within the intertidal zone, meaning any effects to marine receptors will be negligible.

14.6.7 The likely impacts and effects of the Proposed Development on marine ecological features, that have been scoped in for consideration within this PEI Report chapter, are summarised in Table 14-9.

Table 14-9: Likely Impacts Scoped in for Further Assessment and Marine Ecological Features Most Likely to be Affected by the Proposed Development

	DESIGNATED SITES	INTERTIDAL HABITATS AND SPECIES	SUBTIDAL HABITATS AND SPECIES	FISH AND SHELLFISH	MARINE MAMMALS
Indirect Effects to Marine Ecology from Changes in Marine Water Quality During Construction	✓	✓	✓	✓	✓
Changes in the Airborne Soundscape and Visual Disturbance During Construction	✓				✓

Construction

14.6.8 The following sections present a preliminary assessment of likely significant effects during construction of the Proposed Development on marine ecological features.

Indirect Effects to Marine Ecology from Changes in Marine Water Quality

14.6.9 During land-based construction activities for the Proposed Development, there is the potential for discharges into the marine environment from polluted surface water run-off and land drainage, including accidental spillages of fuel, oils and chemicals, as well as 'frac-out' events. These discharges have the potential to alter water quality

in terms of physico-chemical, biological, and chemical parameters in Greatham Creek, the Tees Estuary and Tees Bay, with indirect effects to marine ecology.

14.6.10 The release of air pollutants produced by land-based construction machinery and vehicles during the construction is predicted to have no significant effect upon air quality (see Chapter 8: Air Quality, PEI Report Volume I). As such, there is considered to be no pathway for impacts to water quality and hence marine ecology. Furthermore, it is not anticipated that vessels will be required for the Proposed Development, and therefore accidental spillages of vessel fuel is unlikely and have not been assessed as there will be no impact pathway.

14.6.11 Several design and good practice mitigation measures have been proposed (outlined in Section 14.5) which are intended to reduce and avoid the risk of pollutants entering the marine environment.

14.6.12 The direct effects to marine water quality are considered in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I). With the implementation of appropriate design and good practise measures as detailed in the chapter, the assessment concludes that effects to the nearby waterbodies from changes in surface water quality during the construction phase will not be significant.

14.6.13 All non-marine waterbodies that could also be impacted ultimately discharge into Tees Estuary and then Tees Bay. However, given the highly dynamic nature of Greatham Creek, the Tees River, and Tees Bay, in the unlikely event that pollutants or contaminants were accidently released, these would be rapidly dispersed and diluted. This would mean that any indirect effects to benthic ecology would be highly localised, temporary, and short-term. Furthermore, mobile receptors such as fish and marine mammals (including seals) are expected to move away from any affected area, and thus effects to these receptors would be limited.

14.6.14 Considering the nature of the impact, any significant effect to the abundance, distribution or functioning of habitats and species populations beyond the local level is considered unlikely. Therefore, indirect effects to marine ecology receptors from changes in marine water quality during the construction of the Proposed Development are predicted to be negligible (Not Significant).

Changes in the Airborne Soundscape and Visual Disturbance During Construction

14.6.15 Marine and land-based construction activities associated with the Proposed Development will create airborne sound and changes in visual cues which has the potential to disturb seals that are hauled-out nearby or have surfaced. The effects of disturbance could include a cessation of feeding, travelling, resting, breeding and/or socialising. Long-term effects of repeated disturbance could include a permanent displacement and/or a decline in fitness and productivity (such as moulting and breeding success).

14.6.16 A haul-out site for breeding grey and harbour seals is located at Seal Sands. Seals are also known to haul-out along Greatham Creek and at Bailey Bridge, travelling between these locations. These sites are in proximity to the Proposed Development Site boundary, with the furthest haul-out site located approximately 2.5 km to the east. Seal Sands supports the greatest number of seals followed by Greatham Creek

and Bailey Bridge. On Seal Sands, the majority of harbour seals and grey seals are known to haul-out at hall-out sites A and D, respectively, as shown on Plate 14-7.



Plate 14-7: Location of Haul-Out Sites on Seal Sands (INCA, 2022)

14.6.17 To inform the assessment of changes in the airborne soundscape, baseline ambient sound measurements have been taken from the industrial area surrounding Seal Sands, including on the Seal Sands emergency access road, next to the Venator Greatham Works on Tees Road, and the Seal Sands Office. Noise sensitive receptors are shown in Figure 11-1: Noise Sensitive Receptors (PEI Report, Volume II).

14.6.18 Indicative predictions of construction sound levels will be made to determine the impacts of construction activities on sensitive ecological receptors. The free-field (A-weighted) sound level for a particular receptor for each construction activity will be

predicted assuming a 12-hour working day and extended working hours for activities such as installation of the HDD, where the working day assumption might be extended to 24-hours. Construction activities likely to result in the highest airborne sound levels, include vibratory sheet piling (for the HDD pit setup and anchors), directional drilling, and excavation and backfilling of land-based open-cut trenches.

14.6.19 Sound exposure level (SEL) weighted thresholds will be equated to the onset of the auditory impacts of Permanent Threshold Shifts (PTS)[2] and Temporary Threshold Shifts (TTS)[3] in phocids (harbour and grey seals). These weightings are specific to the phocid seal group, which are 134 and 154 decibels (dB) re (20 µPa) in air, respectively (Southall *et al.,* 2019). These differ from the A-weighting which will be applied in the model, and which is typically used for human receptors. The weightings will reflect variations in peak sensitivity of the receptor groups, which occurs at around 10 kilohertz (kHz) for seals.

14.6.20 Construction activities are expected to be dominated by low or mid-frequency sound. It is also expected that there will be less propagation of high frequency sound (compared to mid- or low-frequency sound) due to ground absorption and dispersion. Thus, in the absence of high frequency sound it will be considered reasonable to assume that the predicted human A-weighted sound pressure level (L_{Aeq}) is equivalent (and a likely worst-case) to phocid-weighted sound pressure level. However, to permit a comparison between the L_{Aeq} value and the TTS and PTS thresholds for seals in air provided by Popper *et al*. (2014) (which are expressed in different units), the predicted L_{Aeq} levels will be reported as 12-hour and 24-hour (for activities where the working day assumption might be extended to 24-hours) unweighted sound pressure levels and then converted to an unweighted SEL. The predicted and threshold values can then be compared for determination of likely impact for phocid seals.

14.6.21 The Tees Estuary is highly industrialised, with lots of activity expected to produce airborne noise. Thus, seals are expected to be habituated to some level of airborne noise in the local area. In addition, the main A178 Seaton Carew Road which crosses Greatham Creek via a bridge to the west of the proposed hydrogen pipeline routes is expected to produce a large amount of background noise.

14.6.22 Any sound production resulting from construction activities for the pipeline crossing is not expected to be considerably greater than the baseline ambient sound levels created by the road and the surrounding industrial activity. The construction activities and estimated sound pressure levels are outlined in Table 14-10. Where sound production is above baseline ambient sound levels, activities will have a very short duration, each lasting a maximum of between one and three weeks.

[2] Permanent Threshold Shift (PTS) - is a permanent elevation in hearing threshold (i.e., an unrecoverable reduction in hearing sensitivity). PTS can occur from a variety of causes, but it is most often the result of intense and / or repeated noise exposures.
[3] Temporary Threshold Shift (TTS) - is a recoverable elevation in hearing threshold (i.e., a non-permanent reduction in hearing sensitivity) most commonly resulting from long-term noise exposure not high enough to cause PTS.

Table 14-10: Sound Pressures Levels for Activities Occurring in the Vicinity of Greatham Creek (Decibels at 10 m)

ACTIVITY	EQUIPMENT	A-WEIGHT SOUND PRESSURE LEVEL (DB AT 10 M)
HDD pit setup/anchors	Vibratory sheet piling rig	88
	Tracked excavator	77
Drilling and pullback	Directional drill (generator)	77
	Tracked drilling rig	86
	Water pump	78

14.6.23 Therefore, considering the nature of the impact, any airborne sound production and visual disturbance is not likely to affect the abundance, distribution or functioning of marine mammals, particularly seals, and their habitats, or the condition of surrounding designated sites in place for the protection of seals (e.g., harbour seal – Teesmouth and Cleveland Coast SSSI).

14.6.24 However, further modelling of the airborne soundscape baseline ambient sound measurements is required, to allow a direct comparison with the threshold criteria presented by Southall *et al.* (2019). At this stage, it cannot yet be concluded that effects resulting from changes in the airborne soundscape and visual disturbance during the construction of the Proposed Development are considered to be Not Significant. Once this analysis has been completed during the EIA further consideration will be given to the requirement for any embedded mitigation measures, such as a seasonal restriction to avoid the most sensitive period for seals (i.e., the breeding and moulting season for harbour seal, from June through to early July).

14.6.25 Table 14-11 provides a summary of the effects described above on marine ecological features during the construction of the Proposed Development.

Table 14-11: Summary of Effects on Marine Ecological Features During Construction of the Proposed Development

ECOLOGICAL FEATURES	IMPACT PATHWAY	VALUE/ IMPORTANCE	SIGNIFICANCE OF LIKELY EFFECTS (WITH EMBEDDED MITIGATION)	ADDITIONAL MITIGATION	RESIDUAL EFFECTS
All marine features	Indirect effects to marine ecology from changes in marine water quality during construction	Low to very high	Not Significant	N/A	Not Significant
Marine mammals	Changes in the airborne soundscape and visual disturbance during construction	Very high	Significant (to be confirmed once further modelling is completed – at this stage a Not Significant conclusion is predicted but cannot be confirmed)	N/A (Further consideration to be given, at the ES stage, to the requirement for further embedded mitigation, such as a seasonal restriction)	Not Significant

Operation

14.6.26 No likely impact pathways to marine ecology receptors have been identified during the operation of the Proposed Development at this stage. However, further consideration of surface water effects, potential pollution of Tees Bay and effects to overall water quality will be undertaken during the EIA. As provided within Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I), these impact pathways are currently considered to be Not Significant.

Decommissioning

14.6.27 No likely effects to marine ecology features have been identified for the decommissioning of the Proposed Development. The effects during decommissioning are generally considered to be less than or equal to those during construction. Therefore, effects are considered to be Not Significant.

14.7 Mitigation and Enhancement Measures

14.7.1 No additional mitigation or enhancement measures have been identified at this stage beyond the embedded design and impact avoidance measures already proposed in Section 14.5.

14.8 Limitations and Difficulties

14.8.1 Construction information and the design for the Proposed Development are still being refined, for example, the exact routing and methods of installation for the hydrogen pipeline. Therefore, a reasonable set of worst-case assumptions have been identified and assessed, using the Rochdale Envelope principle. There is considered to be sufficient information made available within this chapter to enable an informed view of the likely significant environmental effects of the Proposed Development.

14.8.2 As the description of the Proposed Development evolves and further information regarding the proposed construction methodologies become available, the assessment presented within this Chapter of the PEI Report will be re-examined and updated as appropriate during the EIA and reported in the ES. Ongoing engagement with the relevant stakeholders regarding the progress of these assessments will be carried out on matters pertaining to marine ecology.

14.8.3 Information on airborne soundscape modelling is not yet available. However, it is expected that there could be some limitations with the modelling approach such as differences between thresholds for humans and thresholds for phocids. However, the current preliminary assessment considers the worst-case activity for each phase of the Proposed Development and the modelling to be undertaken will likely use a precautionary approach which is likely to over-estimate effects.

14.9 Residual Effects and Conclusions

14.9.1 Having taken into account the design and good practice measures as detailed in Section 14.5, this preliminary assessment has concluded that there will be no significant residual effects to marine ecology as associated with the construction, operation and decommissioning of the Proposed Development.

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15.0 TRAFFIC AND TRANSPORT

15.1 Introduction

15.1.1 This chapter of the Preliminary Environmental Information (PEI) Report identifies the potential impacts and effects on traffic and transport as associated with the Proposed Development.

15.1.2 This chapter is supported by the following figures (PEI Report, Volume II):

- Figure 15-1: Traffic Study Area;
- Figure 15-2: Heavy Goods Vehicle (HGV) Routes to and from the Main Site;
- Figure 15-3: Traffic Count Locations; and
- Figure 15-4: Traffic Routes.

15.2 Legislation and Planning Policy Context

15.2.1 This section outlines planning policy relating to traffic and transport.

Planning Policy Context

National Planning Policy

National Policy Statement (NPS) for Energy (EN-1) (2011)

15.2.2 The National Policy Statement (NPS) (Department for Energy and Climate Change (DECC), 2011a) was published in 2011. Section 5.13 of the NPS outlines planning policy for traffic and transport, including guidance on undertaking relevant parts of an environmental impact assessment (EIA) (which has been taken into account in producing this PEI Report). The most relevant paragraphs for the transport assessment are paragraphs 5.13.2 to 5.13.4 which state:

> *"5.13.2 The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.2 of this NPS.*
>
> *5.13.3 If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport assessment, using the NATA/WebTAG139 methodology stipulated in Department for Transport guidance, or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation.*
>
> *5.13.4 Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts."*

15.2.3 Paragraph 5.13.6 states that the Infrastructure Planning Commission (now the Secretary of State (SoS) should ensure that an applicant has sought to mitigate impacts on the surrounding road infrastructure, including during the construction phase of the development. Where the proposed mitigation measures are insufficient

to reduce the impact on the transport infrastructure to acceptable levels, the SoS should consider additional measures to mitigate the adverse impacts on transport networks arising from the development, which could include:

- demand management measures;
- water-borne or rail transport, where cost effective; and
- including relevant requirements within the consent where there is likely to be substantial HGV traffic.

Draft Overarching NPS for Energy (EN-1) (2023)

15.2.4 The UK Government is currently reviewing and updating the energy NPSs. A revised draft NPS EN-1 was published in March 2023 for consultation by the Department for Energy Security & Net Zero (DESNZ) (Department for Energy Security and Net Zero, 2023a). Section 5.14 considers traffic and transport and confirms the need to consider a development's impacts on the surrounding transport infrastructure. It also states that projects likely to have significant transport implications, an applicant's ES should include a transport appraisal and that a Travel Plan should be prepared. Paragraph 5.14.21 states that the SoS should only consider refusing development where there is an unacceptable impact on highway safety, or where the residual cumulative impacts on the road network would be severe, or it does not show how consideration has been given to the provision of adequate active public or shared transport access and provision.

National Policy Statement for Gas Supply and Gas and Oli Pipelines (EN-4) (2011) and Draft EN-4 (2023)

15.2.5 This NPS (Department of Energy and Climate Change, 2011b) (Department for Energy Security and Net Zero, 2023b) should be read in conjunction with EN-1 and provides the primary basis for the decisions made regarding gas and oil infrastructure. There is no specific mention of the Traffic and Transport impact beyond a reference back to EN-1 and an acknowledgment in section 2.20 of increased HGV traffic resulting in a noise and vibration impact.

National Policy Statement for Electricity Networks (EN-5) (2011) and Draft EN-5 (2023)

15.2.6 This NPS (Department for Energy Security and Net Zero, 2023c) should be read in conjunction with EN-1 and sets out how applications for electricity networks are assessed, with no specific reference to Traffic and Transportation.

National Planning Policy Framework (NPPF) (2021)

15.2.7 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) was last updated in 2021 and was reconsulted on in late 2022 and early 2023 and sets out the UK Government's national planning policies for England and provides guidance on their application.

15.2.8 The NPPF states that the transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how to travel. The policy states that local authorities should support a pattern of development, which,

where reasonable to do so, facilitates the use of sustainable modes of transport. Plans and decisions should ensure that developments that generate significant numbers of vehicle movements are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised.

15.2.9 The NPPF recommends that a Transport Statement (TS) or Transport Assessment (TA) should support all developments that generate significant numbers of vehicle movements, and that development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

Planning Practice Guidance (PPG) (2014) Travel Plans, Transport Assessments and Statements

15.2.10 The Planning Practice Guidance (PPG) for Travel Plans, Transport Assessments and Statements was first published in March 2014 on the Government's planning guidance planning portal (Department for Communities and Local Government, 2014), and provides general guidelines for travel plans, transport assessments and statements. This guidance has been taken into account when defining the traffic and transport assessment methodology applied in this PEI Report.

Local Planning Policy

Redcar and Cleveland Local Plan (2018)

15.2.11 The Redcar and Cleveland Local Plan was adopted in 2018 and sets out the vision and overall development strategy for the borough and how it will be achieved for the period until 2032. It includes a number of policies relevant to traffic and transport, as described below.

15.2.12 Policy TA 1 (Transport and New Development) states that:

"The Council and its partners will ensure that the transport requirements of new development, commensurate to the scale and type of development, are taken into account and seek to promote sustainable travel to minimise environmental impacts and support residents' health and wellbeing."

15.2.13 Proposals will be supported that:

- *"improve transport choice and encourage travel to work and school by public transport, cycling and walking;*
- *minimise the distance that people need to travel,*
- *where appropriate contribute positively to wider demand management measures to address congestion, environmental and safety issues".*

15.2.14 Policy TA 2 (Improving Accessibility Within and Beyond the Borough) states that:

"The council will work together with neighbouring authorities, the Tees Valley Combined Authority, Tees Valley Unlimited (the Local Enterprise Partnership), the Government, developers and transport providers to improve accessibility within and beyond the borough, which will support economic, tourism and regeneration objectives for both Redcar and Cleveland and the wider Tees Valley.

This will include working with Highways England to improve capacity to the A66, A1053 and A174, particularly Greystones roundabout."

Tees Valley Combined Authority Strategic Transport Plan 2020 – 2030 (2020)

15.2.15 The Tees Valley Combined Authority Strategic Transport Plan was developed by five constituent local authorities (Darlington Borough Council, Hartlepool Borough Council (HBC), Middlesbrough Council, Redcar and Cleveland Borough Council (RCBC), and Stockton-on-Tees Borough Council (STBC)) and was published in 2020. It's focus is to improve the transport system for local people and businesses, ensuring integration between different transport modes.

15.2.16 The plan has the following aims and aspirations to be delivered over the plan period:

- better transport links helping to create more jobs;
- improving the affordability, quality and reliability of people's daily commute;
- more reliable and affordable public transport, walking and cycling options; and
- improved technology making travelling around as easy and simple as possible.

15.2.17 The Local Implementation Plan 'Transport for the Future' is part of the Tees Valley Strategic Transport Plan which applies until 2030. The Plan seeks to improve connectivity for all as well as promoting sustainable travel and active travel and ensuring that the network can meet the future needs.

15.2.18 There is also a proposal to work with National Highways, Middlesborough Council and the Tees Valley Combined Authority to improve the capacity of the A66 and A174, as these are key transportation links to the wider South Tees industrial area.

15.2.19 There is acknowledgement that Teesport is a major hub for freight transport with over 2,000 movements per day, with much of the transportation investment being led by National Highways, Network Rail and the Tees Valley Combined Authority. It is recognised that studies to improve capacity and resilience are required.

Other Guidance

Guidelines for the Environmental Assessment of Road Traffic (1993)

15.2.20 The Guidelines for the Environmental Assessment of Road Traffic (GEART) (IEA, 1993) were published in 1993 by the Institute of Environmental Assessment (IEA). The guidelines provide a basis for a comprehensive and consistent approach to the appraisal of traffic and transport impacts. Extensive reference has been made to these guidelines throughout the preparation of this chapter.

15.2.21 However, it is acknowledged that the Institute of Environmental Management and Assessment (IEMA) published the Environmental Assessment of Traffic and Movement in July 2023 which provides an update to GEART, and whilst this PEI Report will be undertaken based upon GEART, (due to the timescales for its production), the ES will reflect the new guidance.

15.2.22 However, the two rules to determine the study area remain unchanged and as such it is not envisaged that any significant change in approach will be required within the ES as a result of the new guidance.

Department for Transport Circular 01/2022: The Strategic Road Network and the Delivery of Sustainable Development (2022)

15.2.23 Circular 01/2022 was published in December 2022 by the Department for Transport (DfT) which sets out the way in which National Highways will engage with the development industry to deliver sustainable development and thus economic growth, whilst safeguarding the primary function and purpose of the strategic road network.

15.3 Assessment Methodology and Significance Criteria

Overview

15.3.1 The environmental impact of traffic generated by the Proposed Development has been assessed with reference to GEART (IEA, 1993) and other guidance as detailed in Section 15.2. GEART is recognised as the industry standard methodology for the assessment of traffic and highway impacts. The guidelines outline the issues and the respective changes in volume and composition of traffic regarded as necessary before each issue results in traffic and transport impacts.

15.3.2 As set out in the Scoping Opinion response, the operational phase traffic flows and traffic movements may be scoped out subject to agreement with the Local Highway Authority. This is due to the low volume of associated vehicle movements, and thus only the construction phase has been considered within this preliminary assessment as the worst-case.

15.3.3 In accordance with the GEART guidance, issues including severance, pedestrian amenity, fear and intimidation, highway safety and driver delay associated with the construction phase of the Proposed Development have been investigated and are reported herein.

15.3.4 For the purposes of this chapter no allowance has been made for the delivery of construction materials by water or rail (to assess worst case construction road traffic impacts), but the selected construction contractors will review options for the use of rail and water when sourcing construction materials, and particularly for the movement of any Abnormal Indivisible Loads (AILs).

15.3.5 In addition, at this preliminary stage, the assessment only includes a preliminary cumulative assessment of the Net Zero Teesside (NZT) development (due to information availability and timing), and the ES will include other development as relevant to traffic and transport.

15.3.6 Environmental effects relating to air pollution and noise and vibration, as generated by traffic associated with the Proposed Development, are considered in Chapter 8: Air Quality (PEI Report, Volume I) and Chapter 11: Noise and Vibration (PEI Report, Volume I), respectively.

15.3.7 Chapter 5: Construction Programme and Management (PEI Report, Volume I) provides details on the proposed construction programme for the Proposed Development.

15.3.8 The construction phase has been assessed within the chapter, assuming a worst case that construction commences in Q1 2025, with a peak of construction in month 17 (May 2026).

Study Area

15.3.9 The Main Site is accessed from the A1085 Trunk Road, a dual carriageway road running north-east to south-west between Redcar and the A1053 Tees Dock Road. The road is subject to the national speed limit. Travelling south-west from the Main Site access, the A1085 Trunk Road provides a link to the A1053 Tees Dock Road, which in turn connects to the A174 to the south and the A66 to the north. The A1053 Tees Dock Road and A174 are part of National Highways core network.

15.3.10 Access routes to the Hydrogen Pipeline Corridor north of the River Tees are assumed to be via the A1046 Haverton Hill Rd/Port Clarence Road and the B1275, with the potential for compound access points off the A178 Seaton Carew Road, A1185, Nelson Avenue, Cowpen Bewley Road and the unnamed road to Seal Sands (commonly known as Seal Sands Road).

15.3.11 The Study Area for this assessment is shown on Figure 15-1: Traffic Study Area (PEI Report, Volume II). It has been defined with reference to the GEART (IEA, 1993) which set out two rules as follows:

- Rule 1 – include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
- Rule 2 – include any other specifically sensitive areas where the traffic flow (or HGV component) are predicted to increase by more than 10%.

15.3.12 To define the Study Area, a network of road links has been identified and then tested against Rules 1 and 2. The road links that have been considered in determining if the above rules are satisfied, and which form the Study Area, are listed below and shown in Figure 15-3: Traffic Count Locations (PEI Report, Volume II):

- A1085 Trunk Road (north of the Main Site roundabout);
- A1085 Trunk Road (south of the Main Site roundabout);
- A1042 Kirkleatham Lane;
- A1085 Trunk Road (south of the British Steel Lackenby entrance);
- A1085 Broadway;
- A66 (west of A1053);
- A1053 Greystone Road;
- B1380 High Street;

- A174 (west of Greystones roundabout);
- A1046 Port Clarence Road;
- A178 Seaton Carew Road;
- Unnamed road serving Seal Sands;
- B1275 Belasis Avenue; and
- A1185.

Impact Assessment Methodology

Sensitivity of Receptors

15.3.13 The sensitivity of a road, or the immediate area through which it passes, can be defined by the type of user groups who may use it. Vulnerable users include elderly residents and children. It is also necessary to consider footpath and cycle route networks that cross the roads within the Study Area.

15.3.14 A desktop exercise has been undertaken to classify the sensitivity of the routes within the Study Area. The classification of the link sensitivity is based on professional judgement. For example, if the route passes a school, care home or similar, it will have a higher sensitivity due to the presence of vulnerable users. Similarly, if the route passes through the middle of a town or village, it will have a higher sensitivity than if there was limited frontage development in the Study Area. Table 15-1 identifies the links, then assigns a sensitivity rating of either Very Low, Low, Medium, or High, together with the rationale. This sensitivity rating, along with the magnitude, is then used to determine the significance of effect within Table 15-3.

Table 15-1: Sensitivity of Transportation Link Receptors

LINK	DESCRIPTION	LINK SENSITIVITY	RATIONALE
1	A1085 Trunk Road, located approximately 100 m east of Ennis Road	Low	The road is a dual carriageway and is subject to a de-restricted speed limit reducing to 40 miles per hour (mph) prior to the junction with Ennis Road. There is no frontage development along the route until reaching the junction with the A1042. A shared footway/cycleway is provided either side of the carriageway which is street lit.
2	A1085 Trunk Road, located approximately 1.3 km south of West Coatham Lane	Low	The road is a dual carriageway and is subject to a de-restricted speed limit. There is no frontage development along the route. A shared footway /cycleway is provided either side of the carriageway which is street lit.
3	A1042 Kirkleatham Lane, located approximately 85 m south of Staintondale Avenue	High	The two-lane single carriageway is subject to a 30 mph speed limit with residential properties on either side and is street lit. Pedestrian footways are provided either side of the carriageway separated by a grass verge. On-road cycle lanes are provided either side of the carriageway. The road passes Outwood Academy Redcar approximately 800 m to the south of the A1085 Trunk Road.
4	A1085 Trunk Road, located approximately 0.5 km north of A1053 Tees Dock Road	Low	The road is a dual carriageway and is subject to a de-restricted speed limit. There is no frontage development along the route. A shared footway/ cycleway is provided either side of the carriageway which is street lit.
5	A1085 Broadway, located approximately 230 m east of Birchington Avenue	Medium	The two-lane single carriageway is subject to a 30-mph speed limit with residential properties on either side and is street lit. On-road cycle lanes are provided either side of the carriageway. Pedestrian footways are provided either side of the carriageway separated by the cycle lane and on-street parking bays.
6	A1380 High Street, located approximately 50 m east of Lackenby Lane	Medium	The two-lane single carriageway is subject to a 30-mph speed limit with a pedestrian footway provided on the northern side of the carriageway. The route passes a cluster of residential properties on the north side of the carriageway.
7	A66, located approximately 140 m east of Whitworth Road	Low	The road is a dual carriageway and is subject to a 50-mph speed limit. Any frontage development is industrial in nature.

LINK	DESCRIPTION	LINK SENSITIVITY	RATIONALE
8	A1046 Port Clarence Road, located approximately 20 m north of Beech Terrace	High	The two-lane single carriageway is subject to a 30 mph speed limit and is street lit. A shared footway/cycleway is provided either side of the carriageway. Residential properties are located on the north side of the carriageway but are located a good distance back from the highway. High Clarence Primary School is located on this road.
9	A178 Seaton Carew Road, located approximately 530 m north of Huntsman Drive	Low	The two-lane single carriageway is subject to a de-restricted speed limit. No footways are provided along the route. There is no frontage development along the route which passes through open country.
10	Unnamed Road, located approximately 720 m east of A178 Seaton Carew Road	Low	The two-lane single carriageway is subject to a 40-mph speed limit and is street lit. No footways are provided either side of the carriageway. The road provides access to a number of petro-chemical facilities; therefore, any frontage is industrial in nature.
11	A1053 Greystone Road, located approximately 600 m north of the A174/A1053 Greystones roundabout	Low	The road is a dual carriageway and is subject to a de-restricted speed limit. There is no frontage development along the route. There are no pedestrian or cycle facilities along the route.
12	A174 (West of Greystone Roundabout), located approximately 1 km west of the A174/A1053 Greystones roundabout	Low	The road is a dual carriageway and is subject to a de-restricted speed limit. There is no frontage development along the route. There are no pedestrian or cycle facilities along the route.
13	B1275 Belasis Avenue, located approximately 1.6 km west of its junction with Cowpen Bewley Road	Low	The two-lane single carriageway is subject to a de-restricted speed limit and is street lit. A footway is provided along the northern side of the carriageway. There is no frontage development along the route which passes through open country.

LINK	DESCRIPTION	LINK SENSITIVITY	RATIONALE
14	A1185, located approximately 800 m west of A178 Seaton Carew Road	Low	The two-lane single carriageway is subject to a de-restricted speed limit. No footways are provided along the route. There is no frontage development along the route which passes through open country.

Potential Environmental Factors

15.3.15 The following environmental factors are susceptible to changes as a result of traffic.

Severance

15.3.16 Severance occurs in a community when a major artery separates people from places and other people. Severance occurs from difficulty of crossing a road or where the road itself creates a physical barrier. Severance can be caused to pedestrians or motorists. The GEART (IEA, 1993) suggest that changes in total traffic flow of 30%, 60% and 90% result in slight, moderate and substantial changes in severance respectively, and whilst the numerical thresholds have been adopted within Table 15-2, the terminology used to describe magnitude have been slightly amended to reflect our assessment criteria.

Pedestrian Amenity

15.3.17 Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition, pavement width and separation between vehicles and pedestrians. The impact manifests itself in fear and intimidation, exposure to noise and vehicle emissions. The GEART (IEA, 1993) suggest that a doubling or halving of total traffic flow or the HGV composition could lead to perceptible negative or positive impacts upon pedestrian amenity.

Fear and Intimidation

15.3.18 The volume of traffic and its HGV composition are the factors that contribute to fear and intimidation. In the absence of thresholds set out in the GEART (IEA, 1993), this assessment considers that changes in total traffic flow of 30%, 60% and 90% are considered to result in slight, moderate or substantial impacts, and whilst the numerical thresholds have been adopted within Table 15-2, the ratings of magnitude have been slightly amended to reflect our assessment criteria.

Highway Safety

15.3.19 Highway safety is assessed by the frequency and severity of injury accidents that are attended by the police and recorded in official accident statistics. Intensification of use or changes in the composition of traffic has the potential to have an impact on collision rates. The examination of recent collision statistics on routes within the Study Area will highlight any hotspots that need further examination.

Hazardous Loads

15.3.20 Hazardous loads are assessed based on the estimated number and composition of such loads. Where the number of movements is considered to be significant, a risk analysis will be undertaken as part of the EIA and reported in the ES to illustrate the potential for an accident to happen and the likely impact of such an event.

Driver Delay

15.3.21 The use of industry standard junction capacity modelling programs provides a methodology to quantify junction delay. Driver delay is only likely to be significant where the existing Study Area highway network is at or close to capacity. This is not

considered to be required at this stage but will be confirmed following the outcome of further assessment in the ES.

Significance Criteria

15.3.22 Using the information as set out above, the magnitude of traffic impacts is defined in Table 15-2.

Table 15-2: Traffic and Transport Assessment Framework – Magnitude of Impacts

TYPE OF IMPACT	MAGNITUDE OF IMPACT			
	VERY LOW	LOW	MEDIUM	HIGH
Severance	Change in total traffic flow of < 30%	Change in total traffic flow of 30% - 60%	Change in total traffic flow of 61% - 90%	Change in total traffic flow of >90%
Pedestrian amenity	Changes in traffic flow (or HGV component) less than 50%	Changes in traffic flow (or HGV component) of 50% to 100%	Changes in traffic flow (or HGV component) of 101% to 150%	Change in traffic flow (or HGV component) of >150%
Fear and intimidation	Change in total traffic flow of < 30%	Change in total traffic flow of 30% - 60%	Change in total traffic flow of 61% - 90%	Change in total traffic flow of >90%
Highway safety	Magnitude of impact derived using professional judgment informed by the frequency and severity of recorded collisions within the Study Area and the forecast increase in traffic			
Driver delay	Magnitude of impact derived using professional judgment informed by the increase in vehicle delay and whether a junction is at, or close to capacity			

15.3.23 By combining the receptor sensitivity with the magnitude of impact using the assessment matrix shown in Table 15-3, traffic effects can be classified as Negligible, Minor, Moderate or Major (Adverse or Beneficial).

Table 15-3: Classification of Effects

MAGNITUDE OF IMPACT	SENSITIVITY/IMPORTANCE OF RECEPTOR			
	HIGH	MEDIUM	LOW	VERY LOW
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible

MAGNITUDE OF IMPACT	SENSITIVITY/IMPORTANCE OF RECEPTOR			
	HIGH	MEDIUM	LOW	VERY LOW
Low	Moderate	Minor	Negligible	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

15.3.24 As outlined in Chapter 2: Assessment Methodology (PEI Report, Volume I), Major and Moderate (Adverse or Beneficial) effects are considered Significant, whilst those that are Minor (Adverse or Beneficial) or Negligible are considered Not Significant.

Sources of Information/Data

15.3.25 A series of 7-day automatic traffic counts (ATCs) were undertaken between 19th November 2019 and 25th November 2019 for the NZT at the following locations to provide a baseline on the road links in the Study Area:

- A1085 Trunk Road (north of the Main Site roundabout);
- A1085 Trunk Road (south of the Main Site roundabout);
- A1042 Kirkleatham Lane;
- A1085 Trunk Road (South of British Steel Lackenby Entrance);
- A1085 Broadway;
- A66 (west of A1053);
- A1053 Greystone Road;
- B1380 High Street;
- A174 (west of Greystone roundabout);
- A1046 Port Clarence Road;
- A178 Seaton Carew Road;
- Unnamed road serving Seal Sands;
- B1275 Belasis Avenue; and
- A1185 (west of A178 Seaton Carew Road).

15.3.26 Traffic flows for the A1053 Greystone Road and A174 were obtained from Highways England's[1] Webtris database for the month of September 2019 (Highways England, 2019). Traffic flows for the A1185 and B1275 were obtained from the DfT Road Traffic Statistics website for 2019 (DfT, 2019).

15.3.27 In addition to the ATC counts, traffic counts were undertaken for the NZT project on Tuesday 19th November 2019 between the hours of 06:00 – 10:00 and 16:00 – 20:00 at the following junctions on the local highway network for the overall network morning (AM) and evening (PM) peak hours:

[1] Now National Highways.

- MCC 1: A1085/West Coatham Lane/Main Site access roundabout;
- MCC 2: A1085/A1053 roundabout; and
- MCC 3: A1053/A174/B1380 roundabout.

15.3.28 Whilst the above traffic data is considered suitable to reuse for the purposes of this preliminary transportation assessment for the Proposed Development, new counts will be collected during the EIA to ensure that the assessment is based on the most recent data.

Consultation

15.3.29 An EIA Scoping Opinion was requested from the Planning Inspectorate ('the Inspectorate') in April 2023, which was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion comments relevant to this discipline are outlined in Table 15-4.

Table 15-4: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	Impacts from operational traffic. The Scoping Report seeks to scope out operational road traffic flows from detailed assessment, stating that the anticipated maximum workforce of 85 staff on site within a 24-hour period is unlikely to give rise to significant effects. This approach is to be agreed with the Local Highway Authority. Having considered the nature and characteristics of the Proposed Development, the Inspectorate agrees that subject to confirmation of the number and type of all operational vehicle movements (i.e. HGVs in addition to staff) in the ES description of development, operational traffic movements are not likely to result in significant effects and that an assessment of this matter can be scoped out of the ES. Agreement should be sought from the relevant Highways Authority.	Noted. Only construction impacts have been assessed within this PEI Report, with the operational and decommissioning phases not considered to result in a severe impact upon the highway network. This assumption will be reviewed during the EIA process.
The Inspectorate	Scoping Opinion 17th May 2023	Future baseline. The ES should clearly explain how the future baseline has been calculated and how this has considered other planned development in the area using the same road network during the construction period.	The future baseline is detailed in Section 15.4 and will be further explained in the ES.
The Inspectorate	Scoping Opinion 17th May 2023	Abnormal indivisible loads (AIL). The Scoping Report states that local ports are being considered for transport of AIL and that consideration will be given to the appropriate port and AIL routes during the design process. The ES should include an assessment of the likely significant effects arising from transportation of AIL via each proposed transportation	Noted – details as applicable will be included in the ES. Although at this stage it is envisaged that most deliveries would be made via the Teesworks Steel House Gate. In cases where abnormal loads are required that cannot pass under the existing

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		method and identify any mitigation measures required and how these would be secured.	bridge at the Teesworks Steel House Gate entrance the alternative would be to use the unnamed private track. However, as mentioned this will be reviewed as part of the ES.
The Inspectorate	Scoping Opinion 17th May 2023	Hazardous loads. The ES should include an assessment of likely significant effects arising from the transportation of hazardous loads during construction and operation of the Proposed Development, and identify any mitigation required (including drainage systems) and how this would be secured through the DCO.	Noted – details as applicable will be included in the ES.
National Highways	Scoping Opinion 17th May 2023	Further information required in relation to the following: • Peak construction flows; • The average car occupancy of 2.33; • Vehicle routings; • The impact upon the Strategic Route Network (SRN); • Measures to be included within the Construction Traffic Management Plan (CTMP).	Further detail is included within this PEI Report at Section 16.6, which sets out the peak construction traffic flows, the car occupancy assumed, vehicle routings and the impact upon the SRN. Section 16.5 sets out the Proposed Development Design and Impact Avoidance which states that as part of the ES a CTMP and CWTP will be submitted.

Use of the Rochdale Envelope

15.3.30 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with The Inspectorate's guidance (The Inspectorate, 2018). This involves assessing the maximum (or where relevant, minimum)/worst case parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example).

15.3.31 Details regarding the maximum and minimum parameters adopted for building sizes within the Rochdale Envelope defined for the Proposed Development do not have any material impact on vehicle numbers accessing the Main Site and Connection Corridors. Similarly, where flexibility is to be retained in the application, this is unlikely to have a material difference on the volumes of traffic accessing the Proposed Development Site during the construction phase. However, the assessment will consider worst case traffic flows as associated with the peak of construction.

15.4 Baseline Conditions

Existing Baseline

Local Highway Network

15.4.1 As presented on Figure 15-2: HGV Routes to and from the Main Site (PEI Report, Volume II), the Main Site is located approximately 2 km north-west of Redcar and will be accessed via the existing roundabout junction with the A1085 and West Coatham Lane. The wider Connection Corridors cover land to the north and south of the River Tees as shown on Figures 4-1 to 4-8 (PEI Report, Volume II).

15.4.2 The A1085 Trunk Road is a dual carriageway road running east to west between Redcar and the A1053 Tees Dock Road and is subject to a de-restricted speed limit. The carriageway is street lit and a shared footway/cycleway is provided on either side of the road.

15.4.3 Travelling west from the site access, the A1085 provides a link to the A1053 which in turn connects to the A174 to the south and the A66 to the north. The A1053 and A174 are part of National Highways strategic network. All other routes are managed by RCBC.

Walking

15.4.4 The Chartered Institution of Highways and Transportation (CIHT) document 'Providing for Journeys on Foot' (2000) suggests a maximum walking distance of 2 km for journeys to work.

15.4.5 Considering a 2 km walking catchment area, the potential for walking access to the Main Site is small with only the built-up area of Dormanstown on the western edge of Redcar located within a 2 km walking distance of the Main Site.

15.4.6 In terms of pedestrian facilities, a footway is provided on both sides of West Coatham Lane and Broadway West which is street lit. In addition, a shared footway/cycleway

is provided along the entire length of the A1085 Trunk Road on either side of the carriageway.

15.4.7 At the A1085/West Coatham Lane Roundabout, dropped kerbs and tactile paving are provided on all arms of the junction. Central refuges are also provided on the A1085 to allow pedestrians to cross the dual carriageway.

15.4.8 Given the limited walking catchment area, it is not therefore anticipated that walking trips will likely represent a practical mode for construction, operational and/or decommissioning staff.

Cycling

15.4.9 Cycling is a viable alternative to private car for journeys up to 8 km, providing a healthy and environmentally friendly form of transport.

15.4.10 In respect of acceptable cycle distances, it is widely accepted that many utility cycle trips are less than 3 miles (approximately 5 km), but for commuter journeys 5 miles (approximately 8 km) is not uncommon. An 8 km catchment area includes Redcar, Marske-by-the-Sea and the suburbs of Eston, Normanby and South Bank to the east of Middlesbrough.

15.4.11 Within the vicinity of the Main Site there is a shared cycle/footway along the length of the A1085 Trunk Road between Redcar and Middlesbrough. Given the cycling infrastructure already in place on the local road network, there is potential for staff living within this catchment area to travel to the Proposed Development Site by bicycle.

Public Transport

15.4.12 The nearest bus stops to the Main Site are located on West Coatham Lane approximately 250 m south-east of the Main Site entrance. Pedestrian crossing facilities in the form of drop kerbs and tactile paving are provided on all five arms of the A1085/West Coatham Lane/Site Access Roundabout allowing for safe crossing of this junction.

15.4.13 There are five services that stop at the West Coatham Lane bus stops, namely services 62, X3, X3A, X4 and X4A. All bus services are run by Arriva Bus.

15.4.14 Bus Service 62 runs between Middlesbrough and New Marske via Dormanstown and Redcar. Service 62 operates a half hourly service Monday to Saturday apart from Sunday which operates an hourly service. The first bus departs Middlesbrough at 06:43 and New Marske at 06:25. The last bus departs Middlesbrough at 20:05 and New Marske at 19:45.

15.4.15 Bus Service X3 runs between Middlesbrough and Lingdale via Dormanstown, Redcar and Saltburn. Service X3 operates an hourly service Monday to Saturday. The first bus departs Middlesbrough at 08:25 and Lingdale at 06:44. The last bus departs Middlesbrough at 17:25 and Lingdale at 17:54.

15.4.16 Bus Service X3A runs between Middlesbrough and Brotton. Service X3A operates an hourly service Monday to Saturday. The first bus departs Middlesbrough at 08:50 and Brotton at 09:15. The last bus departs Middlesbrough at 17:55 and Brotton at 17:15.

15.4.17 Bus Service X4 runs between Middlesbrough and Whitby via Redcar and Saltburn. Service X4 operates a half hourly service Monday to Saturday apart from Sunday which operates an hourly service. The first bus departs Middlesbrough at 06:02 and Whitby at 05:59. The last bus departs Middlesbrough at 18:10 and Whitby at 17:04.

15.4.18 Bus Service X4A runs between Middlesborough and Whitby via Redcar and Saltburn. Service X4A operates an hourly evening service Monday to Sunday.

15.4.19 Given the frequency of bus services, it is anticipated that using the bus could be an attractive option for workers accessing the Main Site.

15.4.20 The nearest railway station to the Proposed Development Site is British Steel, Redcar, which is located within the Proposed Development Site. The station is located on the Tees Valley Line and is operated by Northern Rail. Historically, there were two eastbound services per day to Saltburn via Redcar and two westbound services per day to Bishop Auckland via Middlesbrough and Darlington. Northern Rail suspended all services to and from the station on 14th December 2019 due to the lack of passengers using the station. However, there is potential for the station to be re-opened in the future for both construction staff and operational staff to use the train as a mode of traveling to work. The nearest station to the Main Site that is still open is Redcar Central, located approximately 3 km to the east.

Existing Traffic Flows

15.4.21 The following highway links form the highway network of interest for this assessment, as agreed for NZT. Whilst this is still considered to be applicable for the Proposed Development, it will be reviewed following the completion of the PEI Report and updated if required within the ES.

- A1085 Trunk Road (north of The Main Site roundabout);
- A1085 Trunk Road (south of The Main Site roundabout);
- A1042 Kirkleatham Lane;
- A1085 Trunk Road (South of British Steel Lackenby Entrance);
- A1085 Broadway;
- A66 (west of A1053);
- A1053 Greystone Road;
- B1380 High Street;
- A174 (west of Greystone roundabout);
- A1046 Port Clarence Road;
- A178 Seaton Carew Road;
- Unnamed road serving Seal Sands;
- B1275 Belasis Avenue; and
- A1185 (west of A178 Seaton Carew Road).

15.4.22 Baseline 24-hour Annual Average Daily Traffic (AADT) two-way link flows are provided in Table 15-5.

Table 15-5: 2019 Baseline Annual Average Daily Traffic (AADT) Flows

LINK		TOTAL VEHICLES	TOTAL HGVS	HGV PERCENTAGE (%)
1	A1085 Trunk Road, 100 m east of Ennis Road	12,274	1,049	8.5
2	A1085 Trunk Road, 1,340 m south of West Coatham Lane	14,387	1,275	8.9
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	11,791	762	6.5
4	A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	16,058	2,012	12.5
5	A1085 Broadway, 235 m east of Birchington Avenue	8,093	521	6.4
6	A1380 High Street, 50 m east of Lackenby Lane	9,835	826	8.4
7	A66, 140 m east of Whitworth Road	19,865	3,662	18.4
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	7,612	896	11.8
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	7,814	998	12.8
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	4,206	860	20.4
11	A1053 Greystone Road, 600 m north of the A174/A1053 Greystones roundabout	14,387	1,392	9.7

LINK		TOTAL VEHICLES	TOTAL HGVS	HGV PERCENTAGE (%)
12	A174 (West of Greystone Roundabout), 1 km west of the A174/ A1053 Greystones roundabout.	31,758	1,936	6.1
13	B1275 Belasis Avenue, 1.6 km west of its junction with Cowpen Bewley Road	2,451	72	2.9
14	A1185, 800 m west of A178 Seaton Carew Road	5,651	1,026	18.2

Personal Injury Accidents

15.4.23 Accident data has been taken into consideration in line with the Travel Plans, Transport Assessments and Statements Planning Practice Guidance (2014), which advises an analysis of any road traffic incidents that have occurred within the most recent five-year period within the locality of the proposed development site.

15.4.24 Personal Injury Accident (PIA) data has been obtained from the Crashmap.co.uk (CrashMap, 2023) and accounts for accidents that have occurred within the selected areas between 1st January 2017 and 31st December 2021 (the most up to date data available at the time of preparing this report).

15.4.25 A full analysis of the most recent PIA data will be included in the Transport Assessment reported in the ES, therefore only a summary of the data is included within this PEI Report chapter.

Personal Injury Accidents- South of the Tees

15.4.26 Within the defined area to the south of the River Tees, a total of 50 accidents occurred over the five-year study period (2017-2021). Of these accidents, 41 were classed as slight in severity, eight were classed as serious, and one was classed as fatal. A breakdown of all accidents within this time period, within the Study Area south of the River Tees, is provided in Table 15-6.

Table 15-6: Accident Data Summary – South of the River Tees

YEAR	ACCIDENT SEVERITY			
	SLIGHT	SERIOUS	FATAL	TOTAL
2017	5	1	0	6
2018	10	3	0	13

YEAR	ACCIDENT SEVERITY			
	SLIGHT	SERIOUS	FATAL	TOTAL
2019	7	0	0	7
2020	6	3	1	10
2021	13	1	0	14
TOTAL	41	8	1	50

North of the Tees

15.4.27 Within the defined area outlined to the north of the River Tees, a total of 12 accidents occurred over the five-year study period (2017-2021). Of these accidents, 11 were classed as slight, three were classed as serious, and none were classed as fatal. A breakdown of all accidents within this time period, within the Study Area north of the River Tees, is provided in Table 15-7.

Table 15-7: Accident Data Summary – North of the River Tees

YEAR	ACCIDENT SEVERITY			
	SLIGHT	SERIOUS	FATAL	TOTAL
2017	1	1	0	2
2018	2	0	0	2
2019	5	1	0	6
2020	0	1	0	1
2021	1	0	0	1
TOTAL	9	3	0	12

15.4.28 From the above, there is not considered to be any existing underlying road safety problem that will impact upon the Proposed Development.

Future Baseline

15.4.29 It is currently anticipated that (subject to the necessary consents being granted and an investment decision being made), early enabling works for both phases 1 and 2 will begin in Q2 2025, the construction of Phase 1 will begin in Q3 2025 and be complete in Q1 2028, and the construction of Phase 2 will start in Q2 2028 and be complete in Q4 2030.

15.4.30 The actual peak of construction will occur during Phase 1 in month 17 (May 2026) based on the construction workforce and HGV profile (see Section 15.6). This has therefore been used as the worst-case. During the peak of construction, both construction of the Main Site and the associated pipeline network and utility connections will take place concurrently. The peak of construction programme will be reviewed and confirmed in the ES.

TEMPRO Factors

15.4.31 The future baseline year flows have been derived by applying the national standard programme Trip End Model Presentation Program (TEMPRO) growth factors (TEMPRO 7.2b) to the above flows and are indicated in Table 15-8. These growth factors have been taken into account when comparing the baseline and future traffic scenarios.

Table 15-8: TEMPRO Traffic Growth Factors

YEAR	GROWTH FACTOR FROM TEMPRO
2019 to 2026 Daily	1.054
2019 to 2026 AM Peak	1.055
2019 to 2026 PM Peak	1.055

15.4.32 The above has been used to predict the future baseline traffic at the year of peak construction and which will also make an applicable allowance for future developments within the local area.

Future Baseline Traffic

15.4.33 Future year baseline traffic flows for the assessment year of peak of construction are presented in Table 15-9.

Table 15-9: 2026 Baseline Traffic Flows AADT

LINK		TOTAL VEHICLES	TOTAL HGVS	HGV PERCENTAGE
1	A1085 Trunk Road, 100 m east of Ennis Road	12,948	1,107	8.5%
2	A1085 Trunk Road, 1.3 km south of West Coatham Lane	15,176	1,345	8.9%
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	12,438	804	6.5%
4	A1085 Trunk Road, 0.5 km north of A1053 Tees Dock Road	16,940	2,122	12.5%
5	A1085 Broadway, 230 m east of Birchington Avenue	8,537	549	6.4%
6	A1380 High Street, 50 m east of Lackenby Lane	10,375	871	8.4%

LINK		TOTAL VEHICLES	TOTAL HGVS	HGV PERCENTAGE
7	A66, 140 m east of Whitworth Road	20,955	3,863	18.4%
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	8,030	945	11.8%
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	8,243	1,053	12.8%
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	4,437	907	20.4%
11	A1053 Greystone Road, 600 m north of the A174/A1053 Greystones roundabout	15,177	1,468	9.7%
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	33,502	2,042	6.1%
13	B1275 Belasis Avenue, 1.6 km west of its junction with Cowpen Bewley Road	2,586	76	2.9%
14	A1185, 800 m west of A178 Seaton Carew Road	5,961	1,082	18.2%

15.4.34 The above shows that the highest baseline HGV percentage is on the A66, and on the unnamed road to the north side of the River Tees.

Committed Development

15.4.35 At this preliminary stage, only the Net Zero Teesside (NZT) development has been included, and the ES will include other development as relevant to traffic and transport.

15.5 Proposed Development Design and Impact Avoidance

Construction

15.5.1 The construction contractor will implement a range of good practice mitigation measures during the construction phase to minimise traffic impacts upon local highways – this includes:

- implementation of a Construction Worker Travel Plan (CWTP) which will include measures and procedures to encourage construction workers to adopt modes of transport which reduces reliance on single occupancy private car use (a framework CWTP will be prepared and included with the ES);
- the appointed construction contractors to assess the potential for implementation of construction worker minibuses and car sharing options (to be considered as part of the CWTP);
- implementation of a Construction Traffic Management Plan (CTMP) to control the impact of HGVs on the local road network during construction (a Framework CTMP will be prepared and included with the ES); and
- working with suppliers to ensure that all relevant materials (including chemicals) brought to the Proposed Development Site that are classified as hazardous are transported in compliance with applicable regulations including the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG Regs) (as amended), during the commissioning and (operational)phase. This will include, for example, consignments being marked with the familiar "Emergency Access Codes" and including a telephone number for advice in the event of an emergency.

Operation

15.5.2 Workforce numbers during operation will be a maximum of 130 people (staff) following the opening of both Phases 1 and 2 (with a maximum of 100 staff being employed as part of Phase 1 only). Operations staffing will be on a shift basis to be spread over a 24-hour period. However, during 28-day maintenance periods which are likely to occur approximately every four years, there would be up to 400 people on site. Due to the very low traffic flows this would generate, no impact avoidance measures are considered required or proposed. A Travel Plan for the operational facility will be prepared and agreed prior to any occupation.

Decommissioning

15.5.3 Decommissioning is expected to require some traffic movements associated with the removal (and recycling as appropriate) of material arising from demolition and potentially the import of materials for land restoration and re-instatement. To minimise the impacts of decommissioning upon local highways, a Decommissioning Traffic Management Plan (DTMP) would be prepared to control the impacts of decommissioning worker traffic and HGVs.

15.5.4 Due to this activity being several years in the future, the baseline conditions cannot be estimated with any accuracy and as such no further assessment is possible, although any impact is likely to similar to the construction phase.

15.6 Likely Impacts and Effects

Construction

Introduction

15.6.1 Indicative construction compound locations are shown in Plate 15-1.

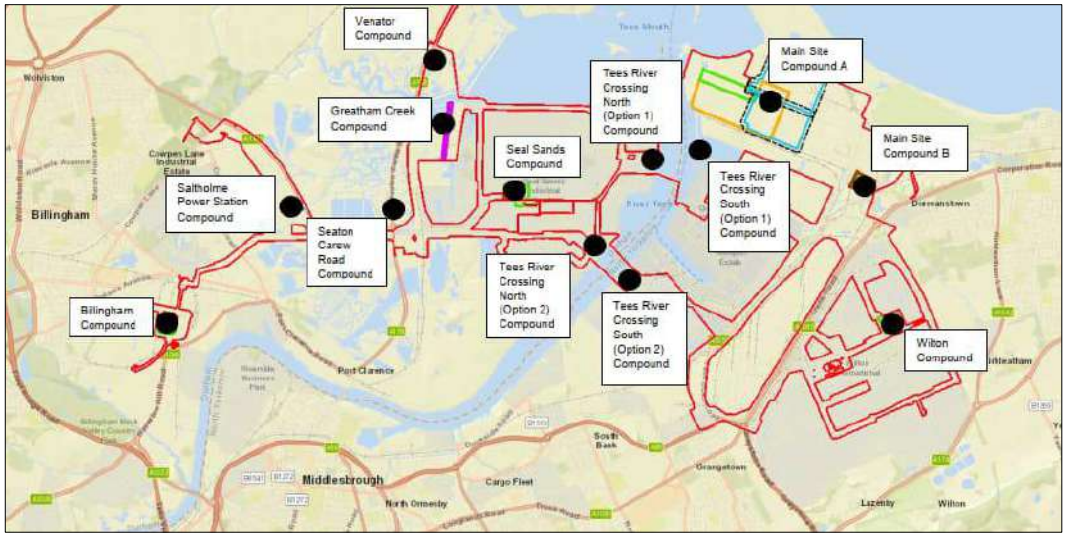

Plate 15-1: Construction Compound Locations

15.6.2 The proposed accesses to each of the above compounds are set out as follows:

South of the River Tees

- Access to the Main Site Compounds A and B and River Tees Crossing South Compound (Option 1) would be via the A1085 Trunk Road and the Teesworks Steel House Gate.
- Access to the River Tees Crossing South Compound (Option 2) would be via A1085 Trunk Road, Teesworks Steel House Gate, unnamed roads and Tees Dock Road or A1085 Trunk Road and Tees Dock Road.
- Access to the Wilton Compound would be via the Trunk Road and Wilton International East Gate or via the A174 and Wilton International South East Gate or Wilton Centre.

North of the River Tees

- Access to Tees River Crossing North Compound (Option 1), Seal Sands Compound and Greatham Creek Crossing Compound would be via A178 Seaton Carew Road and Seal Sands Road.
- Access to the Tees River Crossing North Compound (Option 2) would be via A178 Seaton Carew Road, Huntsman Drive and Riverside Road.
- Access to the Seaton Carew Road Compound and Venator Compound would be via A178 Seaton Carew Road/Tees Road.

- Access to the Saltholme Power Station Compound would be via A178 Seaton Carew Road, Seal Sands Roundabout and A1185.
- Access to the CF Fertilisers Billingham Compound would be via A178 Seaton Carew Road, A1046 Port Clarence Road and Haverton Hill Road or A19 Fleetbridge Road, Portrack Interchange and Haverton Hill Road.

15.6.3 It has been assumed that all construction compounds to the south of the River Tees will be accessed via the A1085 Trunk Road / Teesworks Steel House Gate roundabout. With all construction traffic to the north of the River Tees using the A178 Seaton Carew Road or A1185 to access the unnamed road to the east of the Seal Sands roundabout.

15.6.4 A potential alternative to the above is for HGVs to the south of the River Tees to access the Main Site and Connection Corridor construction compounds via the A1085 Lackenby Steek Works entrance. However, for the purposes of this PEI Report, the access is assumed to be via the Teesworks Steel House Gate, as set out above, and this assumption will be reviewed following this PEI Report as the EIA progresses, and stated in the ES.

15.6.5 The preliminary assessment below includes all elements of the Proposed Development Site, including the Main Site and the Connection Corridors north and south of the River Tees. Plate 15-2 shows the indicative profile of the traffic and worker and HGV trips.

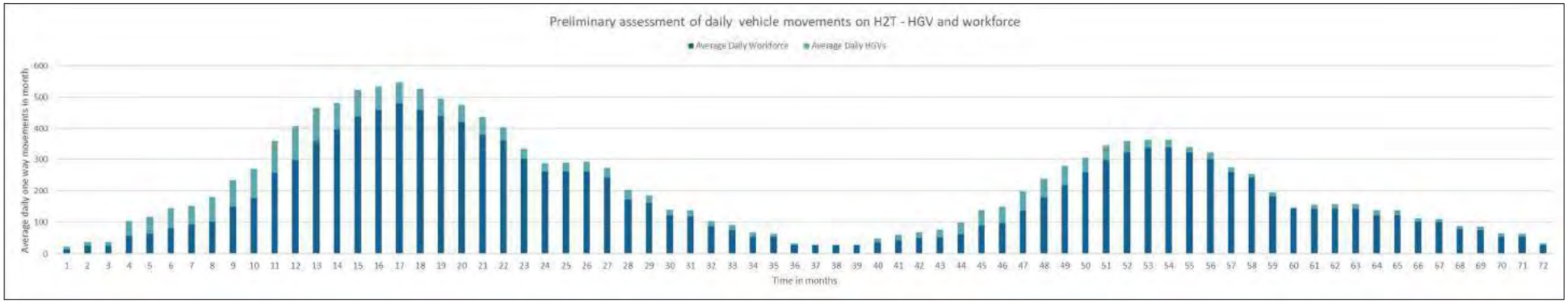

Plate 15-2: Construction Vehicle Profile (Average Daily Workforce and Average Daily HGVs)

Construction Workers

15.6.6 The estimated profile of the construction workers during construction of the Proposed Development is shown in Table 15-10, with the peak month being highlighted for reference.

15.6.7 It should be noted that the following information is used as the basis for distributing workers between the Main Site and the Connection Corridors to the north and south of the River Tees.

Table 15-10: Construction Monthly Worker Profile

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION WORKERS ON THE MAIN SITE	NUMBER OF CONNECTION CORRIDOR CONSTRUCTION WORKERS	TOTAL NUMBER OF CONSTRUCTION WORKERS – MAIN SITE AND CONNECTION CORRIDORS
1	20	0	20
2	50	0	50
3	50	0	50
4	70	20	90
5	80	20	100
6	100	30	130
7	100	40	140
8	120	40	160
9	180	60	240
10	200	80	280
11	300	120	420
12	400	120	520
13	500	140	640
14	600	140	740
15	700	140	840
16	750	140	890
17	800	140	940
18	800	120	920
19	750	120	870
20	700	120	820
21	600	120	720
22	550	120	670
23	400	120	520

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION WORKERS ON THE MAIN SITE	NUMBER OF CONNECTION CORRIDOR CONSTRUCTION WORKERS	TOTAL NUMBER OF CONSTRUCTION WORKERS – MAIN SITE AND CONNECTION CORRIDORS
24	300	120	420
25	300	120	420
26	300	120	420
27	300	100	400
28	250	50	300
29	250	40	290
30	200	20	220
31	200	20	220
32	150	10	160
33	150	0	150
34	100	0	100
35	100	0	100
36	50	0	50
37	50	0	50
38	50	0	50
39	50	0	50
40	70	0	70
41	80	0	80
42	100	0	100
43	100	0	100
44	120	0	120
45	180	0	180
46	200	0	200
47	300	0	300
48	400	0	400
49	500	0	500
50	600	0	600
51	700	0	700
52	750	0	750
53	800	0	800

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION WORKERS ON THE MAIN SITE	NUMBER OF CONNECTION CORRIDOR CONSTRUCTION WORKERS	TOTAL NUMBER OF CONSTRUCTION WORKERS – MAIN SITE AND CONNECTION CORRIDORS
54	800	0	800
55	750	0	750
56	700	0	700
57	600	0	600
58	550	0	550
59	400	0	400
60	300	0	300
61	300	0	300
62	300	0	300
63	300	0	300
64	250	0	250
65	250	0	250
66	200	0	200
67	200	0	200
68	150	0	150
69	150	0	150
71	100	0	100

15.6.8 From the above it can be seen that the peak month is month 17 in 2026 with a total of 940 workers per day.

HGVs

15.6.9 The estimated monthly HGV profile during the construction phase of the Proposed Development is shown in Table 15-11, with the peak month being highlighted for reference.

Table 15-11: Monthly HGV Profile

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION HGVS FOR THE MAIN SITE – TOTAL PER MONTH	NUMBER OF HGVS FOR THE CONNECTION CORRIDOR – TOTAL PER MONTH	TOTAL NUMBER OF CONSTRUCTION HGVS – MAIN SITE AND CONNECTION CORRIDOR – TOTAL PER MONTH
1	200	0	200

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION HGVS FOR THE MAIN SITE – TOTAL PER MONTH	NUMBER OF HGVS FOR THE CONNECTION CORRIDOR – TOTAL PER MONTH	TOTAL NUMBER OF CONSTRUCTION HGVS – MAIN SITE AND CONNECTION CORRIDOR – TOTAL PER MONTH
2	250	0	250
3	250	0	250
4	650	300	950
5	700	400	1100
6	750	500	1250
7	700	500	1200
8	950	600	1550
9	1190	500	1690
10	1440	400	1840
11	1550	500	2050
12	1610	600	2210
13	1560	600	2160
14	1050	600	1650
15	1100	600	1700
16	900	600	1500
17	730	600	1330
18	730	600	1330
19	620	500	1120
20	620	500	1120
21	630	500	1130
22	440	400	840
23	280	400	680
24	130	400	530
25	350	200	550
26	420	200	620
27	410	200	610
28	420	200	620
29	360	100	460
30	310	50	360
31	300	50	350

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION HGVS FOR THE MAIN SITE – TOTAL PER MONTH	NUMBER OF HGVS FOR THE CONNECTION CORRIDOR – TOTAL PER MONTH	TOTAL NUMBER OF CONSTRUCTION HGVS – MAIN SITE AND CONNECTION CORRIDOR – TOTAL PER MONTH
32	300	0	300
33	300	0	300
34	300	0	300
35	200	0	200
36	100	0	100
37	0	0	0
38	0	0	0
39	0	0	0
40	250	0	250
41	350	0	350
42	350	0	350
43	500	0	500
44	750	0	750
45	990	0	990
46	1040	0	1040
47	1240	0	1240
48	1210	0	1210
49	1210	0	1210
50	950	0	950
51	950	0	950
52	800	0	800
53	480	0	480
54	480	0	480
55	420	0	420
56	420	0	420
57	280	0	280
58	240	0	240
59	230	0	230
60	90	0	90
61	280	0	280

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION HGVS FOR THE MAIN SITE – TOTAL PER MONTH	NUMBER OF HGVS FOR THE CONNECTION CORRIDOR – TOTAL PER MONTH	TOTAL NUMBER OF CONSTRUCTION HGVS – MAIN SITE AND CONNECTION CORRIDOR – TOTAL PER MONTH
62	340	0	340
63	330	0	330
64	330	0	330
65	330	0	330
66	210	0	210
67	200	0	200
68	200	0	200
69	200	0	200
70	200	0	200
71	200	0	200

15.6.10 The above monthly HGV traffic flow can then be assessed as a daily flow by assuming 20 working days per month on average and this is set out in Table 15-12 with the overall peak month being highlighted for reference.

Table 15-12: Daily HGV Profile

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION HGVS FOR THE MAIN SITE – TOTAL PER DAY	NUMBER OF HGVS FOR THE CONNECTION CORRIDOR – TOTAL PER DAY	TOTAL NUMBER OF CONSTRUCTION HGVS – MAIN SITE AND CONNECTION CORRIDOR – TOTAL PER DAY
1	10	0	10
2	13	0	13
3	13	0	13
4	33	15	48
5	35	20	55
6	38	25	63
7	35	25	60
8	48	30	78
9	60	25	85
10	72	20	92

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION HGVS FOR THE MAIN SITE – TOTAL PER DAY	NUMBER OF HGVS FOR THE CONNECTION CORRIDOR – TOTAL PER DAY	TOTAL NUMBER OF CONSTRUCTION HGVS – MAIN SITE AND CONNECTION CORRIDOR – TOTAL PER DAY
11	78	25	103
12	81	30	111
13	78	30	108
14	53	30	83
15	55	30	85
16	45	30	75
17	37	30	67
18	37	30	67
19	31	25	56
20	31	25	56
21	32	25	57
22	22	20	42
23	14	20	34
24	7	20	27
25	18	10	28
26	21	10	31
27	21	10	31
28	21	10	31
29	18	5	23
30	16	3	18
31	15	3	18
32	15	0	15
33	15	0	15
34	15	0	15
35	10	0	10
36	5	0	5
37	0	0	0
38	0	0	0
39	0	0	0
40	13	0	13

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION HGVS FOR THE MAIN SITE – TOTAL PER DAY	NUMBER OF HGVS FOR THE CONNECTION CORRIDOR – TOTAL PER DAY	TOTAL NUMBER OF CONSTRUCTION HGVS – MAIN SITE AND CONNECTION CORRIDOR – TOTAL PER DAY
41	18	0	18
42	18	0	18
43	25	0	25
44	38	0	38
45	50	0	50
46	52	0	52
47	62	0	62
48	61	0	61
49	61	0	61
50	48	0	48
51	48	0	48
52	40	0	40
53	24	0	24
54	24	0	24
55	21	0	21
56	21	0	21
57	14	0	14
58	12	0	12
59	12	0	12
60	5	0	5
61	14	0	14
62	17	0	17
63	17	0	17
64	17	0	17
65	17	0	17
66	11	0	11
67	10	0	10
68	10	0	10
69	10	0	10
70	10	0	10

MONTH OF CONSTRUCTION	NUMBER OF CONSTRUCTION HGVS FOR THE MAIN SITE – TOTAL PER DAY	NUMBER OF HGVS FOR THE CONNECTION CORRIDOR – TOTAL PER DAY	TOTAL NUMBER OF CONSTRUCTION HGVS – MAIN SITE AND CONNECTION CORRIDOR – TOTAL PER DAY
71	10	0	10

Total Construction Traffic – Workers and HGVs

15.6.11 The profile of the monthly construction worker trips from Table 15-10 (with the number of workers in each month assumed to be the number of workers attending site each day) and the daily HGV trips from Table 15-12 can then be combined to provide the total construction traffic profile as shown in Table 15-13.

Table 15-13: Daily Worker and HGV Profile – Peak Month

MONTH OF CONSTRUCTION	TOTAL NUMBER OF CONSTRUCTION WORKERS	TOTAL NUMBER OF CONSTRUCTION HGVS	TOTAL CONSTRUCTION NUMBERS
1	20	10	30
2	50	13	63
3	50	13	63
4	90	48	138
5	100	55	155
6	130	63	193
7	140	60	200
8	160	78	238
9	240	85	325
10	280	92	372
11	420	103	523
12	520	111	631
13	640	108	748
14	740	83	823
15	840	85	925
16	890	75	965
17	940	67	1007
18	920	67	987
19	870	56	926
20	820	56	876

MONTH OF CONSTRUCTION	TOTAL NUMBER OF CONSTRUCTION WORKERS	TOTAL NUMBER OF CONSTRUCTION HGVS	TOTAL CONSTRUCTION NUMBERS
21	720	57	777
22	670	42	712
23	520	34	554
24	420	27	447
25	420	28	448
26	420	31	451
27	400	31	431
28	300	31	331
29	290	23	313
30	220	18	238
31	220	18	238
32	160	15	175
33	150	15	165
34	100	15	115
35	100	10	110
36	50	5	55
37	50	0	50
38	50	0	50
39	50	0	50
40	70	13	83
41	80	18	98
42	100	18	118
43	100	25	125
44	120	38	158
45	180	50	230
46	200	52	252
47	300	62	362
48	400	61	461
49	500	61	561
50	600	48	648
51	700	48	748
52	750	40	790

MONTH OF CONSTRUCTION	TOTAL NUMBER OF CONSTRUCTION WORKERS	TOTAL NUMBER OF CONSTRUCTION HGVS	TOTAL CONSTRUCTION NUMBERS
53	800	24	824
54	800	24	824
55	750	21	771
56	700	21	721
57	600	14	614
58	550	12	562
59	400	12	412
60	300	5	305
61	300	14	314
62	300	17	317
63	300	17	317
64	250	17	267
65	250	17	267
66	200	11	211
67	200	10	210
68	150	10	160
69	150	10	160
70	100	10	110
71	100	10	110

15.6.12 From the above it can be seen that the peak month is month 17 in 2026 with a total of 940 workers and 67 HGVs per day.

15.6.13 This assumption will be reassessed in the ES when cumulative developments are included to ensure that the most appropriate design year is being assessed.

15.6.14 Based upon the above, the trip generation can then be set out as follows.

Construction – Worker Car Trips

15.6.15 The total number of construction workers is split between the Main Site and the Connection Corridors with an estimate of the number of construction worker vehicle trips per day. This is set out in Table 15-14.

Table 15-14: Construction Worker Car Trips

WORKER LOCATION	NUMBER OF WORKERS	NUMBER OF WORKER VEHICLE TRIPS PER DAY (ONE WAY)	TWO WAY DAILY FLOW
Main Site	800	320	680
Daily Organisation vehicles	-	20	
Connection Corridors	-	140	280
Total	800	480	960

15.6.16 In the peak month of construction, it is assumed that all Connection Corridor sites will be active, three to the south of the River Tees (Teesworks, Wilton and Tees Crossing) and four to the north (Seal Sands, North Tees, Greatham and Billingham). This can then be assumed to be split evenly based on the number of active sites, with 57% of traffic to the north of the River Tees and 43% of traffic to the south of the River Tees as shown in Table 15-15.

Table 15-15: Connection Corridor Traffic North and South of the River Tees – Construction Workers

CONSTRUCTION ACTIVITY	TOTAL WORKER VEHICLES	NORTH OF THE RIVER TEES (57%)	SOUTH OF THE RIVER TEES (43%)
Connection Corridors	140 (29%)	80	60
Main Site	340 (71%)	N/A	340
TOTAL	480 (100%)	80	400

Construction – Worker Numbers (1,300 workers analysis)

15.6.17 However, based upon information supplied by the client, this PEI Report will be assessed based upon a maximum number of 1,300 workers on site in order to present a worst-case assessment, rather than the peak of 940 as given in Table 15-13 above, and this assumption will be revisited at the ES stage.

15.6.18 The assessment within this PEI Report will then use the same car sharing assumptions and splits between the Main Site and Connection Corridor worker as set out above in Table 15-15.

15.6.19 The peak workforce given above in Table 15-13 is 940 workers in month 17 with a total number of construction worker car trips of 480 as set out in Table 15-15. Therefore, it has been assumed that there will be an average of 2 workers per car, with a new total of 1,300 workers resulting in 650 car trips (one way) or 1,300 two way (650 arriving and 650 departing).

15.6.20 From Table 15-15, 71% of workers will travel to and from the Main Site and 29% will travel to and from the Connection Corridor. Therefore, based upon 650 car trips, 460 will travel to and from the Main Site and 190 will travel to the Connection Corridors.

15.6.21 In addition, based upon the percentage split between the Connection Corridors to the north and south of the Tees, as set out in Table 15-15, the 190 workers will be split 108 to the north of the Tees and 82 to the south of the Tees.

15.6.22 This can then be set out as follows.

Table 15-16: Construction Worker Car Trips (1,300 workers)

WORKER LOCATION	NUMBER OF WORKERS	NUMBER OF WORKER VEHICLE TRIPS PER DAY (ONE WAY)	TWO WAY DAILY FLOW
Main Site	1,300	460	920
Daily Organisation vehicles			
Connection Corridors		190	380
Total	1,300	650	1,300

Table 15-17: Connection Corridor Traffic North and South of the River Tees – Construction Workers (1,300 workers)

CONSTRUCTION ACTIVITY	TOTAL WORKER VEHICLES	NORTH OF THE RIVER TEES (57%)	SOUTH OF THE RIVER TEES (43%)
Connection Corridors	190 (29%)	108	82
Main Site	460 (71%)	N/A	340
TOTAL	650 (100%)	108	542

15.6.23 Based on the above, the daily worker profile for the peak months of construction is set out in Table 15-18.

Table 15-18: Daily Worker Profile – Peak Month of Construction (1,300 workers)

HOUR BEGINNING	% OF DAILY INBOUND	% OF DAILY OUTBOUND	WORKER ARRIVALS	WORKER DEPARTURES	TWO WAY DAILY TRAFFIC FLOW
06:00	34%	2%	221	13	234
07:00	25%	2%	163	13	176
08:00	5%	2%	33	13	46

HOUR BEGINNING	% OF DAILY INBOUND	% OF DAILY OUTBOUND	WORKER ARRIVALS	WORKER DEPARTURES	TWO WAY DAILY TRAFFIC FLOW
09:00	4%	2%	26	13	39
10:00	4%	3%	26	20	46
11:00	4%	3%	26	20	46
12:00	5%	4%	33	26	59
13:00	4%	4%	26	26	52
14:00	3%	3%	20	20	39
15:00	2%	3%	13	20	33
16:00	2%	5%	13	33	46
17:00	3%	15%	20	98	117
18:00	3%	35%	20	228	247
19:00	2%	16%	13	104	117
20:00	0%	1%	0	7	7
21:00	0%	0%	0	0	0
TOTAL	100%	100%	650	650	1,300

15.6.24 From the above, there will be 46 and 117 two-way vehicle movements associated with construction worker trips in the peak month in the traditional weekday AM and PM peak periods respectively, with most workers arriving and departing outside of these times.

HGV Trips

15.6.25 During the peak month (month 17), the volume of construction HGVs on the network is predicted to be 1,330 (730 of which are associated with the Main Site, and 600 of which are associated with the Connection Corridors). This equates to 67 HGVs per day (rounded from 66.5) (37 of which are associated with the Main Site and 30 of which are associated with the Connection Corridors), based on 20 working days per month.

15.6.26 As was assumed for construction workers, for the peak month of construction (month 17), it is assumed that all Connection Corridor sites will be active, three to the south of the River Tees (Teesworks, Wilton and Tees Crossing) and four to the north (Seal Sands, North Tees, Greatham and Billingham). This can then be assumed to be split evenly based on the number of active sites, with 57% of traffic to the north of the Tees and 43% of traffic to the south of the River Tees as shown in Table 15-19.

Table 15-19: Main Site and Connection Corridors HGV Monthly Traffic North and South of the River Tees

CONSTRUCTION ACTIVITY	TOTAL HGVS	NORTH OF THE TEES (57%)	SOUTH OF THE TEES (43%)
Connection Corridors	600	343	257
Main Site	730	N/A	730
TOTAL	1,330	343	987

15.6.27 The daily HGV movement can then be given as follows in Table 15-20.

Table 15-20: Main Site and Connection Corridors HGV Daily Traffic North and South of the River Tees

CONSTRUCTION ACTIVITY	TOTAL HGVS	NORTH OF THE TEES (57%)	SOUTH OF THE TEES (43%)
Connection Corridors	30	17	13
Main Site	37	N/A	37
TOTAL	67	17	50

15.6.28 Based on the above, the HGV daily profile is outlined in Table 15-21, with any minor errors in the data being as a result of rounding.

Table 15-21: Daily HGV Profile – Peak Month of Construction

HOUR BEGINNING	% OF DAILY INBOUND	% OF DAILY OUTBOUND	HGV ARRIVALS	HGV DEPARTURES	TWO WAY DAILY TRAFFIC FLOW
600	0%	0%	0	0	0
700	9%	8%	6	6	12
800	9%	8%	6	6	12
900	9%	8%	6	6	12
1000	9%	8%	6	6	12
1100	9%	8%	6	6	12
1200	9%	8%	6	6	12
1300	9%	8%	6	6	12
1400	9%	8%	6	6	12
1500	9%	8%	6	6	12

HOUR BEGINNING	% OF DAILY INBOUND	% OF DAILY OUTBOUND	HGV ARRIVALS	HGV DEPARTURES	TWO WAY DAILY TRAFFIC FLOW
1600	9%	8%	6	6	12
1700	9%	8%	6	6	12
1800	0%	8%	0	0	0
1900	0%	0%	0	0	0
2000	0%	0%	0	0	0
2100	0%	0%	0	0	0
TOTAL	100%	100%	67	67	133

15.6.29 From the above, the construction phase will generate around 12 HGV movements two way (6 arrivals and 6 departures) per hour during the day.

Trip Distribution and Vehicle Assignment

Distribution

15.6.30 With such a large and specialised workforce required for the construction of the Proposed Development, it is likely that much of the workforce will be sourced from beyond the daily commutable catchment area.

15.6.31 Experience at other similar construction sites has confirmed this and recent transport assessments prepared for other large energy developments have allowed for a split of permanent home-based site staff and transient staff staying in temporary accommodation.

15.6.32 As set out in Chapter 18: Socio-Economics and Land Use (PEI Report, Volume I) it has been assumed that the majority of the employment generated would be occupied by people living in the Middlesbrough and Stockton Travel To Work Area (TTWA) and as such leakage effects are considered to be low and has been set at 25%. The assessment has then been based upon 75% of workers being local and 25% being transient.

15.6.33 The 25% transitory workers will either engage in short term rentals or will reside in B&Bs, small hotels, caravan sites or private households located in the vicinity of the Proposed Development Site. From experience elsewhere on similar types of construction sites, these staff prefer to locate as close to the site as possible to minimise travel time and costs. They also tend to find accommodation in groups and lift share to site (or use contractors' minibuses).

15.6.34 The distribution of the permanent resident construction workforce traffic to the network has been based on a gravity model and the number of those employed in construction in towns and cities (ONS, 2011), within a 45-minute drive time of the site. The catchment area includes the districts of Redcar and Cleveland, Middlesbrough, Stockton-on-Tees, Hartlepool, Darlington, Sunderland and parts of

County Durham. Table 15-20 shows the permanent resident workforce distribution and the number of workers this equates to at the peak month of construction (month 14).

15.6.35 Tables 15-22 and 15-23 below take the worker population and their distance from the Proposed Development Site, and calculate a factor based upon the distance so that those locations further away (e.g., Hartlepool and Darlington) have a lower 'attractiveness' compared to those locations that are closer (e.g., Redcar and Cleveland and Middlesborough). The distribution therefore favours locations closer to the Proposed Development Site – these are shown within Figure 15-4: Traffic Routes (PEI Report, Volume II).

Table 15-22: Permanent Resident Construction Worker Distribution

DISTRICT	CONSTRUCTION WORKER POPULATION	DISTANCE (MILES)	FACTOR (1/D)	POP X FACTOR	PERCENTAGE (%) DISTANCE
Darlington	3,743	22	0.045	170	5%
Durham	9,100	32	0.031	284	8%
Hartlepool	3,764	22	0.045	171	5%
Middlesborough	4,620	6	0.167	770	22%
Redcar and Cleveland	4,976	4	0.250	1244	25%
Stockton-on-Tees	7,200	12	0.083	600	17%
Sunderland	9,345	35	0.029	267	8%

15.6.36 In contrast, the distribution of the transitory workforce has been undertaken based on a gravity model and the estimated number of accommodation beds available in the surrounding districts within a 30-minute travelling distance of the Proposed Development Site. This information has been based upon the methodology adopted and agreed for the NZT project, which was based on the Visit Britain Accommodation Stock Audit (2016), and if required this will be revisited for the ES. Table 15-23 shows the transitory workforce distribution and the number of workers this equates to at the peak month of construction.

Table 15-23: Transitory Resident Construction Worker Distribution

DISTRICT	NUMBER OF BEDS	DISTANCE (MILES)	FACTOR (1/D)	POP X FACTOR	PERCENTAGE (%) DISTANCE
Darlington	3,545	22	0.045	161	13%
Hartlepool	946	22	0.045	43	3%
Middlesborough	2,870	6	0.167	478	37%

DISTRICT	NUMBER OF BEDS	DISTANCE (MILES)	FACTOR (1/D)	POP X FACTOR	PERCENTAGE (%) DISTANCE
Redcar and Cleveland	1,484	4	0.250	371	29%
Stockton-on-Tees	2,711	12	0.083	226	18%

Trip Assignment

15.6.37 Five key routes have been identified that are most likely to be taken by construction workers travelling to and from work and are as follows:

- Route 1: Via A66 onto A1085 Trunk Road, Site Access;
- Route 2: Via A1085 Broadway onto A1085 Trunk Road, Site Access;
- Route 3: Via B1380 High Street onto A1053 Greystone Road, A1085 Trunk Road, Site Access;
- Route 4: Via A174 onto A1053 Greystone Road, A1085 Trunk Road, Site Access; and
- Route 5: Via A1085 Trunk Road, Site Access.

15.6.38 The key routes are shown on Figure 15-4: Traffic Routes (PEI Report, Volume II).

15.6.39 The assignment of the permanent resident construction workforce to the network is summarised in Table 15-24 and is consistent with the assessment of other developments within the local area.

15.6.40 With the total construction workers vehicle number of 960 being split 720 (75%) permanent and 240 (25%) temporary across both the Main Site and the Connection Corridors.

15.6.41 For this assessment, it is assumed that all construction HGVs associated with the Main Site will arrive/depart the site from Tees Dock Road via the A1053/A66/Tees Dock Road roundabout. At the junction with the A1053/A66/Tees Dock Road, it is assumed that 50% will head west on the A66 and 50% will head south on the A1053 then west on the A174.

15.6.42 Similarly, and again reflecting the unknown location of construction material, all Connection Corridor traffic to the north of the River Tees has been assigned along Seaton Carew Road to the junction with Haverton Hill Road and the B1275, where it is assumed it will split 50/50 to access the A19.

15.6.43 This 50/50 split is a conservative approach and reflects the unknown location of construction material during the preparation of this PEIR. If additional information becomes available this will be further assessed during the EIA. HGV routes are presented on Figure 15-2: HGV Routes to and from the Main Site (PEI Report, Volume II).

15.6.44 Table 15-25 presents the route assignment for transient resident workforce, with any minor errors in the numbers being due to rounding.

Table 15-24: Catchment Area and Route Assignment for Permanent Resident Workforce

ROUTE	CATCHMENT AREA	PERCENTAGE (%) CONSTRUCTION WORKER VEHICLES	MAIN SITE WORKERS	CONNECTION CORRIDOR WORKERS	TOTAL DAILY TRAFFIC FLOW
Route 1: Via A66 onto A1085 Trunk Road turning left into Site Access	Redcar & Cleveland Darlington Durham Hartlepool Middlesbrough Stockton-on-Tees Sunderland	50%	345	142	488
Route 2: Via A1085 Broadway onto A1085 Trunk Road turning left into Site Access	Redcar & Cleveland Middlesbrough	17%	117	48	166
Route 3: Via B1380 High Street onto A1053 Greystone Road, A1085 Trunk Road turning left into Site Access	Redcar & Cleveland Middlesbrough	7%	48	20	68
Route 4: Via A174 onto A1053 Greystone Road, A1085	Middlesbrough	6%	41	17	59

ROUTE	CATCHMENT AREA	PERCENTAGE (%) CONSTRUCTION WORKER VEHICLES	MAIN SITE WORKERS	CONNECTION CORRIDOR WORKERS	TOTAL DAILY TRAFFIC FLOW
Trunk Road turning left into Site Access					
Route 5: Via A1085 Trunk Road turning right into Site Access	Redcar & Cleveland	20%	138	57	195
Total			691	284	975

Table 15-25: Catchment Area and Route Assignment for Transient Resident Workforce

ROUTE	CATCHMENT AREA	PERCENTAGE (%) CONSTRUCTION WORKER VEHICLES	MAIN SITE WORKERS	CONNECTION CORRIDOR WORKERS	TOTAL DAILY TRAFFIC FLOW
Route 1: Via A66 onto A1085 Trunk Road turning left into Site Access	Darlington Hartlepool Middlesbrough Stockton-on-Tees	49%	113	46	159
Route 2: Via A1085 Broadway onto A1085 Trunk Road turning left into Site Access	Middlesbrough	22%	51	21	72

ROUTE	CATCHMENT AREA	PERCENTAGE (%) CONSTRUCTION WORKER VEHICLES	MAIN SITE WORKERS	CONNECTION CORRIDOR WORKERS	TOTAL DAILY TRAFFIC FLOW
Route 3: Via B1380 High Street onto A1053 Greystone Road, A1085 Trunk Road turning left into Site Access	-	0%	0	0	0
Route 4: Via A174 onto A1053 Greystone Road, A1085 Trunk Road turning left into Site Access	-	0%	0	0	0
Route 5: Via A1085 Trunk Road turning right into Site Access	Redcar & Cleveland	29%	67	27	94
Total			230	95	325

15.6.45 All the construction workers assignment has been based on the geographic split of population within a 45-minute drive time of the Proposed Development Site for permanent home-based workers and a 30-minute drive time for transitory workers.

15.6.46 The total construction traffic on each link can be assigned as follows in Table 15-26.

Table 15-26: Construction Traffic Flows

LINK		DAILY CONSTRUCTION TRAFFIC	
		TOTAL VEHICLES	TOTAL HGVS
1	A1085 Trunk Road, 100 m east of Ennis Road	289	0
2	A1085 Trunk Road, 1,340 m south of West Coatham Lane	989	99
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	145	0
4	A1085 Trunk Road, 0.5 km north of A1053 Tees Dock Road	989	99
5	A1085 Broadway, 230 m east of Birchington Avenue	238	0
6	A1380 High Street, 50 m east of Lackenby Lane	57	0
7	A66, 140 m east of Whitworth Road	677	49
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	108	17
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	215	34
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	251	34
11	A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout	155	49
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	98	49
13	B1275 Belasis Avenue, 1.6 km west of its junction with Cowpen Bewley Road	108	17
14	A1185, 800 m west of A178 Seaton Carew Road	70	34

Peak Construction Year Assessment

Based on the vehicle assignment, Table 15-27 summarises the likely changes in link flows within the Study Area for the assessment year peak of construction, 2026. As noted, this does not yet contain flows for committed developments which will be included in the EIA and reported in the ES.

Table 15-27: 2026 Baseline Plus Proposed Peak of Construction Development Two Way Annual Average Daily Traffic (AADT) Traffic Flows

LINK		2026 BASELINE		CONSTRUCTION TRAFFIC (1,300 WORKERS)		PERCENTAGE INCREASE (%)	
		TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS
1	A1085 Trunk Road, 100 m east of Ennis Road	12,948	1,107	289	0	2.2	0.0
2	A1085 Trunk Road, 1,340 m south of West Coatham Lane	15,176	1,345	989	99	6.5	7.3
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	12,438	804	145	0	1.2	0.0
4	A1085 Trunk Road, 0.5 km north of A1053 Tees Dock Road	16,940	2,122	989	99	5.8	4.7
5	A1085 Broadway, 230 m east of Birchington Avenue	8,537	549	238	0	2.8	0.0
6	A1380 High Street, 50 m east of Lackenby Lane	10,375	871	57	0	0.5	0.0
7	A66, 140 m east of Whitworth Road	20,955	3,863	677	49	3.2	1.3
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	8,030	945	108	17	1.3	1.8
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	8,243	1,053	215	34	2.6	3.3

LINK		2026 BASELINE		CONSTRUCTION TRAFFIC (1,300 WORKERS)		PERCENTAGE INCREASE (%)	
		TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	4,437	907	251	34	5.7	3.8
11	A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout	15,177	1,468	155	49	1.0	3.4
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	33,502	2,042	98	49	0.3	2.4
13	B1275 Belasis Avenue, 1.6 km west of its junction with Cowpen Bewley Road	2,586	76	108	17	4.2	22.6
14	A1185, 800 m west of A178 Seaton Carew Road	5,961	1,082	70	34	1.2	3.2

15.6.47 As set out in Table 15-27, and based upon the robust analysis of a total of 1,300 workers on site, the increase in traffic flows, including HGVs, associated with the construction of the Proposed Development will result in some increases in traffic flows, and in accordance with GEART (IEA, 1993), only those sensitive links that show a greater than 10% increase in total traffic flows (or HGV component) or, for all other links, a greater than 30% increase in total traffic or the HGV component, are considered when assessing the traffic impacts upon receptors.

15.6.48 The link predicted to experience an increase of above 10% is Link 13: B1275 Belasis Avenue located approximately 1.6 km west of its junction with Cowpen Bewley Road, which has a low level of sensitivity and an increase in HGV movements of 22.6%.

15.6.49 It should be noted that B1275 Belasis Avenue (link 13) has a low level of sensitivity, as set out in Table 15-1. Using the matrix provided in Table 15-3 to assess the significance of transportation effects associated with construction traffic at the peak of construction. Taking into account the link sensitivity and the associate traffic impacts, effects are assessed to be Negligible (Not Significant).

Severance

15.6.50 The predicted change in total traffic associated with the construction of the Proposed Development is considerably less than 30% on each link road (Very Low impact). Therefore, the severance effect upon all links is assessed to be Negligible (Not Significant).

Pedestrian Amenity

15.6.51 The change in total traffic (or HGV component) during the construction of the Proposed Development is considerably less than 50% on each link road (Very Low impact). Therefore, the effect upon pedestrian amenity for all links is assessed to be Negligible (Not Significant).

Fear and Intimidation

15.6.52 The change in total traffic during the construction of the Proposed Development is considerably less than 30% on each link road (Very Low impact). Therefore, the effect upon fear and intimidation for all links is assessed to be Negligible (Not Significant).

Highway Safety

15.6.53 Accident data for the most recent five years has been acquired for the Study Area and is summarised in Section 15.4. The statistics provide information on the location and severity of each PIA. Given that the level of increase in traffic flows resulting from the construction of the Proposed Development on road links is negligible, the effect on highway safety is also considered to be Negligible (Not Significant).

Driver Delay

15.6.54 Driver delay is only likely to be significant where the existing Study Area highway network is at or close to capacity. This is not considered to be required at this stage but will be confirmed following the outcome of further assessment in the ES to be submitted with the DCO Application.

Operation

15.6.55 Operational workforce peak numbers are expected to be a maximum of approximately 130 people (staff) on a shift basis to be spread over a 24-hour period. Although this could increase during periods of periodic maintenance to around 400 workers on site, which is considered to be relatively infrequent and would be managed in liaison with the Local Highway Authority so as to minimise any impacts.

15.6.56 Once the Proposed Development is operational, traffic flows are expected to be very low – significantly lower than those experienced during the construction period. The overall transportation effects during the operation of the Proposed Development are therefore not considered to be severe.

Decommissioning

15.6.57 Detailed information regarding the decommissioning of the Proposed Development is yet not available, given that its design life is 25 years. There are expected to be some traffic movements associated with the removal (and recycling) of material arising from decommissioning and potentially the import of materials for land restoration and re-instatement. However, vehicle numbers are not expected to be any higher than those experienced during the construction period.

15.6.58 Current baseline data collected for the purposes of this assessment is not valid at the year of decommissioning. However, as it is unlikely that baseline traffic figures on local roads will reduce appreciably, it is considered that the percentage increase in traffic due to decommissioning would be Negligible, and that overall, the effects of decommissioning traffic would be no greater than that of construction traffic. Notwithstanding, a DTMP would be implemented during the decommissioning phase to control the impact and routing of HGVs. Therefore, no further assessment will be undertaken.

15.7 Mitigation and Enhancement Measures

Construction

15.7.1 No additional mitigation measures other than those as set out in Section 15.5 are considered necessary. However, the construction contractors will review options for the use of rail and water transport when sourcing construction materials. The contractors will also review the use of rail travel for construction staff accessing the Proposed Development Site potentially using the existing Redcar British Steel railway station (currently mothballed).

Operation

15.7.2 Once operational, the Proposed Development is not considered to have any material impact upon the operation of the local highway network, although any impact could be minimised through the adoption of a Travel Plan, which will be prepared and agreed prior to any occupation.

15.8 Limitations and Difficulties

15.8.1 This preliminary assessment is based upon data and design information available at the time of writing. The baseline traffic data from 2019 is assumed to be representative of current conditions.

15.8.2 For the purposes of this preliminary assessment no allowance has been made for the delivery of construction materials by water or rail (in order to assess the worst-case construction road traffic impact), but the construction contractors will review options for the use of rail and water when sourcing construction materials.

15.8.3 In addition, this preliminary assessment, beyond the NZT project, does not include 'committed developments' in relation to peak construction traffic. This will be reported in the ES, and any developments that are relevant to traffic and transportation will be assessed and included if required.

15.8.4 Driver delay has not been undertaken at this preliminary stage but will be reviewed as part of the future ES assessment and included if required. A separate Transport Assessment, Framework CTMP and Framework CWTP will be presented as appendices to the ES chapter and submitted with the DCO Application.

15.9 Residual Effects and Conclusions

Construction

15.9.1 The additional traffic predicted to be generated by the construction of the Proposed Development based upon a robust analysis of 1,300 workers (both the Main Site and Connection Corridors) will result in small, temporary increases of traffic flows, including HGVs, on the roads leading to the Main Site and the Connection Corridors north and south of the River Tees.

15.9.2 In line with the significance criteria presented herein, the residual effects of construction traffic on all road sections and junctions are anticipated to be Negligible (Not Significant). Notwithstanding this, a number of traffic management measures will be implemented during the Proposed Development's construction phase to minimise traffic impacts upon the local road network.

Operation

15.9.3 The generation of traffic during the operation of the Proposed Development is not considered to be severe and has not been assessed within this PEIR.

Decommissioning

15.9.4 The decommissioning of the Proposed Development is not expected to generate traffic levels any higher than during the construction phases, and therefore no assessment has been included within this PEIR.

15.10 Combined Impact with Net Zero Teesside

15.10.1 An assessment of the likely impact of the Proposed Development combined with that of NZT is set out as follows, assuming that the peaks of construction coincide. Although, within the NZT ES (AECOM, 2021), the peak of construction is given as

occurring in 2024. By including the peak traffic flow for both projects, the worst-case has been assessed.

15.10.2 From Tables 16-14 and 16-15 of the NZT ES, the peak construction traffic can be set out as follows in Table 15-27.

Table 15-27: Net Zero Teesside Peak of Construction Traffic

LINK		TOTAL VEHICLES	TOTAL HGVS
1	A1085 Trunk Road, 100 m east of Ennis Road	411	0
2	A1085 Trunk Road, 1,340 m south of West Coatham Lane	1219	10
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	200	0
4	A1085 Trunk Road, 0.5 km north of A1053 Tees Dock Road	1219	10
5	A1085 Broadway, 230 m east of Birchington Avenue	324	0
6	A1380 High Street, 50 m east of Lackenby Lane	846	0
7	A66, 140 m east of Whitworth Road	129	45
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	44	0
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	85	45
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	130	10
11	A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout	130	10
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	130	10
13	B1275 Belasis Avenue, 1.6 km west of its junction with Cowpen Bewley Road	130	10
14	A1185, 800 m west of A178 Seaton Carew Road	130	0

15.10.3 The combined 2026 future baseline from Table 15-21 can then be combined with the above NZT construction flows as follows in Table 15-28.

Table 15-28: 2026 Baseline plus Net Zero Teesside Peak of Construction Traffic

LINK		TOTAL VEHICLES	TOTAL HGVS	HGV PERCENTAGE (%)
1	A1085 Trunk Road, 100 m east of Ennis Road	13,162	1,107	8.4%
2	A1085 Trunk Road, 1,340 m south of West Coatham Lane	15,933	1,444	9.1%
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	12,545	804	6.4%
4	A1085 Trunk Road, 0.5 km north of A1053 Tees Dock Road	17,696	2,221	12.5%
5	A1085 Broadway, 230 m east of Birchington Avenue	8,713	549	6.3%
6	A1380 High Street, 50 m east of Lackenby Lane	10,417	871	8.4%
7	A66, 140 m east of Whitworth Road	21,468	3,912	18.2%
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	8,114	962	11.9%
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	8,411	1,088	12.9%
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	4,631	941	20.3%
11	A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout	15,304	1,518	9.9%
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	33,587	2,092	6.2%
13	B1275 Belasis Avenue, 1.6 km west of its junction with Cowpen Bewley Road	2,670	93	3.5%
14	A1185, 800 m west of A178 Seaton Carew Road	6,022	1,117	18.5%

15.10.1 Based on the above, Table 15-29 summarises the likely changes in link flows within the Study Area for the assessment year peak of construction, 2026. As noted, this only includes the NZT as a committed development and other sites will be included with the ES.

Table 15-29: Net Zero Teesside Cumulative Impact with the Proposed Development

LINK		2026 BASELINE PLUS NET ZERO TEESSIDE		CONSTRUCTION TRAFFIC FOR THE PROPOSED DEVELOPMENT		PERCENTAGE INCREASE (%) IN TRAFFIC FLOWS WITH THE ADDITION OF THE PROPOSED DEVELOPMENT	
		TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS
1	A1085 Trunk Road, 100 m east of Ennis Road	13,162	1,107	289	0	2.2	0.0
2	A1085 Trunk Road, 1,340 m south of West Coatham Lane	15,933	1,444	989	99	6.1	6.8
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	12,545	804	145	0	1.1	0.0
4	A1085 Trunk Road, 0.5 km north of A1053 Tees Dock Road	17,696	2,221	989	99	5.5	4.4
5	A1085 Broadway, 230 m east of Birchington Avenue	8,713	549	238	0	2.7	0.0
6	A1380 High Street, 50 m east of Lackenby Lane	10,417	871	57	0	0.5	0.0
7	A66, 140 m east of Whitworth Road	21,468	3,912	677	49	3.1	1.3
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	8,114	962	108	17	1.3	1.8

LINK		2026 BASELINE PLUS NET ZERO TEESSIDE		CONSTRUCTION TRAFFIC FOR THE PROPOSED DEVELOPMENT		PERCENTAGE INCREASE (%) IN TRAFFIC FLOWS WITH THE ADDITION OF THE PROPOSED DEVELOPMENT	
		TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	8,411	1,088	215	34	2.5	3.2
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	4,631	941	251	34	5.4	3.6
11	A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout	15,304	1,518	155	49	1.0	3.3
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	33,587	2,092	98	49	0.3	2.4
13	B1275 Belasis Avenue, 1.6 km west of its junction with Cowpen Bewley Road	2,670	93	108	17	4.0	18.4
14	A1185, 800 m west of A178 Seaton Carew Road	6,022	1,117	70	34	1.2	3.1

15.10.2 In accordance with GEART (IEA, 1993), only those sensitive links that show a greater than 10% increase in total traffic flows (or HGV component) or, for all other links, a greater than 30% increase in total traffic or the HGV component, are considered when assessing the traffic impacts upon receptors.

15.10.3 The only link predicted to experience an increase of above 10% is Link 13 B1275 Belasis Avenue, which has a low level of sensitivity and an increase in HGV movements of 18.4%.

15.10.4 However, it should be noted that Link 13 B1275 Belasis Avenue has a low level of sensitivity, as set out in Table 15-1. Therefore, it is considered that all the links within the Study Area fall below the GEART screening thresholds. However, the assessment uses the matrix provided in Table 15-3 to assess the significance of transportation effects associated with construction traffic at the peak of construction. Taking into account the link sensitivity and the associate traffic impacts, effects are assessed to be Negligible (Not Significant).

Severance

15.10.5 The predicted change in total traffic associated with the construction of the Proposed Development is considerably less than 30% on each link road (Very Low impact). Therefore, the severance effect upon all links is assessed to be Negligible (Not Significant).

Pedestrian Amenity

15.10.6 The expected change in total traffic (or HGV component) is considerably less than 50% on each link road (Very Low impact) during the construction of the Proposed Development. Therefore, the effect upon pedestrian amenity for all links is assessed to be Negligible (Not Significant).

Fear and Intimidation

15.10.7 The predicted change in total traffic is considerably less than 30% on each link road (Very Low impact) during the construction of the Proposed Development. Therefore, the effect upon fear and intimidation for all links is assessed to be Negligible (Not Significant).

Highway Safety

15.10.8 Accident data for the most recent five years has been acquired for the Study Area and is summarised in Section 15.4. The statistics provide information on the location and severity of each PIA. Given that the level of increase in traffic flow resulting from the construction of the Proposed Development on road links is Negligible, the effect on highway safety is also considered to be Negligible (Not Significant).

15.10.9 In line with the significance criteria presented herein, the residual effects of construction traffic on all road sections and junctions, when considering the cumulative effect with the inclusion of the construction traffic associated with NZT, are anticipated to be Negligible (Not Significant). Notwithstanding this, a number of traffic management measures will be implemented during the Proposed Development's construction phase to minimise traffic impacts upon the local road

network. The ES will include the full list of committed developments which will be included, and this section of the assessment will be updated accordingly.

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16.0 LANDSCAPE AND VISUAL AMENITY

16.1 Introduction

16.1.1 This chapter of the Preliminary Environmental Information (PEI) Report identifies the potential impacts and effects on landscape character and visual amenity as associated with the Proposed Development. The Landscape and Visual Impact Assessment (LVIA) has been undertaken in accordance with good practice guidance, including the Guidelines for LVIA (GLVIA) third edition (GLVIA3) (Institute of Environmental Management and Assessment (IEMA), 2013).

16.1.2 This chapter is supported by the following figures (PEI Report, Volume II) and technical appendices (PEI Report, Volume III):

- Figure 16-1: Landscape Context;
- Figure 16-2: Landscape Character;
- Figure 16-3: Zone of Theoretical Visibility and Potential Viewpoint Locations;
- Figure 16-4: Topography;
- Figure 16-5: Zone of Theoretical Visibility and Representative Viewpoint Locations;
- Figures 16-6-1 to 16-6-14: Winter Viewpoint Photography;
- Figures 16-7-1 to 16-7-14: Summer Viewpoint Photography;
- Figures 16-8-1 to 16-8-8: Photowires;
- Appendix 16A: Landscape Character;
- Appendix 16B: Landscape and Visual Proposed Methodology; and
- Appendix 16C: Potential Viewpoints.

16.2 Legislation and Planning Policy Context

16.2.1 The following section provides an overview of legislation and planning policy and guidance that is relevant to landscape character and visual amenity.

Legislative Background

The European Landscape Convention (2007)

16.2.2 The European Landscape Convention (ELC) (Council of Europe, 2020) was signed by the UK Government in 2006 and came into effect in March 2007. The ELC recognises landscape in law. It focuses specifically on landscape issues and highlights the importance of integration of landscape into areas of policy, to promote protection, management and planning of all landscapes including the assessment of landscape and analysis of landscape change.

Planning Policy Context

16.2.3 This assessment has been undertaken taking into account relevant national, regional and local planning policy, as summarised below.

National Planning Policy

Overarching National Policy Statement (NPS) for Energy (EN-1) (2011)

16.2.4 The Overarching National Policy Statement (NPS) for Energy (EN-1) (DECC, 2011) includes a number of statements pertinent to landscape and visual impacts of energy infrastructure.

16.2.5 Section 5.9 of EN-1 sets out the requirements for assessing and mitigating landscape and visual impacts of proposed nationally significant energy infrastructure projects (NSIPs). The scope of the assessment should include construction phase effects as well as the effects of the completed facility and its operation on landscape components, landscape character and views and visual amenity. The assessment should also consider the potential effects associated with the decommissioning of the development.

16.2.6 In terms of mitigation, EN-1 encourages the reduction in the scale of the project, taking into consideration function, appropriate siting and design, including colours and materials, and landscaping schemes to mitigate adverse landscape and visual impacts.

16.2.7 Paragraphs 5.9.15 to 5.9.16 to EN-1 state:

> *"The scale of such projects means that they will often be visible within many miles of the site of the proposed infrastructure. The Secretary of State should judge whether any adverse impact on the landscape would be so damaging that it is not offset by the benefits (including need) of the project.*
>
> *In reaching a judgment, the Secretary of State should consider whether any adverse impact is temporary, such as during construction, and/or whether any adverse impact on the landscape will be capable of being reversed in a timescale that the Secretary of State considers reasonable."*

16.2.8 Paragraph 5.9.18 of EN-1 states:

> *"All proposed energy infrastructure is likely to have visual effects for many receptors around proposed sites.*
>
> *The Secretary of State will have to judge whether the visual effects on sensitive receptors, such as local residents, and other receptors, such as visitors to the local area, outweigh the benefits of the project."*

16.2.9 Paragraph 5.9.8 of EN-1 states:

> *"Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints the aim should be to minimise harm to the landscape, providing reasonable mitigation where possible and appropriate."*

16.2.10 Section 5.10 of EN-1 establishes the requirements for identifying and mitigating impacts of energy infrastructure projects on open space, including Green Infrastructure (GI).

16.2.11 An energy infrastructure project will have direct effects on the existing use of the proposed site and may have indirect effects on the use, or planned use, of land in the vicinity for other types of development. Given the likely locations of energy infrastructure projects there may be particular effects on open space and GI.

16.2.12 Where GI is affected, the Secretary of State (SoS) should consider imposing requirements to ensure the connectivity of the GI network is maintained in the vicinity of the development and that any necessary works are undertaken, where possible, to mitigate any adverse impact.

National Policy Statement (NPS) for Gas and Oil Pipelines (EN-4) (2011)

16.2.13 The National Policy Statement (NPS) for Gas and Oil Pipelines (EN-4) (DECC, 2011) includes a number of statements pertinent to landscape and visual impacts of pipeline infrastructure.

16.2.14 Section 2.21 of EN-4 Paragraph 2.21.1 states:

"Additional considerations apply during the construction of a pipeline (which, without mitigation, can affect both landscape and ecology).

These comprise the effect upon specific landscape elements within and adjacent to the pipeline route, such as grasslands, field boundaries (hedgerows, hedgebanks, drystone walls, fences), trees, woodlands, and watercourses."

"There will also be temporary visual impacts caused by the need to access the working corridor and to remove flora and soil."

"The working width of the pipeline will vary depending on the surrounding terrain. Temporary impacts could include large excavations where deep pits are needed for boring beneath rivers, roads and sensitive features."

16.2.15 Section 2.21 of EN-4 Paragraph 2.21.2 states:

"Long term impacts upon the landscape for pipelines are likely to be limited, as once operational the main infrastructure is usually buried. They are likely to include:

• limitations on the ability to replant landscape features such as hedgerows or deep-rooted trees over or adjacent to the pipeline; and

• structures and indication points necessary to identify the pipeline route and provide it with service access."

16.2.16 Section 2.21 of EN-4 Paragraph 2.21.3 states:

"…The application should also include proposals for reinstatement of the pipeline route as close to its original state as possible and take into account any requirements for agreements with the landowner to access areas for aftercare and management work."

"Where it is unlikely to be possible to restore landscape to its original state, the applicant should set out measures to avoid, mitigate, or employ other landscape measures to compensate for, any adverse effect on the landscape."

National Policy Statement (NPS) for Electrical Networks Infrastructure (EN-5) (2011)

16.2.17 The National Policy Statement (NPS) for Electrical Networks Infrastructure (EN-5) (DECC, 2011) includes a number of statements pertinent to landscape and visual impacts of electrical networks infrastructure.

16.2.18 Paragraph 2.8.9 states:

> "*The impacts and costs of both overhead and underground options vary considerably between individual projects (both in absolute and relative terms). Therefore, each project should be assessed individually on the basis of its specific circumstances and taking account of the fact that Government has not laid down any general rule about when an overhead line should be considered unacceptable. The IPC should, however only refuse consent for overhead line proposals in favour of an underground or sub-sea line if it is satisfied that the benefits from the non-overhead line alternative will clearly outweigh any extra economic, social and environmental impacts and the technical difficulties are surmountable. In this context it should consider:*
>
> *a) the landscape in which the proposed line will be set, (in particular, the impact on residential areas, and those of natural beauty or historic importance such as National Parks, AONBs and the Broads);*
>
> *b) the additional cost of any undergrounding or sub-sea cabling (which experience shows is generally significantly more expensive than overhead lines but varies considerably from project to project depending on a range of factors, including whether the line is buried directly in open agricultural land or whether more complex tunnelling and civil engineering through conurbations and major cities is required. Repair impacts are also significantly higher than for overhead lines as are the costs associated with any later uprating.); and*
>
> *c) the environmental and archaeological consequences (undergrounding a 400kV line may mean disturbing a swathe of ground up to 40 metres across, which can disturb sensitive habitats, have an impact on soils and geology, and damage heritage assets, in many cases more than an overhead line would).*"

Draft Overarching NPS for Energy (EN-1) (2023)

16.2.19 The Government is currently reviewing and updating the Energy NPSs to reflect its policies and strategic approach for the energy system that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions.

16.2.20 The detail of the Draft Overarching National Policy Statement for Energy (EN-1) (Draft NPS EN-1) (DECC, 2023) is currently subject to ongoing consultation. Section 5.10 of the draft EN-1 sets out the requirements for assessing and mitigating landscape and visual impacts.

16.2.21 Given the role and importance of the NPS under the Planning Act 2008 (PA 2008), the EIA approach takes account of these new emerging documents and any subsequent

formal adoption of new NPSs for energy infrastructure will be considered where relevant during the production of the Environmental Statement (ES).

Draft National Policy Statement (NPS) for Gas and Oil Pipelines (EN-4) (2023)

16.2.22 The Daft National Policy Statement (NPS) for Gas and Oil Pipelines (EN-4) (DESNZ, 2023) includes a number of statements pertinent to landscape and visual impacts of pipeline infrastructure.

16.2.23 Section 2.21 of Draft EN Paragraph 2.22.6 states:

"Mitigation measures to protect the landscape, visual amenity and ecology could include reducing the working width required for the installation of the pipeline to reduce the impact on the landscape where it will not be possible to fully reinstate the route."

16.2.24 Section 2.21 of Draft EN Paragraph 2.21.29 states:

"Long term impacts upon the landscape for pipelines are likely to be limited, as once operational the main infrastructure is usually buried. They are likely to include:

• limitations on the ability to replant landscape features such as hedgerows or deep-rooted trees over or adjacent to the pipeline; and

• structures and indication points necessary to identify the pipeline route and provide it with service access."

16.2.25 Section 2.21 of Draft EN Paragraphs 2.21.31 to 2.21.32 state:

"The application should also include proposals for reinstatement of the pipeline route as close to its original state as possible and take into account any requirements for agreements with the landowner to access areas for aftercare and management work.

Where it is unlikely to be possible to restore landscape to its original state, the applicant should set out measures to avoid, mitigate, or employ other landscape measures to compensate for, any adverse effect on the landscape."

Draft National Policy Statement (NPS) for Electrical Networks Infrastructure (EN-5) (2023)

16.2.26 The Daft National Policy Statement (NPS) for Electrical Networks Infrastructure (EN-5) (DESNZ, 2023) includes a statement pertinent to landscape and visual impacts of pipeline infrastructure.

16.2.27 Paragraph 2.2.8 states:

"There will usually be a degree of flexibility in the location of the development's associated substations, and applicants should consider carefully their placement in the local landscape, as well as their design."

16.2.28 National Planning Policy Framework (NPPF) (2021) The National Planning Policy Framework (NPPF) (MHCLG, 2021) was last updated in July 2021 and sets out the government's planning policies for England and provides guidance on their

application. Consultation on the NPPF ran from December 2022 to March 2023 and is outlined within the NPPF: draft text for consultation.

16.2.29 Although paragraph 5 of the NPPF confirms that NSIPs are to be determined in accordance with the decision-making framework of the PA 2008 and relevant NPSs, decisions on NSIPs should also take account of any other matters that are "relevant", which may include the NPPF.

16.2.30 The NPPF has a strong emphasis on sustainable development, with a presumption in favour of such development. It sets out requirements for planning policies and decisions to ensure developments are visually attractive, including through appropriate landscape design, are sympathetic to the local character and landscape setting, and create or maintain a strong sense of place.

16.2.31 In relation to the natural environment, NPPF states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

- *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate".*

The National Planning Practice Guidance (NPPG): Natural environment (2019)

16.2.32 Paragraph 36 of the NPPG (MHCLG, 2019) explains the key issues and planning policies relating to the conservation and enhancement of the landscape.

16.2.33 Paragraph 37 of the guidance states that an LVIA can be used to demonstrate the likely effects of a proposed development on landscape character.

Local Planning Policy

Redcar and Cleveland Local Plan (2018)

16.2.34 The Redcar & Cleveland Local Plan (adopted May 2018) (RCBC, 2018) includes a number of policies relevant to landscape and visual considerations as described below.

16.2.35 Policy N1: Landscape aims to protect and enhance the local landscape and states that developments will not be permitted where they would lead to the loss of features important to the character, quality and distinctiveness of the landscape, unless the benefits clearly outweigh landscape considerations. This policy also identifies Locally Important Landscapes, categorising them as either:

- Sensitive Landscapes, in which much landscape structure is present to give high 'strength of character' which is sensitive to change. Priority is placed on the retention of important landscape characteristics/features within these areas.
- Restoration Landscapes, where the landscape structure has been lost to varying degrees and would benefit from restoration, with opportunities sought to achieve this as part of development.

16.2.36 Policy LS1: Urban Area Spatial Strategy aims to protect and enhance the character and special qualities of the Eston Hills.

16.2.37 Policy SD4: General Development Principles sets out a series of criteria against which the suitability of a site or location to development will be considered, highlighting that important environmental, built and historic assets should be protected.

Redcar and Cleveland Local Development Framework: Landscape Character Supplementary Planning Document (SPD) (2010)

16.2.38 The SPD (RCBC, 2010) sets out guidance to be used when designing proposed developments and is to be used in conjunction with the Redcar and Cleveland Landscape Character Assessment (refer to Section 16.4).

16.2.39 The SPD identifies the classification of the rural landscape into the two categories as outlined in Policy NE1 of the Redcar and Cleveland Local Plan above, and provides guidance on habitat creation, species selection, and built design within each of the defined Broad Landscape Areas.

Stockton-on-Tees Local Plan (2019)

16.2.40 The Stockton-on-Tees Local Plan (adopted January 2019) (STBC, 2019) includes the following policies relevant to landscape and visual considerations:

- Policy SD5: Natural, Built and Historic Environment, which aims to ensure the conservation and enhancement of the environment;
- Policy ENV5: Preserve, Protect and Enhance Ecological Networks, Biodiversity and Geodiversity, which states "*development proposals will be supported where they enhance nature conservation and management, preserve the character of the natural environment and maximise opportunities for biodiversity and geological conservation particularly in or adjacent to Biodiversity Opportunity*

Areas in the River Tees Corridor, Teesmouth and Central Farmland Landscape Areas";

- Policy ENV6: Green Infrastructure, Open Space, Green Wedges and Agricultural Land, which aims to "*protect and support the enhancement, creation and management of all green infrastructure to improve its quality, value, multi-functionality and accessibility*"; and
- Policy SD8: Sustainable Design Principles, which states "*new development to be designed to the highest possible standard, taking into consideration the context of the surrounding area*". The policy aims to ensure new development fits in with the surrounding area.

Hartlepool Local Plan (2018)

16.2.41 Hartlepool Local Plan (adopted 2018) (HBC, 2018) includes the following policies relevant to landscape and visual considerations:

- Policy RUR1: Development in the Rural Area, which aims "*to ensure the rural area is protected and enhanced to ensure that its natural habitat, cultural and built heritage and rural landscape character are not lost*"; and
- Policy NE1: Natural Environment, which states "*the borough council will protect, manage and enhance Hartlepool's natural environment*".

16.3 Assessment Methodology and Significance Criteria

Study Area

16.3.1 The extent of the Study Area is determined by the potential visibility of the Proposed Development in the surrounding landscape. It is proportionate to the size and scale of the Proposed Development and nature of the surrounding landscape. GLVIA3 (IEMA, 2013) states that the Study Area should include "*the full extent of the wider landscape around it which the proposed development may influence in a significant manner*".

16.3.2 For the purposes of this assessment, the Study Area has been defined by a combination of Zone of Theoretical Visibility (ZTV) analysis and professional judgement. Professional judgements made during survey work based upon the tallest element of the Proposed Development being the flare (100 m Above Ground Level (AGL)), it is considered that it is highly unlikely that significant effects would be experienced further than 10 km from the Main Site. The Study Area therefore extends 10 km from the Main Site.

16.3.3 Based upon the nature of the works required within the connection corridors (taking account of all permanent above ground structures) and professional judgement, it is considered highly unlikely that significant effects will be experienced further than 2 km from them. Therefore, a Study Area of 2 km has been applied for the connection corridors.

16.3.4 The Study Areas overlap to the north, east, and south of the Study Area, as illustrated by Figure 16-1: Landscape Context (PEI Report, Volume II).

Impact Assessment Methodology

16.3.5 The LVIA has been undertaken based on the following good practice guidance:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA 3) (IEMA, 2013);
- Technical Guidance Note 02/21: Assessing Landscape Value Outside National Designations (Landscape Institute, 2021);
- Technical Guidance Note 04/2020: Infrastructure (Landscape Institute, 2020); and
- Technical Guidance Note 06/2019: Visual Representation of Development Proposals (Landscape Institute, 2019).

Sources of Information

16.3.6 Four site visits were undertaken by a landscape architect, under the supervision of a chartered landscape architect. The winter survey and viewpoint photography were carried out between February 2023 and April 2023 and the summer survey and viewpoint photography was carried out in July 2023 to better understand the existing landscape character of the area and the potential impacts of the Proposed Development upon the surrounding community, and to record views from representative viewpoints.

16.3.7 As stated above, OS maps, aerial photographs, LPA landscape character assessment documents and Natural England's national character mapping have also been utilised to inform the baseline.

16.3.8 Baseline data has been gathered from a study of Ordnance Survey (OS) maps and aerial photographs, publicly available documents such as landscape character assessment documents from local planning authorities (LPAs) within the immediate area and national character mapping available from Natural England. A site visit has also been undertaken to assess the existing character and impact of the Proposed Development on receptors such as residents and to record views from representative viewpoints.

16.3.9 A detailed description of the assessment methodology is included in Appendix 16B: Landscape and Visual Impact Assessment Methodology (PEI Report, Volume III) and is summarised below.

16.3.10 For the purposes of comparison and to establish a 'control' scenario against which the effects of the Proposed Development may be assessed, the baseline conditions are projected forward to produce a future 'no development' (baseline) scenario. The potential impacts of the Proposed Development upon the baseline landscape and receptor views are then identified and the significance of any resulting effect is then assessed. Potential landscape and visual impacts and the resulting effects (both adverse and beneficial) are considered for the following scenarios:

- Construction: Phase 1 from 2025 – 2028 and Phase 2 from 2028 to 2030 (period of 6 years), assumes structures on the former steelworks site have been demolished;

- Operation: 2028 with a life span of 25 years; and
- Decommissioning: 2053 – 2058/9.

16.3.11 Impacts may be temporary, permanent, short-term, medium-term, or long-term. Landscape and visual impacts may be further categorised as being either direct (i.e., originating from the development itself); or indirect and secondary (from consequential change resulting from the development).

16.3.12 The assessment of effects is based on an evaluation of the sensitivity to change and the magnitude of impacts for each landscape or visual receptor, guided by a set of pre-defined criteria, as detailed in Appendix 16B: Landscape and Visual Impact Assessment Methodology (PEI Report, Volume III). This provides a level of consistency and transparency to the assessment and allow comparisons to be made between the various landscape and visual receptors subject to assessment. When assessing the degree of individual effects, these may fall across several different categories and professional judgement is therefore used to determine which level best fits the overall effect on a landscape or visual receptor. In accordance with GLVIA3 this is not a prescriptive process and is provided as a guide to how sensitivity and magnitude are typically combined.

Significance Criteria

Landscape Effects

16.3.13 The assessment of potential effects on landscape character resulting from the Proposed Development involves consideration of the following:

- existing baseline landscape character;
- sensitivity of the landscape to the change proposed; and
- magnitude of likely impacts on the landscape.

16.3.14 The landscape baseline has been determined through a combination of desk-based research and site survey to identify and describe distinct Landscape Character Areas (LCAs) within the Study Area. The value of each landscape receptor is also established as part of the baseline and is often guided by designation and informed by a range of other considerations such as quality and condition, distinctiveness, rarity, function, natural and cultural heritage designation, and perceptual aspects.

16.3.15 The sensitivity of the landscape receptor is a combination of its value and susceptibility to change to the specific type of development being assessed. The susceptibility of the landscape is the degree to which a particular landscape receptor or feature can accommodate change or new features without unacceptable detrimental effects to its essential characteristics.

16.3.16 The magnitude of a predicted landscape impact relates to the size, extent, or degree of change likely to be experienced as a result of the Proposed Development. The magnitude takes into account whether there is a direct impact resulting in the loss of landscape components, or a change beyond the land-take of the Proposed Development that might have an effect on the perceptual qualities or character of the area, and whether the impact is permanent or temporary.

16.3.17 The relationship between sensitivity and magnitude of impact allows an assessment of the significance of predicted landscape effects to be made. Plate 16-1 presents an illustration to demonstrate the relationship between sensitivity and magnitude of impacts in determining the level and significance of effect. As outlined in GLVIA3, this is not a prescriptive process, and the diagram is therefore provided as a guide to how levels of sensitivity and magnitude are typically combined. For the purposes of this assessment, moderate and major effects are deemed 'Significant.'; while minor and negligible effects are considered to be 'Not Significant'.

16.3.18 A full explanation of the criteria used to assess sensitivity, magnitude of impact and classification of landscape effects is included in Appendix 16B: Landscape and Visual Impact Assessment Methodology (PEI Report, Volume III).

Visual Effects

16.3.19 The assessment of potential effects on views and visual receptors resulting from the Proposed Development (see Plate 16-1: Classification of Landscape and Visual Effects) follows a similar process to landscape assessment and involves consideration of the following:

- existing baseline view and visual amenity;
- sensitivity of the view/visual receptor to the change proposed; and
- magnitude of likely impacts experienced by the visual receptor.

16.3.20 Visual receptors are primarily identified through the combination of desk-based study, including ZTV mapping, observation in the field and application of professional judgement. A description of the receptor type and nature and value of the existing view are provided as part of the baseline. The value of the view is often informed by the appearance on OS or tourist maps and in guidebooks, literature or art or identified in policy, or through the provision of facilities such as parking, seating and/or interpretation.

16.3.21 The sensitivity of visual receptors is defined through appraisal of the viewing expectation, or value, placed on the view and the susceptibility of the receptor to change. The susceptibility of visual receptors is a function of the occupation or activity of people experiencing the view and the extent to which their attention or interest is focussed on the view and the visual amenity they experience at a particular location.

16.3.22 The magnitude of a predicted visual impact relates to the extent to which the Proposed Development will alter the existing view and is an expression of the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility.

16.3.23 The sensitivity of a receptor and the magnitude of a likely impact are combined to assess the level and significance of visual effects that the Proposed Development is predicted to have, relative to the existing baseline conditions for that given receptor. As with the landscape assessment, Plate 16-1 presents an illustration to demonstrate the relationship between visual sensitivity and magnitude of impacts in determining the effect level and significance. The assessment involves application of professional

judgement, with reference to the criteria set out in Appendix 16B: Landscape and Visual Impact Assessment Methodology (PEI Report, Volume III).

16.3.24 For the purposes of the visual assessment, moderate and major effects are deemed 'Significant;' while minor and negligible effects are considered to be 'Not Significant'. Where significant environmental effects are identified, measures to mitigate these effects are proposed (where feasible) and the remaining residual effects are identified.

16.3.25 Although some visual receptors may consider the Proposed Development to be visually appealing or interesting, the assessment follows standard best practice methods, and therefore assumes a 'worst case' scenario whereby significant changes to views as a result of new tall/large structures or buildings in an existing relatively open area are generally considered to be adverse.

16.3.26 Viewpoint photography accompanying this assessment has been undertaken in accordance with best practice in Landscape Institute TGN 06/2019: Visual Representation of Development Proposals (Landscape Institute, 2019); Type 1 (annotated viewpoint photograph). Type 3 (photowire/photomontage) will be produced for the Consultation and updated for the ES.

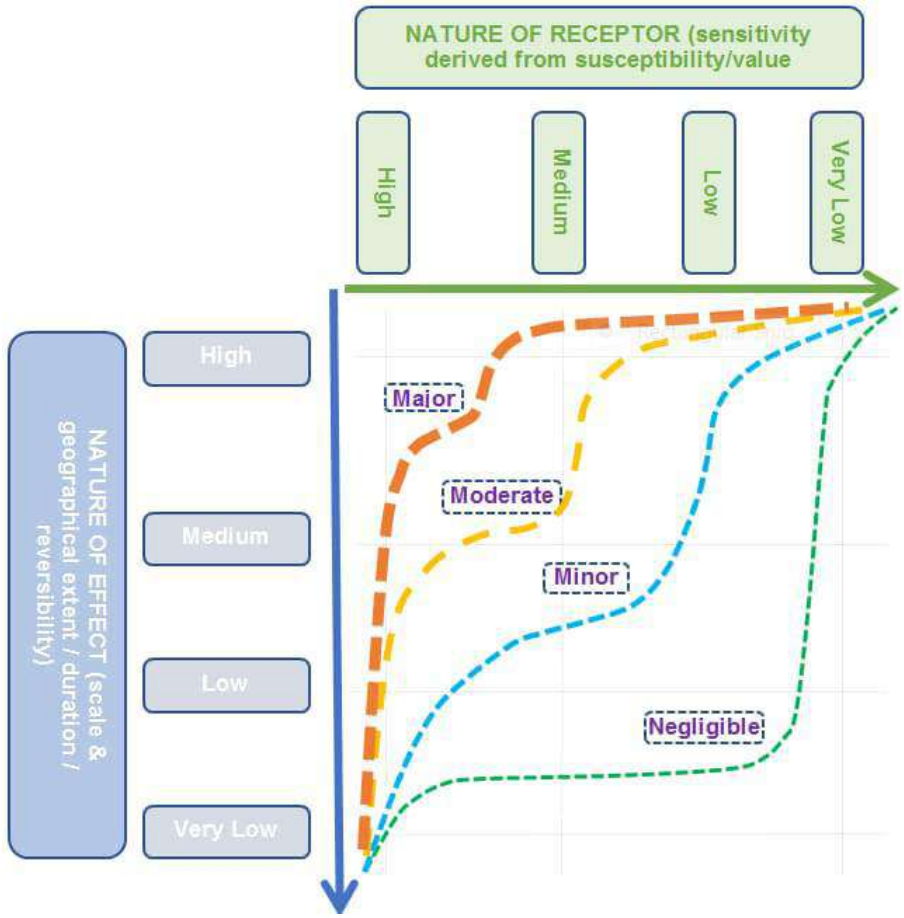

Plate 16-1: Classification of Landscape and Visual Effects

Consultation

16.3.27 An EIA Scoping Opinion was requested from the Planning Inspectorate (the Inspectorate) in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to landscape and visual amenity is outlined in Table 16-1.

Table 16-1: Consultation Summary Table

CONSULTEE	DATE (METHOD OF CONSULTATION)	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion received 17th May 2023	With regard to the night-time light pollution impacts the Scoping Opinion stated that *"…given the scale of the Proposed Development, the ES should provide an assessment of the effects of night-time light pollution on landscape and visual receptors during all phases of the Proposed Development or provide further justification for why significant effects would not arise."*	It is anticipated that night-time assessment will indicate no significant effects due to existing high levels of lighting within the Teesside area and that the Proposed Development will follow recommendations as set out in the Indicative Lighting Strategy that will accompany the DCO Application. A night-time assessment is not included in this assessment as sufficient information on proposed lighting is unavailable at the time of writing. A night-time assessment on landscape and visual receptors will be included in the ES.
		Requested that visual amenity receptors from the waterways are considered within the assessment.	Receptors on the River Tees and within Tees Bay and Estuary are considered at Viewpoint 5.
		The Scoping Opinion states that the *"ES should clearly evidence and justify the final extent of the ZTV used and ensure that any assessment of significance is based on the worst-case scenario. Effort should be made to agree the ZTV with relevant consultation bodies."*	As set out in Section 16.3, above, the Study Area has been defined through desk and field-based analysis, and the extent of the potential for significant effects. Figure 16-3 (PEI Report, Volume II) provides a ZTV, based on the tallest element of the Proposed Development and therefore indicates the worst-case extent of visibility. A request for consultation on the ZTV and representative viewpoints was issued to the relevant Local Planning Authorities and agreed with Hartlepool Borough Council,

CONSULTEE	DATE (METHOD OF CONSULTATION)	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
			Middlesbrough Council, Redcar and Cleveland Borough Council, and Stockton-on-Tees Borough Council (see detailed responses from Local Planning Authorities below).
		Suggested viewpoint locations and requested viewpoint from the North York Moors National Park.	The suggested viewpoint locations are included, however there is unlikely to be significant effects at distances greater than 10 km from the Main Site. Although the ZTV shows theoretical visibility within the North York Moors National Park, as desk-based study and observations made during the site surveys concluded that there is very limited visibility due to the intervening landform and topography to the south of the Study Area.
		Requested that ES explains how the siting and design of proposed structures and materials have been selected to minimise impacts.	This will be considered within the ES.
		Requested that ES describes any proposed planting, including establishment.	This will be considered within the ES.
		Requested that North Yorkshire Moors National Park is considered as a landscape receptor within the assessment.	The North York Moors is located outside the Study Area following refinement of the Study Area through desk-based study and observations made during the site surveys that concluded that there is very limited intervisibility to the south of the Study Area. As a result, it is unlikely there will be significant effects at distances

CONSULTEE	DATE (METHOD OF CONSULTATION)	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
			greater than 10 km from the Main Site. Therefore, North York Moors National Park will not be included in the assessment.
		Requested that viewpoints and photomontages are appropriate and representative and afford flexibility as the final design for the Proposed Development progresses.	Type 3 photomontages/photowires have been produced in accordance with Technical Guidance Note 06/2019: Visual Representation of Development Proposals (Landscape Institute, 2019).
Stockton-on-Tees Borough Council (STBC)	Email sent on 9th March 2023, with email response received 10th March 2023.	Requested an additional viewpoint from Royal Society for the Protection of Birds (RSPB) Saltholme, a popular visitor attraction with quite open and long-range views.	Viewpoints 13 and 14: RSPB Saltholme have been included as part of the visual assessment in this chapter.
Redcar and Cleveland Borough Council (RCBC)	Email sent on 9th March 2023, with email response received 10th March 2023.	Suggested a study area extending up to 5 km from the River Tees. Longer distance views less critical and happy with one VP from the south at either Eston Nab or Longbeck Lane. Requested two viewpoints from the east at the England Coast Path and Warrenby & Coatham Marsh Nature Reserve. A maximum of 2 viewpoints from north of river in Hartlepool area.	No viewpoints have been omitted following comments and the Study Area has been refined to reflect the ZTV. Longer distance views have been retained within other jurisdictions and to represent receptors using the England Coast Path. Additional viewpoints were added to the south-west of the Proposed Development at Priestman Road (Viewpoint O) and Cresswell Road, Grangetown (Viewpoint N) to the north of the Eston area in response to these comments. These locations were visited and later discounted due to limited visibility as a result of

CONSULTEE	DATE (METHOD OF CONSULTATION)	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		One or 2 viewpoints requested to the southwest and north of viewpoint M in the Easton area.	intervening buildings and structures, therefore, no likely significant effects. Refer to Appendix 16C: Potential Viewpoints for a description of all viewpoints taken forward for consideration in the assessment.
Middlesbrough Council (MC)	Email sent on 9th March 2023, with email response received 13th March 2023.	Suggested including viewpoints from Priestman Road near Temenos art installation, and the raised section of A66 further to south-west, both recognised as not particularly sensitive receptors.	A viewpoint (Viewpoint O) was included at Priestman Road, but later discounted due to a lack of intervisibility and therefore would not give rise to likely significant effects. Refer to Appendix 16C: Potential Viewpoints for a description of all viewpoints taken forward for consideration in the assessment. There are no viewpoints from the A66 due to limited pedestrian access to bridges. Site survey confirmed the lack of intervisibility from the south-west due to intervening buildings and structures.
Hartlepool Borough Council (HBC)	Email sent on 9th March 2023, with email response received 21st April 2023. Further response received 10th April 2023.	Suggested that a Seascape Assessment would be beneficial and a viewpoint to be included at North Gare Breakwater. Confirmation received that viewpoint at North Gare Beach can be used to represent views from North Gare Breakwater.	A seascape assessment and a viewpoint at North Gare Beach have been included within the landscape and visual assessment.

Use of the Rochdale Envelope

16.3.28 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with the Inspectorate's Advice Note 9 (The Planning Inpsectorate, 2018). This involves assessing the maximum (or where relevant, minimum)/reasonable worst-case parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example).

16.3.29 The key measurements for the implementation for the Rochdale Envelope (i.e., the maximum parameters for the Proposed Development and in particular its main buildings and structures) will be defined in the ES.

16.3.30 The assessment is based upon the maximum design scenario dimensions for the Proposed Development, and a height of up to 100 m AGL for the flare (which equates to 108 m Above Ordnance Datum (AOD)) assuming a worst case maximum post-development platform construction site elevation of 8 m AOD). The maximum dimensions are based upon the maximum design scenario building footprint and potential height as detailed in 4: Proposed Development (PEI Report, Volume I).

16.3.31 In addition to the Rochdale Envelope parameters, there are also limits of deviation within which the Proposed Development could be constructed. Given the space constraints of the limits of deviation for each part of the Proposed Development (particularly within the Main Site, where the largest structures will be located), it is considered that the overall conclusions of the assessment presented in this chapter would not be materially affected by the positioning of the buildings and structures within these limits.

16.3.32 The assessment has assumed that all vegetation within the connection corridors will be removed during construction as a worst-case scenario and reinstated to its previous condition upon completion. The majority of vegetation consists of grassland and scrub. Through the detailed design process, it is envisaged that the route of the connection corridors and construction methods will be further refined to enable the retention of important screening vegetation where practicable.

16.4 Baseline Conditions

Existing Landscape and Seascape Baseline

National Character Areas

16.4.1 At a national scale, Natural England provide 159 National Character Area (NCA) profiles. Each profile includes a description of the natural and cultural features that shape the landscape. The Study Area contains three NCA profiles:

- NE435: NCA Profile:15: Durham Magnesian Limestone Plateau (Natural England, 2013);
- NE439: NCA Profile: 23 Tees Lowlands (Natural England, 2014); and

- NE352: NCA Profile 25: North York Moors and Cleveland Hills (Natural England, 2015).

16.4.2 An outline description of each NCA is provided below and their locations shown on Figure 16-2: Landscape Character (PEI Report, Volume II).

16.4.3 NCA Profile 23: Tees Lowlands covers the whole Proposed Development Site and the majority of the Study Area. It is characterised by predominately low-lying arable farmland and open plain. The industrial development fringing the tidal reaches of the River Tees contrasts with the surrounding rural landscape. Principal transport corridors, power lines and industrial infrastructure are notable elements in the landscape and the industrial installations around Teesmouth form a prominent skyline, juxtaposed with expansive mudflats, sand dunes and salt marshes. The NCA is judged to have a Medium value as a result of the presence of large scale industrial development, high conservation interest, moderate levels of tranquillity and moderate opportunities for recreation.

16.4.4 NCA Profile 25: North York Moors and Cleveland Hills lies in the south-east of the Study Area, approximately 0.6 km south-east of the Proposed Development Site. It is characterised by upland plateaux and hills dissected by a series of dales, some broad and sweeping but others narrow, steep sided and wooded. The variation creates strong contrasts between open moors and enclosed valleys. The valley landscapes are characterised by pastoral farming providing a strong visual contrast with the bracken fringed moorlands above. The extensive areas of heather moorland on plateaux and hills create a strong sense of space, expansiveness, and openness and some 85% of the area falls within the North York Moors National Park. Large-scale arable landscapes are characteristic within the south and east. The NCA affords panoramic views over moorland plateaux, ridges and dales and out over surrounding lowland landscapes and the North Sea.

16.4.5 NCA Profile 15: Durham Magnesian Limestone Plateau lies in the north-west of the Study Area, approximately 5.8 km north of the Proposed Development Site, in Hartlepool. It is characterised by large-scale, open farmland with widespread urban and industrial development in the north. The dramatic coastline with exposed cliffs, sand dunes and beaches that support large populations of waders and sea birds. There is a strong influence from the historic mining industry in the form of ex-mining towns and villages and reclaimed colliery sites.

16.4.6 No significant adverse landscape effects upon the following landscape receptors are anticipated as a result of the Proposed Development; as such, they are excluded from further assessment:

- NCA 25: North York Moors and Cleveland Hills - due to distance from the Proposed Development Site and the existing influence of industrial areas upon the NCA; and
- NCA 15: Durham Magnesian Limestone Plateau - due to the long distance from the Proposed Development Site and limited intervisibility.

National Seascape Character Assessment

16.4.7 At a national scale, the Study Area includes the North East Marine Character Area (MCA) described in the National Seascape Character Assessment for England (MM01134) (Marine Management Organisation, 2018) and illustrated on Figure 16-2: Landscape Character (PEI Report, Volume II).

16.4.8 The North East MCA is subdivided into nine MCA profiles. MCA 22: Tyne, Tees and Wear Estuaries and Coastal Waters lies within the Study Area, the relevant characteristics of which are summarised below.

16.4.9 MCA 22 Tyne, Tees and Wear Estuaries and Coastal Waters lies to the north of the Study Area and encompasses Tyne Estuary. It is characterised by shelving coastal waters off the extensively developed coast at Tyne, Tees and Wear lowlands contrasting with areas of undeveloped coastline. The coastline is perceived as well-lit from the sea particularly around Middlesbrough due to the extent of industrial facilities. The general absence of headlands results in a wild seascape when storms sweep in from the North Sea. Expansive views across the North Sea allow for prominent views of the offshore wind farms located within the MCA. There is good coastal access along much of the coast providing increasing opportunities for recreation and tourism, including fishing and walking along stretches of the England Coast Path. MCA 22 is judged to have a Medium value as a result of the moderate opportunities for recreation and influence of large scale industry.

Regional Landscape Character

16.4.10 The Proposed Development Site and Study Area are not covered by any regional Landscape Character Assessment.

Local Landscape Character

16.4.11 The Study Area is covered by three local landscape character assessments:

- Redcar and Cleveland Landscape Character Assessment (RCBC, 2006);
- Stockton-on-Tees Landscape Character Assessment (STBC, 2011); and
- Hartlepool Landscape Assessment (HBC, 2000).

Redcar and Cleveland Landscape Character Assessment (2006)

16.4.12 Redcar and Cleveland Landscape Character Assessment divides the rural areas of the Borough into four broad Landscape Character Tracts (LCTrs). These are defined by combinations of physical and land cover characteristics and geographical context that have a recognisable and distinctive local identity setting them apart from neighbouring areas. The relevant characteristics of the LCTrs found within the Study Area are summarised below and in full in Appendix 16A: Landscape Character (PEI Report, Volume III). The LCTr are illustrated on Figure 16-2: Landscape Character (PEI Report, Volume II).

16.4.13 The Main Site is bordered by the Redcar Flats LCTr, which is characterised by arable farmland within the inland part of the tract and a coastal zone, which is classified as Sensitive Landscape. Any development within this coastal zone would be very widely

visible across the LCTr. Few landscape features are present to interrupt the open, gently sloping landscape. The industrial and urban skyline features have a strong local influence on landscape character, including the industry at Wilton Works. Other Sensitive Landscapes include the parkland at Kirkleatham and the wooded valley at Hazel Grove. The remainder of the tract is classified as Restoration Landscape. Existing landscape features are sparse, and the retention of existing features is important as a setting for new development, as the basis for additional planting or for the creation of new planting. The Redcar Flats LCTr is judged to have a Medium value as a result of the high influence of large scale industrial developments, moderate recreational opportunities and moderate scenic value.

16.4.14 The Eston Hills LCTr lies within the southern section of the Study Area and is characterised by prominent steep-sided hills including Eston Hills, higher land at Upleatham and between Skelton and Slapewath which are linked by low saddles, to the south-east of the Proposed Development Site. Open moorland, wooded hillsides and escarpments contribute to the distinctive character of this area. Extensive views are available from many locations. The landscapes on higher land within this LCTr are classified as Sensitive Landscapes with the remainder classified as Restoration Landscapes. The Eston Hills LCTr is judged to have a High value as a result of the high geological and cultural features and associations, moderate levels of tranquillity and low level influence of industrial developments.

16.4.15 The Guisborough Lowland LCTr lies on the southern edge of the Study Area and is characterised by a gently undulating arable farmland, with a distinctively lightly wooded character. The parkland at Guisborough Hall is classified as Sensitive Landscape. The remainder of the LCTr is classified as a Restoration Landscape.

16.4.16 A small section of the East Cleveland Plateau LCTr lies to the east of the Study Area and is characterised by open, elevated, rural coastal plateau. The plateau is dissected by deeply incised wooded valleys. The North Yorkshire and Cleveland Heritage Coast stretches from Saltburn southwards. The area of the LCTr that is located within the Study Area is classed as a Sensitive Landscape.

16.4.17 No significant adverse landscape effects upon the following landscape receptors are anticipated as a result of the Proposed Development; as such, they are excluded from further assessment:

- Guisborough Lowland LCTr - due to the remoteness to the Proposed Development Site and lack of intervisibility to it; and
- East Cleveland Plateau LCTr – due to only a very small proportion of the LCTr being within the Study Area and the remoteness to Proposed Development Site.

16.4.18 In addition to the above, a large part of the Redcar and Cleveland area is of urban character, defined by settlement and large-scale industrial development. These areas have no potential to experience significant adverse landscape effects as a result of the Proposed Development and as such are excluded from further assessment.

Stockton-on-Tees Landscape Character Assessment (2011)

16.4.19 The Study Area includes the East Billingham to Teesmouth LCA, and the Thorpe and Billingham Beck Valley LCA as defined by Stockton on Tees Landscape Character Assessment (STBC, 2011). The relevant characteristics of these LCA are summarised below and in full in Appendix 16A: Landscape Character Descriptions (PEI Report, Volume III). The LCA are illustrated on Figure 16-2: Landscape Character (PEI Report, Volume II).

16.4.20 The East Billingham to Teesmouth LCA lies to the west of the Study Area within the Proposed Development Site and is characterised by industrial landscapes to the east and west and large areas of open space including wetlands and reclaimed semi-improved pasture. Large storage tanks and stacks dominate views towards the east of the LCA. The open spaces contain significant wildlife value with a number of ecological designations including the Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar site, some of which is located within the Proposed Development Site. Ridge and furrow is present within the arable land around Cowpen Bewley. Cowpen Bewley Woodland Park provides the only wooded element within this LCA. The East Billingham to Teesmouth LCA is judged to have a Medium value as a result of the high ecological interest, moderate recreational value and high influence of large scale industrial developments.

16.4.21 The Thorpe and Billingham Beck Valley LCA lies at the south-western edge of the Study Area and is characterised by a wide beck valley. The LCA contains semi-improved and improved pasture influenced by 'A' roads and the Stockton to Darlington railway line. The likelihood of significant adverse landscape effects on the Thorpe and Billingham Beck Valley LCA is considered negligible, as a result of the long distance and limited intervisibility from the Proposed Development. It is therefore not considered further in this assessment.

Hartlepool Landscape Assessment (2000)

16.4.22 The Hartlepool Landscape Assessment (HBC, 2000) defines seven Landscape Character Types (LCTs), four of which are found within the Study Area: Coastal Fringe, Estuarine, Rural Fringe and Undulating Farmlands. The relevant characteristics of these LCTs are summarised below and described in full in Appendix 16A: Landscape Character (PEI Report, Volume III). The LCTs are illustrated on Figure 16-2: Landscape Character (PEI Report, Volume II).

16.4.23 The Coastal Fringe LCT lies in the north to central section of the Study Area. The LCT encompasses the beach and adjoining areas of land which have a maritime influence. The LCT is characterised by exposed tidal beaches, exposed rock and sea cliff areas, man-made features such as coastal defences, harbour or sea wall installations. Coastal dunes, coastal grassland and salt marshes are evident within the LCT. The Coastal Fringe LCT is judged to have a High value as a result of the high ecological interest, moderate recreational opportunities, moderate scenic value and moderate influence of large scale industrial developments.

16.4.24 The Estuarine LCT, located north of Teesmouth estuary, is defined by flat, featureless plains. The area includes semi-natural open water, associated salt marsh, reed beds, sand and mud flats. These areas also typically include low lying agricultural land, low tree and shrub cover and some coastal grassland. The flat low-lying nature of the LCT results in widespread views of the Teesside industrial complex which has a strong visual influence over the LCT. The Estuarine LCT is judged to have a Medium value as a result of the moderate levels of tranquillity, high ecological interest, moderate recreational opportunities and moderate influence of large scale industrial developments.

16.4.25 The Undulating Farmland LCT is in the north-west of the Study Area and largely defines the rural area of Hartlepool. The LCT is characterised by varied field pattern often bound by hedgerows and tree belts. Although, where the removal of hedgerows and field enlargement has taken place, this disrupts the enclosed sense of scale and introduces a barren, industrial element into the landscape. The Undulating Farmland LCT is judged to have a Medium value as a result of the moderate scenic and perceptual qualities, moderate levels of tranquillity and low levels of opportunities for recreation.

16.4.26 The Rural Fringe LCT is in the north-west of the Study Area and includes areas adjacent or in proximity to the urban environment which typically have either lost or had the rural character influenced by adjacent urban development. The LCT extends along the built edge of Hartlepool and surrounds the built edge of the outlying village settlement. Areas are often unmanaged, poorly maintained or enclosed within degraded boundaries. The Rural Fringe LCT is judged to have a Medium value as a result of moderate scenic and perceptual qualities, moderate influence of built development and low levels of opportunities for recreation.

16.4.27 In addition, a large part of the Hartlepool area is of urban character, defined by settlement and large-scale industrial development. These areas have no potential to receive significant adverse landscape effects as a result of the Proposed Development and as such are excluded from further assessment.

Vegetation Cover

16.4.28 Tree and shrub cover within the north-east of the Study Area is generally sparse reflecting the estuarine character of the area. Tree cover is largely located along main arterial routes including the A1085 and the A1042. A small number of wooded landscape areas are present in the south-east of the Study Area at Dormanstown within Foxrush Farm, Kirkleatham within the former estate, the grounds of Wilton Castle, Wilton Wood, Dave's Wood and Lazenby Bank Nature Reserve.

16.4.29 Hedgerows, where present, tend to be sparse and gappy which reduce the sense of enclosure within the farmland areas. Important wetland is located at Cowpen Bewley and RSPB Saltholme.

16.4.30 Vegetation within the Main Site is very limited reflecting the former usage of the site where structures have been removed. The vegetation comprises colonising perennial vegetation, a small area of dense scrub, and a small area of amenity grassland.

Topography and Drainage

16.4.31 The topography of the Study Area in the north is relatively flat, generally lying approximately between 1 m and 25 m AOD. Land gradually rises in the south with an area of high ground located to the south of the Study Area around Eston Moor where the ground rises to 242 m AOD at Eston Beacon as illustrated on Figure 16-4: Topography (PEI Report, Volume II).

16.4.32 The River Tees flows south to north through the centre of the Study Area broadening out into the Tees Mouth estuary. The North Sea is located within the northern part of the Study Area. The wetland at Cowpen Bewley is linked by a number of streams and is part of a former clay pit.

16.4.33 To the west, RSPB Saltholme includes areas of wet grassland and a series of large open water pools.

Settlements

16.4.34 The Study Area is characterised by large to medium sized settlements. Settlements in proximity to the Proposed Development Site include the city of Middlesbrough and its suburbs, which encompass a large area in the south-west of the Study Area. Hartlepool town and Seaton Carew seaside resort are in the north and the edge of Billingham town is in the west. The seaside resorts of Redcar, Marske-by-the-Sea, and Saltburn-by-the-Sea are in the east of the Study Area. The northern section of Guisborough market town is in the south-east of the Study Area.

Communications

16.4.35 Settlements are connected by a series of large 'A' roads. The A1085 lies to the south-east of the Study Area and runs south-west to meet the A66 and the A172 further west. The A1042 runs southwards from the A1085 to meet the A174 leading to the southern edge of Middlesbrough. The A178 lies to the north of Study Area connecting the A1046 at Port Clarence to Hartlepool. The A689 lies to the north of the Study Area and runs south-west connecting Hartlepool to the A19 which lies immediately outside the Study Area.

16.4.36 A number of Public Rights of Way (PRoW) are located within the Study Area. Bridleways Redcar and Cleveland 116 32/1, 33/1 and 36/1 lie near the coast, west of Redcar east of the Main Site. Further bridleways, Redcar and Cleveland 116 9/1 and 9/2 lie near to the north of Wilton Chemical Works connecting to footpaths Redcar and Cleveland 102 2/5, 31/2, and 31/3 running south-west to Middlesbrough as illustrated on Figure 16-5: Zone of Theoretical Visibility and Representative Viewpoint Locations (PEI Report, Volume II).

16.4.37 The long-distance route 'England Coast Path: North East' follows the north-east coastline within the Study Area, before it turns south-west, inland to follow a route along a disused railway line at the edge of the industrial area which borders the River Tees. The route then follows closer to the edge of the Tees, before it crosses the water at the Newport Bridge, following the route of the A1032 to the north, then east. It then turns north and follows the A178, deviating to the east towards North Gare Sands before it then follows the A178 along the coast.

16.4.38 The long-distance path Teesdale Way starts at South Gare lighthouse to the north where it runs south before linking with the England Coast Path route along the south of the River Tees. It crosses the Newport Bridge and then turns south, following the northern bank of the River Tees.

The Site and its Immediate Setting

16.4.39 The Proposed Development Site and surrounding area are heavily influenced by large industrial structures and complexes and residential settlements. The industrial complexes within the Teesside industrial areas are heavily lit, which increases the area's visibility during the hours of darkness. The surrounding landscape contains localised tranquil areas including along the coast, River Tees and inland nature reserves, although the large-scale structures are ever present within views.

16.4.40 The South Gare breakwater lies further to the north-west. Coatham Sands and the North Sea coast lie to the north. To the north-east lie the coastal settlements of Warrenby and Coatham.

16.4.41 To the south of the Main Site lies the Northumbrian Water Bran Sands sewage treatment plant, operational land of PD Ports Teesport and the Wilton International industrial complex. Similar industrial complexes are present at Seal Sands and Billingham on the north bank of the River Tees, west of the Main Site. Areas of rough grassland remain between these industrial areas.

16.4.42 The Redcar Bulk Terminal (RBT) is located immediately east of the Main Site, within the Proposed Development Site, on the south bank of the River Tees.

16.4.43 The Proposed Development Site lies within the Teesside industrial areas and Cowpen Marsh and adjacent to the north of RSPB Saltholme. Located to the south are the residential areas of Lazenby, Wilton and Grangetown. Seal Sands is located to the north on the northern side of the River Tees.

16.4.44 The Main Site lies between approximately 6 to 8 m AOD and currently comprises former industrial land, including large areas of bare ground, hardstanding, road networks and informal vegetation (primarily grass). Within the Main Site there are no natural features of noteworthy landscape value.

16.4.45 The constituent parts of the Proposed Development Site are shown on Figures 4-2 – 4-8 (PEI Report, Volume II) and detailed in Chapter 4: Proposed Development (PEI Report, Volume I).

Designations

16.4.46 The Study Area encompasses Conservation Areas which are illustrated on Figure 17-1: Location of Designated Heritage Assets (PEI Report, Volume II). The closest conservation area to the Main Site is Coatham Conservation Area, located approximately 1.14 km to the east of the Proposed Development Site and approximately 2.5 km east of the Main Site.

16.4.47 There are two Registered Park and Gardens within the Study Area. Albert Park, Grade II listed, is located in the south of the Study Area within Middlesbrough and Ward Jackson Park, Grade II listed, located to the north of the Study Area within Hartlepool.

Existing Visual Baseline

ZTV Analysis

16.4.48 To identify locations with potential to have views of the Proposed Development and to what extent the Proposed Development is likely to be visible, a ZTV has been produced as described below. The ZTV is illustrated in Figure 16-3: Zone of Theoretical Visibility and Potential Viewpoint Locations (PEI Report, Volume II).

16.4.49 A ZTV has been prepared for the Proposed Development Site based upon the tallest structures i.e., the flare at 100 m AGL (up to approximately 108 m AOD, assuming a worst-case maximum post-development platform construction site elevation of 8 m AOD), providing the theoretical visibility of the Proposed Development.

16.4.50 The ZTV has been generated by analysis of a 3D digital terrain model (DTM) of the surrounding terrain and the Proposed Development. The ZTV has been generated using OS Terrain 5 digital terrain data which does not consider the screening effects of vegetation, buildings, or other structures. The ZTV is based upon a grid of points at 50 m apart within the Proposed Development Site at a worst-case height of 108 m AOD for the Main Site with an observer eye height of 1.6 m.

16.4.51 The ZTV indicates that visibility within the Study Area is varied. Due to the low-lying land along the coast and lack of intervening vegetation there are widespread open views in the north-west and east. Visibility in the south and south-west is restricted due to the extent of built form and topography.

Dynamic Views

16.4.52 Users of the main transport routes and long-distance trails may gain dynamic views towards the Main Site to varying degrees dependant on intervening structures, screening vegetation, elevation, and direction of travel.

16.4.53 Users of the Transpennine Express and Northern train lines within the Study Area will gain transient, dynamic views within the Study Area and of the Main Site. Views will include a landscape containing industrial developments, overhead power lines, highway infrastructure and wind turbines.

Visual Receptors and Viewpoints

16.4.54 The viewpoints originally considered are shown on Figure 16-3: Zone of Theoretical Visibility and Potential Viewpoint Locations (PEI Report, Volume II). Through consultation with the relevant stakeholders, listed in Table 16-1, a total of 14 viewpoints were chosen to represent the typical range of views of the Proposed Development from within the Study Area. Details of the viewpoints, including a description of the existing view are provided in Table 16-2 whilst their locations are shown on Figure 16-5: Zone of Theoretical Visibility and Representative Viewpoint Locations (PEI Report, Volume II). Figures 16-6-1 to 16-6-14 illustrate the winter baseline view and Figures 16-7-1 to 16-7-14 illustrate the summer baseline view. The winter photography includes remaining infrastructure at the former steelworks that is now demolished. The winter and summer baseline for the purposes of the assessment has assumed that all infrastructure on the former steelworks is no longer present.

Table 16-2: Representative Viewpoints

VIEWPOINT ID	NAME & LOCATION	RECEPTOR TYPE	ELEVATION M (AOD)	GRID REFERENCE	DESCRIPTION OF VIEW
1 – refer to Figure 16-6-1 Winter Viewpoint 1 and Figure 16-7-1 Summer Viewpoint 1	Albion Terrace, Hartlepool	Residential and PRoW users	8	453044, 533546	Winter baseline: Long distance panoramic view across the North Sea taken from the long-distance England Coast Path along Albion Terrace. Industrial buildings including flares, plumes, stacks and high levels of lighting at night-time associated with the industrial area of Teesside are visible as background elements across the majority of the view and include the remaining infrastructure at the former steelworks. High ground, including Eston Moor, forms a backdrop to the view. The turbines associated with Teesside offshore windfarm are visible on the skyline. This viewpoint is representative of long-range views from the north-west. Summer baseline: Same as identified for the winter scenario although infrastructure associated with the former steelworks site has been further demolished and is no longer visible. Value of view: View likely to be locally valued with medium visitor numbers and medium level of detractors in the distance, therefore the overall value is Medium.
2 – refer to Figure 16-6-2 Winter Viewpoint 2 and Figure 16-7-2 Summer Viewpoint 2	The Cliff, Seaton Carew	Residential and PRoW users	7	452531, 530050	Winter baseline: Wide, open, view taken from the edge of The Green within Seaton Carew Conservation Area along the long-distance England Coast Path. The foreground of the view is dominated by the promenade. The foreshore of Seaton Sands and the North Sea are visible in the mid-ground and the background is dominated by industrial complexes including flares and stacks associated with the former steelworks and Hartlepool nuclear power station. High levels of lighting are visible in the view during night-time. Turbines associated with Teesside offshore wind farm are visible in the wider view. High

VIEWPOINT ID	NAME & LOCATION	RECEPTOR TYPE	ELEVATION M (AOD)	GRID REFERENCE	DESCRIPTION OF VIEW
					ground, including Eston Moor, forms the backdrop of the view. This viewpoint is representative of views from the north-west. Summer baseline: As identified within the winter scenario although infrastructure associated with former steelworks is no longer visible and no longer forms detracting feature. Value of view: Locally valued view from historic asset, with medium visitor numbers and some detracting features present within the wider view, therefore the overall value is Medium.
3 – refer to Figure 16-6-3 Winter Viewpoint 3 and Figure 16-7-3 Summer Viewpoint 3	Teesmouth National Nature Reserve, England Coast Path	Recreational	2	452655, 527758	Winter baseline: Open view across undulating pasture taken from the England Coast Path, on Zinc Works Road. Pasture associated with the Teesside Nature Reserve is visible in the foreground. Overhead lines and a telecommunications mast are visible in the mid ground. Industrial structures including those on the former steelworks site and offshore wind turbines are visible in the background of the view, against the skyline. High levels of lighting are visible in the view during night-time. Sand dunes associated with Teesmouth Nature Reserve partially restrict longer distance views. This viewpoint is representative of medium range views from the west. Summer baseline: As identified within the winter scenario although infrastructure associated with former steelworks is no longer visible on the horizon. Value of view: Locally valued view with medium visitor numbers and medium level of detractors in the distance, therefore the overall value is Medium.

VIEWPOINT ID	NAME & LOCATION	RECEPTOR TYPE	ELEVATION M (AOD)	GRID REFERENCE	DESCRIPTION OF VIEW
4 – refer to Figure 16-6-4 Winter Viewpoint 4 and Figure 16-7-4 Summer Viewpoint 4	North Gare Sands	Recreational	2	453764, 527266	Winter baseline: Open view across North Gare Sands across the Tees Mouth towards the former steelworks site. Infrastructure associated with the former steelworks site, including the demolished Redcar Blast Furnace and cranes associated with RBT are clearly visible. High levels of lighting are visible in the view during night-time. The offshore wind turbines are visible in the wider view. High ground including Eston Moor forms the backdrop of the view. This viewpoint is representative of short-range views for recreational users of the beach and Tees Mouth from the west. Summer baseline: As identified within the winter scenario although only small elements of the infrastructure associated with the former steelworks remain within the view. Value of view: Locally valued view with medium visitor numbers and a high level of detractors in the distance, therefore the overall value is Medium.
5 – refer to Figure 16-6-5 Winter Viewpoint 5 and Figure 16-7-5 Summer Viewpoint 5	South Gare Breakwater	Recreational	9	455623, 527394	Winter baseline: Expansive, open view across the estuary and North Sea from the South Gare Breakwater. Foreshore and vegetated dunes are visible in the foreground to the north and private road and the Tees and Hartlepool Pilotage are visible in the foreground. Infrastructure associated with the former Redcar steelworks site including the Redcar Blast Furnace is visible against the sky in the background of the view. High levels of lighting are visible in the view during night-time. This viewpoint is representative of short-range views from the north. Summer baseline: As identified within the winter scenario although only small elements of the infrastructure associated with the former steelworks remain within the view.

VIEWPOINT ID	NAME & LOCATION	RECEPTOR TYPE	ELEVATION M (AOD)	GRID REFERENCE	DESCRIPTION OF VIEW
					Value of view: Locally valued view with medium visitor numbers and a high level of detractors in the distance, therefore the overall value is Medium.
6 – refer to Figure 16-6-6 Winter Viewpoint 6 and Figure 16-7-6 Summer Viewpoint 6	Cowpen Bewley Country Park	Recreational	28	448593, 525702	Winter baseline: Long distance, elevated, open view from viewpoint within Cowpen Bewley Country Park. Grassland and tree planting belts form the foreground of the view. Mudflats, areas of standing water and localised areas of tree planting form the mid ground. The River Tees is visible towards the background of the view. The background is dominated by industrial structures associated with Teesside, including the former steelworks site which are visible against the skyline. High levels of lighting are visible in the view during night-time. High ground including Eston Moor is visible as is the backdrop of the view to the right. This viewpoint is representative of long-distance views from the west. Summer baseline: As identified within the winter scenario although infrastructure associated with former steelworks is no longer visible on the horizon. Value of view: Locally valued view with medium visitor numbers and a high level of detractors in the distance, therefore the overall value is Medium.
7 – refer to Figure 16-6-7 Winter Viewpoint 7 and Figure 16-7-7	England Coast Path, Warrenby	Recreational	5	458128, 525592	Winter baseline: Open view from the England Coast Path adjacent to the edge of Redcar Beach Caravan Park. The foreground and mid ground consist of the Cleveland Golf Links and sand dunes, which frame the view preventing views towards the North Sea. Industrial units including Redcar Auto and Performance Centre are visible in the mid ground. The former steel works including demolished Redcar Blast Furnace and Hartlepool nuclear power station are prominent features in the background in the right of the view. Wind turbines

VIEWPOINT ID	NAME & LOCATION	RECEPTOR TYPE	ELEVATION M (AOD)	GRID REFERENCE	DESCRIPTION OF VIEW
Summer Viewpoint 7					are visible along the horizon. High levels of lighting are visible in the view during night-time. This viewpoint is representative of short distance views from the east. Summer baseline: As identified within the winter scenario although only small elements of the infrastructure associated with the former steelworks remain within the view. Value of view: Local, commonplace view and medium level of detractors in the distance, therefore the overall value is Medium.
8 – refer to Figure 16-6-8 Winter Viewpoint 8 and Figure 16-7-8 Summer Viewpoint 8	Redcar seafront	Recreational and residential	6	459887, 525470	Winter baseline: Open, partially elevated view along the waterfront at Redcar, adjacent to the bandstand on Newcomen Terrace. The foreground is dominated by the promenade, Coatham Sands beach, and the flood alleviation wall. Coatham boating lake and built structures are visible in the mid ground. Residential areas of Coatham are visible in the middle and background to the left of the view. Industrial structures at Teesside, including the former steelworks site are visible in the background, breaking the skyline. The whole of the view contains high levels of lighting during night-time. Turbines associated with the offshore wind farm are visible to the right of the view and Hartlepool nuclear power station is visible on the horizon. This viewpoint is representative of midrange views from the east. Summer baseline: As identified within the winter scenario although only small elements of the infrastructure associated with the former steelworks remain within the view. Value of view: Locally valued view with medium visitor numbers and high level of detractors in the background, therefore the overall value is Medium.

VIEWPOINT ID	NAME & LOCATION	RECEPTOR TYPE	ELEVATION M (AOD)	GRID REFERENCE	DESCRIPTION OF VIEW
9 – refer to Figure 16-6-9 Winter Viewpoint 9 and Figure 16-7-9 Summer Viewpoint 9	Coatham Marsh Nature Reserve	Recreational	4	459076, 524695	Winter baseline: Low level, partially channelled, view from within Coatham Marsh, off Kirkleatham Lane. Water bodies, grassland and scrub within the nature reserve forms the foreground and middle ground of the view. Residential housing at Coatham forms the backdrop of the view to the right. Industrial structures associated with the former steelworks site are visible on the horizon, viewed against the skyline. High levels of lighting are visible on the horizon during the night-time. This viewpoint is representative of short-range views from the east. Summer baseline: As identified within the winter scenario although infrastructure associated with former steelworks is no longer visible on the horizon. Value of view: Local view with no recognised quality containing a small number of detracting features therefore the overall value is Low.
10 – refer to Figure 16-6-10 Winter Viewpoint 10 and Figure 16-7-10 Summer Viewpoint 10	Eston Nab	Recreational	225	456765, 518354	Winter baseline: Elevated, expansive, view from Eston Nab across Teesside. The foreground contains grassland associated with the Nab. The mid ground is dominated by industrial complexes and structures including stacks, chimneys and plumes. The North Sea and offshore wind turbines are visible in the background of the view to the right. The shoreline of Hartlepool is just visible in the background to the left of the view. High levels of lighting are visible across the whole panorama during night-time. This viewpoint is representative of long range, elevated views from the south. Summer baseline: As described within the winter scenario.

VIEWPOINT ID	NAME & LOCATION	RECEPTOR TYPE	ELEVATION M (AOD)	GRID REFERENCE	DESCRIPTION OF VIEW
					Value of view: Locally valued view with medium visitor numbers. The view relates to the experience of the Eston Nab heritage asset, therefore the overall value is High.
11 – refer to Figure 16-6-11 Winter Viewpoint 11 and Figure 16-7-11 Summer Viewpoint 11	Longbeck Lane	Residential, road users	48	461606, 520959	Winter baseline: Elevated, open, long-distance view from Longbeck Lane. Arable farmland dominates the fore and mid ground. Industrial structures including stacks and chimneys are visible forming the background of the left side of the view. High levels of lighting are visible in the view on the horizon during night-time. The North Sea and offshore wind turbines, breaking the skyline, are visible to the right of the view. This viewpoint is representative of long-distance views from the south-east. Summer baseline: As described within the winter scenario. Value of view: Well composed view with a high number of detracting features in the background, therefore the overall value is Low.
12 – refer to Figure 16-6-12 Winter Viewpoint 12 and Figure 16-7-12 Summer Viewpoint 12	Carpark off A1085 Coast Road, Marske by the Sea	Recreational	14	463150, 523198	Winter baseline: Wide, open, partially elevated view from the carpark off A1085 Coast Road. The foreground and mid ground are dominated by dunes, grassland, Marske Sands beach and the North Sea. Residential properties at the edge of Redcar are visible in the distance. Tall industrial structures, including those on the former steelworks site are visible against the skyline. High levels of lighting are visible in the background of the view during night-time. Off-shore wind turbines are perceptible to the right of the view in the distance. This viewpoint is representative of long-range views from the east.

VIEWPOINT ID	NAME & LOCATION	RECEPTOR TYPE	ELEVATION M (AOD)	GRID REFERENCE	DESCRIPTION OF VIEW
					Summer baseline: As identified within the winter scenario although infrastructure associated with former steelworks is no longer visible on the horizon. Value of view: Locally valued view with medium visitor numbers and medium level of detractors in the distance, therefore the overall value is Medium.
13 – refer to Figure 16-6-13 Winter Viewpoint 13 and Figure 16-7-13 Summer Viewpoint 13	Viewpoint at RSPB Saltholme	Visitors	8	449838, 523250	Winter baseline: Wide, open, elevated view from viewpoint within RSPB Saltholme. The foreground is dominated with grassland, waterbodies and marginal vegetation. Tall, vertical structures associated with industrial development and electrical pylons extend across the horizon adding an extensive wire scape to the skyline. Hartlepool nuclear power station is visible to the left of the view. This viewpoint is representative of open views from the south west. Summer baseline: As described within the winter scenario. Value of view: Locally valued view with high visitor numbers and medium level of detractors in the distance, therefore the overall value is Medium.
14 – refer to Figure 16-6-14 Winter Viewpoint 14 and Figure 16-7-14 Summer Viewpoint 14	RSPB Saltholme	Visitors	4	450382, 522831	Winter baseline: Wide, open view from within RSPB Saltholme. The foreground is defined by grassland and waterbodies associated with the RSPB reserve with board walks and site furniture. Further grassland and waterbodies are in mid-range views. Tall vertical structures associated with industrial development and electrical pylons extend across the horizon adding an extensive wire scape to the skyline. This viewpoint is representative of open views from the south west. Summer baseline: As described within the winter scenario.

VIEWPOINT ID	NAME & LOCATION	RECEPTOR TYPE	ELEVATION M (AOD)	GRID REFERENCE	DESCRIPTION OF VIEW
					Value of view: Locally valued view with high visitor numbers and medium level of detractors in the distance, therefore the overall value is Medium.

Summary of Visual Baseline

16.4.55 The Study Area is characterised by industry, including the existing Teesside, Seal Sands and Hartlepool power stations, petrochemical and steelworks. These large-scale developments are key characteristics influencing the landscape character. Due to the low topography around Middlesbrough and the Tees Valley, views of the existing structures during daytime and the lighting associated with the structures at night-time are commonplace and highly visible. The elevated land to the south of the Study Area allows for wide ranging views, but this landform along with extensive tree cover restricts views of the industrial structures from further afield.

16.4.56 The extent of views available to receptors range from close to long distance. A number of receptors are located at the edge of coastal towns, along roads and PRoW where the landform is low lying. The rising landform in the south-east and localised areas of high land in the west allow for elevated long-distance views towards the Proposed Development.

Future Baseline

16.4.57 The future baseline conditions against which the construction phases (Phase 1 from 2025 - to 2028, and Phase 2 from 2028 - 2030) and operation (from 2028) scenarios for the landscape and visual impact assessment are assessed and comprises a 'modified' baseline where the structures on land within the Main Site are no longer present. The modified baseline is likely to be similar to the conditions described within Table 16-2, summer baseline, for each representative viewpoint.

16.4.58 The future baseline represents the worst-case scenario and does not consider the impacts of adjacent or nearby planning applications such as Net Zero Teesside (NZT). The future baseline conditions will be reassessed within the ES.

16.4.59 In the absence of the Proposed Development (i.e., if it was not to exist in the future baseline) it is considered that the former steelworks site may be used for other large-scale industrial development, but the nature of these is undetermined.

16.4.60 The wider Study Area would continue to be influenced by a number of large-scale industrial building complexes and infrastructure corridors in the future baseline scenario.

16.5 Development Design and Impact Avoidance

16.5.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development (also known as 'embedded measures').

16.5.2 The following impact avoidance measures (i.e., those that are inherent to the design of the Proposed Development) are embedded into the Proposed Development design and also help to avoid and/ or reduce impacts to landscape and visual amenity during the construction and operational phases of the Proposed Development. These measures have therefore been taken into account during the impact assessment process described in this chapter:

- Above Ground Pipelines - much of the above ground pipeline will be routed in designated pipeline corridors with existing pipeline infrastructure. It is anticipated that new pipelines will be installed in parallel to one side of existing pipelines;
- Buried Pipelines – where the pipeline route does not make use of existing infrastructure;
- Trenchless Crossings - where practicable, trenchless construction technologies (HDD) are the preferred method for the connection corridors to avoid watercourses, railways, roads and utilities infrastructure (refer to Chapter 5: Construction Programme and Management (PEI Report, Volume I));
- suitable materials will be used, where practicable, in the construction of structures to reduce reflections and to assist with breaking up the massing of the buildings and structures;
- the selection of finishes for the buildings and other infrastructure will be informed by the finishes of the adjacent developments to reduce the visual impact of the Proposed Development; and
- lighting required during the construction and operation stages of the Proposed Development will be designed, positioned, and directed to prevent or minimise light disturbance to nearby residents. Where needed and appropriate, lighting to site boundaries will be provided, and illumination will be sufficient to provide a safe route for passing public. Precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas. Where appropriate, lighting will be activated by motion sensors to prevent unnecessary usage. Lighting requirements will be set out in the Indicative Lighting Strategy that will accompany the DCO Application.

16.5.3 A Framework CEMP will accompany the DCO Application which will set out the key measures to be employed during the Proposed Development construction phase to control and minimise the impacts on the environment – including the minimisation of landscape and visual effects. A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

16.6 Likely Impacts and Effects

16.6.1 This section identifies the potential impacts and likely effects resulting from the Proposed Development. The magnitude of each impact is defined with reference to the relevant baseline conditions, and effects are determined in accordance with the identified methodology presented within Appendix 16B: Landscape and Visual Impact Assessment Methodology (PEI Report, Volume III).

Landscape Effects

16.6.2 The potential landscape impacts of the Proposed Development relate to direct/physical change to the landscape and indirect change resulting from visibility

of proposed structures (temporary and permanent) and influence on perceptual qualities such as tranquillity.

16.6.3 During construction, potential impacts of the Proposed Development may result from the following:

- movement of plant and heavy goods vehicles, both within the Proposed Development Site and in the surrounding area;
- temporary stockpiling and storage of materials on-site;
- establishment of site compounds resulting in temporary structures to serve the workforce;
- crane activity to assist high level construction works on the Main Site;
- building construction including new stacks on the Main Site; and
- temporary external lighting to illuminate site operations after dark on the Main Site and along the connection corridors.

16.6.4 During the Proposed Development operational phase, potential impacts may result from the following:

- introduction of permanent large-scale structures and buildings within the Main Site, including the flare stack at a height of 100 m AGL;
- introduction of ancillary structures and elements including access roads, security fencing, car parking etc.; and
- introduction of pipelines and associated structures within the Hydrogen Pipeline Corridor.

16.6.5 Table 16-3 provides an assessment of the sensitivity of each landscape receptor.

Table 16-3: Landscape Sensitivity Assessment

LANDSCAPE RECEPTOR	SENSITIVITY ASSESSMENT		
	VALUE	SUSCEPTIBILITY	SENSITIVITY
Natural England National Character Areas			
NCA 23 Tees Lowland	Medium	The broad open plain is influenced heavily by large areas of conurbation and industrial development around the Tees Estuary, within the east of the NCA. Susceptibility to change arising from the Proposed Development is therefore considered to be Low.	Medium

LANDSCAPE RECEPTOR	SENSITIVITY ASSESSMENT		
	VALUE	SUSCEPTIBILITY	SENSITIVITY
Marine Character Areas			
MCA 22 Tyne, Tees and Wear Estuaries and Coastal Waters	Medium	The MCA is relatively industrialised in areas with views of an extensively developed lowland coast. Areas of naturalised coastline and present. Susceptibility to change arising from the Proposed Development is therefore considered to be Low.	Medium
Redcar & Cleveland Landscape Character Assessment (2006)			
Redcar Flats LCTr	Medium	The low-lying, relatively flat, sparsely vegetated landscape has minimal variation of landscape pattern. The proximity to industrial development has a strong influence on the landscape character. Parts of the LCTr are designated for their ecological value. Therefore, it is considered the LCTr is robust and susceptibility to change arising from the Proposed Development is Low.	Medium
Eston Hills LCTr	High	The wooded pattern and dominant landform provide a strong strength of character. There are medium levels of tranquillity and rural qualities including large areas of woodland which create intermittent views of large-scale industrial structures. Susceptibility to change arising from the Proposed Development is therefore considered to be Medium.	High
Stockton-on-Tees Landscape Character Assessment (2011)			
East Billingham to Teesmouth LCA	Medium	The open space within industrial areas contains significant wildlife value with a number of ecological designations. The open low lying, sparsely vegetated landform enables widespread views of Teesside's industrial complex across the LCA. It is considered the LCA is robust and susceptibility to change arising from the Proposed Development is Low.	Medium

LANDSCAPE RECEPTOR	SENSITIVITY ASSESSMENT		
	VALUE	SUSCEPTIBILITY	SENSITIVITY
Hartlepool Landscape Assessment (2000)			
Coastal Fringe LCT	High	As a result of the high levels of tranquillity, influence of detractors in the wider landscape, susceptibility to change arising from the Proposed Development is considered to be Medium.	High
Estuarine LCT	Medium	The LCT is relatively tranquil although the proximity of industrial infrastructure as detractors in the landscape has a strong influence. Susceptibility to change arising from the Proposed Development is considered to be Low.	Medium
Undulating Farmland LCT	Medium	The LCT is generally rural and contains a varied landscape pattern with low levels of influence from the surrounding settlement and industrial areas. Susceptibility to change arising from the Proposed Development is considered to be Medium.	Medium
Rural Fringe LCT	Medium	The proximity to the urban environment influences the rural character of the LCT. Susceptibility to change arising from the Proposed Development is considered to be Medium.	Medium

Construction

16.6.6 The Main Site is situated on the former Redcar steelworks where land-use in the immediate vicinity includes numerous large-scale industrial buildings and structures. The main feature of change during Proposed Development construction will be the introduction of tall cranes and other machinery and temporary structures across the Proposed Development Site.

16.6.7 The landscape assessment considers all elements of the Proposed Development and is undertaken based on the maximum dimensions and parameters as described within Chapter 4: Proposed Development (PEI Report, Volume I). The approach to the proposed connection corridors is subject to review and may involve installation above and/or below ground or may include reuse of existing pipelines. A worst-case approach is taken to different stages of the assessment, with the construction stage assessment undertaken based on the installation of underground pipelines.

16.6.8 Table 16-4 provides an assessment of the anticipated magnitude of landscape impacts and the classification of effects on each landscape receptor during the Proposed Development construction phase.

Table 16-4: Assessment of Landscape Effects – Construction

LANDSCAPE TYPE	RECEPTOR SENSITIVITY	DESCRIPTION OF IMPACT	MAGNITUDE OF IMPACT	CLASSIFICATION OF EFFECT
NCA 23: Tees Lowland	Medium	Construction activities associated with the Proposed Development will directly impact the NCA. Construction activities will be viewed in context with other large-scale industrial developments. Due to presence of large-scale industrial development which lies within this NCA, and the type of construction activities being undertaken, it is considered that the Proposed Development will have very limited potential to affect the landscape character and perception of the NCA in the short term. Impacts will be over a small geographical extent and reversible.	Very Low	Negligible Adverse (Not Significant)
MCA 22 Tyne, Tees and Wear Estuaries and Coastal Waters	Medium	Part of the Proposed Development lies within this MCA, potentially resulting in localised direct change. The majority of the construction works will occur outside but in proximity to this MCA, introducing views of construction activity adjacent to the coast and river. However, as a result of the existing context of large-scale industrial development it is considered that the Proposed Development will have very limited potential to influence the overall character, perception and tranquillity of the MCA. Impacts will be over a small geographical extent, temporary in nature and reversible.	Very Low	Negligible Adverse (Not Significant)
Redcar Flats LCTr	Medium	The majority of the Proposed Development and associated construction will be located outside this LCTr and as such change will largely be indirect. However, a small area on the fringe of this LCTr to the south-west of Warrenby may be subject to direct change if utilised as a construction laydown area. The majority of construction activities will be experienced in context with other large-scale industrial developments adjacent to this LCTr,	Low	Minor Adverse (Not Significant)

LANDSCAPE TYPE	RECEPTOR SENSITIVITY	DESCRIPTION OF IMPACT	MAGNITUDE OF IMPACT	CLASSIFICATION OF EFFECT
		limiting the impression of change. Impacts will be over a medium geographical extent and will be both temporary in nature and reversible.		
Eston Hills LCTr	High	The Proposed Development lies outside of this LCTr and as such change will be indirect and as a result of visibility of construction activity in the adjacent landscape. Due to expansive views containing large-scale industrial complexes and transport infrastructure, it is considered that the construction of the Proposed Development will result in limited perceptible change to the character of the Eston Hills LCTr. Change relating to construction will be relatively limited, temporary in nature and reversible.	Very Low	Minor Adverse (Not Significant)
East Billingham to Teesmouth LCA	Medium	Parts of the Hydrogen Pipeline Corridor network lie within this LCA and as such direct change will occur during construction. Direct change will largely occur along or adjacent to existing road and pipeline corridors, limiting the impression of change. Due to the presence of existing large-scale industrial development and above ground pipelines within this LCA, and the type of construction activities being undertaken, it is considered that the Proposed Development will have limited potential to affect the overall character and perception of this LCA. Impacts will be over a medium geographical extent and would be temporary and reversible.	Low	Minor Adverse (Not Significant)
Coastal Fringe LCT	High	The Proposed Development lies outside of this LCT and as such change will be indirect and as a result of visibility of construction activity in a distinctly separate landscape. The existing context to this LCT is one of extensive industrial and urban development. Construction activity associated with the Proposed Development will occur within this context and have little influence	Low	Minor Adverse (Not Significant)

LANDSCAPE TYPE	RECEPTOR SENSITIVITY	DESCRIPTION OF IMPACT	MAGNITUDE OF IMPACT	CLASSIFICATION OF EFFECT
		on the impression or character of the Coastal Fringe LCT. Impacts will be over a medium geographical extent and will be temporary and reversible.		
Estuarine LCT	Medium	Although parts of the Hydrogen Pipeline Corridor may be located within a small part of this LCT indirect change will be limited through use of existing infrastructure and/or directional drilling techniques for construction. There is also potential for indirect change on this LCT as a result of construction activity within adjacent and nearby landscapes. However, the impression of change will be limited as a result of the existing context of adjacent large scale industrial development. Impacts will be over a medium geographical extent and would be temporary and reversible.	Low	Minor Adverse (Not Significant)
Undulating Farmland LCT	Medium	A short section of the Hydrogen Pipeline Corridor may be located along the fringe of this LCT, potentially resulting in localised direct change during construction. There is also potential for localised indirect change as a result of visibility of construction activity within the adjacent landscape. Construction activity will largely be located alongside existing road and rail corridors, adding further movement of vehicles. It is considered that change from construction will be experienced over a relatively limited extent and have little influence on the overall character and impression of this LCT. Impacts will be temporary in nature and reversible.	Low	Minor Adverse (Not Significant)
Rural Fringe LCT	Medium	A very short section of the Hydrogen Pipeline Corridor may be located at the fringe of this LCT, potentially resulting in very localised direct change during construction. There is also potential for localised indirect change as a result of visibility of construction activity within the adjacent landscape.	Very Low	Negligible Adverse (Not Significant)

LANDSCAPE TYPE	RECEPTOR SENSITIVITY	DESCRIPTION OF IMPACT	MAGNITUDE OF IMPACT	CLASSIFICATION OF EFFECT
		Construction activity will largely be located alongside an existing railway, limiting the impression of change. Construction will be experienced over a small extent and have little influence on the overall character and impression of this LCT. Impacts will be temporary in nature and reversible.		

Operation

16.6.9 During operation, the Proposed Development will introduce a range of new structures, principally within the Main Site.

16.6.10 As outlined above in relation to the construction phase, the landscape assessment considers all elements of the Proposed Development and is undertaken based on the maximum dimensions and parameters currently proposed. The approach to the proposed connection corridors is subject to review and may involve installation above and/or below ground or may include reuse of existing pipelines. A worst-case approach is taken to different stages of the assessment, with the operation stage assessment undertaken based on pipelines being above ground.

16.6.11 Table 16-5 provides an assessment of the anticipated magnitude of landscape impacts and the classification of effects on each landscape receptor during the operation of the Proposed Development.

Table 16-5: Assessment of Landscape Effects – Operation

LANDSCAPE TYPE	RECEPTOR SENSITIVITY	DESCRIPTION OF IMPACT	MAGNITUDE OF IMPACT	CLASSIFICATION OF EFFECT
NCA 23: Tees Lowland	Medium	The Proposed Development will be located within the NCA and as such will result in direct and indirect change. While the Proposed Development will introduce additional built development and infrastructure into this NCA, change will largely occur within areas influenced by previous and existing industrial development and infrastructure. Impacts will occur over a small extent, will be long term and reversible and will have very little influence on the character or perceptual qualities of this NCA.	Very Low	Negligible Adverse (Not Significant)
MCA 22 Tyne, Tees and Wear Estuaries and Coastal Waters	Medium	The Proposed Development lies outside of this MCA but will introduce a range of built development and infrastructure elements into the adjacent area. The Proposed Development will add to the context of large-scale industrial development and infrastructure in views from the MCA. The impression of change on this MCA will be limited due to the existing context of similar development within the site area and surroundings. Impacts will occur over a small extent, will be long term and reversible, with very little influence on the character or perceptual qualities of this MCA.	Very Low	Negligible Adverse (Not Significant)
Redcar Flats LCTr	Medium	It is anticipated that the areas temporarily occupied for construction laydown will be reinstated as part of construction and as such change on this LCTr during operation will be indirect. Existing large-scale industrial developments and road and rail infrastructure adjacent to the LCTr provide a context to potential change. The Proposed Development will add further development and infrastructure into this existing context but will result in only a small change to the character of this LCTr. Impacts will be over a relatively small area, long term and reversible.	Low	Minor Adverse (Not Significant)

LANDSCAPE TYPE	RECEPTOR SENSITIVITY	DESCRIPTION OF IMPACT	MAGNITUDE OF IMPACT	CLASSIFICATION OF EFFECT
Eston Hills LCTr	High	The Proposed Development lies outside of this LCTr and as such potential change will be indirect as a result of visibility of new structures and infrastructure. The impression of change on the character of this LCTr will be limited by the existing context of large-scale industrial developments and transport infrastructure within the adjacent landscape. Impacts will be over a relatively small area, reduced by prevalence of trees and woodland, will be long term and reversible, with very little or no influence on the overall character or impression of this LCTr.	Very Low	Minor Adverse (Not Significant)
East Billingham to Teesmouth LCA	Medium	Part of the Hydrogen Pipeline Corridor lies within this LCA, with the Main Site outside but in proximity and as such change will be both direct and indirect. Direct change through introduction of pipelines will largely occur along existing pipeline or infrastructure corridors and/or in areas influenced by existing development, limiting the sense of change. The proposed structures on the Main Site will add further built development to the immediate context of this LCA which includes a range of existing large-scale industrial development and infrastructure. Impacts will be over a medium extent, long term and reversible and although add to the existing context of development they will have only a limited influence on the character of this LCA.	Low	Minor Adverse (Not Significant)
Coastal Fringe LCT	High	The Proposed Development lies outside of this LCT and as such potential change will be indirect, largely resulting from visibility of structures at the Main Site. Due to existing context of large-scale industrial development in the adjacent landscapes, it is considered that the Proposed Development will have little perceptible change on the landscape character and perceptual qualities of this LCT. Impacts will be over a medium extent and will be long term and reversible.	Very Low	Minor Adverse (Not Significant)

LANDSCAPE TYPE	RECEPTOR SENSITIVITY	DESCRIPTION OF IMPACT	MAGNITUDE OF IMPACT	CLASSIFICATION OF EFFECT
Estuarine LCT	Medium	Part of the Hydrogen Pipeline Corridors is within this LCT and as such there is potential for both direct and indirect change, depending on the method of pipeline installation employed. If pipelines are above ground, they will add to existing infrastructure elements within this LCT and the adjacent landscapes, resulting in only limited change. Structures on the Main Site will also be visible from this LCT, adding to the existing context of industrial development which defines the baseline of this landscape. Impacts will be over a small to medium extent, long term and reversible, with very little influence on the character or impression of this LCT.	Very Low	Negligible Adverse (Not Significant)
Undulating Farmland LCT	Medium	Any parts of this LCT directly affected by construction will be reinstated and as such potential change at operation will be indirect as a result of visibility of new structures or infrastructure in the adjacent and more distant landscape. The Main Site area is relatively distant from this LCT and will be experienced in the context of existing industrial development in the foreground, resulting in little or no change. Similarly, although in closer proximity, the Hydrogen Pipeline Corridor will result in very little or no discernible change to this LCT. Impacts will be very limited in extent, long term and reversible.	Very Low	Negligible Adverse (Not Significant)
Rural Fringe LCT	Medium	Those areas of the Rural Fringe LCT directly influenced during construction will be reinstated and as such potential change during operation will be indirect. Although the Proposed Development will introduce additional structures and infrastructure into views from parts of this LCT, the impression of change will be limited as a result of the existing context of similar development. Impacts will be very limited in extent, long term and reversible resulting in very little or no discernible change to this LCT.	Very Low	Negligible Adverse (Not Significant)

Decommissioning

16.6.12 The impacts on landscape character arising as a result of decommissioning of the Proposed Development are considered (using professional judgement) to be similar to those identified at the construction stage. This is due to the scale and nature of the Proposed Development in relation to the existing industrial structures and complexes present in the wider landscape and the large-scale of the LCAs.

Effects on Visual Amenity

16.6.13 Potential visual effects of the Proposed Development in comparison with the future baseline visual context are considered in Table 16-6 by reference to representative viewpoints. The assessments contained within Table 16-6 should be read in conjunction with Figures 16-6-1 to 16-6-14 (PEI Report, Volume II) which illustrate the baseline situation at each viewpoint for winter views.

16.6.14 A series of photowires have been prepared (Figures 16-8-1 to 16-8-8: Photowires (PEI Report, Volume II) which illustrate the likely visibility of the Proposed Development at four of the assessed viewpoints. The photowires represent the heights of key elements of the Proposed Development with the flare being a worst-case height of 100 m AGL (108 m AOD), the CO_2 absorber at 50 m AGL (58 m AOD) and all other structures on the Main Site at a maximum of 30 m AGL (38 m AOD) or below.

Table 16-6: Viewpoint Assessment

VIEWPOINT 1: ALBION TERRACE, HARTLEPOOL

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
453044, 533546	Residential and PRoW Users	8	7.9	South-east
Visual susceptibility to change		Value of view		Sensitivity of receptor
Residents are considered to generally have an expectation of enjoyment of their view from the property and users of the long-distance route are typically likely to be involved in activity which includes enjoyment of the view resulting in a high susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be High.		Medium		High for residential and PRoW users.
Size/scale, duration and reversibility of impact at construction				

VIEWPOINT 1: ALBION TERRACE, HARTLEPOOL

Long distance views towards the Main Site with construction activity visible at the end of the headland. Construction activities will be visible, although viewed from a long distance of over 8 km. The operations will be viewed as an extension of the Teesside industrial port. The increase in cranes and construction activity will be noticeable, but not alter the overall balance of features and viewed in the context of an area containing a high number of large-scale industrial structures. The availability of alternative views, long distance and the presence of other detracting features in the landscape reduce the impact that Proposed Development has on visual amenity. The impact is assessed to be Very Low, over a small geographic extent, short term and reversible.		
Magnitude of impact at construction		Very Low
Significance of effect at construction	Residential and PRoW users	Negligible Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation		
The operational Main Site will be visible on the headland, with the structures, stacks and associated plume from the flare appearing against the high ground in the distance. The structures and plumes will be visible, viewed within a context of existing large-scale structures as part of the wider view. The Proposed Development will be barely noticeable and will not alter the overall context of the view. The impact is assessed to be Very Low, over a small geographic extent, long term and reversible.		
Magnitude of impact at operation		Very Low
Significance of effect at operation	Residential and recreational users	Negligible Adverse (Not Significant)

VIEWPOINT 2: THE CLIFF, SEATON CAREW

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
452531, 530050	Residential and PRoW users	7	5.2	South-east
Visual susceptibility to change		Value of view		Sensitivity of receptor
Residents are considered to generally have an expectation of enjoyment of their view from		Medium		High for residential

VIEWPOINT 2: THE CLIFF, SEATON CAREW

the property and users of the long-distance route are typically likely to be involved in activity which includes enjoyment of the view resulting in a high susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be High.		and PRoW users.
Size/scale, duration and reversibility of impact at construction		
Long distance views towards the Main Site with construction activity visible in the centre of the view. The movement of vehicles and low-level operations may not be perceptible at this distance. The presence of cranes and construction activity will be noticeable, but not alter the overall balance of features. The availability of alternative views, long distance and the presence of other detracting features in the landscape reduces the impact on visual amenity. The impact is assessed to be Low, over a small geographic extent, short term and reversible.		
Magnitude of impact at construction		Low
Significance of effect at construction	Residential and PRoW users	Minor Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation		
Long distance view towards the operational Main Site. The structures, stacks and plume associated with the flare will appear against the high ground, with the tip of the stack breaking the skyline. The structures will be clearly visible, although viewed within a context of existing large-scale structures within the wider view. The Proposed Development will be noticeable, but not overall alter the context of the view. The impact is assessed to be Low, over a small geographic extent, long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Residential and PRoW users	Minor Adverse (Not Significant)

VIEWPOINT 3: TEESMOUTH NATIONAL NATURE RESERVE, ENGLAND COAST PATH

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
452655, 527758	Recreational	2	3.6	East
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the long distance route are typically likely to be involved in activity which includes enjoyment of the view resulting in a high susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be High.		Medium		High for recreational users.
Size/scale, duration and reversibility of impact at construction				
Medium distance views towards the Main Site with the majority of construction activity visible in the centre of the view. Low level construction activities will be screened by intervening landform and vegetation. Construction activities, including crane movements will be clearly visible and form the most prominent structures in the view. As a result of the existing structures within the wider view and long distance, the addition of construction operations associated with the Proposed Development will not alter the balance of features in the view. The impact is assessed to be Low, over a medium geographic extent, short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Recreational		Minor Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation				
During operation, the majority of low-level structures on the Main Site will be screened as a result of intervening landform and vegetation. The larger structures, stacks and plume associated with the flare will appear against the sky. The Proposed Development will be noticeable, but not alter the overall balance of the view as a result of the existing large-scale structures within the wider view. The impact is assessed to be Low, over a medium geographic extent, long term and reversible.				
Magnitude of impact at operation				Low

VIEWPOINT 3: TEESMOUTH NATIONAL NATURE RESERVE, ENGLAND COAST PATH

Significance of effect at operation	Recreational	Minor Adverse (Not Significant)

VIEWPOINT 4: NORTH GARE SANDS

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
453764, 527266	Recreational	2	2.4	East
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the beach are not typically likely to be involved in activities which solely include enjoyment of the view resulting in a medium susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be Medium.		Medium		Medium for recreational users.
Size/scale, duration and reversibility of impact at construction				
Medium range view towards construction activities on the Main Site including the Hydrogen Pipeline Corridor. The majority of construction activities will be visible due to the lack of intervening built form. Views of high-level construction activities on the Main Site, including cranes will be seen in the context of existing large-scale industrial structures, visible against the sky within the wider view. The addition of construction operations associated with the Proposed Development will be noticeable but will not alter the overall balance of features in the view. As a result of the proximity and scale of operations the impact is assessed to be Low, over a medium geographic extent, short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Recreational		Minor Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation				
Medium range view towards the operational Main Site. The structures, stacks and plume associated with the flare will appear against the skyline, increasing their visibility. The structures will be viewed within a context of existing large-scale structures. The Proposed				

VIEWPOINT 4: NORTH GARE SANDS

Development will be noticeable, but not alter the overall context of the view. The impact is assessed to be Low, over a medium geographic extent, long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Recreational	Minor Adverse (Not Significant)

VIEWPOINT 5- SOUTH GARE BREAKWATER

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
455623, 527394	Recreational (users of the beach, boat users at Tees Mouth, and users of the Teesdale Way)	9	1.2	South
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the beach, Tees Mouth, and Teesdale Way are not typically likely to be involved in activities which solely include enjoyment of the view resulting in a medium susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be Medium.		Medium		Medium for recreational users.
Size/scale, duration and reversibility of impact at construction				
Views of construction operations likely to be screened from view by sand dunes and sea wall at South Gare Breakwater for receptors using the beach and Tees Mouth. Medium range view of construction operations visible to the centre of the view for users of the Teesdale Way. Low level construction operations will be largely screened behind localised sand dunes and low-level vegetation. Construction operations will be seen in the context of existing large-scale structures in the distance and vertical structures within the middle ground of the view. The introduction of cranes and the gradual increase in structures will be apparent, however, the key characteristics of the view will remain unchanged. The				

VIEWPOINT 5- SOUTH GARE BREAKWATER

impact is assessed to be Minor, over a medium geographic extent, short term and reversible.		
Magnitude of impact at construction		Low
Significance of effect at construction	Recreational	Minor Adverse (Not significant)
Size/scale, duration and reversibility of impact at operation		
Medium distance view towards the operational Main Site, where the majority of the high-level structures, stacks and plume associated with the flare will appear against a backdrop of elevated landform, which will decrease their visibility. The operational Main Site will be seen in the context of other industrial structures including stacks and flares and will not form the focus of the view. The Proposed Development will be noticeable but will not change the overall balance of the view. The impact is assessed to be Low, over a large geographic extent, long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Recreational	Minor Adverse (Not Significant)

VIEWPOINT 6- COWPEN BEWLEY COUNTRY PARK				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
448593, 525702	Recreational	28	7	East
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the lookout point are typically likely to be involved in activity which includes enjoyment of the view resulting in a high susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be High.		Medium		High for recreational users.

VIEWPOINT 6- COWPEN BEWLEY COUNTRY PARK		
Size/scale, duration and reversibility of impact at construction		
Long distance views towards the Main Site with construction activities visible to the right of the view. Due to lack of intervening vegetation or landform, construction activities including the use of cranes will be visible, although at a long distance and set within a wide 360º panorama containing a high number of existing industrial structures. Views of construction activities related to the Hydrogen Corridor will be screened by vegetation from this location. Construction activities will form a barely noticeable part of the view. The impact is assessed to be Very Low, over a small geographic extent, short term and reversible.		
Magnitude of impact at construction		Very Low
Significance of effect at construction	Recreational	Negligible Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation		
Long distance view towards the operational Main Site viewed to the right of the view. The structures including stacks and plume associated with the flare will be viewed against the skyline, marginally increasing their visibility. The presence of additional structures in the view will be barely noticeable and will not alter the overall balance of the view that contains a high number of industrial structures. The impact at operation is assessed to be reduced in comparison with the construction stage, although will remain at Very Low. Impacts will be Very Low, over a small geographic extent, long term and reversible.		
Magnitude of impact at operation		Very Low
Significance of effect at operation	Recreational	Negligible Adverse (Not Significant)

VIEWPOINT 7- ENGLAND COAST PATH, WARRENBY

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
458128, 525592	Recreational	5	1.3	West
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the long distance route are typically likely to be involved in activity which includes enjoyment of the view resulting in a high susceptibility. When combined with the		Medium		High for recreational users.

VIEWPOINT 7- ENGLAND COAST PATH, WARRENBY

overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be High.		
Size/scale, duration and reversibility of impact at construction		
Medium distance views of construction activities associated with the Main Site. Low level activities, including construction operations within the Water, Electrical and Hydrogen Pipeline Corridors will be largely screened by intervening sand dunes and localised landforms. Higher level activities will be clearly visible within the middle ground of the view. The use of high-level cranes and the movement of construction activity will be readily apparent and form a noticeable part of the view. The impact is assessed to be Medium, over a medium geographic extent, short term and reversible.		
Magnitude of impact at construction		Medium
Significance of effect at construction	Recreational	Moderate Adverse (Significant)
Size/scale, duration and reversibility of impact at operation		
Medium distance views of the operational Main Site, including stacks and plume associated with the flare will be highly visible from this location. The increase in massing of structures associated with the operational Main Site will become the most prominent structure from this location, occupying a large proportion and altering the overall balance of the view. The impact is assessed to be Medium, over a medium geographic extent, long term and reversible.		
Magnitude of impact at operation		Medium
Significance of effect at operation	Recreational	Moderate Adverse (Significant)

VIEWPOINT 8- REDCAR SEAFRONT

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
45988, 525470	Recreational users and residential	6	3.1	West

VIEWPOINT 8- REDCAR SEAFRONT

Visual susceptibility to change	Value of view	Sensitivity of receptor
Residents are considered to generally have an expectation of enjoyment of their view from the property and users of the long distance route are typically likely to be involved in activity which includes enjoyment of the view resulting in a high susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be High.	Medium	High for residential and recreational users.
Size/scale, duration and reversibility of impact at construction		
Medium distance view towards construction activity associated with the Main Site, visible on the headland in the centre of the view. Construction operations, including low level activities will be clearly visible, set within a wide, open view that contains a small number of detractors. The presence of cranes and construction activity will be readily apparent, although will not alter the overall balance of features. The impact is assessed to be Medium, over a small geographic extent, short term and reversible.		
Magnitude of impact at construction		Medium
Significance of effect at construction	Recreational users and residential	Moderate Adverse (Significant)
Size/scale, duration and reversibility of impact at operation		
At operation the Main Site will be visible in the view. The stacks and plume associated with the flare will be visible, with the operational Main Site forming a visible structure in the background of the view that will be noticeable. Due to the presence of existing structures, the Proposed Development will not alter the overall balance of the view. The impact is assessed to be Low, over a small geographic extent, long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Recreational users and residential	Minor Adverse (Not Significant)

VIEWPOINT 9- COATHAM MARSH NATURE RESERVE

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
459076, 524695	Recreational	4	2.5	North-west
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the Coatham Marsh Nature Reserve are not typically likely to be involved in activities which solely include enjoyment of the view resulting in a medium susceptibility. When combined with the overall Low value, the overall receptor sensitivity with respect to the Proposed Development is considered to be Medium.		Low		Medium for recreational users.
Size/scale, duration and reversibility of impact at construction				
User of Coatham Marsh Nature Reserve will experience medium distance view towards construction activities associated with the Main Site, where no intervening vegetation is present. Construction activities, including the presence of high-level cranes will be visible, set within a wide, open view that contains a number of existing detractors. Construction activities will form a noticeable part of the view but will not alter the overall balance of the view. The impact is assessed to be Low, over a small geographic extent, short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Recreational		Minor Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation				
The operational Main Site will be clearly visible in the view. The stacks and plume associated with the flare will be visible, increasing the number of large-scale structures within the view. The Proposed Development will be clearly noticeable but will not alter the overall balance of features in the view as a result of the presence of existing built structures. The impact is assessed to be Low, over a small geographic extent, long term and reversible.				
Magnitude of impact at operation				Low

VIEWPOINT 9- COATHAM MARSH NATURE RESERVE

Significance of effect at operation	Recreational	Minor Adverse (Not Significant)

VIEWPOINT 10- ESTON NAB

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
456765, 518354	Recreational	225	6.5	North
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the historical landmark and PRoW are typically likely to be involved in activity which includes enjoyment of the view resulting in a high susceptibility. When combined with the overall High value, the overall receptor sensitivity with respect to the Proposed Development is considered to be High.		High		High for recreational users.
Size/scale, duration and reversibility of impact at construction				
Long distance, elevated view towards construction activities associated with the Main Site and connections corridors. Construction associated with the connection corridors will be partially screened by intervening vegetation and structures. The construction of the Main Site including high level cranes will be visible, forming a small, barely noticeable feature within the wider view. The impact is assessed to be Very Low, over a medium geographic extent, short term and reversible.				
Magnitude of impact at construction				Very Low
Significance of effect at construction		Recreational		Negligible Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation				
The operational Main Site will be visible within the wider view. The stacks and plume associated with the flare will form the most visible structures of the Proposed Development, viewed against the North Sea, increasing their visibility. As a result of the				

VIEWPOINT 10- ESTON NAB

number of existing industrial structures, the Proposed Development will be barely noticeable as part of the wider view. The impact is assessed to be Very Low, long term and reversible.		
Magnitude of impact at operation		Very Low
Significance of effect at operation	Recreational	Negligible Adverse (Not Significant)

VIEWPOINT 11- LONGBECK LANE

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
461606, 520959	Residential	48	6.5	North-west
Visual susceptibility to change		Value of view		Sensitivity of receptor
Residents are considered to generally have an expectation of enjoyment of their view from the property resulting in a high susceptibility. When combined with the overall Low value, the overall receptor sensitivity with respect to the Proposed Development is considered to be Medium.		Low		Medium for residential users.
Size/scale, duration and reversibility of impact at construction				
Long distance views towards construction activities associated with the Main Site. Due to lack of intervening vegetation or landform, construction activities including the use of cranes will be clearly visible, although at a long distance and set within a wide panoramic view containing a high number of existing industrial structures. Construction activities will form a barely noticeable part of the wider view. The impact is assessed to be Very Low, short term and reversible.				
Magnitude of impact at construction				Very Low
Significance of effect at construction		Residential		Negligible Adverse (Not Significant)

VIEWPOINT 11- LONGBECK LANE

Size/scale, duration and reversibility of impact at operation		
The operational Main Site will be visible to the left of the centre of the view. The stacks and plume associated with the flare will be visible in the background of the view, seen in the context of a high number of industrial structures including stacks and plumes. The Proposed Development will form a barely noticeable feature within the wider view. The impact is assessed to be Very Low, long term and reversible.		
Magnitude of impact at operation		Very Low
Significance of effect at operation	Residential	Negligible Adverse (Not Significant)

VIEWPOINT 12- CARPARK OFF A1085 COAST ROAD, MARSKE BY THE SEA

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
463150 , 523198	Recreational	14	6.8	North-west
At construction				
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the beachfront are not typically likely to be involved in activities which solely include enjoyment of the view resulting in a medium susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be Medium.		Medium		Medium for recreational users.
Size/scale, duration and reversibility of impact at construction				
Long distance view towards construction activities associated with the Main Site. Low and medium level activities will be largely screened by housing within Redcar. High level activities, including the use of cranes, will be barely noticeable above the intervening structures, viewed against the sky. The impact is assessed to be Very Low, short term and reversible.				
Magnitude of impact at construction				Very Low

VIEWPOINT 12- CARPARK OFF A1085 COAST ROAD, MARSKE BY THE SEA

Significance of effect at construction	Recreational	Negligible Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation		
The upper sections of the operational Main Site including stacks and plume associated with the flare will be visible, viewed above the residential area of Redcar. The high-level structures will be barely noticeable as a result of the long distance, viewed against the sky, although there are limited industrial structures visible within the wider view from this location. The impact is assessed to be Very Low, long term and reversible.		
Magnitude of impact at operation		Very Low
Significance of effect at operation	Recreational	Negligible Adverse (Not Significant)

VIEWPOINT 13- VIEWPOINT AT SALTHOLME WILDLIFE RESERVE AND DISCOVERY PARK (RSPB)

Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
449838, 523250	Visitors/recreational users	8	6.1	North-east
At construction				
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the RSPB reserve are not typically likely to be involved in activities which solely include enjoyment of the view resulting in a medium susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be Medium.		Medium.		Medium for recreational users.

VIEWPOINT 13- VIEWPOINT AT SALTHOLME WILDLIFE RESERVE AND DISCOVERY PARK (RSPB)

Size/scale, duration and reversibility of impact at construction		
Long distance view towards construction activities associated with the Main Site. Low and medium level activities will be largely screened by existing development and structures within Teesside. High level activities, including the use of cranes will be barely visible beyond existing tall structures forming part of a wider panorama which contains numerous tall industrial structures. The impact is assessed to be Very Low, short term and reversible.		
Magnitude of impact at construction		Very Low
Significance of effect at construction	Recreational	Negligible Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation		
The upper sections of the operational Main Site including stacks and plume associated with the flare will be barely visible beyond the numerous tall industrial structures visible within the view. The impact is assessed to be Very Low, long term and reversible.		
Magnitude of impact at operation		Very Low
Significance of effect at operation	Recreational	Negligible Adverse (Not Significant)

VIEWPOINT 14- VIEWPOINT AT SALTHOLME WILDLIFE RESERVE AND DISCOVERY PARK (RSPB)				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Main Site (km)	Direction of view
450479, 522590	Visitors/recreational users	4	5.7	North-east
At construction				
Visual susceptibility to change		Value of view		Sensitivity of receptor
Users of the RSPB reserve are not typically likely to be involved in activities which solely include enjoyment of the view resulting in a		Medium		Medium for recreational users.

medium susceptibility. When combined with the overall Medium value, the overall receptor sensitivity with respect to the Proposed Development is considered to be Medium.		
Size/scale, duration and reversibility of impact at construction		
Long distance view towards construction activities associated with the Main Site. Low level activities will be largely screened by intervening landform and vegetation. High level activities, include the use of cranes will be barely visible, viewed on the horizon as part of a wider panorama which contains a high number of industrial structures. The impact is assessed to be Very Low, short term and reversible.		
Magnitude of impact at construction		Very Low
Significance of effect at construction	Recreational	Negligible Adverse (Not Significant)
Size/scale, duration and reversibility of impact at operation		
The upper sections of the operational Main Site including stacks and plume associated with the flare will be visible, viewed above intervening landform and vegetation which screens the lower levels of the Proposed Development. The high-level structures will be barely noticeable as a result of the long distance, viewed against the sky. The impact is assessed to be Very Low, long term and reversible.		
Magnitude of impact at operation		Very Low
Significance of effect at operation	Recreational	Negligible Adverse (Not Significant)

Table 16-7: Summary of Effects on Visual Amenity

VIEWPOINT REFERENCE	SENSITIVITY OF RECEPTOR	RECEPTOR LOCATION	RECEPTOR TYPE	CONSTRUCTION	OPERATION
1	High	Albion Terrace, Hartlepool	Residential and PRoW users	Negligible Adverse (Not Significant)	Negligible Adverse (Not Significant)
2	High	The Cliff, Seaton Carew	Residential and PRoW users	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)
3	High	Teesmouth National Nature Reserve, England Coast Path	Recreational	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)
4	Medium	North Gare Sands	Recreational	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)
5	Medium	South Gare Breakwater	Recreational	Minor Adverse (Not significant)	Minor Adverse (Not Significant)
6	High	Cowpen Bewley Country Park	Recreational	Negligible Adverse (Not Significant)	Negligible Adverse (Not Significant)
7	High	England Coast Path, Warrenby	Recreational	Moderate Adverse (Significant)	Moderate Adverse (Significant)
8	High	Redcar seafront	Recreational and residential	Moderate Adverse (Significant)	Minor Adverse (Not Significant)
9	Medium	Coatham Marsh Nature Reserve	Recreational	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)

VIEWPOINT REFERENCE	SENSITIVITY OF RECEPTOR	RECEPTOR LOCATION	RECEPTOR TYPE	CONSTRUCTION	OPERATION
10	High	Eston Nab	Recreational	Negligible Adverse (Not Significant)	Negligible Adverse (Not Significant)
11	Medium	Longbeck Lane	Residential	Negligible Adverse (Not Significant)	Negligible Adverse (Not Significant)
12	Medium	Carpark off A1085 Coast Road, Marske by the Sea	Recreational	Negligible Adverse (Not Significant)	Negligible Adverse (Not Significant)
13	Medium	Saltholme Wildlife Reserve and Discovery Park (RSPB)	Recreational	Negligible Adverse (Not Significant)	Negligible Adverse (Not Significant)
14	Medium	Saltholme Wildlife Reserve and Discovery Park (RSPB)	Recreational	Negligible Adverse (Not Significant)	Negligible Adverse (Not Significant)

Dynamic Views

16.6.15 Users of the main transport routes and long-distance trails will gain dynamic views towards the Main Site to varying degrees dependent on intervening structures, screening vegetation, elevation and direction of travel. Due to the height of the tallest structure within the Main Site (the flare with a maximum height of 100 m above ground level/108 m AOD), these receptors will gain a wide variety of views, dependent upon the proximity to the Proposed Development and direction of travel.

16.6.16 Within the Study Area there are a number of local roads in proximity of the Main Site and connection corridors which join the settlements. Generally, views from these roads will be dynamic and ever changing. Views are often broken or restricted by screening vegetation and built form located along the road corridors. Where views are open, the flare, stacks and associated plumes will be clearly visible, appearing prominent in close views.

Decommissioning

16.6.17 The impacts on visual amenity arising as a result of decommissioning of the Proposed Development are considered (using professional judgement) to be similar to those identified at the construction stage. This is as a result of the visibility of decommissioning and demolition activities not being prominent for the majority of viewpoints as a result of long-distance views and intervening vegetation.

16.7 Mitigation and Enhancement Measures

16.7.1 The assessment has concluded that there will be no significant effects on landscape receptors during the construction and operation of the Proposed Development.

16.7.2 Significant adverse visual effects have been assessed for two representative viewpoints, as follows:

- Viewpoint 7 (England Coast Path, Warrenby) during construction and operation assessment scenarios; and
- Viewpoint 8 (Redcar Seafront) during the construction assessment scenario.

16.7.3 The assessment is based on a modified future baseline and represents the worst-case scenario. The baseline will be updated for the ES to include relevant applications and consented schemes.

16.7.4 The following mitigation measures will be undertaken as part of design development to address requirements of a number of relevant planning policies:

- the design of the Proposed Development will seek to minimise adverse impacts on visual amenity through appropriate siting of infrastructure including materials and colours (in line with EN-1 (DECC, 2011), policy N1 of the Redcar and Cleveland Local Plan (RCBC, 2018) and policy SD8 of the Stockton-on-Tees Local Plan (STBC, 2019).

16.7.5 No potential additional mitigation has been identified for Viewpoints 7 and 8 due to the proximity to the Proposed Development and the scale of the structures.

16.8 Assumptions and Limitations

16.8.1 Field visits were undertaken between February 2023 and April 2023 and so a comparison of visibility of visual effects over four seasons or during a wide range of light and weather conditions has not yet been possible. The field visit was undertaken with trees with no leaf cover to represent a 'worst case' scenario.

16.8.2 Guidance (IEMA, 2013) suggests that consideration be given to seasonal variation in effects where appropriate but acknowledges that the timing of the assessment may mean that this is not practical. A further site visit will be undertaken during the summer months when there is leaf cover and where there are important differences between seasonal views this will be indicated in and taken into consideration in reaching conclusions. Summer viewpoint photography will also be taken, and this will inform the preparation of the ES to support the DCO Application.

16.8.3 Assessment of visual impact using representative viewpoints is often limited/restricted by the limits of public access. Land outside of the control of the Applicants was accessed from points of public access (roads and PRoW) only. This is considered good practice and therefore has not affected the appropriateness of the viewpoints selected nor the robustness of the assessment.

16.8.4 The viewpoints that have been included within the assessment were based on representative views from where the receptor was considered the most sensitive (based on professional judgement).

16.9 Residual Effects and Conclusions

16.9.1 The assessment has determined that the Proposed Development is unlikely to result in significant adverse landscape effects during any of the assessment scenarios.

16.9.2 The visual amenity assessment has determined that a small number of recreational receptors England Coastal Path (Viewpoint 7) and Redcar Seafront (Viewpoint 8)) are likely to experience significant short-term adverse visual effects during the construction phase of the Proposed Development, as a result of the proximity to the Main Site and the limited intervening vegetation.

16.9.3 The impact on receptors at Redcar Seafront (Viewpoint 8) will reduce to levels that are Not Significant during Proposed Development operation. However, effects will remain Significant during Proposed Development operation along the England Coastal Path (Viewpoint 7) due to the proximity and prominence of structures associated with the Proposed Development. A summary of significant visual effects is presented in Table 16-8: Summary of Significant Effects.

Table 16-8: Summary of Significant Effects

DEVELOPMENT STAGE	ENVIRONMENTAL EFFECT (FOLLOWING DEVELOPMENT DESIGN AND IMPACT AVOIDANCE MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S)*
Construction (and decommissioning)	Impact on recreational users at viewpoint 7 England Coastal Path – during construction activities	Moderate Adverse (Significant)	None	Moderate Adverse (Significant)	St/T/D
Construction (and decommissioning)	Impact on recreational users at viewpoint 8 Redcar seafront during construction activities	Moderate Adverse (Significant)	None	Moderate Adverse (Significant)	St/T/D
Operation	Impact on recreational users at viewpoint 7 England Coastal Path – during opening	Moderate Adverse (Significant)	None	Moderate Adverse (Significant)	Lt/T/D
* Long term (Lt)/ Medium term (Mt)/ Short term (St) and Permanent (P)/ Temporary (T) and Direct (D)/ Indirect (In)					

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17.0 CULTURAL HERITAGE

17.1 Introduction

17.1.1 This chapter of the Preliminary Environmental Information (PEI) Report provides an initial assessment of potential cultural heritage impact as a result of the Proposed Development. For the purposes of this chapter cultural heritage comprises, archaeology, built heritage and historic landscape.

17.1.2 This chapter is supported by the following figures (PEI Report, Volume II) and appendix (PEI Report, Volume III):

- Figure 17-1: Location of Designated Heritage Assets;
- Figure 17-2: Location of Non-Designated Heritage Assets;
- Figure 17-3: Location of Cultural Heritage Events;
- Figure 17-4: Historic Landscape Character; and
- Appendix 17A: Cultural Heritage Desk-Based Assessment (DBA).

17.2 Legislation, Planning Policy and Guidance

Legislative Background

17.2.1 The following legislation is relevant to this cultural heritage assessment.

The Infrastructure Planning (Decisions) Regulations (2010)

17.2.2 The Infrastructure Planning (Decisions) Regulations (2010) (HMSO, 2010) sets out the duties of the Secretary of State (SoS) in the Development Consent Order (DCO) process which includes having regard to the desirability of:

- preserving listed buildings, their setting or any features of special architectural or historic interest which they possess;
- preserving or enhancing the character or appearance of conservation areas; and
- preserving scheduled monuments and their settings.

The Planning (Listed Buildings and Conservation Areas) Act (1990)

17.2.3 The Planning (Listed Buildings and Conservation Areas) Act 1990 (HMSO, 1990) sets out the principal statutory provisions concerning the listing of buildings and designation of conservation areas, and provisions that must be considered in the determination of any application affecting listed buildings or conservation areas.

17.2.4 It requires the SoS to hold a list of buildings of special architectural or historical interest, which are accorded statutory protection. In addition, it expects Local Planning Authorities (LPAs) to designate conservation areas which are parts of their area considered to be "*of special architectural or historic interest, the character or appearance of which is desirable to preserve or enhance and design*".

17.2.5 Section 66 of the Act states that in considering whether to grant planning permission for development which affects a listed building or its setting, the LPA, or the SoS, shall

have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses. By virtue of Section 1(5) of the Act a listed building includes any object or structure within its curtilage.

17.2.6 Section 72 of the Act establishes a general duty on a LPA or the SoS with respect to any buildings or other land in a conservation area to pay special attention to the desirability of preserving or enhancing the character or appearance of a conservation area.

The Ancient Monuments and Archaeological Areas Act (1979)

17.2.7 The Ancient Monuments and Archaeological Areas Act 1979 (HMSO, 1979) states that sites assessed to be of national importance may be included within the Schedule of Monuments. These sites are afforded statutory protection and Scheduled Monument Consent is required before any works are carried out which would have the effect of demolishing, destroying, damaging, removing, repairing, altering, adding to, flooding or covering up a Scheduled Monument. This Act also provides for the designation of areas of archaeological interest in which statutory provisions for access to construction sites for the purpose of carrying out archaeological works apply.

Planning Policy Context

17.2.8 This preliminary assessment has been undertaken taking into account relevant national, regional and local planning policy, as summarised below.

National Planning Policy

National Policy Statement (NPS) for Energy (EN-1) (2011)

17.2.9 The National Policy Statements (NPSs) for energy infrastructure set out the Government's policy for delivery of major energy infrastructure (Department for Energy and Climate Change, 2011). The Overarching NPS for Energy (EN-1) published in 2011 is of relevance to the cultural heritage assessment (refer to Section 5.8 Historic Environment).

17.2.10 Section 5.8 Historic Environment of the NPS recognises that the construction, operation and decommissioning of energy infrastructure has the potential to result in adverse impacts on the historic environment. Paragraph 5.8.2 defines the historic environment as, "*all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, landscaped and planted or managed flora*." The NPS states that as part of the ES, the applicant should describe the significance of heritage assets; carry out an appropriate desk-based assessment and, where such desk-based research is insufficient to properly assess the interest, a field evaluation. Paragraph 5.8.10 states the applicant should ensure the impact of proposed development on the significant of heritage assets can be understood from the submitted application documents.

Draft National Policy Statements

17.2.11 The Government is currently reviewing and updating the Energy NPSs to reflect its policies and strategic approach that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions. As part of the review process, the Government published Draft Energy NPSs for consultation in September 2021 and later revised versions on 30th March 2023. The details of these provisions are subject to consultation. However, these emerging documents and any subsequent formal adoption of new NSPs for energy infrastructure have been considered where relevant during the production of this PEI Report. A summary of the relevant draft NPSs is below.

Draft Overarching NPS for Energy (EN-1) (2023)

17.2.12 Section 5.9 of the Draft NPS (EN-1) (DESNZ, 2023) relates to the historic environment. The Draft NPS states the applicant should undertake an assessment of any likely significant heritage impacts of the proposed development as part of the EIA. The applicant should provide a description of the significance of heritage assets affected by the proposed development, including any contribution made by their setting, and the level of detail should be proportionate to the importance of the assets and sufficient to understand the potential impact on their significance. A desk-based assessment should be carried out and, where heritage interest needs to be assessed more fully, a field evaluation.

Draft National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (2023)

17.2.13 Paragraph 2.13.17 of the Draft NPS (EN-4) states "Dredging can also affect water quality and resources. Other potential impacts include chemical pollution, and morphological changes, exposure to contaminants and adverse effects on heritage assets."

17.2.14 Additional dredging, particularly at RBT Quayside for delivery vessels and mooring arrangements is not anticipated to be required for the Proposed Development therefore this policy is not considered or applied further in the assessment.

Draft NPS for Electricity Networks Infrastructure (EN-5) (2023)

17.2.15 Paragraph 2.2.10 of the Draft NPS (EN-5) refers to obligations on transmission and distribution licence holders under Section 9 of the Electricity Act 1989, in formulating proposals for new electricity networks infrastructure, to "*have regard to the desirability of preserving… sites, buildings and objects of architectural, historic or archaeological interest; and …do what [they] reasonably can to mitigate any effect on any such …features, sites, buildings or objects*". Paragraph 2.9.25 of the Draft NPS states that where the undergrounding of electrical connections forms part of a proposed development, the disruptive effects to archaeological and heritage sites should be recognised.

National Planning Policy Framework (NPPF) (2021)

17.2.16 Although the NPPF is not the principal policy against which the Proposed Development will be evaluated, due regard is given to this policy in the assessment of archaeological and cultural heritage effects.

17.2.17 Notably Section 16: Conserving and Enhancing the Historic Environment of the NPPF sets out the Government's planning policies for the historic environment. The NPPF sets out the importance of being able to assess the significance of heritage assets that may be affected by a development. Significance is defined in Annex 2 as being, "*the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic*". The significance of a heritage asset is not only derived from an asset's physical presence, but also from its setting. The setting of a heritage asset is defined in Annex 2 as, "*the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve*".

17.2.18 Paragraph 194 of the NPPF states that in determining applications, LPAs should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. Similarly, paragraph 195 includes a requirement on LPAs, having assessed the particular significance of any heritage asset that may be affected by a proposal, to take this into account when considering the impact of a proposal on a heritage asset.

17.2.19 Paragraphs 199 to 203 of the NPPF introduce the concept that heritage assets can be harmed or lost through alteration, destruction or development within their setting. This harm ranges from less than substantial to substantial. With regard to designated assets, paragraph 199 states that great weight should be placed on its conservation, irrespective of whether any potential harm is considered to be substantial or less than substantial. The paragraph goes further to say that the more important the asset, the greater the weight should be on its conservation. In paragraph 200, a distinction is made in respect of those assets the NPPF identifies as being of the highest significance (e.g. scheduled monuments, Grade I and Grade II* listed buildings) where substantial harm to or loss should be wholly exceptional.

17.2.20 With regard to non-designated assets, paragraph 203 states that the effect of the application on the significance of the asset should be taken into account in determining the application. A balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.

Local Planning Policy

Redcar and Cleveland Local Plan (2018) (RCBC, 2018a)

17.2.21 Policy HE1 of the Redcar and Cleveland Local Plan, adopted 2018, relates to development affecting the setting of a conservation area and states that, "*development within or otherwise affecting the setting of a conservation area will only be permitted where it preserves or enhances the character or appearance of the conservation area*". Policy HE2 of the Plan relates to heritage assets and requires

development proposals to preserve or enhance the significance of designated heritage assets, including its setting. The policy states that development would only be permitted if it preserved or enhances the significance of a designated heritage asset; protects its immediate setting, including trees, hedges, walls and fencing, and retains historic plot boundaries. In relation to non-designated heritage assets, the policy states that in determining applications that would result in substantial harm to, or total loss of, a non-designated heritage asset or its setting, "*the applicant will be required to demonstrate that the benefits of the development would outweigh any harm or loss of the heritage asset, based on its significance*".

17.2.22 Policy HE3 aims to protect important archaeological sites from inappropriate development. The policy stats that, "*development that may affect a known or possible archaeological site, whether designated or non-designated, will require the results of a desk-based assessment to be submitted as part of the planning application. An archaeological evaluation may also be required to identify the most appropriate course of action*".

South Tees Area Supplementary Planning Document (SPD) (2018) (RCBC, 2018b)

17.2.23 Development Principle STDC8 of the SPD states that the Council will, in consultation with the local community and key stakeholders, identify industrial heritage assets which are appropriate and viable to retain as part of the development of an industrial heritage trail. Proposals which would result in unacceptable harm to the significance of specific retained assets will not be supported. Proposals that will affect a designated or non-designated heritage asset or its setting, should be in accordance with the requirements of the Redcar and Cleveland Local Plan Policy HE2.

Stockton-on-Tees Local Plan (2019)

17.2.24 Policy HE2 of the Stockton-on-Tees Local Plan, adopted 2019, states that "*proposals should conserve and enhance heritage assets, including their setting, in a manner appropriate to their significance. Where development will lead to harm to or loss of significance of a designated or non-designated heritage asset the proposal will be considered in accordance with Policy SD8, other relevant Development Plan policies and prevailing national planning policy*".

Hartlepool Local Plan (2018)

17.2.25 The Hartlepool Borough Council Local Plan was adopted in 2018. Policy HE1 relates to heritage assets and states that any development proposals that has an impact on an asset and its setting is required to preserve or enhance its value, appropriate to its significance, be of a design that has a positive impact on the asset and ensure the sensitive and viable use of the asset. Policy HE2: Archaeology, states than an assessment will be required to support development proposals that may affect sites of archaeological interest, and that the assessment should inform potential mitigation strategies. Policy HE3: Conservation Areas states that development proposals need to demonstrate that they will conserve or positively enhance the character of a conservation area. Policy HE4: Listed Buildings and Structures states that the Borough Council will ensure harm is not caused to the significance of a listed buildings through inappropriate development within its setting. Policy HE5 which

deals with local listed structures states that, "*where a proposal affects the significance of a non-designated heritage asset, a balanced judgment should be weighed between the scale or the harm or loss against the public benefits of the proposal*".

Planning Practice Guidance (PPG) for the Historic Environment (2019)

17.2.26 The PPG for the historic environment (MHCLG, 2019) provides further advice and guidance that expands the policy outlined in the NPPF. It expands on terms such as 'significance' and its importance in decision making. The PPG clarifies that being able to properly assess the nature, extent and the importance of the significance of the heritage asset and the contribution of its setting, is crucial to understanding the potential impact and acceptability of development proposals (paragraph 007; Reference ID: 18a-007-20190723).

17.2.27 The PPG states that in relation to setting a thorough assessment of the impact on setting needs to take in to account, and be proportionate to, the significance of the heritage asset under consideration and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it (paragraph 013; Reference ID: 18a-013-20190723).

17.2.28 The PPG discusses how to assess if there is substantial harm. It states when assessing if a proposal causes substantial harm, it is the impact on the asset's heritage significance that is important (paragraph 018; Reference ID: 18a-018-20190723).

17.2.29 The NPPF indicates that any degree of harm should be considered alongside any public benefits that can be delivered by development. The PPG states that these benefits should flow from the proposed development and should be of a nature and scale to be of benefit to the public, and not just a private benefit, and would include securing the optimum viable use of an asset in support of its long-term conservation (paragraph 020; Reference ID: 18a-020-20190723).

Other Relevant and Guidance

17.2.30 The following guidance has been taken into account during the preparation of this preliminary cultural heritage assessment.

Historic Environment Guidance

17.2.31 Historic England has published a series of Good Practice Advice (GPA) of which those most relevant to this assessment are GPA2 - Managing Significance in Decision-Taking in the Historic Environment (Historic England, 2015), GPA3 - The Setting of Heritage Assets (Historic England, 2017) and Advice Note 12: Statements of Heritage Significance (Historic England, 2019).

17.2.32 GPA2 (Historic England, 2015) emphasises the importance of having a knowledge and understanding of the significance of heritage assets likely to be affected by the development and that the "*first step for all applicants is to understand the significance of any affected heritage asset and, if relevant the contribution of its setting to its significance*".

17.2.33 GPA3 (Historic England, 2017) provides detail on the setting of heritage assets and provides general advice on understanding setting, and how it may contribute to the significance of heritage assets and allow that significance to be appreciated. The document provides advice on how views contribute to setting and provides a broad approach to assessing the impact of a Proposed Development on the setting of heritage assets, by outlining a series of steps that can be applied proportionately to the complexity of the case.

17.2.34 Advice Note 12 (Historic England, 2019) outlines a recommended approach to assessing the significance of heritage assets in line with the requirements of NPPF. It includes a suggested reporting structure for a 'Statement of Heritage Significance', as well as guidance on creating a statement that is proportionate to the asset's significance (heritage value) and the potential degree of impact of a Proposed Development. The Advice Note also offers an interpretation of the various forms of heritage interest that an asset can possess i.e., its archaeological, architectural, artistic and historic interest, based on the terms provided in the NPPF Annex 2: Glossary (MHCLG, 2021) as follows:

- Archaeological Interest – there will be archaeological interest in a heritage asset if it holds, or has the potential to hold, evidence of past human activity worthy of expert investigation at some point.
- Architectural and Artistic Interest – these are interests in the design or general aesthetics of a place. They can arise from conscious design or fortuitously from the way the heritage asset has evolved. More specifically, architectural interest is an interest in the art or science of the design, construction, craftsmanship and decoration of buildings and structures of all types. Artistic interest is an interest in other human creative stills, such as sculpture.
- Historic Interest – An interest in past lives and events (including pre-historic). Heritage assets can illustrate or be associated with them. Heritage assets with historic interest not only provide a material record of our nation's history but can also provide meaning for communities derived from their collective experience of a place and can symbolise wider values such as faith and cultural identity.

Chartered Institute for Archaeologists (CIfA) Standard and Guidance for Historic Environment Desk-Based Assessment

17.2.35 The baseline assessment set out in Appendix 17A: Cultural Heritage Desk-based Assessment (PEI Report, Volume III) has been undertaken in accordance with guidance published by the Chartered Institute for Archaeologists (CIfA), specifically the Standard and Guidance for Historic Environment Desk-Based Assessment (CIfA, 2020).

Institute of Environmental Management and Assessment (IEMA) Principles of Cultural Heritage Impact Assessment in the UK

17.2.36 The Principles of Cultural Heritage Impact Assessment in the UK (IEMA, 2021) is a guide to good practice in cultural heritage impact assessment published jointly by IEMA, the Institute of Historic Building Conservation (IHBC) and CIfA. The document

provides guidance on understanding cultural heritage assets and evaluating the consequences of change.

17.2.37 Understanding cultural heritage assets is split into three stages: Description, Significance and Importance. The description arrives at a factual statement that establishes the nature of the asset. The heritage values of the asset are then analysed (the guidance stresses that these include but are not limited to aesthetic, historic, scientific, social or spiritual values) and a statement of cultural significance given. Finally, the importance of the asset is assessed, and a conclusion drawn as to the level of protection that the asset merits in planning policy and cultural heritage legislation.

17.3 Assessment Methodology and Significance Criteria

17.3.1 This section presents the following:

- the methodology behind the baseline assessment including the definition of an appropriate Study Area;
- the methodology and terminology used in the assessment of effects; and
- identification of the information sources that have been consulted throughout preparation of this chapter.

Study Area

17.3.2 The Study Area has been defined to capture the historic environment baseline data correlating to the predicted impacts from the Proposed Development.

17.3.3 The Study Area for capturing data relating to non-designated heritage assets (archaeological sites, findspots, locally listed buildings) is 1 km from the Proposed Development Site (Figure 17-2: Location of Non-Designated Heritage Assets (PEI Report, Volume II)). This Study Area is assessed as proportionate and relevant for identifying cultural heritage assets that may be physically impacted by the Proposed Development, including buried assets outside of the Proposed Development Site that may extend into it. In addition, the Study Area provides relevant information relating to previous archaeological fieldwork events and studies that, collectively, provide a contextual baseline for the Proposed Development Site in line with the guidance set out in CIfA guidance (CIfA, 2020).

17.3.4 The Study Area for capturing data relating to designated heritage assets (World Heritage Sites, scheduled monuments, listed buildings, conservation areas, registered parks and gardens, registered battlefields) is 5 km from the Proposed Development Site. The extent of this Study Area has been informed by an understanding of the area's topography and the nature of the Proposed Development. It is assessed to be appropriate for identifying assets whose setting may change because of the construction, operational, or decommissioning activities of the Proposed Development. This larger Study Area has been further informed by the Zone of Theoretical Visibility (ZTV) shown on Figure 16-5: Zone of Theoretical Visibility and Representative Viewpoint Locations (PEI Report, Volume II), accompanying Chapter 16: Landscape and Visual Amenity (PEI Report, Volume I), and from the results of the heritage site visit conducted in Spring 2023.

Significance Criteria

17.3.5 This section presents the methodology used for determining the magnitude of impact and significance of effect to heritage assets as a result of the construction, operation and decommissioning of the Proposed Development.

17.3.6 The principles of impact assessment methodology rest upon independently evaluating the value of heritage assets and the magnitude of impact upon that value. By combining the value of the heritage asset with the predicted magnitude of impact, the significance of the effect arising from the Proposed Development can be determined.

Sensitivity Criteria

17.3.7 The sensitivity of a heritage asset is determined by a combination of its heritage value and its susceptibility to change, either as a result of physical changes or arising from changes to its setting. The criteria for determining an asset's value and its susceptibility to change are set out in Table 17-1 and Table 17-2.

Assessing Heritage Value

17.3.8 The value of a heritage asset (its heritage significance) is guided by its designated status but is derived also from its heritage interest.

17.3.9 Annex 2: Glossary of the NPPF (NPPF, 2021) defines value as "*the value of a heritage asset to this and future generations because of its heritage interest*", which comprises archaeological, architectural, artistic and historic interest. The value of a heritage asset can therefore be defined by the sum and understanding of its heritage interests. Each identified heritage asset can be assigned a value in accordance with the criteria set out in Table 17-1. The results of statutory consultation and engagement also contribute to the assessment of value. Regional variations, contribution to regional research agenda, and individual qualities of heritage assets are also taken into account.

17.3.10 Whilst it is recognised that all designated assets are considered to be of national importance, a distinction in value is made in Table 17-1 between Grade I and Grade II* graded assets and those at Grade II. This reflects the separation of the grades in paragraph 200 of the NPPF which makes a distinction between Grade II listed buildings and registered parks and gardens, and other heritage assets which it considers to be of "*the highest significance*", notably scheduled monuments, Grade I and Grade II* listed buildings, and Grade I and Grade II* registered parks and gardens.

Table 17-1: Criteria for Determining the Significance (Heritage Value) of Heritage Assets

VALUE	CRITERIA
High	World Heritage Sites; Grade I and Grade II* Listed Buildings; Grade I and Grade II* Registered Parks and Gardens; Scheduled Monuments;

VALUE	CRITERIA
	Registered battlefields; Conservation areas (of demonstrable high value, i.e., high number of Grade I and II* buildings; diverse and high-quality buildings); Non-designated heritage assets that can be shown to have demonstrable national or international importance.
Medium	Grade II listed buildings; Conservation areas (majority Grade II buildings displaying regional and local characteristics and styles); Grade II Registered Parks and Gardens; Locally listed buildings as recorded on a local authority list; Non-designated heritage assets that can be shown to be of regional importance; Historic Townscapes with historic integrity in that the assets that constitute their make-up are clearly legible; Averagely well-preserved historic landscape character areas with reasonable coherence, time-depth or other critical factors.
Low	Non-designated buildings, monuments, sites or landscapes that can be shown to be of limited or local interest only; Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade; Historic landscape character areas whose value is limited by poor preservation and/or poor survival of contextual associations.
Very Low	Assets whose values are entirely compromised by poor preservation, or survival, or that have little or no contextual associations to justify inclusion into a higher grade; Historic landscape with no or little surviving historic interest.

Magnitude of Impact

17.3.11 Having identified the value of the heritage asset, the next stage in the assessment is to identify the level and degree of impact to an asset arising from the Proposed Development. Potential impacts to heritage assets may arise during construction, operation or decommissioning and can be temporary and reversible or permanent. An impact can occur to the physical fabric of a heritage asset or arise from changes to its setting. If the impact harms the heritage interest(s) of an asset, then this is likely to affect its value (its heritage significance).

17.3.12 The level and degree of impact (impact rating) is assigned with reference to the criteria as set out in Table 17-2. The magnitude of impact arising from the Proposed Development takes into account embedded and good practice mitigation measures that have been developed as part of the design process (refer to Section 17.5).

Table 17-2: Criteria for Determining the Magnitude of Impact on Heritage Assets

MAGNITUDE OF IMPACT	IMPACT DESCRIPTION
High	Changes to the heritage interests of an asset such that the value of the asset is totally altered or destroyed; Comprehensive change to, or total loss of, elements of setting that would adversely affect the ability to understand and appreciate the asset, resulting in likely harm to its value.
Medium	Change such that the value of the asset is significantly altered or modified; Changes such that the setting of the asset is noticeably different, resulting in changes in our ability to understand and appreciate the value of the asset.
Low	Changes to heritage interests such that the value of the asset is slightly affected; Changes to setting that result in changes in the ability to understand and appreciate the value of the asset.
Very Low	Changes to the heritage interest(s) of an asset that hardly affect its value; Changes to the setting of an asset that have little change to the ability to understand and appreciate the value of the asset.
No Impact	No change to a heritage asset, including changes to its setting, and no change to its value.

Significance of Effect

17.3.13 An assessment to classify the cultural heritage effect, having taken into consideration any relevant embedded mitigation, is determined by cross-referencing between the significance (heritage value) of the asset (Table 17-1) and the magnitude of impact (Table 17-2). The resultant effect is determined using the matrix detailed in Table 17-3. Where the assessment indicates that there would be no impact to a heritage asset, this is classified as no impact and no effect.

Table 17-3: Criteria for Determining the Significance of Effect

VALUE OF HERITAGE ASSET	MAGNITUDE OF IMPACT				
	HIGH	MEDIUM	LOW	VERY LOW	NO IMPACT
High	Major	Major	Moderate	Minor	No Effect
Medium	Major	Moderate	Minor	Negligible	No Effect
Low	Moderate	Minor	Negligible	Negligible	No Effect
Very low	Minor	Negligible	Negligible	Negligible	No Effect

17.3.14 As outlined in Chapter 2: Assessment Methodology (PEI Report, Volume I), major and moderate (adverse or beneficial) effects are considered to be significant, whilst those that are minor (adverse or beneficial) or negligible are considered not significant.

17.3.15 Where significant effects are predicted, if appropriate, additional mitigation is required and therefore proposed, as set out in Section 17.7. Additional mitigation may reduce the magnitude of the impact, and therefore reduce the overall significance of the effect (for example from moderate to minor).

17.3.16 Within the NPS EN-1, Section 5.8 Paragraphs 5.8.14–5.8.15, and NPPF Section 16 Paragraphs 199–204 impacts affecting the value of heritage assets are considered in terms of harm, and there is a requirement to determine whether the level of harm amounts to 'substantial harm' or 'less than substantial harm'.

17.3.17 There is no direct correlation between the classification of effect as reported herein and the level of harm caused to heritage significance. The PPG, revised in 2019, states that it is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed.

Sources of Information/Data

17.3.18 The following data sources have been reviewed as part of the preparation of the DBA. This sets out the baseline conditions for heritage assets within the Proposed Development Site and Study Area and is presented in Appendix 17A: Cultural Heritage Desk-based Assessment (PEI Report, Volume III):

- Tees Archaeology Historic Environment Record (HER) for information relating to non-designated heritage assets, previous fieldwork events and reports, and historic landscape data (Tees Archaeology, 2023);
- Redcar and Cleveland HER for information relating to non-designated heritage assets, fieldwork events and historic landscape data Historic environment and heritage management (RCBC, 2023a);
- National Heritage List for England (NHLE) for designated heritage assets datasets (NHLE, 2023);
- existing heritage assessment reports undertaken within the 1 km study area for other development proposals, including those to support Net Zero Teesside DCO;
- Defence of Britain Database archive (Archaeology Data Service, 2023);
- Ordnance Survey (OS) historic mapping data (National Library of Scotland, 2023);
- National Collection of Aerial Photographs (National Collection of Aerial Photography, 2023);
- Cambridge Air Photos (University of Cambridge, 2023);
- the results of previous geotechnical site investigations for the Proposed Development Site;
- conservation area appraisals and buildings on the local list accessed from LPA websites (RCBC, 2023b; HBC, 2023; Middlesborough Council, 2023; STBC, 2023);

- online sources including British Geological Survey (BGS) for geological data (BGS, 2023).

Consultation

17.3.19 An EIA Scoping Opinion was requested from the Inspectorate in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to cultural heritage is outlined in Table 17-4.

Table 17-4: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
Historic England	9th May 2023 Scoping Opinion	In line with the advice in the National Planning Policy Framework (NPPF 2021) and the relevant National Policy Statements (NPS), we would expect the Environmental Statement to contain a thorough assessment of the likely effects the proposed development might have upon those elements which contribute to the significance of these assets. We would like to draw attention to the specific NPS documents and their policies in relation to the historic environment. We would expect to see these referred to in the cultural heritage section of the ES to show how the application complies with them. Our initial assessment broadly tallies with the baseline conditions set out in the scoping report. We concur that there are no highly designated heritage assets within the red-line boundary. However, we note that there are circa 700 non-designated heritage assets both within the boundary and the defined 1km study area. The proposed pipeline across the Tees will be bored and therefore will not impact any	The assessment presented herein comprises a preliminary assessment of likely effects associated with the Proposed Development. The Historic England comments in the Scoping Opinion have been reviewed and will be taken into account when preparing the final assessment to be reported in the ES. The relevant NPS documents are referenced in this preliminary assessment and will also be included in the ES. Noted. Noted.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		maritime heritage assets in this area. We concur that it is unlikely that there will be any significant impacts on marine cultural heritage by this proposal as noted in 6.11.18 and consequently that marine heritage can be scoped out.	
		It is clear that the terrestrial cultural heritage must be scoped into the EIA as there could be impacts to known heritage assets. At present the potential for currently unrecorded heritage assets is not known and should also be included in the assessment.	The potential for currently unrecorded heritage assets is presented in Section 17.9 of Appendix 17A (PEI Report, Volume III).
		We expect the Environmental Statement to consider the potential impacts on non-designated features of historic, architectural, archaeological or artistic interest, since these can also be of national importance and make an important contribution to the character and local distinctiveness of an area and its sense of place.	This preliminary assessment, and the ES, does and will consider potential impacts to non-designated heritage assets.
		We expect the assessment to clearly demonstrate that the extent of the proposed study area is of the appropriate size to ensure that all heritage assets likely to be affected by	The rationale for the Study Area is set out in Section 17.3 of this preliminary assessment.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		this development have been included and can be properly assessed. It is important that the assessment is designed to ensure that all impacts are fully understood. Pre-determination archaeological evaluation such as geophysical surveys and other evaluation techniques may assist with determination of archaeological potential and ground truthing of desk-based data. The assessment should also take account of the potential impact associated activities (such as construction, servicing and maintenance, and associated traffic) might have upon perceptions, understanding and appreciation of the heritage assets in the area. The assessment should also consider, where appropriate, the likelihood of alterations to drainage patterns that might lead to in situ decomposition or destruction of below ground archaeological remains and deposits and can also lead to subsidence of buildings and monuments. We suggest that the applicant should seek advice from and liaise closely with the Local Planning Authority's Heritage / Archaeology Advisors for this application.	Geotechnical data has been used to determine archaeological potential for the Main Site as set out in Section 17.7 of Appendix 17A (PEI Report, Volume III). Geophysical survey is proposed for parts of the Hydrogen Pipeline Corridor and the results will be included in the ES. These matters will be considered in the ES, alongside potential impacts arising from construction noise, dust and vibration. Consultation with the LPA's Heritage / Archaeology Advisors will continue during the preparation of the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
Hartlepool Borough Council - Tees Archaeology	9th May 2023 Scoping Opinion	Tees Archaeology agrees with the proposed scoping methodology for cultural heritage and agree that a cultural heritage DBA will be produced.	Noted.
RCBC	9th May 2023 Scoping Opinion	No comment from archaeology advisor to RCBC	Noted.
The Inspectorate	17th May 2023 Scoping Opinion	The Applicant intends to scope out direct impacts to marine cultural heritage assets during construction and operation of the Proposed Development. The Scoping Report states that no construction works are proposed in areas below MHWS where marine heritage assets are likely to be located and more highly concentrated. The Inspectorate agrees that based on the information provided, construction and operation of the Proposed Development is unlikely to give rise to significant effects from direct impacts to marine cultural heritage assets and is therefore content for this matter to be scoped out.	Noted.
The Inspectorate	17th May 2023 Scoping Opinion	The Applicant proposes to scope out direct impacts to heritage assets located in the River Tees as construction methodologies such as HDD or Micro-bored Tunnel (MBT) will be	Noted.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		utilised to minimise disturbance to sensitive receptors during construction of the hydrogen pipeline beneath the river. The Inspectorate agrees that based on the information provided, construction and operation of the Proposed Development is unlikely to give rise to significant effects from direct impacts to marine cultural heritage assets in the River Tees and therefore agrees that this matter can be scoped out.	
The Inspectorate	17th May 2023 Scoping Opinion	The Scoping Report states that a desk-based assessment would be produced. No reference is made to whether any further surveys are required to inform the archaeological baseline. The Inspectorate is of the opinion that should the desk-based assessment identify the need for further investigation, such as geophysical survey, monitoring of geotechnical ground investigations or trial trenching, the Applicant should make every effort to agree the scope of such activities with relevant consultation bodies. The results and assessment of effects to archaeology should be clearly presented within the ES along with a description of any uncertainties or assumptions applied, and	Geophysical survey to enhance the baseline and inform the ES is planned for July/ August 2023. The results of the geophysical survey will inform the scope of any additional evaluation, including trial trenching. The resulting fieldwork reports will be submitted with the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		confirmation of any further survey and evaluation required and how this would be secured.	
The Inspectorate	17th May 2023 Scoping Opinion	The ES should clearly describe how the final study areas have been defined according to sensitivity of receiving heritage assets and potential impacts during construction and operation of the Proposed Development. The Applicant should seek agreement with the relevant consultation bodies regarding the study areas used to inform the assessment and evidence this in the ES.	The Applicant will seek agreement on the study areas with the relevant consultation bodies, which will be confirmed in the ES.
The Inspectorate	17th May 2023 Scoping Opinion	Indirect impacts to marine cultural heritage assets, such as temporary and permanent changes to their setting during construction and operation of the Proposed Development respectively, have not been explicitly identified in the Scoping Report. The ES should consider the potential for indirect impacts to marine heritage assets to give rise to likely significant effects or provide a justification as to why they would not experience significant effects.	Potential temporary and permanent changes to the settings of marine heritage assets, such as submerged wrecks and obstructions, as a result of the construction and operation of the Proposed Development will be included in the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	17th May 2023 Scoping Opinion	The ES should also assess effects to historic landscape character where significant effects are likely to occur.	The ES will include assessment of impact to the historic landscape character where significant effects are likely to occur.

Use of the Rochdale Envelope

17.3.20 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with The Planning Inspectorate's guidance (The Planning Inspectorate, 2012). This involves assessing the maximum (or where relevant, minimum)/realistic worst-case parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example).

17.3.21 The Rochdale Envelope approach has been adopted in this preliminary assessment, ensuring that the worst case is assessed. As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), only than trenchless methods (such as Horizontal Directional Drilling (HDD) or Micro Bored Tunnelling (MBT)) are being considered for the Hydrogen Pipeline Corridor crossings of Greatham Creek and the River Tees. Apart from these crossings, the worst-case for cultural heritage assumes that open-cut trench construction would be used to construct some sections of the following:

- CO_2 Export Corridor;
- Hydrogen Pipeline Corridor;
- Natural Gas Connection Corridor;
- Water Connections Corridor;
- Electrical Connection Corridor; and
- Other Gases Connection Corridor.

17.3.22 Open cut trench construction methods have the potential to physically remove buried heritage features, therefore, where this method of construction is proposed, it has the potential to result in the permanent loss of heritage assets within the construction footprints. For further detail regarding the proposed construction methodologies, please refer to Chapter 4: Proposed Development (PEI Report, Volume I) and Chapter 5: Construction Programme and Management (PEI Report, Volume I).

17.3.23 The maximum construction duration represents the worst case for the length of temporary impacts arising from changes to the setting of heritage assets. The worst-case scenario is therefore represented by the sequential and continuous construction of Phase 1, which is likely to last approximately three years, followed by Phase 2 construction which will last for up to three years. This worst-case scenario does not mean that all heritage assets would be impacted continuously for the maximum construction duration, but rather is a recognition that an impact to a heritage asset may occur, temporarily, during this period.

17.3.24 The reasonable worst-case operational scenario is measured by the level of permanent change to the setting of heritage assets. As such, the greatest magnitude of change to the setting of heritage assets is represented by the presence of the operational Proposed Development (both Phase 1 and Phase 2).

17.3.25 It is assumed there would be no additional permanent impacts to heritage assets during the Proposed Development decommissioning phase as all impacts of this nature would have occurred during the construction phase. Therefore, the reasonable worst-case decommissioning scenario is measured only by the level of change to the setting of assets, which is represented by temporary activities associated with the decommissioning of the Proposed Development and would likely be no greater than the temporary setting effects predicted during construction.

17.4 Baseline Conditions

Existing Baseline

17.4.1 This section presents a summary of the existing baseline conditions for cultural heritage relevant to this preliminary assessment. Detailed baseline information, including the results of a site walkover survey of parts of the Proposed Development Site and a description of its setting, is set out in the DBA presented in Appendix 17A: Cultural Heritage Desk-based Assessment (PEI Report, Volume III). Reference should be made to Figures 17-1 to 17-4 (PEI Report, Volume II). Heritage assets and features from the HER and NHLE are identified in the baseline text by reference number.

Geology and Topography

17.4.2 The solid geology beneath the Proposed Development Site, including the connection corridors, comprises Redcar Mudstone Formation, Penarth Mudstone and Mercia Mudstone. The superficial geology beneath the Main Site comprises Blown Sand and Tidal Flat Deposits of sand and silt (BGS 1:50,000 Digital Geological Map of Great Britain).

Historic Landscape

17.4.3 The character of the landscape within the 1 km Study Area is dominated by the area's industrial heritage, particularly on the reclaimed land to the north and south of the River Tees. The saltmarshes which would have been exploited for resources throughout the history of human habitation in the area still form the boundary between agricultural land and the sea. Pockets of saltmarsh exist to the north of the Tees with fewer areas surviving on the river's south banks. The fields beyond the saltmarsh and industrial zones are indicative of post-World War II amalgamation of earlier, smaller fields into larger land parcels to accommodate more intensive farming practices, whilst small villages and farmsteads outside of settlement areas are indicative of the area's agricultural heritage.

Summary of Archaeological and Historical Background

Palaeolithic

17.4.4 Palaeolithic activity tends to be represented in archaeological record by finds of flint tools and/or the waste flint associated with the production of such, either as individual pieces or larger scatters of material tool. These tools were used for hunting and processing animals, and the environment of the River Tees would have been a perfect environment for hunting. Recent land reclamation activities within the Study Area may well have destroyed much of the archaeological evidence of this period.

However, it is possible that deeply buried deposits of this period do survive and have the potential to contain information about this period.

Mesolithic

17.4.5 During the Mesolithic period, the Tees Estuary was occupied by extensive saltwater marsh and would have been a focal point for hunting and fishing activities (Daniels, 2014). Intertidal peat beds, a submerged Late Mesolithic forest, and evidence of occupation (Batchelor et al, 2012) have been recorded to the north of the Tees Estuary at Hartlepool and Seaton Carew. Intertidal peat beds have also been recorded at Redcar (Carter, 2014). Mesolithic and Neolithic worked flints were recovered during fieldwalking of the fields between Kirkleatham and Yearby, on the edge of the 1 km Study Area and included a section of a blade and a transverse arrowhead (HER 1701). A fragment of Beaker pottery (HER 240) was found in a field to the south-west of Kirkleatham, approximately 590 m south of the Hydrogen Pipeline Corridor.

Neolithic and Bronze Age

17.4.6 Approximately 500 m north-east of the Main Site is the record for 'Coatham Man' (HER 6798), consisting of fragments of human skull which were radiocarbon dated to the Early Neolithic period.

17.4.7 To the north-west, north of the Tees Estuary, the Hydrogen Pipeline Corridor crosses fields within Cowpen Marsh, where previous assessment reports have identified evidence of Bronze Age midden deposits (HER 1817) exposed during excavations at Fore Marsh, just outside of the Proposed Development Site, and medieval salt mounds. The salt marshes would have provided excellent hunting grounds for early prehistoric groups. The midden feature was preserved beneath estuarine clays and above a peat deposit dated to 4-5,000 years before present. The midden contained well-preserved horse, cattle and sheep bones, all containing butchery marks. The feature is indicative of Bronze Age groups using the marshes for temporary activities and suggests that more permanent settlement, evidence of which is rare in the archaeological record, may have been in the vicinity of the marsh.

17.4.8 Within the wider 5 km Study Area, Early Bronze Age settlement archaeology has been recorded at Eston Nab hillfort which is a scheduled monument (NHLE 1011273) and comprises a palisaded settlement. The Bronze Age is also represented in the archaeological record by funerary monuments, and a cluster of funerary monuments from this period the majority of which are scheduled monuments, are present on Eston Hills.

Iron Age

17.4.9 During the Iron Age this area of Britain was within the territory of the Brigantes tribe. Recent research in the Tees Valley has identified the Iron Age communities as a discrete cultural group within the larger Brigantes tribe, with a cultural identify that was distinctly different to the tribes to the north and south of the valley (Sherlock, 2012).

17.4.10 Cropmark evidence of Iron Age settlement in the 1 km Study Area includes a farmstead at Foxrush Farm in Dormanstown (159), located approximately 550 m east

of the Water Connection Corridor, and part of a beehive quern stone found at Kirkleatham (1043), located approximately 750 m south-east of the Hydrogen Pipeline Corridor. This evidence demonstrates that the valley and floodplain of the River Tees continued to be used for settlement and crop growing.

17.4.11 There is no evidence recorded on the HER for Iron Age or Roman activity within the Proposed Development Site north of the Tees, but activity is recorded in Seaton Carew, approximately 3.4 km north-east of the Proposed Development Site. It is likely that the resources provided by the salt marsh environment would have been exploited during these periods but transient activities, such as hunting and fishing, do not generally leave trace archaeological evidence.

Roman

17.4.12 Approximately 2 km west of the Hydrogen Pipeline Corridor is the site of a purported Roman road running from Billingham north-west to Sedgefield, where it possibly connected to Cade's Road (Mason, 2020). The road is purported due to an association with a possible military installation or port in the Billingham or Middlesbrough area (Mason, 2020).

17.4.13 Six records on the HER from the Roman period are located within the Proposed Development Site comprising, 9068, 9437, 9438, 9439, 9502 and 9523. They are grouped together and located within the Hydrogen Pipeline Corridor, to the west of the Main Site. These all relate to a Roman settlement site at Saltholme, discovered during a programme of archaeological works undertaken in 2019 (1470, 1468, 1498 and 1497). The work revealed a series of enclosures as well as pits, postholes and ditches. The settlement also included two stone-lined cist burials, the remains of three corn dries and finds including the base of a rotary quern, a trumpet brooch and pottery. The work demonstrated the presence of a large farmstead engaged in domestic and agricultural activities.

Early Medieval

17.4.14 The early medieval period is one of the least archaeologically visible across Britain, with evidence from this period restricted, almost exclusively, to burial and religious centres. It was during this period that new settlements and settlement patterns emerged, many churches and villages were established, field systems changed, and open-field agriculture was introduced.

17.4.15 The villages of Greatham and Cowpen Bewley are not mentioned in the Bolden Book. However, the Church of St. John the Baptist in Greatham, a Grade II* listed building (1263522), has fragments of sculptured masonry, dating to the 8th and 12th centuries, built into its north aisle wall and late-12th century nave arcades which suggests a community was established at this place during the medieval period.

17.4.16 Medieval material culture, derived from the archaeological record, is generally sparse across the region. Documentary evidence records that large tracts of the countryside were devastated by Scottish raids during the 14th to the 16th centuries which, coupled with plague and famine, resulted in a decrease in population and tenure (Surtees, 1816) and the reduction in the area's population may be one of the reasons for the very small quantities of medieval pottery noted in the archaeological record. The

decrease in population is articulated in the archaeological record by the site of the deserted medieval village of West Coatham (355), which is located within the Water Connections Corridor. However, despite population decrease and settlement contraction, small villages such as Greatham and Cowpen Bewley, remained part of the medieval landscape alongside individual farmsteads.

17.4.17 Agriculture would have been the principal means of subsistence, but other industry such as salt production is also documented in the archaeological record. The extraction of salt from seawater was a major industry in the medieval period and numerous salt mounds, identified as earthworks, have been recorded from historical maps and aerial photographs around Coatham Marsh. The sites of several salt mounds within the Hydrogen Pipeline Corridor (3759; 3760; 3751; 3752; 3753; 3754; 3755 and 3756) are marked on early editions of OS maps but there are no visible remains surviving within the Proposed Development Site.

17.4.18 The layout of the village of Cowpen Bewley follows the traditional Norman form of two rows of properties on either side of a broad green. The earthwork remains of the village's medieval origins, including three tofts at the eastern end of the southern row of properties, are recorded as assets 604 and 624 whilst asset 3612, to the north of the village, appears to represent a raked at midden to the rear of a property. A number of assets within and around Greatham attest to the medieval origins of this village. The village is recorded initially as two-rows of cottages with a green, followed by infilling at the southern end of the green and a further planned row added to the north of the village (602).

17.4.19 The medieval village of Kirkleatham is recorded as having a Church in the Domesday survey, and a Chancery with 12 priests was endowed in 1348, the site of which is currently not known. Assets (489, 5134, 4807, 169, 1426, 1802 and 1801) relate to archaeological features associated with the medieval village (principally ridge and furrows and boundary ditches) along with find sites of pottery and worked stone. Ridge and furrow remains extend south and west beyond Kirkleatham and towards the fields around Lazenby And Lackenby and contribute to the setting and value of the area. The small medieval village of Lackenby is recorded in Domesday as having a population of only one household. The remains of the medieval village survive as a small number of enclosure earthworks (4478) with areas of associated ridge and furrow (1082 and 372) within its hinterland.

Post-Medieval to Modern

17.4.20 The dissolution of the monasteries (1536) and enclosure of the land (1750 onwards) would have had the biggest impact on the society during the early parts of the post-medieval period. There is little evidence for planned parliamentary enclosure within the Study Area with only Marske (1756) and Kirkleatham (1850) receiving parliamentary awards (British History online, 2023) suggesting the enclosure of the land within the Study Area was likely undertaken by Private Act. Mapping appears to indicate that by 1811, the majority of the Study Area was enclosed (North Yorkshire County Council, n.d.), with common pasture and moorland only remaining around the edges of settlements at Coatham and at the foot of the Eston Hills. The enclosure of land farming practices intensified which assisted in supporting the burgeoning

industrial development of the area and the associated increase in population. Maps from the late 1800s show a large increase in the number of farms and farmsteads in the region (such as Marsh Farmhouse and Cottage (NHLE 1160308), garden wall (NHLE 1139619) and stable and barn (NHLE 1139620)).

17.4.21 The discovery of iron ore in the Eston Hills in 1850 created an industrial boom in the area, leading to the growth of iron works in the area and attracting people into the region to work at the new foundries. Transport and communication (significantly rail and docks) underwent major development to support this industry. Many of the small medieval settlements in the Study Area saw significant growth, either as towns supporting this activity (such as Kirkleatham and Greatham), or as coastal tourist resorts (such as Redcar and Coatham). Hand in hand with this, the construction of reclamation walls and banks dried out former marshlands and mudflats, reclaiming land to be turned over to the region's industrial development and to increase its agricultural output, as well as making the River Tees more navigable and suitable for heavy shipping.

17.4.22 To the west of the River Tees, 4172 represents the line of the Stockton and Hartlepool Railway – a branch line linking West Hartlepool to the main line of the Clarence Railway near Billingham. Construction began in 1839 (opening in 1841), with the purpose of moving passengers (often workers) and freight from Hartlepool to ports and industry along the River Tees. The line still operates a limited service today. A section of the railway line runs through part of the Hydrogen Pipeline Corridor, along the western edge of the Main Site. The railway also connected the Greatham Salt and Brine Company factory (1887) (1222), which is also located within the northern section of the Hydrogen Pipeline Corridor.

17.4.23 The Greatham Salt and Brine Company factory became the Cerebros Saltworks in 1903 and ceased salt production in 1970, although it continued food production until 2007. The site was demolished in 2012 and now exists as a large area of overgrown hardstanding and rubble within the Hydrogen Pipeline Corridor.

17.4.24 A signal box (4783) was constructed in 1889 at the site of Greatham Station (4586) which itself opened in 1841 opposite the Greatham Salt and Brine Company works. The station closed to traffic in 1991 and whilst the platform remains, all buildings have been demolished. The signal box (a tower with a control room at the first floor) is still in operation. Both the signal box and the site of the station are located within the Hydrogen Pipeline Corridor.

17.4.25 The industries of the North-East were strategic targets during the Second World War and the vast majority of the cultural heritage assets within the Study Area, which date to this period, relate to the Second World War, and include anti-aircraft batteries, anti-landing obstacles, search light batteries, pillboxes, section posts, mortar emplacements, air raid shelters, barracks, command posts, storage areas and bombing decoy sites. Bomb craters have been recorded across Cowpen Marsh resulting from attacks on the industries of the Tees area.

Future Baseline

17.4.26 The general approach to defining future baseline is described in Chapter 2: Assessment Methodology (PEI Report, Volume I).

17.4.27 For buried archaeological remains within the Proposed Development Site, the future baseline is expected to be the same as the current baseline. Buried archaeological remains are a static resource, which have reached equilibrium with their environment and do not change (e.g., decay or grow) unless their environment changes because of human or natural intervention. For above ground heritage assets, there may be some decay over time in the absence of the Proposed Development as they near the natural end of their design lifespan.

17.5 Proposed Development Design and Impact Avoidance

17.5.1 The Proposed Development design has evolved to take into consideration heritage assets within the Proposed Development Site and Study Area, and to minimise impacts on the historic environment.

17.5.2 This section describes the embedded and good practice mitigation measures for cultural heritage that have been incorporated into design of the Proposed Development or assumed to be in place before undertaking the preliminary assessment.

Construction

17.5.3 The following design and impact avoidance measures are of relevance to the Proposed Development construction phase:

- refining the routeing of connections, where practicable, to avoid known heritage assets;
- proposed use of existing pipeline infrastructure and established corridors, as far as is practicable in the design in order to avoid impacts to known and previously unrecorded heritage assets;
- siting as much of the Hydrogen Pipeline Connection in an existing above ground, pipeline racking network, thereby avoiding impacts to potential buried archaeological remains;
- proposed use of trenchless technologies, including Horizontal Directional Drilling (HDD) or Micro-Bored Tunnel (MBT) for the connections (crossing of the River Tees and Greatham Creek as well as some other parts of the Hydrogen Pipeline Corridor) to avoid impacts to known and previously unrecorded heritage assets;
- use of brownfield sites or existing hard standing areas, where practicable within the Proposed Development Site for construction laydown areas; and
- lighting required during the construction stage of the Proposed Development will be designed, positioned, and directed to prevent or minimise light spill.

17.5.4 A Framework Construction Environmental Management Plan (CEMP) will be included within the ES which will accompany the DCO Application which will set out the key

measures to be employed during the Proposed Development construction phase to control and minimise the impacts on the environment. The CEMP will set out how impacts upon heritage assets will be managed during construction. An Outline CEMP has been prepared and is presented within Appendix 5A: Outline CEMP (PEI Report, Volume III). A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

Operation

17.5.5 In line with the design and impact avoidance measure during the construction stage, lighting required during the operational stage of the Proposed Development will be designed, positioned, and directed to prevent or minimise light spill. There are currently no other embedded mitigation measures identified for cultural heritage assets applicable to the operational stage of the Proposed Development. Potential measures may be identified as the design evolves and, if so, these will be highlighted in the ES.

Decommissioning

17.5.6 A Decommissioning Environmental Management Plan (DEMP) would be prepared by the Applicant which would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated, including impacts upon the setting of heritage assets.

17.5.7 No other mitigation measures have been identified for cultural heritage assets applicable to the Proposed Development decommissioning stage. Potential measures may be identified as the design evolves and, if so, will be highlighted in the ES.

17.6 Likely Impacts and Effects

17.6.1 This section presents the results of the preliminary assessment of cultural heritage effects taking into account the embedded and good practice mitigation measures as described in Section 17.5.

17.6.2 In undertaking this preliminary assessment, it is noted that a number of heritage assets have been scoped out of the assessment where the Applicant's site visit confirmed they would experience no change as a result of the Proposed Development. A summary of the rationale for the scoping out of heritage assets will be included in a gazetteer which will be submitted with the ES.

17.6.3 Heritage assets included in this preliminary assessment are referenced by either their HER identification number or, for designated heritage assets, by the identification number allocated by the NHLE.

Construction

17.6.4 The construction of the Proposed Development may result in physical impacts to heritage assets, resulting in a permanent loss of heritage value, or may result in impacts to heritage assets through temporary change to their setting as a result of

construction activities. The principal components of the Proposed Development and their potential impacts upon heritage assets during construction are discussed below.

The Main Site

Potential Permanent Impacts

17.6.5 There are no designated heritage assets located within the Main Site.

17.6.6 The site of a former 19th century tramway (5712) extends into the Main Site. In addition, the site of South Gare Breakwater (5663) and tramway which ran along its course (5708), both dating to the late-19th century, extend partially into the northern section of the Main Site. This asset is also no longer extant and is recorded from historical map evidence only. Earthworks associated with the breakwater are visible to the north-west of the Main Site, but do not extend into it. The route of the tramway (5708) is marked by a footpath to the north-west of the Main Site, but there is no evidence to suggest survival of the tramway within it.

17.6.7 The Main Site has been developed extensively since the late-19th century which is likely to have removed all trace of the breakwater and tramway features that appear on 19th century map evidence. These features therefore survive only as documentary evidence on historical maps. They have a level of historic interest as features that are indicative of the area's industrial heritage, but as there are no surviving remains of the features within the Main Site, they have no archaeological interest. Construction of the Proposed Development will not affect their historic interest and will therefore result in no impact and no effect.

17.6.8 The baseline information, presented in Appendix 17A: Cultural Heritage Desk-based Assessment (PEI Report, Volume III), indicates that the potential for previously unrecorded archaeological remains to be present within the Main Site is very low. The results of site investigations within the Main Site records made ground, principally consisting of slag-dominant material, with an average depth of between 4 m and 5 m across the site, up to a maximum of 7 m depth. The made ground overlies post-glacial sand and glacial till deposits, but deposits with an organic content were not present.

Potential Temporary Impacts

17.6.9 Marsh Farmhouse and cottage (NHLE 1160308), garden wall (NHLE 1139619) and stable and barn (NHLE 1139620) are located approximately 1.4 km east of the Main Site. The buildings are all Grade II listed and their heritage value, which is Medium in accordance with the criteria in Table 17-1, derives from their historical and architectural interest. The building group, as an example of the type of dispersed farmstead that was characteristic of the area in the late-18th and 19th centuries, also contributes to their heritage value.

17.6.10 The farmhouse, which dates to the mid-18th century, with 19th and 20th century additions, occupies an area at the head of Coatham Marshes, a space between the arable landscape of the south, heavy industry to the west, and the sea to the north. Its historic interest derives, in part, from its relationship with both the land and the sea. The main architectural interest of the farmhouse, barn and stable is as a

relatively cohesive example of vernacular buildings constructed on a local scale, using local materials and built in a local style. The addition of a later cottage on the eastern side of the farmhouse buildings demonstrates that the building use has seen adaptation and represents change throughout its life.

17.6.11 The barn and stable represent the functional setting of the farmhouse and the walled garden provides its aesthetic and domestic setting. Historically, the agricultural landscape to the south of the building group would have represented the principal setting of the buildings. However, the landscape around the buildings has been much altered and is no longer in agricultural use so no longer contributes to, or helps articulate, the buildings' heritage interests. An appreciation of the buildings' historical relationship with the sea has also been lost, or at least eroded significantly, by the presence of building and structures to the north of the farmhouse which detract from its setting. The presence of industrial buildings and infrastructure to the west of the asset group, within the Proposed Development Site, is partially obscured by the presence of an earthen bund but noise from these existing industrial activities is noticeable from the building group and, even though a quiet noise environment is not critical to appreciate the function of the building group, the invasive noises further detract from its setting. The principal setting of the building group which makes an appreciable positive contribution to its value is therefore the associative relationships of the buildings with each another.

17.6.12 The wider landscape does not make a positive contribution to the assets' setting and does not add to an appreciation of the assets' function. The construction of the Proposed Development therefore is unlikely to introduce a level of change that will impact the assets' historic and architectural interests such as to harm their value. The construction of the Proposed Development is therefore assessed to result in no impact to the heritage interests or value of the building group, and no effect.

17.6.13 The location of Marsh Farmhouse and cottage is identified as a noise receptor (noise receptor H5) in Chapter 11: Noise and Vibration (PEI Report, Volume I) and is illustrated on Figure 11-1 (PEI Report, Volume II). The preliminary noise assessment in Chapter 11 predicts a negligible change in noise levels at Marsh Farmhouse, when compared to baseline levels, as a result of construction activities at the Main Site, and a negligible effect (refer to Table 11-24 of Chapter 11). The change in noise levels would be imperceptible within the baseline setting and existing noise environment of Marsh Farmhouse and associated buildings and would constitute no impact to their heritage value and no effect.

17.6.14 Potential impacts arising from noise and vibration will be reassessed in ES to capture any potential changes in construction methodologies following submission of the preliminary assessment.

Natural Gas Connection Corridor

Potential Permanent Impacts

17.6.15 There are no designated heritage assets located within the Natural Gas Connection Corridor. There is one record on the HER located partially within the corridor, being

the site of the 19th century Normanby Jetty to South Gare reclamation wall (5602). The reclamation wall is no longer extant.

17.6.16 The site of the asset survives only as documentary evidence on historical maps. It has a level of historic interest as part of the area's industrial heritage, but as there are no surviving remains of the wall within the area, it has no archaeological interest. Construction of the Natural Gas Connection Corridor will not affect the asset's historic interest. The construction of the Proposed Development is therefore assessed to result in no impact and no effect.

Potential Temporary Impacts

17.6.17 There are no heritage assets in proximity to the Natural Gas Connection Corridor with the nearest asset being Marsh Farmhouse and cottage (NHLE 1160308), garden wall (NHLE 1139619) and stable and barn (NHLE 1139620), approximately 0.8 km to the north-east. Construction within the Natural Gas Connection Corridor would not introduce noticeable change within the setting of the building group (as defined above) and activities will be obscured by an intervening earthen bund. There will therefore be no impact to the building group, resulting in no effect.

17.6.18 The preliminary noise assessment in Chapter 11: Noise and Vibration (PEI Report, Volume I) predicts a negligible effect from an increase in noise levels at Marsh Farmhouse (noise receptor H5), when compared to baseline levels, as a result of the construction activities within the Natural Gas Connection Corridor. The change in noise levels would be imperceptible within the baseline setting and existing noise environment of Marsh Farmhouse and associated buildings and would constitute no impact to their heritage value and no effect. Potential temporary impacts arising from construction noise will be reassessed in the ES.

Hydrogen Pipeline Corridor

Potential Permanent Impacts

17.6.19 The Hydrogen Pipeline Corridor extends across the Tees Valley with the construction type comprising a mixture of above ground, below ground trenches and trenchless technologies, such as HDD and MBT. The construction of below ground trenches, and the excavation of launch and receptor shafts for HDD and MBT, has the potential to result in permanent impacts to buried archaeological remains that may be present.

17.6.20 On the southern banks of the Tees River, within the Hydrogen Pipeline Corridor, there are several records on the HER that relate to riverside features that are no longer present. The features are annotated on 19th century map evidence and follow the line of a former reclamation wall (6046). They comprise, from north to south:

- dolphin mooring bollards (6059 and 6058);
- seventh buoy navigation light (6057);
- eighth buoy scarp beacon navigation light (6056); and
- beacons/navigation lights (6065, 6051 and 6050).

17.6.21 These features are no longer present within the Hydrogen Pipeline Corridor. They have limited historic interest as map evidence features of the area's industrial and maritime heritage. Construction of the Hydrogen Pipeline Corridor will not affect the assets' historic interest and will therefore result in no impact and no effect.

17.6.22 At the eastern edge of the Hydrogen Pipeline Corridor and to the south-west of Coatham Marsh is a series of medieval salt mound features that relate to salt production. The extraction of salt from seawater was a major industry in the medieval period and numerous salt mounds, identified as earthworks, have been recorded from historical maps and aerial photographs around Coatham Marsh. The site of the salt mounds within Hydrogen Pipeline Corridor are marked on early editions of OS maps but there are no visible remains surviving within the Hydrogen Pipeline Corridor. The records within the Hydrogen Pipeline Corridor comprise, 3759; 3760; 3751; 3752; 3753; 3754; 3755 and 3756.

17.6.23 Map evidence from the 20th century and aerial imagery shows that the area of the salt mounds has been developed significantly since the 1900s and is currently occupied by light industry and road networks. Furthermore, there is no evidence of the salterns from light detection and ranging (LiDAR) imagery. The salterns have the potential to be of regional importance, and therefore Medium heritage value, deriving from their archaeological and historical interest associated with salt production. However, due to the history of development and ground disturbance in this area, there is unlikely to be any subsurface remains associated with historical salt production. The documentary records have a level of historical interest, as indicators of the type of industry that supported communities during the medieval period, but there is unlikely to be any surviving archaeological interest. It is assessed therefore that the construction of the Hydrogen Pipeline Corridor will have no impact on the value of these assets resulting in no impact and no effect.

17.6.24 The sites of Coatham Iron Works (5709) and Redcar Iron Works (5711) are located within the northern section of the Hydrogen Pipeline Corridor. There is no evidence for any surviving components of Coatham Iron Works, but the DBA identified features associated with Redcar Iron Works within the Hydrogen Pipeline Corridor. The remains, identified from aerial imagery and LiDAR only, appear to represent foundation remains associated with furnaces and railway sidings. A site walkover and visual inspection of the remains would be required to confirm the degree of survival, and hence their heritage value, and this will be completed for the ES. However, based on the desk-based evidence, the remains are assessed to be at least of local importance and Low value. The construction of the Hydrogen Pipeline Corridor has the potential to permanently remove a proportion of these remains but will not remove then entirely. This constitutes a Medium magnitude of impact, resulting in a Minor Adverse effect which is not significant.

17.6.25 The sites of other assets within the Hydrogen Pipeline Corridor that have been recorded from 19th century historical map evidence, but are no longer present within the Hydrogen Pipeline Corridor, include:

- Lazenby Railway Station (5688);

- Lackenby Railway Station (5647);
- a section of training wall which began at Normanby Jetty and extended to the South Gare (5602);
- Unnamed spoil ground (5652) and brick yard (5653);
- Annealed Concrete Works (5659); and
- the site of a World War II bombing decoy located within Wilton Chemical Works (3628).

17.6.26 All of these features are no longer present within the Hydrogen Pipeline Corridor and due to the history of development within the area, there is no potential for subsurface remains associated with the features to be present. Furthermore, the sites of these assets are located in an area of the Hydrogen Pipeline Corridor that will be housed above ground. All the assets have limited historic interest as map evidence records of the area's industrial, maritime and military defence heritage. Construction within the Hydrogen Pipeline Corridor will not affect the assets' historic interest and will therefore result in no impact and no effect.

17.6.27 To the north of the Tees River the Hydrogen Pipeline Corridor passes through an area of reclaimed land that was formerly salt marsh, through the lands around Greatham Marsh, and extends as far as the fields around Cowpen Bewley and south of Greatham village. Features recorded on the HER in the vicinity of Greatham Creek and within the Hydrogen Pipeline Corridor include a World War II section post (6903). The asset is identified from aerial photographs but is recorded in the HER as having been demolished. The Proposed Development will therefore have no impact on this asset, resulting in no impact and no effect.

17.6.28 A 19th century former harbour on the south side of Greatham Creek (4683) is recorded in the area. The form of the harbour is still evident and appreciable from aerial imagery; it is formed from two sets of slag retaining walls which are still present within the site. The harbour is adjacent to Greatham Creek. The construction of the hydrogen connections in this section of the Hydrogen Pipeline Corridor would utilise trenchless techniques and avoid impacting the harbour. The Proposed Development will therefore have no impact and no effect.

17.6.29 There is extensive evidence of activity in the area during World War II as a result of the defensive position of the coastline. The site of another former World War II Section Post (6902) or similar defensive building is located on the south side of Greatham Creek. It is visible on aerial photographs of 1946 and 1972 which, at magnification, show a sub-rectangular building with turned in entrances at the north-west and north-east corners. Remains of the Section Post are still visible on modern aerial imagery.

17.6.30 Potential remains of a pillbox (4684) are recorded in the HER as being located on the south side of Greatham Creek, at the western end of a small harbour (4683). The remains comprised the base of a small square building and was constructed of the same type of reinforced concrete used elsewhere for similar structures. Remains of the pillbox are not visible on modern aerial imagery, but it is unlikely that any

surviving remains have been removed and hence are possibly still present within the Proposed Development Site.

17.6.31 A spigot mortar post (3289), described from a survey dated 1993 as comprising the remains of a buried column of reinforced concrete, is located on the south side of Greatham Creek. Remains of the spigot mortar are not visible on modern aerial imagery, but it is unlikely that the buried remains have been removed and are still in situ within the Proposed Development Site.

17.6.32 To the south of Greatham Creek and east of Seaton Carew Road, the HER records the location of a World War II light machine gun rifle post pillbox (985) at the north end of an unfinished railway embankment. Modern aerial imagery shows that the structure is still surviving within the Proposed Development Site.

17.6.33 Approximately 54 m south of the pillbox is a World War II Station Post (6092) built into the side of the unfinished railway embankment. The remains of the structure, which are visible on modern aerial imagery, comprise four walls around a central space.

17.6.34 Another World War II pillbox (3287) is recorded on the HER in an area of scrubby saltmarsh to the east of Billingham Community Fire Station. Aerial imagery shows that the pillbox, which retains its mounting column for an anti-aircraft gun, is still present.

17.6.35 The typology of the pillboxes (4684), (985) and (3287) (Type 23 or variants of Type 23) are relatively uncommon and their condition, varying from foundation remains only to upstanding walls, is generally poor. Their heritage value, which is assessed to be Low, derives from their historical interest as features that contribute to the history of wartime defence in the region and also archaeological interest from the mode of their construction which can be varied and a reflection of local building materials. The heritage value of the remaining World War II structures and features, the Station Post (6092) and section post (6902) and spigot mortar (3289), are also assessed to be of Low heritage value, deriving from their historical interest and lower level of archaeological interest. In line with the measures set out in Section 17.5, the routeing of the connections required within the Hydrogen Pipeline Corridor, which would be housed below ground in this section of the corridor, will avoid upstanding remains of these assets, thereby avoiding any impact to their historical and archaeological interests, and their heritage value. The Proposed Development will therefore result in no impact and no effect.

17.6.36 The site of a World War II bombing decoy (4366) is located approximately 500 m south-east of the Station Post (6092). The feature is recorded on the HER as a fire-based decoy, designed to replicate the furnace gases of the industries that were located across the Tees valley during World War II. Modern aerial imagery suggests that this feature does not survive within the site and its former location is currently occupied by an area of hardstanding and the asset is no longer present. The Proposed Development will therefore have no impact and no effect on this asset.

17.6.37 A section of the Greatham Creek Branch of the North Eastern Railway (8717) is located approximately 270 m east of the pillbox. The railway is still in use, passing

through the Proposed Development Site on a north to south alignment. It will not be physically impacted by the construction of the Proposed Development resulting in no impact and no effect.

17.6.38 The HER has entries for a cluster of records at the site of an operational energy plant, Saltholme Statera, to the west of the A1185 and within the Hydrogen Pipeline Corridor. The records relate to evidence from archaeological evaluation and excavation of Romano-British settlement and comprise three Roman corn driers (9439); a small assemblage of Roman pottery (9523) dating between the 2nd and 4th centuries; two Roman stone-lined cist burials (9437); ditches and enclosures (9068); a 1st to 2nd century trumpet brooch (9502) and the base of a rotary quern stone (9438). The archaeological investigations focussed within the area of the development which currently occupies the site, and there is potential for additional features relating to the Romano-British settlement to extend into the Hydrogen Pipeline Corridor.

17.6.39 Previously unrecorded archaeological settlement remains from this period have the potential to be of Low to Medium heritage value, depending on their complexity and preservation level. Their heritage value derives from their historical and archaeological interests because of the contribution their evidence could make to local and regional research agenda. The section of the Hydrogen Pipeline Corridor in the vicinity of the known settlement will be located underground and therefore its construction could result in the permanent loss of the archaeological remains and therefore the permanent loss of heritage value. This would constitute a High magnitude of impact resulting in a Major Adverse effect, which is Significant.

17.6.40 The moat (5156) that surrounded the medieval Manor House at Belasis is located within the Hydrogen Pipeline Corridor, approximately 1.3 km south-west of the Romano-British settlement. The moat is now backfilled and is a non-designated heritage asset. The asset derives its value, which is assessed to be Low, from its historical interest for its association with the medieval manor of Belasis. The backfilling of the feature is likely to have compromised the preservation of structural remains and waterlogged deposits, but the asset may have limited archaeological interest if deeply buried structural components and deposits survive beneath the backfill material. The asset is located within a section of the Hydrogen Pipeline Corridor that will be housed above ground in existing conduit. As such, there will be no impact to the site of the asset resulting in no effect.

17.6.41 Two records on the HER to the north of Cowpen Bewley comprise a find spot of a Roman silver denarius (1458), and the site of the Cowpen Bewley Brick and Tile Yard. The coin, found by a metal detectorist, has been removed from this location and the brick and tile yard has been built over and its site is occupied largely by the A1185 carriageway. The Proposed Development will therefore have no impact on these records, and no effect.

Potential Temporary Impacts

17.6.42 The northern edge of Cowpen Bewley Conservation Area extends into the Hydrogen Pipeline Corridor. The conservation area, although small and arranged in a linear

layout, has an open, quiet and rural character due to the large central green which the houses face onto and through which Cowpen Lane passes. Views within the conservation area are framed by the linear layout of the buildings and views out towards the landscape beyond the village are only possible from the outer limits of the conservation area. The landscape outside the settlement core comprises fields, many of which display the characteristic pattern of ridge and furrow that provide a tangible link between the medieval landscape and the medieval origins of the village. The heritage value of the conservation area, which is Medium, derives from its historical origins as a medieval settlement and its rural setting contributes to this appreciation and understanding. The conservation area also derives its value from its layout which is clearly legible as medieval in origin, and from the architectural qualities of its buildings which demonstrate local distinctiveness and character.

17.6.43 The Hydrogen Pipeline Corridor is located to the north of the conservation area, falling partially within its boundaries and also taking in the ridge and furrow fields on the northern limits of the conservation area. The Proposed Development Site is located approximately 65 m from the settlement core, and it is possible that construction activities, noise and potentially dust may be visible and audible from within the core of the village. This may introduce a slight change within its setting that is incongruous to its quiet, rural character but would not affect the ability to appreciate the architectural qualities of its buildings and the historical relevance of its layout. The magnitude of impact is therefore assessed to be Low which would result in a temporary Minor Adverse effect which is Not Significant.

17.6.44 The preliminary noise assessment in Chapter 11: Noise and Vibration (PEI Report, Volume I) predicts a minor effect from increased noise levels when compared to baseline levels, as a result of the construction activities within the Hydrogen Pipeline Corridor, in the vicinity of Cowpen Bewley village (refer to Chapter 11, Table 11-25, noise receptor H1). This would represent slight change within the baseline setting of Cowpen Bewley Conservation Area but would not impact its character or heritage value. This would therefore constitute a Very Low impact, resulting in a temporary Negligible effect.

17.6.45 Greatham Conservation Area is located approximately 2 km from the Hydrogen Pipeline Corridor, which represents the closest component of the Proposed Development. The conservation area is separated from the Proposed Development by later housing on the outskirts of the village, fields, intervening hedgerows and a railway. The intervening settlement is likely to preclude any intrusion from the Proposed Development into the appreciation of the conservation area, including visual, noise and dust intrusion. Due to the distance involved it is assessed there will be no impact to the conservation area during construction and therefore no effect.

17.6.46 Kirkleatham Conservation Area, to the south of the River Tees, is located approximately 263 m from the edge of the Hydrogen Pipeline Corridor, this section of which will be housed above ground. The value of the conservation area derives from the history, quality and diversity of its buildings' architectural styles which date to the 17th and 18th centuries and range from Queen Anne through Baroque, Rococo and Palladian to Gothic. The high number of highly graded listed buildings,

comprising five Grade I, six Grade II* and 12 Grade II listed buildings, also contribute to its heritage value which is assessed to be High. The experience of the conservation area is intimate and enclosed, due to the prominence of mature woodland and planting along its edges, which creates a secluded feeling and emphasises the importance of internal views. This experience is an important component of the area's setting and contributes to its heritage value.

17.6.47 The intimate and enclosed setting of the conservation area will likely preclude any experience of the construction of the Hydrogen Pipeline Corridor from within the area. Construction activities may be appreciable when entering and leaving the conservation area to the south-west, but these activities will be viewed within the context of the existing Wilton Complex and will not therefore be out of place with the current setting. It is assessed therefore that there will be no impact to the conservation area's heritage value during construction and no effect.

17.6.48 Due to the distance of Greatham Conservation Area from the Hydrogen Pipeline Corridor, and the screening from mature woodland around Kirkleatham Conservation Area (noise receptor H3), the noise and vibration impacts during construction of the Hydrogen Pipeline Corridor are predicted to result in a negligible effect to both assets (Chapter 11: Noise and Vibration, Table 11-25 (PEI Report, Volume I)). This would constitute no impact to the character and heritage values of both conservation areas, resulting in no effect.

Electrical Connection Corridor

Potential Permanent Impacts

17.6.49 Heritage assets recorded on the HER that are located within both the Electrical Connection Corridor and the Hydrogen Pipeline Corridor have been assessed as part of potential impacts arising from the Hydrogen Pipeline Corridor.

17.6.50 Grangetown signal box (4782), which was constructed in 1954, is located within the Electrical Connection Corridor on the side of the railway to the north-east of the site of Grangetown Station (4360). The signal box is still in use and will be avoided by all components of the Proposed Development, resulting in no impact and no effect.

17.6.51 The railway station at Grangetown (4360), formerly known as Eston Grange opened in November 1885, replacing Eston Junction station (4358) to the west, which is outside of the Proposed Development Site. The name change to Grangetown occurred in 1902. The road which led to the station is still in place and named as Grangetown Station Road, but there are no standing buildings surviving, and the area is occupied by a local road network and railway lines. The site of the railway station survives as documentary evidence only but has no surviving archaeological interest or value. As such, the construction of the Electrical Connections will result in no impact to the former station, resulting in no effect.

17.6.52 The site of a brick field (5649) shown on second edition OS maps to the south-west of Lackenby Station and the site of Old Clay Pits (5646), an area of extensive quarrying mapped on 19th century OS maps, are recorded on the HER as being within the Electrical Connection Corridor. Both former assets are no longer present with the site of the brick field now occupied by railway lines and a road network, and the quarry

pits occupied by an area of modern quarrying and spoil heaps adjacent to the Southbank Steelmaking Plant. Both former assets survive only as mapped features on documentary evidence and have no surviving archaeological interest or value. The construction of the Electrical Connection will therefore result in no impact to the former assets, resulting in no effect.

Potential Temporary Impacts

17.6.53 There are no heritage assets in proximity to the Electrical Connection Corridor whose setting could experience change during construction. As such, there will be no temporary effects during construction to the heritage value of heritage assets.

Water Connection Corridor

Potential Permanent Impacts

17.6.54 There are no designated heritage assets within the Water Connection Corridor and only one asset recorded on the HER.

17.6.55 To the south of the site of the medieval salt mounds (located within the Hydrogen Pipeline Corridor) and located within the Water Connection Corridor is a record for the deserted medieval village of West Coatham (355). The settlement is noted in documentary evidence from 1236, which records the village being engaged in salt production. Earthworks associated with the village are visible on the OS map dated 1884, but the site has been developed extensively through the late-19th and 20th centuries and surface features are no longer present.

17.6.56 Due to the extent of historical development and ground disturbance there is a low potential for deeply buried features associated with the village to be present, such as wells and waterholes. If they were present, the features would represent heavily truncated remains with few contextual associations and their heritage value is therefore assessed to be Very Low. The removal of any surviving remains as a result of the Proposed Development would constitute a High impact, as it would represent total loss of any remaining archaeological interest. However, due to the likely low heritage value of the remains, this would result in a Minor Adverse effect, which is Not Significant.

Other Gases Connection Corridor (O_2 and N_2)

17.6.57 The Other Gases Connection Corridor is located within the Hydrogen Pipeline Corridor, and the assumed construction methodologies are the same. As such, potential permanent and temporary impacts to heritage assets associated with the Other Gases Connection Corridor will be the same as those reported for the Hydrogen Pipeline Corridor and are not repeated here.

Operation

17.6.58 There will be no additional physical impacts to buried heritage assets during the Proposed Development's operational stage, as any potential impacts will have occurred during the construction phase. As such, the assessment of impact during Proposed Development operation focusses on the magnitude of change to a heritage asset's setting as a result of the physical presence of the Proposed Development,

including components of the operational development that may result in aural intrusion to setting.

17.6.59 The connection corridor pipelines will either be housed in a below-ground conduit or housed in existing above ground racking. During the operational phase, therefore, the pipelines will either not be visible or represent no change to the character of an area or to the setting of a heritage asset. The most visually prominent components of the operational development will be the flare and the Production Facility, located on the Main Site. The Main Site is located on the edge of a heavily industrial area of Teesside; an area that has been occupied by industrial structures since the 19th century and which has also seen multiple changes as industries and technologies adapted and advanced.

17.6.60 The Production Facility will be designed to operate 24 hours a day, seven days a week and external lighting will be used at the facility to provide safe working conditions during its operation. Lighting would be designed, positioned and directed to prevent or minimise light disturbance to sensitive receptors and low-energy fittings would be used where possible. The presence of the Production Facility will represent a new building amongst the cluster of existing industrial buildings in this part of the Tees Valley. Its presence will represent a change in views of this area, but the change will not be incongruous with the area's existing character.

17.6.61 Eston Nab hillfort scheduled monument (NHLE 1011273) is located approximately 6.55 km south of the Main Site. The heritage value of the asset, which is High, derives from its archaeological interest for the information it could provide relating to Bronze Age society and hillfort construction methods. The asset also has historical interest as a long-standing and visually prominent feature of Eston Hills. The asset's associative relationship with other monuments on Eston Hills, largely comprising Bronze Age funerary monuments, is a significant part of its setting. Its visual prominence and the ability to have long-ranging, uninterrupted views from the fort, a strategic feature of a defended settlement, also contribute highly to its setting. The operational development would not change the asset's immediate setting, which is defined by the remnants of its outer defensive circuit and the remnant prehistoric landscape on Eston Hills. Rather, the operational development would be viewed as part of the mid-ground cluster of industrial complexes that include cooling towers, chimneys and plumes. Beyond the cluster of industrial works, long-range views towards the coastline and the North Sea would not change. As the operational development would not be incongruous to the asset's setting, its presence would result in no change; therefore, the operational development would result in no impact and no effect.

17.6.62 Marsh Farmhouse and cottage (NHLE 1160308), garden wall (NHLE 1139619) and stable and barn (NHLE 1139620) are located approximately 1.4 km east of the Main Site. Their heritage value, which is Medium in accordance with the criteria in Table 17-1, derives from their historical and architectural interest. The building group, as an example of the type of dispersed farmstead that was characteristic of the area in the late-18th and 19th centuries, also contributes to their heritage value. The assessment has already confirmed that the wider landscape does not make a positive

contribution to the assets' setting and does not add to an appreciation of the assets' function. The operational development will introduce a new built component in the area around the asset group but will not represent a change that will impact the assets' historic and architectural interests, nor will it harm their value. The operational Proposed Development is therefore assessed to result in no impact to the heritage interests or value of the building group, and no effect.

17.6.63 Kirkleatham Conservation Area is located approximately 4 km south-east of the Main Site. The experience of the conservation area is intimate and enclosed, due to the prominence of mature woodland and planting along its edges, which creates a secluded feeling and emphasises the importance of internal views. This experience is an important component of the area's setting and contributes to its heritage value.

17.6.64 The intimate and enclosed setting of the conservation area will likely preclude any experience of the Proposed Development from within the area. Views towards the Main Site are not possible from either within the conservation area or from its northern edge, due to the mature treelined boundary along Kirkleatham Lane. There will be no change to the character or setting of the area as a result of the operational Proposed Development resulting in no impact and no effect.

17.6.65 Coatham Conservation Area is located approximately 2.6 km east of the Main Site. The heritage value of the conservation area, which is assessed as Medium in accordance with the criteria set out in Table 17-1, is defined by the architectural and historical interest of its individual buildings and settlement form. The experience of the conservation area is articulated by the two-storey Victorian and Edwardian houses which dominate the area's character and which frame views within and out of the area. Views from the western edge of the area, away from the conservation area, will include views of the Production Facility in the Main Site in the background. The introduction of the Production Facility into this view will not be incongruous with the area's existing character which takes in the remaining components associated with the site's former blast furnace. This change will not affect the ability to appreciate the architectural character of the conservation area, which is experienced from within the conservation area, and will not affect any key views. It is assessed therefore that there will be no impact to the value of the conservation area, resulting in no effect.

17.6.66 Seaton Carew Conservation Area is located approximately 4.8 km north-west of the Main Site. The central part of the conservation area comprises 2-storey buildings on either side of The Front with shops at ground level. Views here are dominated by the colourful buildings on both sides, many of which are in neutral tones but several that are coloured in bright blues and pinks, and which evoke the spirit of the seaside holiday destination. The northern and southern parts of the conservation area are made up of coherent rows of two and three-storey buildings, some with open views of the sea, and of designed public spaces. These areas provide extensive views across the North Sea, of the Headland to the north and the Cleveland Hills to the south.

17.6.67 The value of the conservation area, which is assessed to be Medium, derives from the historic interest of its development from a fishing village into a seaside resort, and from the architectural interest of its buildings which, while of varied design, are

unified by their restricted scale and range of materials. However, many of the buildings appear to be in a poor state of repair which does detract from the experience of the area. On a clear day, the Production Facility at the Main Site will be visible, seen against the backdrop of the existing industrial structures within the Wilton Complex. The introduction of the Production Facility into this view will not represent a noticeable change and will not affect the character or heritage significance of the conservation area. It is assessed therefore that there will be no impact from the Proposed Development, resulting in no effect.

17.6.68 Yearby Conservation Area is located approximately 5.2 km south of the Main Site. The layout of Yearby is based on a typical medieval form; comprising two rows of houses arranged either side of a principal through road. The buildings within the village consist of single and two-storey 18th century cottages and farm buildings. The setting of Yearby is defined by the arable landscape it sits within, however the landscape has changed significantly and the former medieval layout of burgage plots and small strip fields has been replaced by large, enclosed fields as a consequence of 18th and 19th century enclosure and modern farming practices. Views within the conservation area are framed by the linear layout of the buildings, although long-range views out over the surrounding fields and the Eston Hills beyond are possible to the south, from the southern edge of the area. Views to the north and north-east, towards the Main Site, are precluded by mature planting which frames the northern edges of the village. The conservation area derives its value, which is Medium, from the historical legibility of its planned form, and from the architectural interest of its buildings which demonstrate local distinctiveness and character.

17.6.69 The mature planting along the northern edge of the conservation area will likely preclude views of the Production Facility and the distance from the Production Facility will preclude any changes to the character and setting of the conservation area arising from any aural intrusion. It is assessed therefore that there will be no impact to the conservation area, and no effect.

Decommissioning

17.6.70 Decommissioning impacts will be temporary and associated activities are assumed to be similar to construction impacts (movement of traffic and machinery, potential for noise and dust). The impacts will not be greater than those reported during construction. In addition, decommissioning will be undertaken within the same footprint used during construction and therefore any impact to buried cultural heritage remains that could have occurred will have occurred during construction and will have been mitigated as required.

17.6.71 The Proposed Development will have a design life of 25 years. It is assumed for this preliminary assessment that, at the end of its operating life, all above-ground components of the Proposed Development would be decommissioned and removed. It is assumed that prior to the removal of plant and equipment, all residues and operating chemicals will be cleaned out from the plant and disposed of in an appropriate manner. Removal of above ground structures may enhance the setting of heritage assets.

17.6.72 The design of the Proposed Development is ongoing and additional mitigation strategies, not related to heritage assets, may therefore be agreed in response to the emerging design. The ES will where possible consider any further potential impacts that may arise from decommissioning as a result of the presence of mitigation strategies, such as landscape planting, that may still be in place after the facility's decommissioning.

17.7 Mitigation and Enhancement Measures

Construction

17.7.1 Known heritage assets have been avoided by design (embedded mitigation). The design process is still ongoing and further opportunities to avoid, where feasible, heritage assets identified from baseline surveys carried out for the Proposed Development, will inform the emerging design. Where it is not practicable to avoid heritage assets, which will principally comprise below-ground archaeological remains, essential mitigation will be secured through a programme of archaeological evaluation and mitigation, consisting of excavation and recording, which will be carried out prior to construction. This strategy will be suitable for previously unrecorded archaeological remains within the Proposed Development Site, such as potential Romano-British settlement archaeology that may be present within a section of the Hydrogen Pipeline Corridor that will be located underground.

17.7.2 All programmes of archaeological investigation will be carried out in accordance with a Written Scheme of Investigation (WSI) that has been agreed with the relevant archaeology officer/s and approved in writing by the relevant LPAs.

17.7.3 Some parts of the Proposed Development Site are not suitable for traditional archaeological evaluation measures due to the nature of the ground conditions. For example, the Main Site is located on made ground comprising slag-dominant material which would preclude archaeological geophysical survey. The depths of the made ground, which average 4.7 m deep, would also preclude safe archaeological trial trenching. Waterlogged and high-moisture content deposits, which represent the soil environment in the vicinity of Greatham Creek, would also not be suitable ground conditions for geophysical survey or trial trenching. Therefore, it is recommended that a protocol is adopted to mitigate potential impacts to previously unknown archaeological assets that may be encountered during construction. The protocol will be included in the Framework CEMP and will include procedures for the reporting, protection and management of unexpected archaeological discoveries. The following wording is currently proposed, which remains subject to ongoing discussion and refinement:

- Any archaeological remains not previously identified which are revealed when carrying out the authorised development must be retained in situ and reported to the relevant LPA, as soon as reasonably practicable from the date they are identified.
- No construction operations are to take place within 10 m of the remains referred to in sub-paragraph (i) for a period of 14 days from the date of any notice served

under sub-paragraph (i) unless otherwise agreed in writing by the relevant LPA in consultation with any other relevant heritage stakeholders as required.

- If the relevant LPA determines in writing that the archaeological remains referred to in sub-paragraph (i) require further investigation or mitigation, no construction operations are to take place within 10 m of the remains until provision has been made for such mitigation or the further investigation and recording of the remains in accordance with details to be submitted in writing to, and approved in writing by, the relevant LPA in consultation with any other relevant body as required.

17.7.4 The adoption of this protocol will ensure the safeguarding during construction of unexpected archaeological remains.

Operation

17.7.5 As no significant adverse heritage effects have been identified, there is currently no need for additional mitigation measures during the operation of the Proposed Development. However, as the Proposed Development design progresses this assessment will be updated for the ES and the need for additional mitigation reconsidered.

Decommissioning

17.7.6 It is assumed for the purpose of this assessment that there will be no additional impacts to buried cultural heritage assets during decommissioning activities. Decommissioning will be undertaken within the same footprint used during construction and therefore any impact to buried heritage assets would have occurred, and have been mitigated, at the construction phase. As such, there is no need for additional mitigation measures for the Proposed Development decommissioning stage. However, as the Proposed Development design progresses, this assessment will be updated for the ES and the need for additional mitigation reconsidered.

17.8 Limitations and Difficulties

17.8.1 A heritage walkover of some parts of the Proposed Development Site still needs to be undertaken. Such walkover surveys will be completed to inform the assessment to be reported in the ES and any additional heritage assets identified will be included in the updated assessment as applicable.

17.9 Residual Effects and Conclusions

17.9.1 Based upon the worst-case scenario, a Major Adverse (Significant) effect has been identified on potential archaeological remains associated with Romano-British settlement within the Hydrogen Pipeline Corridor. The mitigation measures described in Section 17.7, comprising a programme of archaeological evaluation and excavation in advance of construction, will ensure that the significant effect is mitigated to a level where no residual significant effects occur. The details of the evaluation and mitigation will be agreed with the archaeology officer for the relevant LPA and defined within the ES. The implementation of the agreed evaluation and

mitigation will be secured through a WSI agreed with the archaeology officers for the relevant LPAs. No other significant adverse heritage effects are anticipated as a result of the Proposed Development.

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18.0 SOCIO-ECONOMICS AND LAND USE

18.1 Introduction

18.1.1 This chapter of the Preliminary Environmental Information (PEI) Report provides an initial assessment of the potential socio-economic impacts arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development. It reports on the potential effects on employment, local businesses, land use and population.

18.2 Legislation and Planning Policy Context

Policy Context

National Energy Policy

National Policy Statements for Energy (EN-1) (2011)

18.2.1 The National Policy Statements (NPSs) for energy infrastructure set out the Government's policy for delivery of major energy infrastructure (UK Government, 2011). The Overarching NPS for Energy (EN-1) identifies that "*information on the likely significant social and economic effects of the development"* should be set out alongside '*how any likely significant negative effects would be avoided or mitigated'*. Impacts should be assessed at local or regional level and cumulative effects should also be considered. This chapter considers the effects identified in this policy for the Proposed Development.

Draft Overarching National Policy Statement for Energy (EN-1) (2023)

18.2.2 The Draft Overarching NPS for Energy (EN-1) was published in March 2023 by the Department for Energy Security and Net Zero (DESNZ) (DESNZ, 2023), and updates the existing NPS EN-1 (DECC, 2011). In addition to the socio-economic impacts of energy infrastructure development outlined in the existing NPS EN-1, the Draft NPS at 5.13.4 outlines additional socio-economic impacts to be considered:

- *"the creation of jobs and training opportunities. Applicants may wish to provide information on the sustainability of the jobs created, including where they will help to develop the skills needed for the UK's transition to Net Zero*
- *the contribution to the development of low-carbon industries at the local and regional level as well as nationally*
- *the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities*
- *any indirect beneficial impacts for the region hosting the infrastructure, in particular in relation to use of local support services and supply chains*
- *effects on tourism*
- *the impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure. This could change the local population dynamics and could alter the demand for services*

and facilities in the settlements nearest to the construction work (including community facilities and physical infrastructure such as energy, water, transport and waste). There could also be effects on social cohesion depending on how populations and service provision change as a result of the development

- *cumulative effects - if development consent were to be granted to for a number of projects within a region and these were developed in a similar timeframe, there could be some short-term negative effects, for example a potential shortage of construction workers to meet the needs of other industries and major projects within the region"*

18.2.3 In alignment with the Draft NPS EN-1, this chapter considers the socio-economic and land use effects detailed in this policy for the Proposed Development.

Energy White Paper: Powering Our Net Zero Future (2020)

18.2.4 The Energy White Paper was published by the UK Government in December 2020 (UK Government, 2020). Within this, the Prime Minister's Ten Point Plan is outlined with respect to the areas of focus for green energy in the UK. Among these key points, the Hydrogen and the Carbon Capture, Usage and Storage (CCUS) sectors are considered important emerging green sectors for the UK. For Hydrogen, the paper states that "*the UK is aiming for 5GW of low-carbon hydrogen production capacity by 2030".* For CCUS, the paper states that "*our ambition is to capture 10Mt of carbon dioxide a year by 203"'.* Given the intended future use of the Proposed Development, this chapter takes into account these national goals, which the Proposed Development supports.

National Planning Policy

National Planning Policy Framework (NPPF, 2023)

18.2.5 The National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities (DLUHC), 2023) and the wider planning system are currently undergoing consultation and the NPPF was subject to consultation most recently in March 2023. The NPPF sets out the Government's planning policies in a single document. The NPPF acknowledges that while it "*does not contain specific policies for nationally significant infrastructure projects"* (NSIPs), it may be given weight in decision-making for NSIPs where the policies in the NPPF are "*other matters that are relevant"*.

18.2.6 From December 2022 to March 2023 the Department for Levelling Up, Housing and Communities (DLUHC) held a consultation with the Local Government Association (LGA) in respect of the Levelling-up and Regeneration Bill: reforms to nation planning policy, sought views on updates to the NPPF (the '*Draft NPPF'*) (LGA, 2023). The LGA has since noted that the proposed amendments to the NPPF "*do not go far enough to underline the challenges posed by climate change"*. The LGA also stated that plans should be led by the most up to date evidence and they "*urge the Government to consider the impact on local plan preparation timelines of the release of the ONS population projections in mid-2024".*

18.2.7 The NPPF places emphasis on its overarching economic, social and environmental objectives and presumption in favour of sustainable development. It states that

planning policies should help create the conditions in which businesses can invest, expand and adapt. The following sections of the NPPF are relevant to this topic.

18.2.8 Section 8 *"Promoting healthy and safe communities*" makes specific reference to the enablement of "*healthy lifestyles, especially where this would address identified local health and well-being needs – for example through the provision of safe and accessible green infrastructure, sports facilities, local shops"*. This section also goes on to emphasise the provision of "*social, recreational and cultural facilities the community needs"*.

18.2.9 Paragraph 98 describes that "*access to a network of high quality open spaces and opportunities for sport and physical activity is important for the health and well-being of communities"*. Moreover, paragraph 100 states that "*decisions should protect and enhance public rights of way"*.

18.2.10 In line with the NPPF, this chapter assesses the effect of the Proposed Development on local communities, community facilities, open space and Public Rights of Way (PRoWs).

Planning Policy Guidance (PPG): Housing and economic land availability assessment

18.2.11 The PGG for Housing and economic land availability assessments was published in 2014 and last updated in July 2019 (UK Government, 2019). This PPG sets out the required assessment methodology to:

- *"identify sites and broad locations with potential for development;*
- *assess their development potential; and*
- *assess their suitability for development and the likelihood of development coming forward (the availability and achievability)."*

18.2.12 The PPG also states that "*Development potential is a significant factor that affects the economic viability of a site / broad location and its suitability for a particular use. Therefore, assessing achievability (including viability) and suitability can usefully be carried out in parallel with estimating the development potential".*

18.2.13 In line with PPG, this chapter assesses any impacts of the Proposed Development on the development potential of sites.

Planning Policy Guidance (PPG): Open Space, Sports and Recreation Facilities, Public Rights of Way and Local Green Space

18.2.14 This PPG was published in March 2014, and establishes key advice on the designation on open space and PRoWs (UK Government, 2014). Within this, the guidance states that "*Open space should be taken into account in planning for new development and considering proposals that may affect existing open space".* It also states that "*Public rights of way form an important component of sustainable transport links and should be protected or enhanced. The Defra Rights of Way circular gives advice to local authorities on recording, managing and maintaining, protecting and changing public rights of way".*

18.2.15 In line with PPG guidance, this chapter assesses the impacts of the Proposed Development on existing open space.

Regional Planning Policy

Tees Valley Combined Authority Strategic Economic Plan (2016-2026)

18.2.16 The Tees Valley Strategic Economic Plan (SEP) (2016-2026) sets out the priorities for economic growth in the Tees Valley area (Tees Valley Combined Authority (TVCA), 2016). By 2026, the Combined Authority aim to create 26,000 additional jobs and grow the Tees Valley economy by £2.8 billion. The process, chemicals and energy sector is one of seven priority sectors identified as having the potential for further growth in the Tees Valley. The SEP is focused around six themes which reflect the main priorities over the ten-year plan period. This includes ''*research, development, innovation and energy''* where the aim is to ''*introduce new processes and practices which reduce carbon emissions, increase productivity and the availability of high value jobs".* This includes carbon capture and storage (CCS).

18.2.17 The SEP also includes the Strategic Priority of ''*Place''*, which aims to ''*revitalise our town centres and urban core, bring forward surplus public and blighted brownfield land for development and strengthen our commercial property offer''.* It also seeks to create a place where business wants to invest, which is supported by the Proposed Development. The Proposed Development would also help to promote the location as a core energy cluster, develop brownfield land in the South Tees Development Corporation (STDC) area and promote the use of low carbon energy options.

Local Planning Policy

18.2.18 This section considers the relevant local policies of Redcar and Cleveland Borough Council (RCBC), Stockton on Tees Borough Council (STBC) and Hartlepool Borough Council (HBC).

Redcar and Cleveland Local Plan (2018)

18.2.19 The Redcar and Cleveland Local Plan and Policies Map (RCBC, 2018) was adopted in May 2018. A key issue identified in the Local Plan is the fragility of the economic landscape and a need for jobs to be generated in the private sector. The Local Plan indicates future growth is likely to be driven by low carbon technologies and manufacturing, energy and food security and an efficient use of natural resources.

18.2.20 The Local Plan indicates that creating local employment opportunities is key to delivering economic growth. The decline of the traditional steel and chemical industries has impacted on many communities in Redcar and Cleveland leading to areas of deprivation and a declining population.

18.2.21 Policy ED 8 focuses on the Rural Economy, stating that, among other actions, the rural economy will be supported by:

- *"promoting and retaining rural community facilities and local services which meet rural needs; and*
- *supporting the management of land for nature conservation and heritage assets."*

18.2.22 The plan also states that "*Rural economic development will not be supported which would result in the loss of the best and most versatile agricultural land''.*

18.2.23 The Local Plan allocates land for specialist employment uses, and places focus on the role of the STDC. The Local Plan states that "*this substantial area of economic opportunity''* will "*drive economic growth and regeneration''* in the area. Therefore, the Proposed Development supports the economic ambitions of RCBC, and this chapter will assess to what extent community facilities, agricultural land and development land will be affected by the Proposed Development.

Stockton on Tees Local Plan (2019)

18.2.24 Stockton-on-Tees Borough Council Local Plan (STBC, 2019) was adopted in January 2019. A Strategic Priority set out in the Local Plan is to "*encourage economic growth, job creation and a more entrepreneurial culture within the Borough, as a means of diversifying the economic base and strengthening existing economic strengths, clusters and sectors''*.

18.2.25 The Local Plan also allocates sufficient employment sites to ensure economic growth will be prioritised, including the use of previously developed or under-used land. The Proposed Development supports the targets for STBC regarding economic growth in the borough.

Hartlepool Local Plan (2018)

18.2.26 HBC adopted the Hartlepool Local Plan in May 2018 (HBC, 2018). A theme of '*Hartlepool's Ambition'* for the Local Plan is for '*Jobs and the Economy, Lifelong Learning and Skills'.* The Local Plan focuses on this theme through the following spatial objectives:

- to diversify the economic base of Hartlepool and promote an entrepreneurial culture to create more employment opportunities for local people;
- to develop Hartlepool as a destination of choice for inward investment;
- to enhance the tourism offer; to support the development of educational and training facilities that will develop a skilled workforce;
- to facilitate development in the key investment areas in the Borough; and
- to continue to protect and enhance the vitality and viability of the Town Centre.

18.2.27 In line with HBC ambitions, the Proposed Development supports objectives for economic growth, and in creating employment opportunities for local people.

Tees Valley Joint Minerals and Waste Core Strategy Development Plan Document (DPD) and Waste Policies and Sites DPD (both 2011)

18.2.28 The Tees Valley Minerals and Waste Development Plan Documents (DPDs) – prepared jointly by the boroughs of Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton-on-Tees – bring together the planning issues for minerals and waste within the Tees Valley area (TVCA, 2011).

18.2.29 Within Redcar and Cleveland, there are a number of policies relating to minerals, waste and recycling processing, allocated in the Tees Valley Joint Minerals and Waste Development Plan Document (DPD). These are as follows:

- MWC9 Sewage Treatment: development involving the extension or upgrade of existing sewage treatment facilities, including at the Bran Sands Regional Sludge Treatment Centre (Redcar and Cleveland) will be supported. This is located within the boundary of the Proposed Development Site, adjacent to the Tees.
- MWC5 Protection of Minerals Extraction sites: operational safeguarding areas are identified around the following minerals extraction sites: a) Hart Quarry (Hartlepool) and b) Stockton Quarry (Stockton-on-Tees). The latter is located along the River Tees within the boundary of the Proposed Development Site. Within these areas, development proposals will be required to demonstrate that they are compatible with the permitted minerals operations.

18.2.30 Within the Waste Policies and Sites DPD, two Mineral and Waste Policies (MWP) are noted to be located within the vicinity of the Proposed Development Site to the south. These policies, MWP8 and MWP10(b), both refer to the South Tees Eco-Park, and provide proposals for facilities to recycle up to a combined total of 700,000 tonnes per year of construction and demolition wastes by 2016, rising to 791,000 tonnes per year in 2021. The site of the South Tees Eco-Park is located towards the south of the boundary of the Proposed Development Site.

Further Guidance

18.2.31 Whilst there is no dedicated United Kingdom (UK) legislation that details the content required for a socio-economic assessment as part of an EIA, the preliminary socio-economic assessment presented in this chapter is based upon a range of relevant guidance. This includes:

- Additionality Guide (4th Edition) (Homes and Communities Agency (HCA), 2014);
- Research to Improve the Assessment of Additionality (Department for Business, Innovation and Skills (BIS), 2009);
- The Green Book – Appraisal and Evaluation in Central Government (HM Treasury, 2022); and
- The Magenta Book – Guidance for Evaluation (HM Treasury, 2020).

18.3 Assessment Methodology and Significance Criteria

18.3.1 The preliminary assessment is based on information obtained to date. It should be read in conjunction with the following chapters:

- Chapter 4: Proposed Development (PEI Report, Volume I);
- Chapter 8: Air Quality (PEI Report, Volume I);
- Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I);
- Chapter 11: Noise and Vibration (PEI Report, Volume I);

- Chapter 15: Traffic and Transport (PEI Report, Volume I);
- Chapter 16: Landscape and Visual Amenity (PEI Report, Volume I);
- Chapter 19: Climate Change (PEI Report, Volume I); and
- Chapter 22: Human Health (PEI Report, Volume I).

Study Area

18.3.2 Office for National Statistics statistical geographies have been used to define the Study Area for the socio-economic assessment as described below.

18.3.3 The Lower layer Super Output Area (LSOAs)[1] included within the H2Teesside Study Area follow a best-fit approach, to represent the local areas potentially impacted by the Proposed Development. The inclusion of additional LSOAs were considered as a part of defining the H2Teesside Study Area, including those in the local authority of Hartlepool. However, only a small proportion of the Hartlepool LSOAs lie within the boundary of the Proposed Development Site. Therefore, these areas have not been included in the H2Teesside Study Area.

18.3.4 The direct impact areas are listed below for which the statistical information has been compared for this baseline:

- the H2Teesside Study Area[2];
- Middlesbrough and Stockton Travel To Work Area (TTWA); and
- England.

Impact Assessment Methodology

18.3.5 A preliminary assessment of potential impacts has been undertaken to determine the potential effects of the Proposed Development on baseline socio-economic conditions. This follows the methodology stated in Chapter 2: Assessment Methodology (PEI Report, Volume I) and assesses the level of significance of effects. The following potential effects have been assessed:

- direct and indirect employment creation;
- the potential for the promotion/provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits;
- local traffic flows on the local and strategic road networks;
- PRoWs;

[1] LSOAs are a geographic hierarchy with an average population of between 1,000 and 2,000 people. LSOAs are used to collect data at a local level to ascertain the key trends of an area in comparison to regional and national trends.
[2] Includes the following Lower layer Super Output Areas (LSOAs) : E01012107, E01032560, E01032561, E01012114, E01012109, E01012198, and E01012279. LSOAs from the Hartlepool local authority do not accurately cover the Proposed Development Site and would misrepresent the baseline statistics covered in this section. Therefore, they have not been included within the geography for the H2Teesside Study Area.

- local businesses, residential properties, educational and community facilities, either direct (demolition/land take) or indirect via in combination effects identified by other discipline assessments; and
- any socio-economic impacts from land use impacts (such as effect on planned developments).

Significance Criteria

18.3.6 For socio-economics, there is no accepted definition of what constitutes a significant (or not significant) socio-economic effect. It is recognised that 'significance' reflects the relationship between the scale of impact (magnitude) and the sensitivity (or value) of the affected resource or receptor. As such the significance criteria for socio-economic effects has been assessed using the expert judgment of authors with professional experience in socio-economics, and relies on the following considerations:

- The sensitivity of a given receptor: the assessment takes account of the qualitative (rather than quantitative) '*sensitivity*' of each receptor, particularly their ability to respond to change based on the given impacts of the Proposed Development.
- The magnitude of the impact: this entails consideration of the size of the impact on people, businesses, users of PRoWs, private properties, employees and development land in the context of the area in which impacts will be experienced.

18.3.7 These factors have then been combined to determine the consequent significance of the effect.

Receptor Sensitivity

18.3.8 The sensitivity of socio-economic receptors is assessed as high, medium, low or very low. Socio-economic receptors for this assessment include:

- agricultural, industrial and development land;
- users of PRoWs;
- private assets (including resident and business premises);
- users of education and community facilities; and
- construction and decommissioning employees using temporary accommodation.

18.3.9 The criteria for assessing and classifying levels of receptor sensitivity used within the assessment are defined in Table 18-1, based on professional judgement.

Table 18-1: Sensitivity Classification

LEVEL OF SENSITIVITY	DESCRIPTION
High	There are limited/no comparable and accessible alternatives to the receptor that exist within the relevant

LEVEL OF SENSITIVITY	DESCRIPTION
	catchment area; and/or receptors have limited ability to absorb the change.
Medium	There are limited comparable and accessible alternatives to the receptor within the relevant catchment area; and/or receptors have limited ability to absorb the change.
Low	Receptors are able to relatively easily absorb the change; and/or there are some comparable and accessible alternatives to the receptor that exist within the relevant catchment area.
Very low	Receptors are able to relatively easily absorb the change; and/or there are many comparable and accessible alternatives to the receptor that exist within the relevant catchment area.

Impact Magnitude

18.3.10 The magnitude of the socio-economic impacts associated with the Proposed Development have been assessed as being high, medium, low or very low – refer to Table 18-2. The receptors detailed in the receptor sensitivity criteria are also considered for the magnitude criteria. This has been determined by having regard to:

- Extent of change – the absolute number of people affected and the size of area in which the impact will be experienced (i.e., the level of change to baseline conditions including the proportion of the existing workforce);
- Scale of the impact – the relative magnitude of each impact in its relevant market context (for example, the impacts on local employment will be considered in the context of the overall size of the local labour market); and
- Duration of impact – more weight is given to long-term, permanent changes than to short-term, temporary ones. Temporary to short-term impacts are those associated with the construction works. Medium to long-term impacts are those associated with the operation of the Proposed Development.

Table 18-2: Magnitude Classification

MAGNITUDE	DESCRIPTION
High	An impact that is expected to have considerable adverse or beneficial socio-economics effects. Such impacts will typically affect large numbers of businesses, workers or residents.
Medium	An impact that will typically have a noticeable effect on a moderate number of businesses, workers or residents, and will lead to a small change to the study area's baseline socio-economic conditions.

MAGNITUDE	DESCRIPTION
Low	An impact that is expected to affect a small number of businesses, workers or residents or an impact that may affect a larger number of receptors but does not materially alter the study area's baseline socio-economic conditions.
Very low	An impact which has very little change from baseline conditions where the change is barely distinguishable, approximating to a ''*no change*'' situation.

Overall Significance of Effects

18.3.11 The overall effects of the Proposed Development have been defined in line with Chapter 2: Assessment Methodology (PEI Report, Volume I):

- Beneficial – advantageous or positive effect to an environmental resource or receptor;
- Negligible – imperceptible effect to an environmental resource or receptor;
- Adverse – detrimental or negative effects to an environmental resource or receptor; and
- No effect – no discernible effects on a receptor.

18.3.12 Duration of effect is also considered, with more weight given to permanent changes than to temporary ones. Permanent effects are generally those associated with the completed Proposed Development. Temporary effects are those associated with the construction works. For the purposes of this assessment, short-term effects are of one year or less, medium-term effects of one to five years and long-term effects for durations over five years.

18.3.13 Where an effect is assessed as being beneficial or adverse, the effect has been classified as Major, Moderate, Minor or Negligible. The assessment of significance is informed by considering the sensitivity of the receptor (refer to Table 18-1) and the magnitude of impact (refer to Table 18-2) as set out in Table 18-3. For the purposes of this assessment, only Moderate and Major effects are considered significant.

Table 18-3: Significance of Effects Matrix

MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR				
	NEGLIGIBLE	LOW	MEDIUM	HIGH	VERY HIGH
HIGH	Minor	Moderate	Moderate	Major	Major
MEDIUM	Negligible	Minor	Moderate	Moderate	Major
LOW	Negligible	Negligible	Minor	Moderate	Moderate

MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR				
	NEGLIGIBLE	LOW	MEDIUM	HIGH	VERY HIGH
NEGLIGIBLE	Negligible	Negligible	Negligible	Minor	Minor

Sources of Information/Data

18.3.14 The socio-economic baseline has been determined and informed using a number of recognised data sources, including the following Office for National Statistics (ONS) datasets: Census 2021 (ONS, 2021a); Indices of Multiple Deprivation (MHCLG, 2019b); Business Register and Employment Survey (ONS, 2021b); and Population Projections (ONS, 2018).

Consultation

18.3.15 An EIA Scoping Opinion was requested from the Inspectorate in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to socio-economic and land use are outlined in Table 18-4.

Table 18-4: Responses to Scoping Opinion Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17th May 2023	The Scoping Report describes that parts of the proposed hydrogen pipeline corridor comprise BMV land under the Agricultural Land Classification (ALC) system. ALC Grade 2 land is located near Kirkleatham. Grade 3 land near Greatham is identified as being possible BMV land. The Applicant seeks to scope out effects on BMV land on the basis that impacts would be temporary during pipeline installation. It is stated that in the worst-case scenario of open cut method, soil that is disturbed would be retained in-situ to infill the trench. The Scoping Report does not state the area of BMV land that would be affected or whether there would be a requirement for restrictions over the pipeline corridor during operation. No information is provided about soil handling and reinstatement following construction and/ or requirements for maintenance during operation. These matters should be addressed in the ES. The Inspectorate notes that National Policy Statement (NPS) EN-4, paragraph 2.23.7 requires information about mitigation measures for soil to be provided. The Inspectorate does not have sufficient information to agree that this matter can be scoped out of	Potential effects upon soils and agricultural land, including Best and Most Versatile (BMV) land, are assessed in Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I). This chapter will use these findings and assess them further for the socio-economic impacts of the potential effects on soils and agricultural land from the Proposed Development. This assessment is detailed in Section 18.6 Likely Impacts and Effects. This is assessed for all stages of the Proposed Development in this Chapter. Please refer to this and to Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I) for further detail on this assessment of the impacts.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		assessment. It is also noted that paragraph 3.5.3 of the Scoping Report states that the pipeline could be above ground and it is unclear whether any BMV land would be permanently sterilised. The ES should provide an assessment of effects to BMV land and an explanation of how any loss of BMV land would be minimised or demonstrate that impacts would not give rise to likely significant effects, including evidence of agreement with relevant consultation bodies.	
	Scoping Opinion 17th May 2023	The Scoping Report states that 2011 census data would be used. The Office for National Statistics (ONS) has commenced publication of 2021 census data and the Inspectorate advises that reference should be made to 2021 data where relevant to the assessment.	Census 2021 data has been incorporated into the baseline section of this PEI Report.
	Scoping Opinion 17th May 2023	The Scoping Report does not reference potential impacts on housing during construction. It is noted that construction workforce peak will be approximately 3,100 people per day (paragraph 3.14.1 of the Scoping Report), but it is not stated whether these would be non-home-based workers or if there would be a requirement for temporary living accommodation. The Inspectorate advises that if a significant number of non-home-based construction workers are required, this could foreseeably have an impact on local availability of	The baseline section of the PEI Report provides information on the main housing settlements near the Proposed Development. Potential impacts on increased demand for accommodation are considered in Section 18.6. The area surrounding the Proposed Development is mostly industrial land; and does not contain any tourism businesses or major tourism sites. Therefore, an assessment has not been undertaken for the impact on tourism accommodation.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		affordable housing, including from cumulative effects with other large developments nearby. The ES should provide an assessment of effects on the local private rented sector and tourist accommodation or demonstrate that impacts would not give rise to likely significant effects, including evidence of agreement with relevant consultation bodies.	For non-home-based construction workers, the assessment of employment effects in each stage of the Proposed Development considers the leakage of employment, whereby the proportion of employment originating from outside of the Wider Impact Area is considered. A value of 25% for leakage has been applied to gross construction job estimates, in line with HCA Additionality Guidance (HCA, 2014), as it is expected that the majority of employment in this stage will originate from the Middlesbrough and Stockton TTWA. In addition to this assessment, as part of the ES, the effects on the local private rented sector and temporary workers' accommodation will be further assessed for significance. This will include an assessment of available bedspaces and capacity in the private rented sector.

Use of the Rochdale Envelope

18.3.16 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the "Rochdale Envelope'' approach where appropriate in line with the Inspectorate's Advice Note 9 (The Planning Inspectorate, 2012). This involves assessing the maximum (or where relevant, minimum) parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example). For example, through this Chapter, the minimum scenario will be assessed for employment, as it is envisioned to be a beneficial impact. In contrast, maximum parameters for impacts on other receptors (such as PRoW and development land) will be assessed, whereby the 'worst case scenario' is considered, as the effect of the Proposed Development is expected to be an adverse impact.

18.4 Baseline Conditions

18.4.1 This section outlines the socio-economic baseline conditions in the Direct Impact Area, Wider Impact Area and England. The Direct Impact Area comprises of the LSOAs that the Proposed Development Site falls into, as detailed in Section 18.3. The Wider Impact Area is the Middlesbrough and Stockton TTWA. Both impact areas are shown in Figure 18-1. The local labour market in the Wider Impact Area is the main receptor for the assessment of employment effects. The baseline conditions help to determine the impact of employment generated by the Proposed Development, and the impact of the Proposed Development on the economy and other local businesses. The impact is mostly influenced by the size of the labour market and whether it has the relevant skills, occupations and sector strengths to access employment opportunities.

Existing Baseline

Population

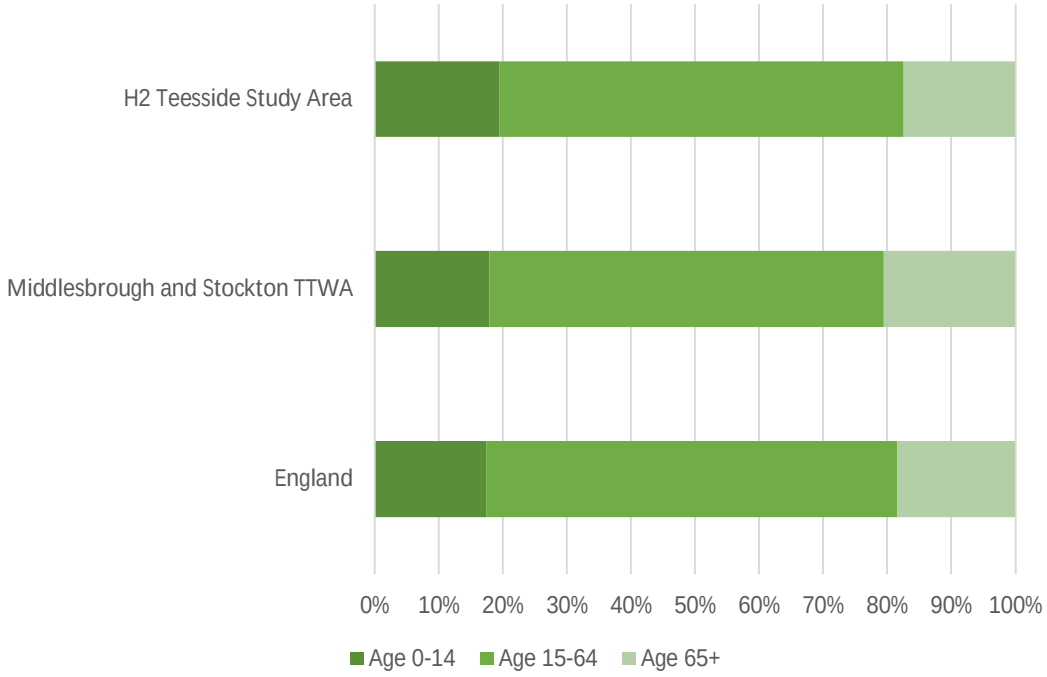

Plate 18-1: Population Age Breakdown (H2Teesside Study Area, Middlesbrough and Stockton TTWA and England)

Source: Census 2021 Population Estimates (ONS, 2021a)

18.4.2 The Proposed Development Site is located within three local authorities, Redcar and Cleveland, Stockton-on-Tees, and Hartlepool. The population of the H2Teesside Study Area was 9,702 in 2021, which accounted for approximately 2% of the Middlesbrough and Stockton TTWA (ONS, 2021a). In the H2Teesside Study Area, 63% of the population are of working age[3], which is in line with national averages and the TTWA. The proportion of elderly people (65+ years) in the H2Teesside Study Area (17%) is comparatively smaller than for the TTWA (21%), and nationally (18%), implying a smaller dependency ratio in the H2Teesside Study Area. This can be seen in Plate 18-1.

Skills

18.4.3 Data from the Census 2021 dataset, presented in Table 18-5, shows that there is a higher proportion of residents with no qualifications in the H2Teesside Area than regionally or nationally (ONS, 2021a). The data also show that the proportion of residents attaining a level 4 qualification (equivalent to degree level) or above is 20% in the H2Teesside Area, compared to 28% in the Middlesbrough and Stockton TTWA and 34% in England.

[3] Between 16 and 64 years of age.

Table 18-5: Skills Profile

	H2TEESSIDE AREA	MIDDLESBROUGH AND STOCKTON TTWA	ENGLAND
No qualifications	25%	21%	18%
Level 1 and entry level qualifications	11%	10%	10%
Level 2 qualifications	15%	14%	13%
Apprenticeship	8%	7%	5%
Level 3 qualifications	19%	18%	17%
Level 4 qualifications or above	20%	28%	34%
Other qualifications	3%	3%	3%

Source: Census 2021 Highest Level of Qualification (ONS, 2021a)

Economic Activity Trends

18.4.4 Census 2021 data shows that in the H2Teesside Study Area, approximately 53% of the working age population are economically active, with the most common form of economic activity being full time employment (49%) (ONS, 2021a). Rates of economic activity are in line with the TTWA area (53%), but below national rates (59%). Of the economically active, approximately 4% are unemployed in the H2Teesside Study Area, compared to 3% for the TTWA and nationally. Among the economically inactive in the H2Teesside Study Area, the most common reason is retirement.

Deprivation

18.4.5 Multiple sections of the H2Teesside Study Area lie in areas of relative deprivation. Of the seven LSOAs within the H2Teesside Study area, four are in the most deprived decile nationally (MHCLG, 2019b). More widely, areas of deprivation are prevalent in the local authorities in which the H2Teesside Study Area resides, as Redcar and Cleveland and Stockton-on-Tees are ranked the 40th and 73rd most deprived local authorities nationally.

Employment by Industry

18.4.6 In the H2Teesside Study Area, manufacturing (Sector C, 21% of total employment) is the largest industry - this percentage is considerably larger than the Middlesbrough and Stockton TTWA average (9%) and national average (8%) (ONS, 2021a). The second largest industry is transport and storage (Sector H, 16%), followed by professional, scientific and technical (Sector M, 16%), both of which are higher percentages than the TTWA and national averages.

18.4.7 The industries of business administration and support services (Sector N, 11%), mining, quarrying & utilities (Sectors B, D and E respectively, 7%) and construction (Sector F, 7%) are comparatively higher for the H2Teesside Study Area than the TTWA and national averages. This compares to the percentages for education (Sector P, 3%), health (Sector Q, 2%) and accommodation and food services (Sector I, 1%) which are considerably lower for the H2Teesside Study Area than for the TTWA and national averages. These trends are shown in Plate 18-2.

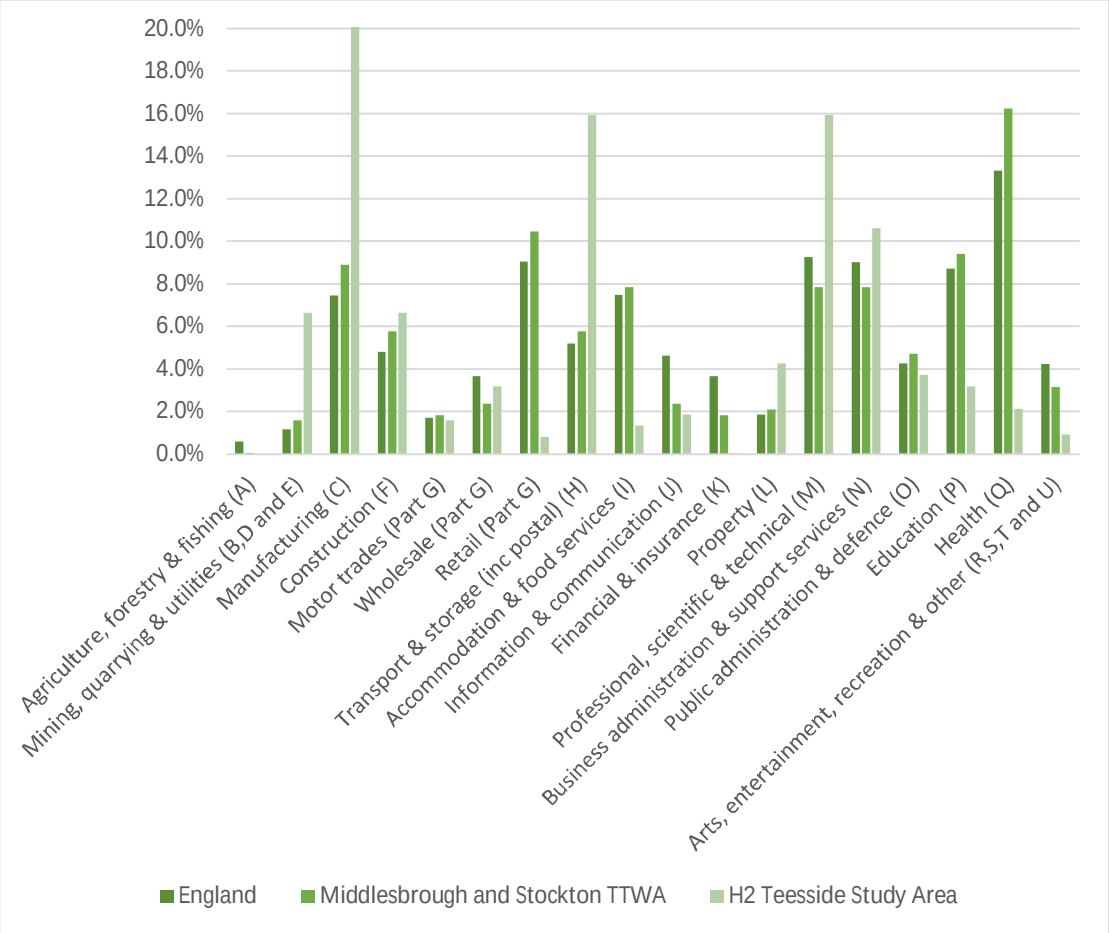

Plate 18-2: Employment by Industry (H2Teesside Study Area, Middlesbrough and Stockton TTWA and England)

Source: Office for National Statistics (ONS) Business Register and Employment Survey (BRES), 2021 (ONS, 2021a)

Land Use

18.4.8 The Proposed Development Site is located in a largely urban area, consisting of existing and former sites of industrial installations north and south of the River Tees. The Main Site is located on the former site of the materials handling area and associated plant for the neighbouring coke ovens and blast furnace of the Teesside Steelworks. The Connection Corridors south of the River Tees are located within or in proximity of the existing industrial area, generally following existing pipeline routes.

18.4.9 The Connection Corridors north of the River Tees also generally follow existing pipeline routes within the existing industrial area, as well as extending into areas of open or agricultural land north and west of the existing industrial area.

18.4.10 Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I) provides a detailed baseline of the Natural England Agricultural Land Classification (ALC) map for the North East Region (ALC001) (Natural England, 2023), which is summarised here. Part of the Proposed Development Site, near Kirkleatham, is located within Grade 2 'Very Good' agricultural land. ALC Grades 1 to 3a are classified as ''Best and Most Versatile'' (BMV) land.

18.4.11 There are further areas of Grade 3 ''Good to Moderate'' (potentially BMV) agricultural land within the north-west of the Proposed Development Site, in the vicinity of Greatham. The remainder of the Proposed Development Site is located within areas of Grade 4 'Poor' or Grade 5 'Very Poor' agricultural land or non-agricultural land ('land predominantly in urban use' or 'other land primarily in non-agricultural use'), and not BMV.

Public Rights of Way

18.4.12 There are no PRoWs within the Main Site. The Teesdale Way long distance route runs adjacent to the northern boundary of the Main Site. However, there are multiple footpaths that lie within the boundary of the Proposed Development Site as detailed below and shown on Figure 3-1: Environmental Receptors within 1 km of the Proposed Development Site Boundary (PEI Report, Volume II):

- Bridleway 116/10/2, which runs along the eastern boundary of the Wilton International site, in Kirkleatham;
- Footpaths 102/2A/1, 102/2A/2, 116/31/1, 116/31/2 and 116/31/3, which run adjacent to the Teesport Estate and Tees Dock Road;
- Footpaths 102/2/1, 102/2/2 and 102/2/3 and bridleways 116/9/1 and 116/9/2, which are located to the south of the above footpaths and the Teesport Estate, and form part of the Teesdale Way long distance footpath and the England Coastal Path (Filey Brigg to Newport Bridge);
- Footpath 31, which connects Cowpen Lane and Seal Sands Link Road;
- An unnamed footpath, which runs along the railway line north of Claxton Beck, north-east of Cowpen Bewley Woodland Park; and
- Three unnamed footpaths, which run north-east from Tees Road to Marsh House Lane; part of the southernmost of these is part of the England Coastal path (Newport Bridge to North Gare).

18.4.13 These PRoW may be affected by the selected routes of the hydrogen pipelines and other connections. In addition to the above, byway 30 is adjacent to the Proposed Development Site, north of Wolviston Back Lane. Bridleway 102/194/2 is located adjacent to the Proposed Development Site in Grangetown.

18.4.14 Footpaths 116/1/1, 116/1/2, 116/2/1, 116/37/1, 116/38/1 and 116/39/1 and bridleways 116/32/1, 116/33/1 and 116/36/1 are also located to the north-east of

the Proposed Development Site, in Warrenby and Coatham. Bridleways 116/32/1 and 116/36/1 are the closest of this group to the Proposed Development Site; at the closest point (where they connect to the Teesdale Way long distance route), they are located approximately 310 m north-east of the Proposed Development Site. Bridleways 116/32/1 and 116/33/1 are part of the England Coastal Path (Filey Brigg to Newport Bridge).

Residential Properties

18.4.15 The Proposed Development Site is situated in a predominantly industrial area, with some agricultural land towards the north-west, near Billingham.

18.4.16 There are no residential areas within the Proposed Development Site or within 1 km of the site boundary. Marsh Farmhouse is the closest residential receptor to the Main Site, located approximately 1.3 km to the east in Warrenby. The nearest residential settlement to the Main Site is the town of Redcar (approximately 2.6 km east of the Main Site), including the borough of Dormanstown (approximately 1.3 km south-east of the Main Site).

18.4.17 The nearest residential settlements to the Connection Corridors are:

- Dormanstown, located approximately 0.4 km to the east of the Water Connections Corridor, approximately 0.7 km to the east of the Hydrogen Pipeline Corridor and Electrical Connection Corridor, approximately 0.9 km to the south-east of the Natural Gas Connection Corridor and approximately 0.9 km to the south-east of the CO_2 Export Corridors;
- Redcar, located approximately 1.8 km to the north-east of the Electrical Connection Corridor, approximately 2 km to the north-east of the Hydrogen Pipeline Corridor, approximately 2 km to the east of the Natural Gas Connection Corridor and Water Connections Corridor, and approximately 2 km to the-east of the CO_2 Export Corridors;
- Kirkleatham, which is to the immediate east of the Hydrogen Pipeline Corridor, where it extends into the Wilton International Estate;
- Billingham and Wolviston, located approximately 1.2 km south-west and 0.6 km west of the Hydrogen Pipeline Corridor's western extent respectively;
- Grangetown, adjacent to the Electrical Connection Corridor at its southern end; and
- Greatham, located approximately 0.6 km north-west of the Hydrogen Pipeline Corridor.

Business Premises

18.4.18 The Proposed Development Site is in proximity to multiple businesses, although there are none within its boundary. To the west of the River Tees, there are sites for Conoco Philips, Seal Sands, Intertek, Greenenergy Biofuels Teesside Ltd, KD Pharma Ltd, Lianhetech, Teesside Gas Processing Plant, Wood UK Ltd, Hertal Industrial Services, BOC Teesside Hydrogen and Oceaneering International Services.

18.4.19 To the east of the River Tees, there are business premises located close to the docks, including a Tesco and ASDA distribution centre, Northumbrian Water, Kemira, BOC Ltd, PD Ports, Doosan Babcock, HM Customs and Excise and British Steel Lackenby.

18.4.20 Further to the east of the Proposed Development Site are the businesses located in Lazenby, including Hoggart Haulage, Falck Fire Services UK, Anglo American Wilton site, Talke UK, Viswalab UK PTE Limited, Wilton Power stations, Sembcorp Utilities UK, SUEZ recycling and recovery, Blue Phoenix, Wurth Trade Store, Telcoss, Algeco, Nippon Gases, Ensus and XPO Logistics.

18.4.21 The residential areas mentioned in the preceding section also contain a variety of businesses. To the east, there are clusters of businesses in Billingham and Stockton-on-Tees, and to the south in Middlesbrough city centre. To the east, many businesses are located in Redcar and Marske-by-the-Sea.

Education

18.4.22 There are no education facilities located within the Proposed Development Site, however, there are multiple schools within approximately 3 km of the Proposed Development Site boundary. The following schools are located in Redcar within 3 km of the Proposed Development Site:

- Coatham Primary School;
- Redcar And Cleveland College;
- Mo Mowlam Academy;
- Sacred Heart Catholic Secondary School;
- St. Benedict's Catholic Primary School;
- Dormanstown Primary Academy;
- Lakes Primary School;
- Riverdale Primary School; and
- Kirkleatham Hall School.

18.4.23 There are also schools within 3 km to the south of the Proposed Development Site in Middlesbrough:

- Wilton Primary Academy;
- Grangetown Primary School;
- Pathways School;
- St. Peter's Catholic College; and
- Caedmon Primary School.

18.4.24 To the west of the Proposed Development Site, there are a number of educational facilities in Billingham and Stockton-on-Tees:

- Bewley Primary School;

- St. Joseph's Catholic Primary School;
- Oakdene Primary School;
- Roseberry Primary School;
- Pentland Primary School; and
- St. Michael's Catholic Academy.

Community Facilities

18.4.25 Within 3 km of the Proposed Development Site there are a range of community and recreational facilities, as detailed in Table 18-6.

Table 18-6: Community Facilities Within 3 km of the Proposed Development Site

RECEPTOR	DESCRIPTION
Churches	
All Saints Church	Church in the town of Redcar
Christ Church, Coatham	Church in the town of Redcar
Sacred Heart Catholic Church	Church in the town of Redcar
South Bank Baptist Church	Church in Middlesbrough
St. Luke's Church	Church in the town of Billingham
St. Joseph's R C Church	Church in the town of Billingham
Social Clubs and Community Centres	
St. Williams Social Club	Social club in the town of Redcar
St. Marys Social Club	Social club in Middlesbrough
Cloud 9 Community Centre	Community centre to the east of Middlesbrough
Low Grange Community Centre	Community centre to the east of Billingham
Grangetown Youth and Community Centre	Youth and community centre to the east of Middlesbrough
Coatham Childrens Centre	Centre located in the village of Redcar
Greenspace and Nature Reserves	
Playing fields near Billingham	Playing fields south- west of the development site, adjacent to High Clarence Primary School
Coatham Green	Playing fields in the town of Redcar
Mannion Nature Park	Park to the east of Middlesbrough
Cowpen Bewley Woodland Park	Park to the west of the Proposed Development Site, north east of Billingham

RECEPTOR	DESCRIPTION
South Gare and Coatham Sands	Site of Special Scientific Interest (SSSI) to the west of Redcar
Saltholme East Pool	Nature reserve to the south- east of Billingham
Dorman Pool	Nature reserve to the south- east of Billingham
Paddy's Pool	Nature reserve to the south- east of Billingham
RSPB Saltholme	Nature reserve to the south- east of Billingham
Teesmouth National Nature Reserve	Nature reserve to the north- west of the Proposed Development Site
Other Recreational Facilities	
The Lobster Inn	Pub in the town of Redcar
The Three Horseshoes	Pub to the east of the town of Billingham
Billingham Community Fire Station	Fire station in the town of Billingham
Haverton Hill Hotel	Hotel to the south- east of Billingham
Old Billingham Community Centre	Event venue in Stockton-on-Tees

Development Land

18.4.26 Parts of the Proposed Development Site lie within the boundary of the South Tees Development Corporation (STDC) area, which is now known as Teesworks. STDC is a Mayoral Development Corporation, established to further the economic development of the South Tees Area through physical, social and environmental regeneration. RCBC retains planning powers for the area and continues to act as the Local Planning Authority (LPA) in respect of planning policy and development management and the processing and determination of planning applications.

18.4.27 In September 2014, York Potash Ltd submitted a planning application for a mineral (polyhalite) granulation and storage facility involving the construction of buildings, conveyor systems, substations, water treatment plant, internal access roads, car parking, attenuation ponds, landscaping, restoration and aftercare, and construction of a tunnel portal including the landforming of spoil and associated works. The development is located approximately 0.3 km to the south of the Main Site. The application was granted in August 2015. Construction is currently underway.

18.4.28 Tees Combined Cycle Power Plant (CCPP) is a proposed gas-fired combined cycle gas turbine (CCGT) power station with a maximum generating capacity of up to 1,700 MW. It is proposed on approximately 15 hectares (ha) of land formerly used as a gas-fired generating station within the south-western part of the Wilton

International Complex, to the south of the Proposed Development Site. The DCO application was approved in April 2019, but is understood to be undergoing an amendment to enable development of the Whitetail project – a proposed 300 MW power plant at Sembcorp Energy UK's Wilton International site, with CCS. It is expected that construction of the Tees CCPP will begin in 2024, with the generating station becoming operational in 2027.

18.4.29 Redcar Energy Centre (REC) is a proposed material recovery facility incorporating a bulk storage facility, an energy recovery facility, and an incinerator bottom ash recycling facility along with ancillary infrastructure and landscaping, located to the immediate west of the Main Site. A planning application for REC was submitted in August 2020 and granted in January 2021. It was anticipated that construction would begin within approximately 15 months of the decision date, but construction is yet to begin.

18.4.30 In July 2016, CBRE submitted a planning application for an anaerobic biogas production facility and Combined Heat and Power (CHP) plant, south-east of the Main Site. This facility would involve the anaerobic digestion of mixed feedstock to create a biogas to be used as fuel in the CHP. Planning permission was granted in October 2016, but construction is yet to begin.

18.4.31 In September 2022, Tees Valley Lithium Ltd submitted a planning application for the construction of a lithium hydroxide monohydrate manufacturing plant and ancillary development (the ''Tees Valley Lithium Project''), within the Wilton International Estate, Redcar. Planning permission was granted in November 2022. The development is located within the Wilton International estate, south-east of the Main Site. The development will be constructed on a phased basis and eventually comprise four process trains. Train 1 will employ a caustication process, whilst Trains 2, 3 and 4 will utilise an electrochemical process. It is anticipated that construction of Train 1 will be complete by Q4 2024, and construction of Trains 2, 3 and 4 will be complete by Q4 2025.

18.4.32 In July 2023, RCBC granted planning permission for the Green Lithium development programme within the Wilton International Chemicals Park in Teesside. This will support the development of commercial lithium in Europe. The project is expected to produce 50,000 tonnes of lithium hydroxide annually and generate approximately 1,200 construction jobs and approximately 250 operation jobs.

18.4.33 Off-site storage of hydrogen is not included within the Proposed Development Site. Should there be the requirement for off-site storage, it is expected that these would be owned and operated by a third-party provider who would be responsible for any consenting requirements. Details regarding this will be limited, with any potential developments being at a pre-planning stage, although the potential for cumulative effects will be assessed at a high level, based on available information. In the event any proposals come forward, these would be assessed from a CIA perspective for any relevant projects.

18.4.34 Within the Stockton-on-Tees Local Plan (STBC, 2019), a number of sites are identified for Specialist Employment Allocations (SDG4, EG4) and General Employment Allocations (SD4, EG1). These have not been proposed at this time.

Future Baseline

18.4.35 This section outlines future socio-economic baseline conditions. The future baseline conditions help to identify any changes anticipated to baseline conditions in the absence of the Proposed Development.

18.4.36 Data on future baseline conditions for the H2Teesside Study Area and the Middlesbrough and Stockton TTWA are not available as they have not been released for these areas by ONS. In the absence of these, data from the local authorities for Stockton-on-Tees and Redcar and Cleveland have been used to identify future employment patterns, as these local authorities most closely match the H2Teesside Study Area.

18.4.37 Table 18-7 shows population projections for these local authorities and shows that the resident population is expected to marginally increase in both local authorities between 2023 and 2043 (ONS, 2018). Between 2023 and 2043, the population of Stockton-on-Tees is expected to increase by approximately 1% (circa 2,000) to 202,000 to 2043, whilst the population of Redcar and Cleveland is expected to increase by 2% (circa 3,000) to 143,000. This is compared to an expected 7% (4,187,000) increase in England's population to 2043.

Table 18-7: Population Projections by Local Authority

YEAR	2023	2043	INCREASE (%)
STOCKTON-ON-TEES	199,465	201,186	0.9%
REDCAR AND CLEVELAND	139,201	142,548	2.3%
ENGLAND	57,557,526	61,744,108	6.8%

Source: Population Projections, ONS, 2018

18.4.38 Table 18-8 shows that, in both local authorities, the proportion of young people (0-15) is expected to fall by 2043, and both local authorities will experience an increasing population cohort aged 65 or over, which is in line with national trends. The proportions of the working age population are expected to fall by 3% between 2023 and 2043 for all geographies, highlighting that there is expected to be a higher dependency ratio in the future, at both a local and national level.

Table 18-8: Population Projections by Age

YEAR	AGE COHORT	2023	2043
STOCKTON-ON-TEES	0 to 15	18%	16%
	16 to 64	58%	55%
	65+	24%	29%
REDCAR AND CLEVELAND	0 to 15	20%	17%
	16 to 64	61%	58%
	65+	20%	25%
ENGLAND	0 to 15	19%	17%
	16 to 64	62%	59%
	65+	19%	24%

Source: Population Projections, ONS, 2018

18.4.39 In terms of the local economy, it would be reasonable to expect that employment and Gross Value Added (GVA) will increase, associated with the expected increase in population over time. However, this is likely to be restrained by the reduction in the working age population in the future.

18.4.40 It is expected that PRoW in the area will continue to be used. Businesses and community facilities may open and close. However, it is not expected that there will be any perceptible changes to the local economic baseline. Therefore, the Proposed Development should be assessed against current baseline conditions and policies. These changes are not considered to constitute significant changes to the existing baseline.

18.5 Proposed Development Design and Impact Avoidance

18.5.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development (also known as 'embedded measures'). Embedded mitigation measures, as applicable to this assessment, include minimising impacts on the PRoW that cross the Proposed Development Site.

18.5.2 Construction methods will also be selected that aim to minimise local disruption. For example, several options are being considered for the hydrogen pipeline crossing under the River Tees, including the construction of new trenchless crossings (in pipelines or tunnels) or the repurposing of existing pipelines or tunnels (where feasible). Although subject to ongoing studies (engineering and environmental), the construction methodology most likely to be used for the crossing of the River Tees will be a Micro Bored Tunnel (MBT). This methodology would ensure that disruption to users of surrounding area is reduced as far as reasonably practicable.

18.5.3 Further details of the measures which will be implemented will be included in a Framework Construction Environmental Management Plan (CEMP) which will form

part of the ES. The Final CEMP will be prepared by the Contractor prior to construction in accordance with the Framework CEMP. A Construction Traffic Management Plan (CTMP) will also be implemented to control the impact of HGVs on the local road network during construction. A Framework CTMP will be prepared and included with the ES.

18.6 Likely Impacts and Effects

18.6.1 This section identifies the likely impacts and effects on socio-economics and land use resulting from the Proposed Development. This section considers construction, operation and decommissioning phases.

18.6.2 Each section is split to first show the assessment of potential employment impacts, before detailing other potential socio-economic impacts associated with the Proposed Development.

Construction

18.6.3 The following section estimates gross construction employment arising from the Proposed Development and accounts for leakage displacement and multiplier effects (to define the indirect and induced employment) to assess net impacts on the sub-regional and national economies.

Construction Employment

18.6.4 Construction is anticipated to commence in 2025 and will be split into two phases. Phase 1 will last approximately three years, with Phase 2 commencing thereafter for another two years, with overall construction expected to be completed by 2030 (refer to Chapter 5: Construction Programme (PEI Report, Volume I)). This four-year period will generate employment opportunities in construction, which will represent a temporary positive economic impact for the area. This is through the direct expenditure involved in the construction phase, which will lead to increased output generated in the Middlesbrough and Stockton TTWA economy.

18.6.5 As detailed in Chapter 5: Construction Programme and Management (PEI Report, Volume I), based on an initial estimate, it is considered likely that construction workforce peak numbers would be approximately 1,300 direct and indirect construction workers per day in both Phases 1 and 2. However, given that the employment assessment will assess the minimum scenario, the minimum number of direct and indirect construction workers has been estimated at 900 based on minimum estimates for the construction phase of the Proposed Development. This is assumed as the minimum for both Phase 1 and Phase 2 of the construction period.

Leakage

18.6.6 Leakage effects refer to the proportion of jobs within an Impact Area that are filled by residents living outside the Impact Area (i.e., outside the Wider Impact Area, defined as the Middlesbrough and Stockton TTWA). Overall, it is assumed that the majority of the employment generated would be occupied by people living in the Middlesbrough and Stockton TTWA and as such leakage effects are considered to be low. Leakage has been set at 25% in line with the guidance from HCA Additionality

Guide (HCA, 2014). A 25% discount is applied to the estimated 900 gross direct and indirect jobs created. As such it is anticipated that approximately 225 workers from outside the Middlesbrough and Stockton TTWA and approximately 675 workers from within the TTWA would benefit from working at the Proposed Development Site during the construction period.

Displacement

18.6.7 Displacement measures the extent to which the benefits of a given project are offset by reductions of output or employment elsewhere. Any additional demand for labour cannot simply be treated as a net benefit – it removes workers from other posts and the net benefit is reduced to the extent that this occurs.

18.6.8 Overall, it is assumed that due to the flexibility of a typical construction workforce (i.e., they quickly move from project to project) displacement effects are considered to be low. The HCA Additionality Guide (HCA, 2014) suggests 25% as a 'ready reckoner' for low levels of displacement (i.e., there are expected to be some displacement effects, although only to a limited extent). Applying this level of displacement to total gross direct employment results in net direct and indirect employment estimate of 675.

Multiplier Effect

18.6.9 Multiplier estimates have been applied to the jobs estimate prior to this assessment by the operator of the Proposed Development, which resulted in the original figure of 900 gross direct and indirect jobs.

Net Construction Employment

18.6.10 Based on the gross construction worker requirements in the construction schedule and the additionality factors outlined above, it is estimated that 675 net construction jobs would be generated by the construction of the Proposed Development, of which around 506 are expected to be from the Middlesbrough and Stockton TTWAs.

18.6.11 Table 18-9 summarises the net construction employment arising from the Proposed Development's construction phase, in the Middlesborough and Stockton TTWA.

Table 18-9: Net Construction Employment in Middlesbrough and Stockton TTWA (Average Number Of Workers Onsite Per Year)

EMPLOYMENT IMPACTS	WITHIN MIDDLESBROUGH AND STOCKTON TTWA	OUTSIDE MIDDLESBROUGH AND STOCKTON TTWA	TOTAL
GROSS DIRECT AND INDIRECT EMPLOYMENT	675	225	900
LESS DISPLACEMENT	169	56	225

EMPLOYMENT IMPACTS	WITHIN MIDDLESBROUGH AND STOCKTON TTWA	OUTSIDE MIDDLESBROUGH AND STOCKTON TTWA	TOTAL
NET DIRECT AND INDIRECT EMPLOYMENT	506	169	675
TOTAL NET EMPLOYMENT	506	169	675

18.6.12 The sensitivity of the receptors in the vicinity of the Proposed Development Site is considered High, and the magnitude of the impact of the Proposed Development Site upon employment during the construction phase is considered Low. This is because the net employment generated by the Proposed Development in the Middlesbrough and Stockton TTWA represents 5% of total employment in construction for the area. Therefore, this results in a medium-term, temporary Moderate Beneficial effect, which is considered Significant.

Wider Impacts and Effects during the Construction Phase

18.6.13 This section considers the wider likely socio-economic effects during the Proposed Development construction phase – refer to Table 18-10. These contrast in detail and level of confidence from the impacts on employment, as the wider effects require further inputs at this time. Given the length of the construction phase, the duration of these potential impacts is considered medium term.

Table 18-10: Likely Wider Socio-economic Impacts and Effects in the Proposed Development Construction Phase

RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
Agricultural and industrial land	• Land take required to construct the Proposed Development	• Temporary loss of open space; • Temporary land take; and • Potential for noise and vibration, air quality and visual effects arising from construction activities associated with the construction on the Proposed Development Site.	Given that industrial and agricultural land lie close to the Proposed Development Site, the effect of the Proposed Development Site has the potential to be Minor Adverse, but not Significant.
PRoW	• Land take required to construct the Proposed Development	• Temporary loss of open space; • Potential temporary disruption of access to residences during and after construction; and • Potential temporary disruption of access to visitor attractions or open space leading to impact on residents' physical activity and health.	The effect of the Proposed Development Site on recreational routes and PRoW during the construction phase has the potential to be Minor Adverse, but not Significant.
Private assets (resident and business premises)	• Land take required to construct the Proposed Development • Construction activities in proximity to private and community facilities as a result of the Proposed Development	• Temporary land take of private assets; • Potential for noise and vibration, air quality and visual effects arising from construction activities associated with the construction of the Proposed Development Site to impact on the amenity of residential and business premises; and • Potential temporary disruption of access to residences during and after construction.	There are no residential properties within the boundary of the Proposed Development Site, but many businesses lie close by. Based on the information currently available, the effect of the Proposed Development has the potential to be Minor Adverse, but not Significant.
Education and community facilities			There are some educational and community facilities within proximity of the Proposed Development Site. The effect of the Proposed

RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
			Development has the potential to be Minor Adverse, but not Significant.
Development land	• Land take required to construct the Proposed Development	• Potential severance to development land at housing and employment site allocations during construction • Potential land take of development land through construction activities at the Proposed Development Site.	There are multiple planning applications or permissions within the vicinity of the Proposed Development Site that do not correspond to the development itself. However, the potential for the impacts at the Proposed Development Site on this receptor are expected to be minimal, and therefore, this has the potential to be Minor Adverse, but not Significant.
Temporary workers' accommodation	Increased demand for accommodation in the construction phase.	• Positive impacts for the local economy through additional demand for local businesses. • Negative impacts through increased rental costs from an increased demand in the rental market.	Though there is likely to be a reasonable in-flow of construction workers to the project, this pool of accommodation will likely benefit from the medium-term increase in usage. However, negative impacts on the increased cost of temporary and rental accommodation on the existing local population is also acknowledged and could outweigh the positive benefit. Therefore, it is anticipated that this will result in an overall Minor Adverse, but not Significant effect.
Demographic effects and community disruption	Increase in construction workers from the construction phase	• Potential change in the demographic characteristics of the local area. • Potential disruption to community facilities and activities.	The sensitivity has been assessed as Medium due to the ability of the local population and community to generally have a moderate capacity to experience these impacts without incurring a change on their economic well-

RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
			being. No significant difference from baseline conditions is expected in relation to demand for local services, such as schools or health services, during the construction phase, and therefore no additional provision of local services or infrastructure is required. Therefore, the magnitude has been assessed as Low. A Minor Adverse, but not Significant effect is anticipated on the demographic characteristics of the local area.

18.6.14 A full assessment will be undertaken and reported in the Environmental Statement (ES) together with mitigation measures where practicable.

Operation

Net Operational Employment

18.6.15 The Proposed Development would generate long-term jobs once the operational phase has commenced. This section details the operational employment estimates arising from the Proposed Development, and takes into account the additionality factors (deadweight, leakage, displacement and multiplier effects) to assess the net impacts in the Middlesbrough and Stockton TTWA.

18.6.16 Following the completion of the construction stage, the operational stage is expected to last for 25 years for the Phase 1 elements, and a total of 28 years for the Phase 2 elements. The operational life of the Proposed Development Site could last longer should the market conditions and plant condition remain favourable.

18.6.17 Gross operational employment will be a minimum level assessed for both Phases of the Proposed Development, which has been assessed to be 60 gross direct jobs.

Leakage and Displacement

18.6.18 As with the construction employment, additionality values have been used to estimate the net operational employment. These include a 25% leakage figure (a low ready reckoner from the HCA Additionality Guide (HCA, 2014)), and a 25% displacement figure (a low ready reckoner from the HCA Additionality Guide).

Multiplier Effects

18.6.19 In addition to the direct operation employment generated by the Proposed Development itself, there will be an increase in local employment arising from indirect and induced effects of the operation activity, which can be calculated for the operational phase. Employment growth will arise locally through manufacturing services and suppliers to the Proposed Development (indirect or supply linkage multipliers). Additionally, part of the income of the operational workers and suppliers will be spent in the Middlesbrough and Stockton TTWA, generating further employment (induced or income multipliers).

18.6.20 The impact of the multiplier depends on the size of the geographical area that is being considered, the local supply linkages and income leakage from the area. The HCA Additionality Guide (HCA, 2014) provides '*ready reckoners*' of composite multipliers – the combined effect of indirect and induced multipliers. It has been assumed that the Middlesbrough and Stockton TTWA has '*average*' supply linkages based on the scale of its economy. A multiplier of 1.3 is determined from the HCA guidance.

Net Operational Employment

18.6.21 As with the construction employment, additionality values have been used to estimate the net operational employment. These include a 25% leakage figure (a low ready reckoner from the HCA Additionality Guide (HCA, 2014)), a 25% displacement figure (a low ready reckoner from the HCA Additionality Guide), and a multiplier of 1.3 (a multiplier for ''average'' supply linkages in the economy of the Middlesbrough

and Stockton TTWA, from the HCA Additionality Guide). Accounting for these additionality values, it is estimated that there would be 58 net jobs, with 44 of these filled by residents of the Middlesbrough and Stockton TTWA. A breakdown of additionality factors is shown in Table 18-11. This is a Medium sensitive receptor, and an impact of Low magnitude, resulting in a Minor Beneficial effect (Not Significant).

Table 18-11: Net Operational Employment in Middlesbrough and Stockton TTWA (Average Number of Workers Onsite Per Year)

	WITHIN MIDDLESBROUGH AND STOCKTON TTWA	OUTSIDE MIDDLESBROUGH AND STOCKTON TTWA	TOTAL
Gross Direct Employment	45	15	60
Less displacement	11	4	15
Net Direct Employment	34	11	45
Net Indirect/ Induced Employment	10	3	13
Total Net Employment	44	14	58

Wider Impacts and Effects during the Operational Phase

18.6.22 This section considers the wider likely socio-economic effects during the Proposed Development operational phase – refer to Table 18-12. These contrast in detail and level of confidence from the impacts on employment, as the wider effects require further inputs at this time. Given the length of the operational phase, the duration of any potential impacts is considered long term. A full assessment will be undertaken and reported in the ES together with mitigation measures where practicable.

Table 18-12: Likely Wider Socio-economic Impacts and Effects in the Proposed Development Operational Phase

RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
Agricultural and industrial land	• Potential land take in the operational phase.	• Permanent loss of agricultural and industrial land.	Given that industrial and agricultural land lie close to the Proposed Development Site, the effect of the Proposed Development has the potential to be Minor Adverse, but not Significant.
PRoW	• Potential land take in the operational phase.	• Potential permanent disruption of access to residences during and after construction; and • Potential permanent disruption of access to visitor attractions or open space leading to impact on residents' physical activity and health.	The effect of the Proposed Development Site on recreational routes and PRoW for the operational phase is likely to be Minor Adverse, but not Significant.
Private assets (resident and business premises)	• Potential land take in the operational phase. • Potential disruption and congestion impacts from the operational workforce at the Proposed Development.	• Permanent land take; and • Potential permanent disruption of access to residences from operational activities.	There are no residential properties within the boundary of the Proposed Development Site, but many businesses lie close by. However, the Proposed Development Site does not involve any land take of these premises. Furthermore, the operational activities of the site are not likely to cause disruption to socio-economic activities for residents in private assets. Therefore, based on current information, the effect of the Proposed Development is likely to be Negligible and not Significant.

RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
Education and community facilities	• Potential land take in the operational phase. • Potential disruption and congestion impacts from the operational workforce at the Proposed Development.	• Permanent land take; and • Potential permanent disruption of access to educational and community facilities from operational activities.	There are some educational and community facilities within proximity of the Proposed Development Site. However, the Proposed Development Site does not involve any land take of these facilities through the operational phase. Therefore, the effect of the operational phase of the Proposed Development is likely to be Negligible and not Significant.
Development land	• Potential land take in the operational phase. • Potential disruption and access impacts from the operational workforce at the Proposed Development.	• Potential severance to development land at housing and employment site allocations during the operation phase. • Potential land take of development land resulting from construction and operation activities at the Proposed Development Site.	There are multiple planning applications or permissions within the vicinity of the Proposed Development Site that do not correspond to the development itself. The effect of the Proposed Development Site has the potential to be Minor Adverse, but not Significant.

Decommissioning

18.6.23 The Production Facility would have a design life of 25 years for each Phase. However, the operational life could be longer subject to market conditions and plant condition. At the end of its operational life, the most likely scenario would be that the Proposed Development Site would be shut down, with all above ground structures on the Main Site removed, and the ground remediated as required to facilitate future re-use. The same timescales would apply for the hydrogen pipeline and connections.

18.6.24 It is often the case that sufficient information is not available at the time of assessment to inform an assessment of decommissioning impact. However, it is generally assumed that the effects associated with decommissioning will be no worse than those experienced during construction. As such, socio-economic effects during Proposed Development decommissioning are likely to be similar to the construction effects as identified in Tables 18-9 and 18-10. Likely employment effects during decommissioning are anticipated to be temporary Moderate Beneficial. A full assessment will be undertaken and reported in the ES with mitigation measures suggested where practicable.

18.7 Mitigation and Enhancement Measures

18.7.1 No significant adverse socio-economic effects are predicted during the construction, operation and decommissioning of the Proposed Development. As such no specific mitigation is required. No other additional mitigation measures, over and above those stated in the other technical chapters of this PEI Report are required to avoid or minimise the socio-economic effects identified in this chapter.

18.8 Limitations and Difficulties

18.8.1 This assessment is based on baseline and design information available at the time of writing this PEI Report (August 2023). A full assessment is being undertaken as part of the EIA and will be reported in the ES that will be submitted with the DCO Application.

18.8.2 The assessment of the significance of effects has been carried out against a benchmark of current socio-economic baseline conditions prevailing around the Proposed Development Site, as far as is possible within the limitations of such a dataset. Baseline data is also subject to a time lag between collection and publication. As with any dataset, these conditions may be subject to change over time which may influence the findings of the assessment.

18.8.3 The assessment of likely socio-economic effects arising from the Proposed Development is based on professional judgement, drawing on relevant guidance as set out in Section 18.3 which considers both potential beneficial and adverse impacts that the Proposed Development is likely to have on socio-economic receptors.

18.8.4 As a result of the long time period prior to the decommissioning phase, the confidence of assessment of all effects in this stage is currently low, as the baseline for socio-economic effects cannot yet be ascertained. Therefore, no judgement on

significance has been passed for potential effects related to the decommissioning stage, except for employment effects.

18.9 Residual Effects and Conclusions

18.9.1 It is considered that the Proposed Development would have an overall positive economic effect on the Middlesbrough and Stockton TTWA economy, through the provision of employment and through associated multiplier effects.

18.9.2 The residual effects associated with the Proposed Development during the construction, operational and decommissioning stages are summarised in Table 18-13.

18.9.3 As explained in Table 18-4, through the responses to the Scoping Opinion, the effects on the local private rented sector and tourist accommodation will be further assessed for significance as part of the ES.

Table 18-13: Residual Socio-economic Effects

EFFECT	EFFECT CLASSIFICATION	EXPLANATION
CONSTRUCTION AND DECOMMISSIONING PHASES		
Construction employment	Moderate Beneficial (Significant – construction phase[4])	High sensitivity, Low magnitude
Agricultural and industrial land	Minor Adverse (Not Significant)	Medium sensitivity, Low Magnitude
PRoW	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
Private assets (resident and business premises)	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
Education and community facilities	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
Development land	Minor Adverse (Not Significant)	Medium sensitivity, Low Magnitude
Temporary workers' accommodation	Minor Adverse (Not Significant)	Medium sensitivity, Low Magnitude
Demographic effects and community disruption	Minor Adverse (Not Significant)	Medium sensitivity, Low Magnitude
OPERATIONAL PHASE		
Operation employment	Minor Beneficial (Not Significant)	Medium sensitivity, Low magnitude

[4] Because of the long time period prior to the decommissioning phase, the confidence of this assessment is currently low, therefore, no judgement on significance has been passed at this stage for decommissioning phase employment effects.

EFFECT	EFFECT CLASSIFICATION	EXPLANATION
Agricultural and industrial land	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
PRoW	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
Private assets (residential and business premises)	Negligible (Not Significant)	Low sensitivity, Low magnitude
Education and community facilities	Negligible (Not Significant)	Low sensitivity, Low magnitude
Development land	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude

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19.0 CLIMATE CHANGE

19.1 Introduction

19.1.1 This chapter of the Preliminary Environmental Information (PEI) Report considers the potential impacts and effects of Proposed Development construction, operation (including maintenance) and decommissioning on the climate, as well as the impacts of climate change on the Proposed Development and surrounding environment.

19.1.2 The assessment has been undertaken in accordance with the requirements of guidance from the Institute of Environmental Management and Assessment (IEMA) for Assessing Greenhouse Gas the Evaluating their Significance (IEMA, 2022) and Climate Change Resilience and Adaptation (IEMA, 2020) has been applied. This chapter addresses three separate aspects:

- Lifecycle Greenhouse Gas (GHG) impact assessment – the potential effects on the climate from GHG emissions arising from the Proposed Development, including how the Proposed Development would affect the ability of the UK Government to meet its carbon reduction targets;
- Climate Change Resilience (CCR) assessment – the resilience of the Proposed Development to projections for climate change, including how the Proposed Development design will be adapted to take account of the projected impacts of climate change; and
- In-combination climate change impacts (ICCI) assessment – the in-combination effects of a changing climate and the Proposed Development on receptors in the surrounding environment.

19.1.3 This chapter is supported by:

- Appendix 19A: Climate Change Resilience Assessment (PEI Report, Volume III).

19.2 Legislation and Planning Policy Context

Legislative Background

19.2.1 This section identifies legislation, policy and guidance of relevance to the assessment of the potential impacts associated with the Proposed Development. Legislation, policy and other relevant guidance has been considered on an international, national and local level.

International Legislation

Paris Agreement (2015)

19.2.2 The Paris Agreement is an agreement under the United Nations Framework Convention on Climate Change (UNFCCC) dealing with GHG emissions mitigation, adaptation and finance starting in the year 2020. It requires all signatories to strengthen their climate change mitigation efforts to keep the increase in global average temperature to well below 2°C this century above pre-industrial levels and to pursue efforts to limit the increase to 1.5°C (UNFCCC, 2016). This ambition is addressed in Section 19.3.

National Legislation

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

19.2.3 The 2017 Regulations (UK Government, 2017) state that an EIA (where relevant):

"must include a description of the likely significant effects of the development on the environment resulting from … the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and vulnerability of the project to climate change".

19.2.4 This requirement is addressed in Sections 19.3 and 19.4.

Climate Change Act 2008/ Climate Change Act (2050 Target Amendment) Order 2019

19.2.5 The Climate Change Act 2008 (UK Government, 2008) set a legally binding target for the UK to reduce its greenhouse gas emissions from 1990 levels by at least 80% by 2050. This target is supported by a system of legally binding five-year 'carbon budgets' and an independent body to monitor progress, the Climate Change Committee (CCC). The UK carbon budgets restrict the amount of GHG emissions the UK can legally emit in a defined five-year period.

19.2.6 The Act was amended in 2019 to revise the existing 80% reduction target and legislate for net zero emissions by 2050 (through the Climate Change Act 2008 (2050 Target Amendment) Order 2019) (UK Government, 2019).

19.2.7 In 2020, the 6th carbon budget (Climate Change Committee, 2020) was published by the CCC for consideration by government and is the first budget to reflect the amended trajectory to net zero by 2050.

19.2.8 The existing UK carbon budgets are used to determine significance of GHG emissions from the Proposed Development, as described in Section 19.3.

UK Nationally Determined Contribution (2020)

19.2.9 Under Article 4 of the Paris Agreement, parties are required to communicate their intended domestic GHG mitigation targets. In 2020, the UK communicated its new Nationally Determined Contribution to the UNFCCC. Within this, the UK has committed to reducing GHG emissions by at least 68% by 2030 compared to 1990 levels (UK Government , 2022).

Planning Policy Context

National Planning Policy

Overarching National Policy Statement for Energy (EN-1) (2011)

19.2.10 Published by the Department of Energy and Climate Change (2011a), the National Policy Statement (NPS) EN-1 describes the national policy for energy infrastructure in relation to climate impacts and adaptation; adverse effects and benefits; in relation to the European Union (EU) Directive and environmental assessment requirements; and in relation to adaptation measures in response to climate projections; and in relation to climate projections, flood risk and the importance of relevant mitigation.

19.2.11 EN-1 promotes Carbon Capture and Storage (CCS) as an emerging technology that the government is aiming to facilitate and encourage. Paragraph 2.2.23 of EN-1 states that CCS is part of the UK's plans to *"reduce its dependence on fossil fuels, particularly unabated combustion"*.

19.2.12 In March 2023, the Department for Energy Security and Net Zero (previously the Department for Business, Energy, and Industrial Strategy (BEIS)) published an update of the existing statement (NPS EN-1). The Draft EN-1 sets out that energy transformation is needed including renewables and "*hydrogen manufactured using low carbon processes (low carbon hydrogen) and, where we still emit carbon, developing the industry and infrastructure to capture transport and store it."* Paragraphs 3.4.12 to 3.4.21 of the document discuss the need for hydrogen as part of a decarbonised energy system (Department for Energy Security and Net Zero, 2023).

National Policy Statement for Gas and Oil Pipelines (EN-4) (2011)

19.2.13 The NPS EN-4 sets out policy for energy infrastructure in the UK (Department of Energy and Climate Change, 2011b). Section 2.2 of the legislation sets out the need to transition to a low carbon economy and the need to ensure that adaptation planning is embedded into planning on new energy NSIPs. Section 4.7 sets out the need for CCS as an emerging technology to be enabled with pipeline and storage networks. Section 4.8 of this NPS sets out the need for applicants to take the effects of climate change into account when developing and consenting infrastructure, which includes undertaking a Climate Change Risk Assessment.

National Policy Statement for Electrical Networks Infrastructure (EN-5) (2011)

19.2.14 NPS EN-5 sets out policy on assessments of impacts across a range of technologies associated with energy and electricity networks infrastructure (Department of Energy and Climate Change, 2011c). Section 2.4 sets out the requirements of an assessment of infrastructures resilience to climate change. In particular any assessment is expected to consider how vulnerable or resilient it would be to flooding, winds and storms, higher temperatures or earth movement caused by flooding or drought.

Draft Overarching NPS for Energy (EN-1) (2023)

19.2.15 National Policy Statement (NPS) EN-1 describes the national policy for energy infrastructure in relation to climate impacts and adaptation; adverse effects and benefits; in relation to the European Union (EU) Directive and environmental assessment requirements; and in relation to adaptation measures in response to climate projections; and in relation to climate projections, flood risk and the importance of relevant mitigation (Department for Energy Security and Net Zero, 2023).

19.2.16 Paragraph 2.4.4 commits to developing business models to incentivise CCS and low carbon hydrogen production in the UK, and business models for hydrogen transport and storage. Paragraph 3.4.12 to 3.4.21 highlights the role of low carbon hydrogen in transitioning to a decarbonised energy sector.

Draft National Policy Statement for *Natural Gas Supply Infrastructure and Gas and Oil Pipelines* (EN-4) (2023)

19.2.17 The 2023 draft update to NPS EN-4 relates to energy infrastructure in the UK. Section 2.3 sets out the requirements for climate change adaptation which is expanded to say that any assessment should consider any other increased risks as well as the identified risks of flooding, sea level rise, higher temperatures and earth movements (Department for Energy Security and Net Zero, 2023).

Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023)

19.2.18 The 2023 draft update to NPS EN-5 relates to energy infrastructure in the UK. Section 2.3 sets out the requirements for climate change adaptation which is expanded to say that any assessment should consider any other increased risks as well as the identified risks of flooding, sea level rise, higher temperatures and earth movements (Department for Energy Security and Net Zero, 2023).

The National Planning Policy Framework (2021)

19.2.19 The revised National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) sets out the Government's planning policies for England. While the NPPF does not set specific policies for Nationally Significant Infrastructure Projects (NSIPs), its policies may be of relevance to decision making.

19.2.20 Policies of relevance to climate change include those meeting the challenge of moving to a low carbon economy, climate change, flooding and coastal change (Section 14). The NPPF states that the planning system should support this transition by supporting low carbon energy and associated infrastructure.

National Planning Policy Guidance (NPPG) on Climate Change (2019)

19.2.21 Guidance published by the Ministry of Housing, Communities and Local Government (2019b) describes how to identify suitable mitigation and climate adaptation measures to incorporate into the planning process. It states that "*effective spatial planning is an important part of a successful response to climate change as it can influence the emission of greenhouse gases… Planning can also help increase resilience to climate change impact through the location, mix and design of development*."

Biodiversity Strategy 2020 (2011)

19.2.22 A strategy for England's wildlife and ecosystem services (Department for Environment, Food and Rural Affairs (Defra, 2011) establishes principles for considering biodiversity and the potential effects of climate change. This assessment will reflect these principles and identify how the effects of the Proposed Development on the natural environment will be influenced by climate change, and how ecological networks will be maintained.

Local Planning Policy

North and South Tees Industrial Development Framework (2009)

19.2.23 This framework discusses the need to promote carbon capture and storage networks as an important opportunity for both the North and South Tees, and for the UK to meet its climate change reduction targets (Parsons Brinckerhoff Ltd & Genecon, 2009).

Tees Valley Climate Change Partnership Climate Change Strategy (2010)

19.2.24 This Partnership (made up of the five Tees Valley Local Authorities, the Environment Agency, Renew@CPI, Tees and Durham Energy Advice Centre (TADEA) and the Energy Savings Trust) published the Tees Valley Climate Change Strategy (Tees Valley Unlimited, 2010). The Partnership represents five local neighbouring local authorities and details its strategy for emissions reductions, climate change adaptation and resilience communities.

19.2.25 The combined Tees Valley GHG baseline was calculated as 7,125,000 tonnes of carbon dioxide (CO_2) equivalents (CO_2e) in 2005 as shown in Plate 19-1.

19.2.26 Plate 19-1 also illustrates the Partnership's total emission reductions that would be needed to meet the previous UK Government target of an 80% reduction in emissions by 2050 compared to that in 1990. Tees Valley calculated that their emissions would need to be under 2,000,000 tonnes of CO_2e by 2050 to meet the previous UK target. As set out above, the Climate Change Act (2050 Target Amendment) Order 2019 revised that 80% reduction target to a net zero target (paragraph 19.2.6). The Tees Valley Climate Change Partnership has yet to recalculate their emissions reduction target in light of the revised net zero target, though it would need to still be net zero by 2050 to align with the national target.

19.2.27 Redcar and Cleveland Borough Council (RCBC) and Stockton-on-Tees Borough Council (STBC) have adopted the Tees Valley Climate Change Strategy (Tees Valley Unlimited, 2010). The Council is also a member of UK100, a network of community leaders committed to *"100% clean energy production by 2050".* This enhances the need and commitment for developments that lead to clean energy.

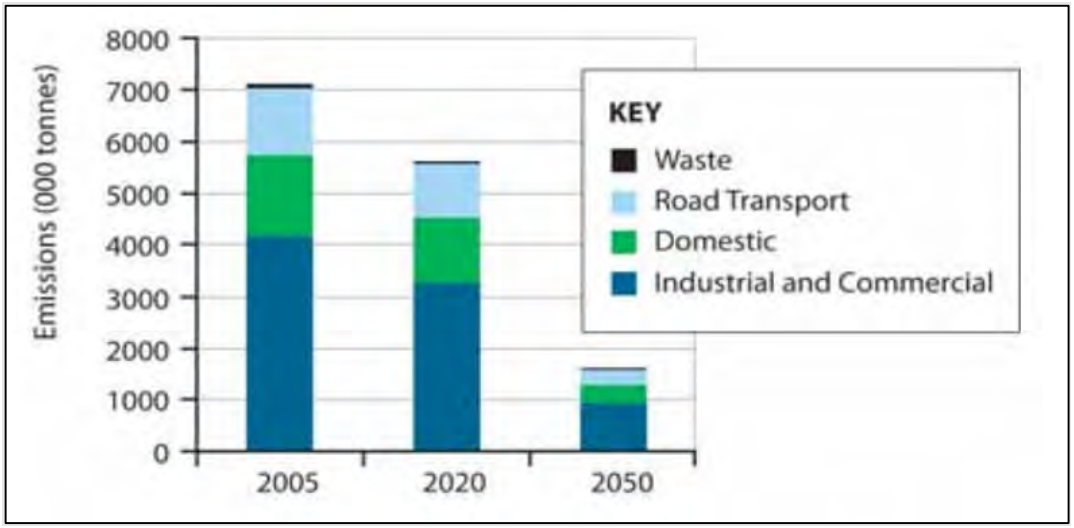

Plate 19-1: Tees Valley GHG Emissions Baseline and Reduction Targets (Taken from Tees Valley Unlimited, 2010)

Redcar and Cleveland Borough Council

Redcar and Cleveland Borough Council Carbon Neutral Declaration (2019)

19.2.28 RCBC declared a climate emergency in March 2019 and have declared an intent to be carbon neutral by 2030 (Redcar & Cleveland Borough, 2019a). This notably includes the support of a carbon capture storage and utilisation network for industry stating *"[to achieve carbon neutrality by 2030] This must include protecting our manufacturing industry and associated jobs by facilitating an industrial Carbon Capture Storage and Utilisation (CCSU) network in our Borough".*

19.2.29 RCBC's Strategic Flood Risk Assessment (JBA Consulting, 2018) is used as guidance for new developments to help avoid increased flooding risks from projections for sea level rise and increased rainfall. As the council is defined as the Lead Local Flood Authority (LLFA) and a Local Planning Authority, Strategic Flood Risk Assessments must be developed as a base for new Local Plans and Sustainability Appraisals. This is described in more detail in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I).

Redcar and Cleveland Borough Council Local Plan (2019)

19.2.30 RCBC's Local Plan (Redcar & Cleveland Borough Council, 2019b) describes the need for new developments to be *"sustainable in design and construction, incorporating best practice in resource management, energy efficiency and climate change adaptation"* (Redcar & Cleveland Borough Council, 2019b, p. 42) with particular climate change adaptation measures to be incorporated in flood and water management design.

Stockton-on-Tees Borough Council

Stockton-on-Tees Borough Council Climate Strategy and Action Plan (2022)

19.2.31 In 2022, STBC adopted and published its Climate Change Strategy and Action Plan, active until 2032 (STBC, 2022). The strategy details its low carbon vision for the area and the industrial sector being a priority area for emission reductions.

19.2.32 In 2018, STBC completed a Level 1 Strategic Flood Risk Assessment (JBA consulting, 2018), which is used as guidance for new developments in understanding the flood risks of rainfall and sea level rise. More detail can be found in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I).

Stockton on Tees Borough Council Local Plan (2019)

19.2.33 STBC adopted the Local Plan in 2019 with a commitment to contribute towards the national targets on CO_2 reductions by 2050 (STBC, 2019). As part of this plan paragraph 8.5 identifies opportunities in hydrogen and CCS to achieve economic growth and decarbonisation.

Hartlepool Borough Council (HBC)

Hartlepool Local Plan (2019)

19.2.34 HBC's local plan, published in 2019, sets the planning framework for Hartlepool council for the next 15 years (HBC, 2018). Chapter 7 commits to a range of policies related to minimising and adapting to climate change. Policy CC3 encourages the development of renewable and low carbon energy. The local infrastructure plan also commits to ensuring that the replacement of pipelines across Tees Valley will be able to accommodate hydrogen.

Other Guidance

Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013)

19.2.35 This guidance aims to help EU Member States improve the way in which climate change and biodiversity are integrated in Environmental Impact Assessments (EIAs) undertaken across the EU (EU Commission, 2013). Although the UK is no longer a Member State of the EU, this guidance is still considered relevant in the context of EIAs undertaken in respect of developments in the UK.

EC Non-paper Guidelines for Project Managers: Making Vulnerable Investments Climate Resilient (2011)

19.2.36 These guidelines aim to help developers of physical assets and infrastructure incorporate resilience to current climate variability and future climate change within their projects (EU Commission, 2011). Although the UK is no longer a Member State of the EU, this guidance is still considered relevant in the context of EIAs undertaken in respect of developments in the UK.

Guidance for the Calculation of Land Carbon Stocks (2010)

19.2.37 The EU Commission (EU Commission, 2010) provides a calculation methodology for calculating carbon stocks (i.e., CO_2 stored in land or soil habitats), from land use. This guidance is applied in Section 19.3.

British Standards (2019)

19.2.38 The British Standards Institution (BSI) BS EN ISO 14064-1:2019 and 14064-2:2019 (BSI, 2019a; BSI, 2019b) provides specifications for organisational-level and project-level guidance for the quantification and reporting of GHG emissions and removals. These are used within the GHG emissions calculation methodology, as described in Section 19.3.

IEMA Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022)

19.2.39 In the absence of any widely accepted guidance on assessing the significance of the impact effect of GHG emissions, guidance published by IEMA (2022) has been followed. This provides a framework for the consideration of GHG in the EIA process, in line with the 2014 EU Directive (EU Directive 2014/52/EU). The guidance sets out how to:

- identify the GHG emission baseline in terms of GHG current and future emissions;
- identify key contributing GHG sources and establish the scope and methodology of the assessment;
- assess the impact of potential GHG emissions and evaluate their significance; and
- consider mitigation in accordance with the hierarchy for managing project related GHG emissions (avoid, reduce, substitute and compensate).

19.2.40 This guidance is used within the GHG emissions calculation methodology, as described in Section 19.3.

IEMA Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation (2020)

19.2.41 The IEMA Guidance for assessing climate change resilience and adaptation in EIA (IEMA, 2022) has been followed. It provides guidance for consideration of the impacts of climate change within project design. The guidance sets out how to:

- define potential climate change concerns and environmental receptors vulnerable to climate factors;
- define the environmental baseline with projections for changing future climate parameters; and
- determine the resilience of project design and define appropriate mitigation measures to increase resilience to climate change.

19.2.42 This guidance is used within the climate change resilience and ICCI methodology, as described in Sections 19.4 and 19.5.

GHG Protocol (2004)

19.2.43 The World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) GHG Protocol provides overarching guidance on developing GHG inventories and reporting standards (World Resource Institute & World Business Council for Sustainable Development, 2004). This guidance is used within the GHG emissions calculation methodology, as described in Section 19.3.

PAS 2080: 2023

19.2.44 Publicly Available Specification (PAS) 2080 specifies whole life carbon management for both buildings and infrastructure. PAS 2080:2023 is an updated revision from the last issue in 2016 and brings an increased emphasis on whole life carbon (BSI, 2023).

2020 UK Greenhouse Gas Emissions, Final Figures (2022)

19.2.45 The 2020 UK Greenhouse Gas Emission, Final Figures (UK Government, 2022) provides the latest estimates of 1990-2015 UK GHG emissions by source and by end user sector.

19.2.46 In 2020, UK emissions of the seven GHGs covered by the Kyoto Protocol were estimated to be 406 million tonnes CO_2 equivalent ($MtCO_2e$). This was 9.5% lower than the 2019 figure.

19.2.47 CO_2 is the main GHG, accounting for 79% of total UK GHG emissions in 2020. The drivers for the decrease in emissions were in the energy supply sector (down 12%), the business sector (4.8%) and the waste management sector (6.7%). The decrease in the energy supply sector is due to the change in the fuel mix for electricity generation, with less use of coal and greater use of nuclear and renewables.

UK Low Carbon Hydrogen Standard (2023)

19.2.48 The UK Low Carbon Hydrogen Standard (Department for Business, Energy and Industrial Strategy, 2023) provides standards to define what constitutes low carbon hydrogen at the point of the production, setting a threshold of 20 gCO_2e/MJ_{LHV} to be considered low carbon. This is to ensure that low carbon hydrogen supported by government makes a direct contribution to the GHG emissions set out in the Climate Change Act.

19.2.49 The methodology sets out the boundaries of calculations e.g., up to the point of production, to be considered when calculating GHG emission from hydrogen.

19.2.50 The requirements around fugitive hydrogen emissions are set in the policy including producing a plan for how hydrogen emissions will be minimised, expected rates of emissions and monitoring plans.

19.2.51 The latest version of the Low Carbon Hydrogen Standard was published in April 2023 following consultation in 2021, with further review expected later in 2023 and for the standard to be updated at regular review points.

19.3 Greenhouse Gas Assessment Methodology and Significance Criteria

Methodology for Determining Baseline Conditions and Sensitive Receptors

Baseline Environment

19.3.1 The baseline environment for the GHG assessment is a '*business as usual'* scenario where the Proposed Development is not undertaken. The baseline comprises existing carbon stock and sources of GHG emissions within the boundary of the Proposed Development Site. The Proposed Development Site covers an area of approximately 1,391 ha.

19.3.2 For the purposes of determining net changes in GHG emissions as a consequence of the Proposed Development, it is assumed that there are no activities on the Proposed Development Site currently and that the area is fully under hardstanding. The baseline emissions were considered to be zero and all project emissions were considered as additional.

19.3.3 The methodology for calculating GHG emissions and removals has been consistently used across the baseline, construction and operational phases of the Proposed Development, as described below.

19.3.4 The GHG baseline also considers the impact of grid electricity generation where the Proposed Development is not built.

Project Environment

19.3.5 The alternative environment to the 'business as usual' in which the Proposed Development is not undertaken is a 'do something' scenario with the delivery of the Proposed Development, which includes its construction, operation and decommissioning.

Study Area

19.3.6 The Study Area for the lifecycle GHG impact assessment considered direct GHG emissions arising from activities within the Proposed Development boundary and indirect emissions from activities outside of the Proposed Development Site but related to the construction, operation and decommissioning of the Proposed Development (for example, the transportation of materials and embodied carbon within construction materials). As it is not known where constructional materials will be sourced from at this stage, the Study Area for indirect emissions was assumed to be global.

Sensitive Receptors

19.3.7 The identified receptor for GHG emissions is the global climate as effects are not geographically constrained which means that all development has the potential to result in a cumulative effect on GHG emissions. Therefore, for the purpose of the GHG emissions impact assessment, the global climate was used as the sensitive receptor. The UK's relevant five-year carbon budget will be used as a proxy for the global climate.

Cumulative Assessment

19.3.8 In line with IEMA guidance, a Cumulative Assessment is not considered appropriate or meaningful in terms of assessing the Proposed Developments impact on the receptor of the global climate.

19.3.9 IEMA guidance states that *"All global cumulative GHG sources are relevant to the effect on climate change, and this should be taken into account in defining the receptor (the atmospheric concentration of GHGs) as being of 'high' sensitivity to further emissions."*

19.3.10 In essence, there is no difference in the impact on the global climate of a tonne of CO_2e emitted at one location compared to the same mass of CO_2e emitted anywhere else on the planet. So, it is not meaningful to carry out a cumulative assessment of the Proposed Development alongside other developments in a geographical area, nor is such an exercise reasonably practicable due to the difficulties in accessing reliable future emissions data for other developments.

19.3.11 The GHG assessment is considered inherently cumulative as all GHG emissions have the potential to equally impact the receptor i.e. the global climate. UK Carbon budgets, setting binding limits on the total emissions that can be emitted in the UK, are used as a proxy for the global climate for the GHG assessment.

Rochdale Envelope

19.3.12 A focused use of the Rochdale Envelope approach has been adopted to present a worst-case assessment of potential environmental effects of the different parameters of the Proposed Development that cannot yet be fixed. The Rochdale Envelope approach has specifically been used to estimate likely emissions from construction, upstream operational emissions and operational chemicals used.

Impact Assessment Methodology

19.3.13 The assessment has adopted a project lifecycle approach to identify 'hot spots' of GHG emissions (i.e., the project stage(s) likely to generate the largest amount of GHG emissions) and enable priority areas for mitigation to be identified. This approach is consistent with the principles set out in IEMA guidance (IEMA, 2022) and PAS 2080 (BSI, 2023).

19.3.14 In line with the WRI and WBCSD GHG Protocol guidelines (World Resource Institute & World Business Council for Sustainable Development, 2004) the lifecycle GHG impact assessment has been reported as tonnes of CO_2 equivalent (tCO_2e) and has considered the seven Kyoto Protocol gases:

- CO_2;
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Sulphur hexafluoride (SF_6);
- Hydrofluorocarbons (HFCs);

- Perfluorocarbons (PFCs); and
- Nitrogen Trifluoride (NF_3).

19.3.15 Where data is available, GHG emissions arising from construction activities, embodied carbon in materials and operational emissions of the Proposed Development have been quantified using a calculation-based methodology as per the following equation and aligned with the GHG Protocol (World Resource Institute & World Business Council for Sustainable Development, 2004):

Activity data x GHG emissions factor = GHG emissions

19.3.16 A set of standard data quality principles have been applied so that the results from the GHG assessment are as accurate and representative as possible. This has included the selection of emission factors that are representative of the UK construction industry.

19.3.17 The Department for Energy Security and Net Zero (ESNZ) 2022 emissions factors (ESNZ, 2023) and embodied carbon data from the Inventory of Carbon and Energy V3.0 (ICE, 2019) have been used as the main sources of emissions factors for calculating GHG emissions. The resulting carbon footprint has been compared to the existing baseline condition to identify the impact of the Proposed Development.

Methodology for Determining Demolition, Construction and Operation Effects

19.3.18 Where relevant GHG activity data is unavailable, assumptions and estimations have been developed based on similar developments, industry benchmarks and professional judgement. Any assumptions, inclusions and exclusions that inform the GHG emissions calculation have been clearly described in the sections below.

19.3.19 In order to assess the potential impacts of GHG emissions arising from the Proposed Development, likely activities and their associated GHG emissions sources have been estimated. Potential activities related to the Proposed Development that could cause GHG emission impacts are presented in Table 19-1.

Table 19-1: GHG Emission Sources

LIFECYCLE STAGE	ACTIVITY	PRIMARY EMISSION SOURCES
Pre-construction (including demolition)	On-site pre-construction activity i.e., enabling works etc. (not including Teesworks preparation works which would take place prior to commencement of the Proposed Development)	GHG emissions from fuel consumption by construction plant and vehicles, generators on-site, and worker commuting.
	Transportation and disposal of earthworks/ waste	GHG emissions from transportation and disposal of earthworks/pre-construction waste.

LIFECYCLE STAGE	ACTIVITY	PRIMARY EMISSION SOURCES
	Land clearance	GHG emissions associated with the loss of carbon stock.
Product manufacture	Raw material extraction and manufacturing of products/materials	Embodied GHG emissions associated with product and material manufacture.
	Transport of products/ materials to site	GHG emissions from fuel consumption of transportation of products and materials to site.
Construction	On-site construction activity	Energy (electricity, fuel etc.) consumption from plant and vehicles, generators on-site, and material consumption.
	Transport of construction workers	Energy (electricity, fuel etc.) consumption from worker commuting.
	Transportation and disposal of earthworks/ waste	GHG emissions from transportation and disposal/treatment of earthworks/ construction waste.
Operations	Operation of the Proposed Development	GHG emissions from energy use, fugitive emissions of gases including carbon and hydrogen, natural gas supply and additional traffic.
	Transportation and disposal of waste	GHG emissions from transportation and disposal of waste.
	Building and grounds maintenance (out of scope)	GHG emissions associated with replacement materials/products.
	Emissions displacement	Avoided or displaced emissions through use of hydrogen or offsetting.
	Landscaping	Changes in GHG emissions/sinks from landscaping and re-vegetation.

LIFECYCLE STAGE	ACTIVITY	PRIMARY EMISSION SOURCES
Decommissioning	Removal and or renewal of the Proposed Development	GHG emissions arising from fuel consumption for plant and vehicles and disposal of materials.

Classification and Significance of Effects

Significance Criteria

19.3.20 IEMA (2022) guidance states that there are currently no agreed methods to evaluate levels of GHG significance and that professional judgement is required to contextualise a proposed development's emission impacts.

19.3.21 In GHG accounting, it is considered good practice to contextualise emissions against pre-determined carbon budgets (IEMA, 2022). The Tees Valley targets noted in Plate 19-1 do not have a statutory or policy requirement to be considered so the UK Carbon Budgets are used to contextualise the level of significance.

19.3.22 There is currently no published standard definition for receptor sensitivity of GHG emissions. As per IEMA (2022) guidance, all GHG emissions were classed as having the potential to be significant as all emissions contribute to climate change. The global climate has been identified as the receptor for the purposes of the GHG assessment. The sensitivity of the climate to GHG emissions was considered to be 'High'. The rationale supporting this includes:

- Any additional GHG impacts could compromise the UK's ability to reduce its GHG emissions and therefore the ability to meet its future carbon budgets.
- The importance of meeting the Paris Agreement goal of limiting global average temperature increase to well below 2°C above pre-industrial levels (paragraph 21.2.4). Additionally, a recent report by the Intergovernmental Panel on Climate Change (IPCC) highlighted the importance of limiting global warming below 1.5°C (IPCC, 2023)

19.3.23 Table 19-2 summarises IEMA guidance on how to apply significance criteria for GHG impact of projects.

Table 19-2: IEMA Significance Criteria

LEVEL OF EFFECT	SIGNIFICANCE CRITERIA	SIGNIFICANCE
Major Adverse	The project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful	Significant

LEVEL OF EFFECT	SIGNIFICANCE CRITERIA	SIGNIFICANCE
	contribution to the UK's trajectory towards net zero.	
Moderate Adverse	The project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.	Significant
Minor Adverse	The projects GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.	Not Significant
Negligible	The projects GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.	Not Significant
Beneficial	The project's net GHG impacts are below zero and it causes a reduction in atmospheric concentration, whether directly or indirectly compared to the without project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.	Significant

19.3.24 To comply with the UK Government's low carbon hydrogen standard, hydrogen must be able to be produced at an intensity of 20gCO_{2e}/MJ_{LHV} or less (Department for Business, Energy and Industrial Strategy, 2023). The accounting boundary for this does not include construction, or downstream transmission and leakage emissions. The GHG assessment has been carried out both as a whole-life assessment, and compared against the boundary of the UK low carbon hydrogen standard.

19.3.25 The boundaries of the low carbon hydrogen standard are not whole life carbon as they do not include construction or any downstream combustion emissions. Where the overall emissions of the development were compared against the $20gCO_{2e}/MJ_{LHV}$ standard the boundaries align with the scope of the standard. Elsewhere total emissions were calculated across a whole life carbon scope.

19.3.26 The significance criteria compare emissions from the Proposed Development against the baseline within the Proposed Development Site i.e. no operational activity. In this context the Proposed Development will have GHG emissions.

19.3.27 When viewed in a wider context the fuel from the Proposed Development will have a role in displacing different fuel and energy sources. Therefore, a broader approach to significance has been taken, looking at the reductions and mitigations associated with introducing hydrogen into the UK fuel supply over time.

UK Carbon Budgets

19.3.28 The UK carbon budgets, shown in Table 19-3, are in place to restrict the volume of GHG emissions the UK can legally emit in a five-year period (UK Government, 2023). The UK is currently in the 4th carbon budget period which runs from 2023 to 2027. The 3rd to the 5th carbon budgets reflect the earlier UK target (80% reduction target by 2050). The 6th carbon budget, (Climate Change Committee, 2020), is the first budget to reflect the amended net zero target. As the Proposed Development will be active past 2050, the assessment also compared the emissions against the net zero by 2050 target.

Table 19-3: Current UK Carbon Budgets

UK CARBON BUDGET (PERIOD)	TOTAL BUDGET ($MTCO_2E$)	INDICATIVE CARBON BUDGETS BASED ON CCC'S NET-ZERO PATHWAY ($MTCO_2E$)
4th (2023-2027)	1,950	-
5th (2028-2032)	1,725	-
6th (2033- 2037)	965	-
7th (2038-2042)	-	526
8th (2043-2047)	-	195
9th (2048-2050)	-	17

Determining Construction Effects

19.3.29 Due to unavailability of construction data in terms of quantities of materials or design, benchmark values for industrial construction projects have been used to estimate the embodied carbon associated with construction of the Proposed Development. The included emissions are summarised in Table 19-4.

19.3.30 There is the potential that landfill sites may be affected or disturbed by underground construction, leading to GHG emissions from the Proposed Development Site. It was

not possible to currently quantify the potential emissions from this, though they can be avoided through mitigation actions where possible.

19.3.31 As detailed in Chapter 5: Construction Programme and Management (PEI Report, Volume I), site preparation and remedial works at the Main Site would be completed by Teesworks prior to the commencement of construction of the Proposed Development. Teesworks would obtain the necessary consents and permits to do this work; as such they are not considered in this assessment. The proposed remediation works will be subject to further review following the assessment of ground condition information. Further remedial measures may be required during the construction phase of the Proposed Development. These would be localised, targeted remediation works. As such, these works are considered and assessed, along with site construction activities including management and movement of previously remediated material, as detailed in Table 19-4 below.

Table 19-4: Scope of Potential GHG Emission Sources from the Construction Stage

LIFECYCLE STAGE	ACTIVITY	PRIMARY EMISSION SOURCES	SCOPED IN/ OUT
Enabling Works	Any enabling works (excluding Teesworks preparatory works)	GHG emissions from any activities required onsite prior to construction including targeted excavation activities of previously remediated material for the purpose of the installation of the foundations.	In
	Land clearance	Loss of carbon sink.	In
Production Stage	Raw material extraction and manufacturing of products/materials. Transport of products/materials to site.	Embodied GHG emissions. GHG emissions from fuel consumption for transportation of materials.	In
Construction process stage	On-site construction activity Transport of construction workers	Energy (electricity, fuel etc.) consumption from plant and vehicles, generators on site and construction workers commuting. GHG emissions from fuel consumption for transportation of construction workers.	In

LIFECYCLE STAGE	ACTIVITY	PRIMARY EMISSION SOURCES	SCOPED IN/ OUT
	Transportation and disposal of construction waste	GHG emissions from energy use and from fuel consumption for transportation of waste.	In
	Provision and treatment of water	GHG emissions from the supply of potable water, and the disposal and treatment of wastewater.	In

Determining Operational Effects

19.3.32 The methodology for determining Proposed Development operational GHG emissions was the same as that for the enabling works, production stage and construction process stage emissions. Table 19-5 summarises the key anticipated GHG emissions sources and whether they have been scoped in or out of the assessment. There are a range of uncertainties associated with fugitive hydrogen, carbon capture, and Global Warming Potential (GWP) values which are discussed in paragraphs 19.3.77-19.3.80.

19.3.33 Maintenance and repair have been scoped out due to its low contribution to the overall footprint. Whole Life Carbon assessment methodology often recommends setting usage and maintenance emissions at 1% of the embodied construction emissions for the building and based on the construction emissions having a relatively small contribution to the life cycle this was considered to be immaterial to the footprint (Greater London Authority, 2022).

19.3.34 There is currently no information available for the quantities of amines and other chemicals required for the carbon capture process, but this is expected to be immaterial to the overall footprint and less than 1% of total emissions as it is a closed loop system for amines so raw material procurement should be minimal.

Table 19-5: Scope of Potential GHG Emission Sources from the Operational Stage

LIFECYCLE STAGE	ACTIVITY	PRIMARY EMISSION SOURCES	SCOPED IN/ OUT
Operation	Operation of the Proposed Development	GHG emissions from flare, methane extraction and well to tank, electricity for plant, CO_2 atmospheric emission not captured, and any other materials required for operation of plant.	In
	Use of vehicles i.e., cars and motorcycles	GHG emissions from vehicle use from worker journeys to and from the site.	In

LIFECYCLE STAGE	ACTIVITY	PRIMARY EMISSION SOURCES	SCOPED IN/ OUT
	Disposal and transportation of operational waste	GHG emissions from recycling/ disposal of process waste and domestic waste. GHG emissions from fuel consumption for transportation of raw materials and waste.	In
	Provision and treatment of water	GHG emissions from the supply of potable water, and the disposal and treatment of wastewater.	In
	Combustion of Hydrogen Product	GHG emissions from combustion of residual methane in Hydrogen Stream	In
	Building/ infrastructure maintenance	GHG emissions from maintenance of buildings and infrastructure/assets in the operational stage.	Out

Determining Decommissioning Effects

19.3.35 The methodology for determining Proposed Development decommissioning GHG emissions is the same as for that for the enabling works, production stage, construction process stage and operational emissions. Table 19-6 summarises the key anticipated emissions sources and whether they were scoped in or out of the assessment.

19.3.36 Due to the high uncertainty around decommissioning emissions, resulting from the long life-cycle of the Proposed Development and the anticipated decarbonisation of technologies associated with decommissioning, it was not possible to do a quantitative assessment.

Table 19-6: Scope of Potential GHG Emissions Sources from the Decommissioning Stage

LIFECYCLE STAGE	ACTIVITY	PRIMARY EMISSION SOURCES	SCOPED IN/OUT
Decommissioning	Raw material extraction and manufacturing of products/materials. Transport of products/materials to site.	Embodied GHG emissions. GHG emissions from fuel consumption for transportation of materials.	In

LIFECYCLE STAGE	ACTIVITY	PRIMARY EMISSION SOURCES	SCOPED IN/OUT
	On-site decommissioning activity. Transport of decommissioning workers	Energy (electricity, fuel etc.) consumption from plant and vehicles, generators on site, and workers commuting. GHG emissions from fuel consumption for transportation of workers.	In
	Transportation and disposal of waste	GHG emissions from energy use and from fuel consumption for transportation of waste.	In
	Provision and treatment of water	GHG emissions from the supply of potable water, and the disposal and treatment of wastewater.	In

Consultation

19.3.37 The Scoping Opinion was provided on 17th May 2023 by the Planning Inspectorate ('the Inspectorate'). A high-level summary of responses to the Scoping Opinion comments of relevance to this assessment are outlined in Table 19-7.

Table 19-7: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Planning Inspectorate ('the Inspectorate')	Scoping Opinion 17th May 2023	<u>GHG emissions arising from disturbance of landfill sites</u> Figure 10 of the Scoping Report shows that there are active and historic landfill sites present within the Proposed Development Site. There is a potential that underground construction works could lead to GHG emission from these sites that should be included in the assessment.	The PEI Report acknowledges the potential for GHG emissions from disturbing landfill sites in paragraph 19.3.30 This will be further considered in the Environmental Statement (ES).
The Inspectorate	Scoping Opinion 17th May 2023	<u>Carbon Capture</u> The scoping report states that CO_2 will be captured at a rate of 95%, secured through an environmental permit. Should the draft DCO allow for generating station to operate independently of carbon capture a worst-case assessment of emissions should be undertaken.	It is a fundamental assumption of the project that CO_2 will be captured. This has been emphasised in paragraph 19.3.60. An assessment of the impact without carbon capture has been made in response to this request in paragraph 19.3.73.
The Inspectorate	Scoping Opinion 17th May 2023	<u>CO_2 Emissions</u> The CO_2 generated from the Proposed Development is proposed to be exported via the proposed NZT project and to the proposed NEP offshore storage. The ES should describe the status of these projects and any uncertainty around this method of exportation and/or alternative proposals. Please refer to the Inspectorate's comments at ID 2.1.3 of this Scoping Opinion regarding assessment of CO_2 emissions should the DCO seek or allow for powers for	It is a fundamental assumption of the project that CO_2 will be captured. This has been emphasised in paragraph 19.3.60. An assessment of the impact without carbon capture has been made in response to this request, in paragraph 19.3.73.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		the generating station component to operate independently of the carbon capture.	
The Inspectorate	Scoping Opinion 17th May 2023	$\underline{CH_4}$ The ES should include consideration of CH_4 emissions as part of the GHG assessment or otherwise demonstrate why the emissions are so small so as not to result in likely significant effects. The ES should describe any mitigation required in respect of CH_4 emissions and confirm how this would be secured in the DCO.	CH_4 emissions are considered in Table 19-5 of this chapter, where the well-to-tank emission factor used for CH_4 supply is processed into hydrogen as the first step. CH_4 leakage is accounted for in the ESNZ well-to-tank emission factors used (Exergia, 2015; ESNZ, 2023). This has been clarified in the assumptions in paragraph 19.3.6060.

GHG Impact Avoidance Measures

Construction

19.3.38 The Proposed Development is being designed, as far as possible, to avoid and minimise impacts and effects through the process of design development, and by embedding mitigation measures into the design. One of the key drivers for the Proposed Development is to assist the UK in meeting its net zero targets through the production and distribution of hydrogen to help decarbonise the transportation sector and to help facilitate the use of carbon capture and storage.

19.3.39 During construction GHG emissions will be managed through a Construction Environmental Management Plan (CEMP) and related plans including a Site Waste Management Plan (SWMP). The CEMP will control construction activities to minimise any impact on the environment through relevant regulations, industry good practice and specific measures, including those described in this PEI Report and the Environmental Statement (ES).

19.3.40 A Framework CEMP will be included within the ES which will accompany the DCO Application. A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

19.3.41 The CEMP will require that the appointed contractors develop and implement processes to measure, monitor and report energy and water consumption and GHG emissions during Proposed Development construction. Examples include, but are not limited to:

- fuel consumption on site in vehicles, equipment and plant through minimisation of idling, and switching off when not being used;
- reduction in water consumption in the on-site amenity blocks and construction activities (including dampening down as part of dust mitigation);
- minimisation of transportation of materials to the site, by implementing measures set out in the Framework CTMP that will be included within the ES;
- minimisation of emissions through worker commuting by encouraging group transport by the provision of minibuses pursuant to a Framework CTMP that will be included within the ES;
- provision of facilities for cyclists pursuant to a Framework CTMP that will be included within the ES;
- provision of information on public transport links pursuant to a Framework CTMP that will be included within the ES; and
- setting minimum rates for material recycling and re-use.

Operation

19.3.42 The main mitigation strategy is carbon capture which is designed to capture in excess of 95% of the emissions resulting from the Proposed Development operation. It is a key assumption that carbon capture is part of the Proposed Development and transported and stored using NEP infrastructure.

19.3.43 When comparing emissions against the low carbon hydrogen standard, it is assumed that all CO_2 injected into the network is stored and that there is zero leakage in the CO_2 network and storage sites. This is in alignment with the standard which states "*For the purposes of hydrogen emissions reporting under the standard, it is assumed that once CO2 is injected into the CO2 network, and the liability for the CO2 is transferred between parties, there is zero leakage in the CO2 network and storage sites.*"

19.3.44 For the Whole Life Carbon assessment, a small amount of leakage of CO2 from the network is expected, but likely to be insignificant in the overall assessment.

19.3.45 Process emissions, mainly CO_2, H_2 and CH_4, would be managed and regulated through an Environmental Permit by the Environment Agency in accordance with the Environmental Permitting (England and Wales) Regulations 2016.

19.3.46 The permit application will present a number of measures that the Proposed Development will include in order to improve energy efficiency and to reduce overall GHG emissions.

19.3.47 In addition, the Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001.

19.3.48 Other embedded measures incorporated in the operational design will be outlined in the ES when the Proposed Development design is more progressed.

19.3.49 Additional maintenance and mitigation measures could include the following and appropriate measures will be developed and assessed further and included in the ES as relevant:

- minimising flaring and venting of gases in operation
- minimising leakage of hydrogen and using trace systems;
- minimising of CO_2 and CH_4 leakage in connection corridors;
- use of energy efficient lighting; and
- optimisation of overall auto thermal reforming process.

Decommissioning

19.3.50 At this stage, limited specific additional mitigation measures have been identified for the Proposed Development decommissioning phase due to uncertainties in the activities that will be undertaken, future emission factors and technologies available. A Decommissioning Environmental Management Plan (DEMP) would be produced

pursuant to a DCO Requirement, in accordance with guidance and legislation at the time and would likely include measures to reduce GHG emissions (for example encouraging the contractors to recycle the bulk of the plant, equipment and materials).

Likely Impacts and Effects

Description of Potential Effects

19.3.51 This section presents preliminary findings of the GHG impact assessment for the construction (including commissioning), operation and decommissioning of the Proposed Development. It identifies any likely significant effects that are predicted to occur and then highlights the mitigation and enhancement measures that are proposed to minimise any potential adverse significant effects.

Construction

19.3.52 Construction emissions were calculated using data about vehicle movements and quantities of key construction materials required for the Proposed Development. Total emissions are summarised in Table 19-8.

19.3.53 The main materials are aggregates for earthworks and backfill, concrete for foundations and piles, steel for structural reinforcement, pipework and asphalt for roads. Total quantities were multiplied by emission factors from the ICE database (ICE, 2019).

19.3.54 Transport of materials is assumed to be a 50km return trip by Heavy Goods Vehicle (HGV), using the ESNZ emission factor for an average laden HGV journey of 0.8539 $kgCO_2e/km$ (ESNZ, 2023). There are expected to be approximately 50,550 HGV journeys associated with the Proposed Development.

19.3.55 Transport of workers is assumed based on a weighted average of 19.2km based upon distribution of permanent workers detailed in Traffic and Transport, Table 15-20. A return journey is calculated using the ESNZ emission factor for an average unknown car journey of 0.20874 $kgCO_2e/km$. There are 259,020 journeys during construction.

19.3.56 5% of construction materials are assumed to go to waste and emissions are calculated using the landfill-based emission factors from ESNZ (2023).

19.3.57 Detailed data is not currently available for plant operation energy and fuel consumption however this is considered to be relatively immaterial and will not impact the overall significance of the Proposed Development's emissions. Detailed construction data will be updated during the EIA.

19.3.58 As outlined in Chapter 5: Construction and Programme Management (PEI Report, Volume I) construction of Phase 1 is due to be completed in 2028, with Phase 2 commencing in 2028 for a further 3 years, with construction to be completed by late 2030.

Table 19-8: Construction Emissions

LIFECYCLE STAGE	ACTIVITY/EMISSION SOURCE	EMISSIONS (TCO_2E)
Raw Materials (A1-3)	Concrete, aggregate, steel and asphalt for construction	20,944
Transport of Materials (A4)	50km return HGV trip transport for construction materials	4,317
Transport of workers (A5)	Return trip via car for workers	2,074
Waste (A5)	Disposal of 5% of raw materials at landfill, disposal of hazardous and non-hazardous waste from site preparation.	550
TOTAL	27,885	
Annual estimation over 4-year Period[1]	6,971	

19.3.59 A further assessment will be carried out and reported in the ES which will provide a breakdown of relevant construction activities such as worker commuting, transport of materials, fuel and electricity use.

Operation

19.3.60 There are a range of uncertainties with future operation that are discussed in 19.3.77 to 19.3.80. To assess the magnitude of climate change impacts associated with operating the Proposed Development, the GHG emissions that are associated with relevant activities were calculated based on the assumptions listed below:

- the Proposed Development is expected to be available and manned 24 hours a day, 7 days per week for 28 years (25 years from completion of phase 2). With regard to maintenance schedules, it is assumed that any outages are brief, so a fully operational plant is assumed at 8,760 hours per year;
- the majority of the emissions arise from a scenario of 5% unabated CO_2 from the Hydrogen Production Facility, upstream CH_4 emissions and downstream combustion of residual CH_4 in H_2 stream. More minor contributions come from processing CO_2 flue gases from the fired heater and vent, imported electricity and worker transport;
- there is currently no information available for the quantities of amines and other chemicals required for the carbon capture process, but this is expected to be immaterial to the overall footprint;

[1] Four years used as worst case to give highest annual emissions.

- all residual CH_4 in the hydrogen output product is combusted and converted to CO_2 and water;
- natural gas used for the start-up of the fired heater is not considered in the analysis - further details will be provided in the ES;
- staff levels are expected to be the same in Phases 1 and 2;
- electricity demand, hydrogen output, CO_2 streams and Scope 3 emissions double in scale after Phase 2;
- the Proposed Development is designed to capture in excess of 95% of the carbon, as required by UK government for hydrogen;
- electricity-related emissions have been calculated using ESNZ projections for grid intensity to 2100 (ESNZ, 2023); and
- natural gas leakage on site is relatively low due to the first process of the Auto Thermal Reformer (ATR) splitting natural gas. Therefore, natural gas leakages are only accounted for in upstream emissions calculations.

19.3.61 The key activity data for the emissions assessment is provided in Table 19-9. The resulting calculated emissions based on the data presented Table 19-9 are shown in Table 19-10 and Table 19-11. These emissions were categorised in line Scopes 1, 2 and 3 in line with the GHG protocol. Scope 1 covers direct emissions from controlled sources such as on-site combustion, whilst scope 2 covers indirect emissions from purchase of electricity, steam, heating and cooling. Scope 3 emissions are a consequence of activities of the company from sources not owned or controlled by the company.

19.3.62 The unabated CO_2 emissions in Table 19-9 were back-calculated based upon the quantity of CO_2 captured in the process. The natural gas demand was back-calculated based on the emissions listed in the report and the emission factor used, to identify the raw natural gas demand.

19.3.63 Downstream CH_4 combustion emissions arise from the anticipated residual CH_4 in the hydrogen export steam. When combusted this is assumed to convert to CO_2.

Table 19-9: Activity Data from Phase 1

ITEM	ACTIVITY	VALUE
Scope 1	Flare, gas, flue, vent and seal leakage	497 $kgCO_2e$/hour
	Uncaptured CO_2 emissions (5% that is not captured at 95% capture rate)	8216.8 $kgCO_2e$/hour
Scope 2	Electricity demand	33,925 kW
Scope 3	Natural Gas demand	64,074 kg/hour

ITEM	ACTIVITY	VALUE
	Downstream residual methane combustion emissions	2,127 $kgCO_2e$/hour
	Regular workers	50 Staff
	Irregular maintenance workers	400 people over a 7 day period every 4 years

19.3.64 The flare gas, flue vent and seal leakages, unabated CO_2 emissions and downstream CH_4 combustion emissions are already in kgCO2e/year, so were multiplied by the operational hours per year to calculate emissions in Table 19-10 and Table 19-11.

19.3.65 Imported electricity from the grid will decarbonise throughout the life of the project, and this is calculated using projections from ESNZ projections (2023). The figures in Table 19-10 and Table 19-11 represent the average grid emissions per year across the different phase timescales.

19.3.66 Upstream CH_4 emissions were calculated using the ESNZ well-to-tank factor of 0.423 $kgCO_2e/kg$ for natural gas which represents the upstream emissions from sourcing and extracting natural gas (Exergia, 2015; ESNZ, 2023). This emission factor also accounts for leakage in the upstream natural gas sourcing (Exergia, 2015).

19.3.67 Worker transport was calculated using the same assumptions and emission factors as construction emissions, detailed in paragraph 19.3.55.

Table 19-10: Average Annual GHG Emissions from Phase 1

ITEM	ACTIVITY/EMISSION SOURCE	EMISSIONS (TCO_2E/YEAR)
Scope 1	Flue gases, flare, vent gases and seal leakage	4,356.7
	Uncaptured CO_2 emissions (5% that is not captured at 95% capture rate)	72,028.6
Scope 2	Imported electricity (average of 2028-2029)	32,772.6
Scope 3	Upstream emissions (well to tank methane extraction)	237,679.8
	Downstream emissions (combustion of methane in output hydrogen product)	18,645.3
	Worker transport	172.7
TOTAL		365,655.6

Table 19-11: Average Annual GHG Emissions from Phase 2

ITEM	ACTIVITY/EMISSION SOURCE	EMISSIONS (TCO_2E/YEAR)
Scope 1	Flue gases, flare, vent gases and seal leakage	8713.4
	Uncaptured CO_2 emissions (5% that is not captured at 95% capture rate)	144,057.3
Scope 2	Imported electricity (average of 2030-2055)	14,209.1
Scope 3	Upstream emissions (well to tank methane extraction)	475,359.5
	Downstream emissions (combustion of methane in output hydrogen product)	37,290.6
	Worker transport	172.7
TOTAL		679,802.5

19.3.68 Over 28 years (25 years from completion of phase 2) the overall GHG emissions from Proposed Development operation add up to 16,404,094 tCO_2e.

19.3.69 The Proposed Development has an output of 22,175kg/hour of hydrogen in phase 1, which scales up to 44,350kg/hour in phase 2. The output stream has an energy content of 97,407 kJ/kg, or 27.06 kWh/kg. This gives an energy output of 252,461 GWh over 28 years (25 years from completion of phase 2).

19.3.70 Dividing the emissions in scope of the low carbon hydrogen standard, not including downstream combustion of residual CH_4 in the hydrogen stream and construction emissions, by the energy produced gives an emission factor of 17.0 gCO_2e/MJ compared to the low carbon standard of 20 gCO_2e/MJ_{HV} (Department for Business, Energy and Industrial Strategy, 2023).

19.3.71 The whole life carbon emissions of the Proposed Development, including downstream and construction emissions, have an emission factor of 65.0 gCO_2e/kWh represents a 72% reduction against the emissions associated with the whole life carbon emissions of natural gas (236.14 gCO_2e/kWh including combustion and well to tank).

19.3.72 This would add to an abatement of 43.2 $MtCO_2e$ over the life cycle of the project, as a result of replacing natural gas with hydrogen on a per kWh basis. It should be noted that this does constitute a higher footprint per kWh than electricity beyond 2029, which means that the benefits of the hydrogen product differ if used to displace other fuels such as coal or diesel. Its benefit would be maximised in 'hard-to-electrify' sectors.

19.3.73 If the DCO were to seek powers for generating hydrogen independently of carbon capture, effectively a carbon capture rate of 0%, the life cycle emissions would add up to 82,094,21 tCO_2e, equivalent to 111 gCO_2e/Mj compared to the low carbon standard of 20 gCO_2e/MJ. The overall emission factor of 405 gCO_2e/kWh represents a 71 % increase against the emissions associated with natural gas. Therefore, it is an assumption of the Proposed Development that 95% carbon capture will be achieved, secured via the environmental permit.

Decommissioning

19.3.74 In order to assess the magnitude of the climate change impacts through GHG emissions associated with Proposed Development decommissioning, the GHG emissions that would be associated with decommissioning activities include those associated with:

- demolition and excavation of all buildings and infrastructure, as required;
- Blowdown/venting of natural gas lines
- disposal and treatment of wastes; and
- return of the Proposed Development Site to an industrial brownfield use under hardstanding (i.e. no change in land use).

19.3.75 The Proposed Development has a long design life and as such it is not considered possible to reliably forecast decommissioning requirements and infrastructure far in the future. The decommissioning phase is anticipated to involve the removal of all above surface structures. It is assumed that all underground infrastructure would remain in-situ; however, all connection and access points would be sealed or grouted to ensure disconnection.

19.3.76 As the main processes associated with decommissioning are likely to be decarbonised by the end of the life-cycle of the plant, the emissions from decommissioning are expected to be minimal. To comply with the UK government's net zero commission, any decommissioning after 2050 would have to be net zero. For this reason it is not possible to provide a quantitative assessment of the decommissioning GHG emissions, but they are expected to be low in relation to Proposed Development construction and operation.

Uncertainty in Impact Analysis

Hydrogen Fugitive Emission

19.3.77 Hydrogen is not a recognised GHG, but has an indirect effect on the climate due to its effect on hydroxyl radicals leading to lengthening the atmospheric lifetime of CH_4 (Warwick, et al., 2022). The global warming effect of Hydrogen is still uncertain (Warwick, et al., 2022), therefore it has not been accounted for in the GHG assessment. There is a potential that fugitive emissions of Hydrogen could contribute to the impact of the Proposed Development though, so in line with the low carbon hydrogen standard the Proposed Development will minimise cold venting and fugitive emissions of Hydrogen throughout the operation.

Short Lived GHG Gases

19.3.78 CH_4 and hydrogen are both gases that break down relatively quickly in the atmosphere, compared to the 100-year timespan used for global warming analyses. GWP is a measure used to compare non-CO_2 gases that have a global warming effect to CO_2. In this CO_2 has a GWP of 1, so if a theoretical gas has a GWP of 2 then it has twice the warming effect over the selected timespan. This means that the effect of fugitive emissions are far higher if considered on a shorter time horizon such as 20 years. The IPCC estimates CH_4 to have a GWP of 56 as opposed to 21 (IPCC, 2023), while a UK Government study suggests hydrogen would have a GWP of 33 instead of 11 (Warwick, et al., 2022). This suggests that the risks of large increases in hydrogen emissions, from factory leakage, and CH_4 leakage from upstream extraction, may be far higher when considered in the 20-year time horizon to 2050. A key difference between these and CO_2 however is that the short term lifespan means that the global warming effect is more related to the rate of change of emissions i.e. if CH_4 emissions stay constant for 13 years (the atmospheric lifespan of CH_4) then there would not be any increased global warming effect (Allen, et al., 2018). CH_4 emissions are not likely to increase with the Proposed Development, however, as the CH_4 used comes from an existing connection and the resulting Hydrogen will likely serve the surrounding industrial cluster displacing natural gas. With hydrogen having a short lifespan of 2 years, and the Proposed Development reaching a relatively steady state of production after 2 years of phase 2, it is possible that there would not be any additional global warming effects from hydrogen leakage after the initial 2 years of phase 2 operation.

Effects from GHG Transport and Storage Network

19.3.79 As the carbon capture depends on a transport and storage network from the Net Zero Teesside (NZT) development, consideration needs to be given to construction and operational emissions from the network. The offshore construction, operation and decommissioning emissions from the network combine to 357,408 tCO_2e. The offshore element will provide CO_2 transport and storage capacity for multiple industrial emitters in the cluster, including NZT and H2 Teesside. As there are multiple users this 357,408 tCO_2e is not accounted for in the overall emissions. In the context of the overall construction emissions and long-term operation emissions of the development this is unlikely to affect the significance of the Proposed Development.

Natural Gas Leakage and Decarbonisation

19.3.80 65% of the assessed operational emissions are driven from upstream well-to-tank emissions of natural gas that already exist irrespective of the Proposed Development. This is often driven by CH_4 leakage in the supply chain (Bauer, et al., 2022). There is a degree of uncertainty in how much leakage from natural gas is likely, and whether it can be reduced. Whilst studies suggest it is possible that this leakage may be reduced, in turn reducing the carbon footprint of blue hydrogen (Bauer, et al., 2022), there are no reliable projections to base this on currently, so the current well-to-tank emissions of CH_4 extraction are extrapolated over the lifetime of the Proposed Development from current Government conversion factors. Whilst the upstream well-to-tank

emissions are a major contributor the GHG assessment, the hydrogen produced will likely be used by industrial users who rely on natural gas.

Summary of GHG Impact

19.3.81 Overall, the GHG emissions from the Proposed Development are Minor to Moderate adverse when viewing the plant boundary in isolation. However, when looking at the hydrogen product and its ability to enable a transition to a lower carbon economy, the Proposed Development has a Significant benefit due to its reduced footprint vs natural gas or other fuels such as diesel or coal. The overall quantitative benefit depends on the end-use of hydrogen.

19.3.82 Overall the Proposed Development would lead to a saving of 43.2 $MtCO_2e$, 63.3 $MtCO_2e$ and 84.3 $MtCO_2e$ over the lifetime of the Proposed Development compared to natural gas, diesel (vehicle usage scenario) and industrial coal (steel plant scenario) respectively - these savings are shown in Plate 19-2. It is anticipated that natural gas will be the main fuel source that is replaced by hydrogen in Phase 1, and uncertain beyond Phase 2.

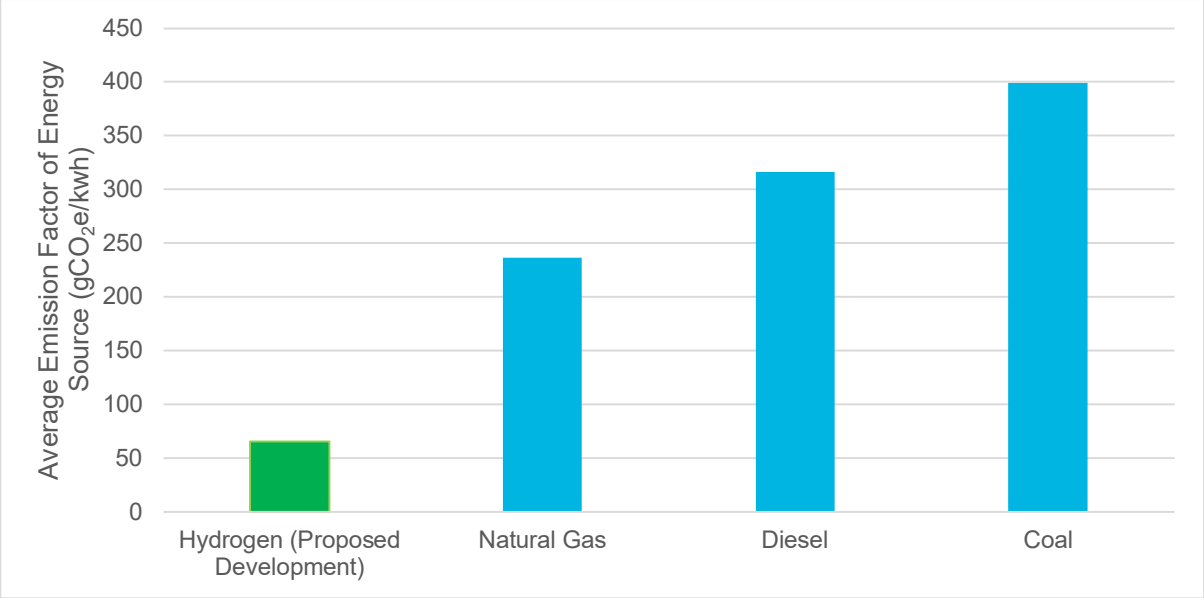

Plate 19-2: Projected Emission Factor of Hydrogen from the Proposed Development, Contrasted with Natural Gas, Diesel and Coal

19.4 Climate Change Resilience Assessment

Methodology

Study Area

19.4.1 The Study Area for the Climate Change Resilience Assessment (CCRA) is the Proposed Development Site itself.

Project Environment

19.4.2 The CCRA considers a '*do something*' scenario with the delivery of the Proposed Development, including its construction, operation and decommissioning.

Sensitive Receptors

19.4.3 Sensitive receptors include workers, occupiers, users, equipment, utilities and associated infrastructure. Sensitive receptors affected by specific climate impacts are detailed in Appendix 19A: Climate Change Resilience Assessment (PEI Report, Volume III).

Climate Variables and Parameters

19.4.4 Climate parameters considered in the CCRA during the construction, operation and decommissioning of the Proposed Development include the following:

- extreme weather events;
- flood risk;
- sea level rise (SLR);
- temperature change; and
- rainfall change.

19.4.5 The CCRA has qualitatively reviewed the Proposed Development's resilience to climate change considering the UK Climate Projections 2018 (UKCP18) (Met Office, 2018a) for the geographical location and timeframe of the Proposed Development (including its construction, operation and decommissioning).

19.4.6 The CCRA has been undertaken for the Proposed Development to identify potential climate change impacts on the Proposed Development and associated receptors, and to consider their potential consequence and likelihood of occurrence, taking account of the measures incorporated into the Proposed Development design.

19.4.7 Climate change projections for the Proposed Development Site during the construction phase have been examined against receptors applicable to this stage, namely the construction workforce, plant, machinery and materials.

Determining Construction Effects

19.4.8 As the construction phase is relatively short from a climatic perspective (4-5 years) and is expected to occur in the immediate future, it is not anticipated that there will be any significant climate impacts. Accordingly, the CCRA for the construction phase uses a qualitative descriptive based approach.

Determining Operational Effects

19.4.9 For the Proposed Development operational phase, potential climate change impacts have been identified using relevant projections from UKCP18. The CCRA considers potential consequence to receptors and the likelihood of occurrence, taking account of the measures incorporated into the Proposed Development design. Receptors when the Proposed Development is complete include the Proposed Development's assets and their operation, maintenance and refurbishment.

19.4.10 The CCRA considers the strategic aims and objectives encompassed within national and local planning policy (refer to Section 19.2), such as the NPS EN-1, the NPPF, the National Planning Policy Guidance on Climate Change, the Tees Valley Climate Change

Strategy and the RCBC Local Plan. These documents detail the broader aims of minimising the adverse impacts of climate change, whilst requiring new development to take climate change considerations into account within their designs. Ways in which resilience of the Proposed Development to climate change can be enhanced have been assessed and mitigation measures identified.

19.4.11 The CCRA considers resilience against both gradual climate change and the risks associated with an increased frequency of extreme weather events as per the UKCP18 (The Met Office, 2018a).

19.4.12 The identification and assessment of climate change resilience within EIA is an area of emerging practice. There is no single prescribed format for undertaking such assessments; therefore, the approach adopted to undertaking and reporting the assessment has drawn on good practice from other similar developments and studies and is aligned with existing guidance such as that of IEMA (IEMA, 2020).

19.4.13 The types of receptors considered vulnerable to climate change include:

- construction phase receptors (i.e. workforce, plant and machinery);
- the Proposed Development assets and their operation, maintenance and refurbishment (e.g. pavements, structures, earthworks and drainage, technology assets, etc.); and
- end-users (e.g. staff and commercial operators etc.).

19.4.14 The potential climate change impacts identified in the CCRA are determined based on the UKCP18 projections. Climatic parameters that are included in the CCRA are detailed in paragraph 19.4.4. Further data has been obtained, where available, for other climate variables and types of extreme acute weather events, namely:

- heavy rainfall events;
- droughts (extended periods of low precipitation);
- heat waves (high temperatures);
- frosts/freezes (low temperatures);
- humidity;
- wind speed;
- storm surges;
- lightning; and
- fog.

Determining Decommissioning Effects

19.4.15 Although the impacts of climate change are likely to be more acute during the Proposed Development decommissioning phase, this phase is expected to be of shorter in duration than construction. Accordingly, the CCRA for the decommissioning phase follows a descriptive based approach.

Scope of CCR Assessment

19.4.16 The scope of the CCRA is set out in Table 19-12.

Table 19-12: CCRA Climate Variable Scope

CLIMATE PARAMETER	CONSIDERED IN CCRA REVIEW	RATIONALE
Extreme weather event	In	The Proposed Development may be vulnerable to extreme weather events such as storm damage, coastal erosion and storm surge to structures and assets.
Precipitation	In	The Proposed Development may be vulnerable to changes in precipitation, for example, pressure on water supply during periods of reduced rainfall, and damage to structures and drainage systems during periods of heavy precipitation and resultant flooding.
Temperature	In	Increased temperatures may increase cooling requirements of the Proposed Development and could impact on structural integrity of buildings and materials.
Sea level rise	In	The Proposed Development Site is located in an area that is susceptible to sea level rise.
Sea temperature	Out	The Proposed Development is not likely to be affected by the small increase in sea temperature during its operational life.
Wind	Out	The impacts of wind on receptors in the surrounding environment and the Proposed Development assets are likely to be no worse relative to baseline conditions.

19.4.17 The CCRA identifies potential climate change impacts and considers their potential consequence and likelihood of occurrence. The following key terms and definitions relating to the CCRA are used:

a) Climate hazard – a weather or climate related event which has the potential to do harm to environmental or community receptors or assets, for example, increased winter precipitation;

b) Climate change impact – an impact from a climate hazard which affects the ability of the receptor or asset to maintain its function or purpose; and

c) Consequence – any effect on the receptor or asset resulting from the climate hazard having an impact.

19.4.18 A stepped approach has been used to assess the impacts of climate change on the Proposed Development as follows:

a) Identify climate hazard;

b) Identify likelihood of climate impact occurring;

c) Identify consequence of impact on the Proposed Development; and

d) Identify significance of effect (likelihood of impact occurring x consequence of impact).

19.4.19 Potential climate hazards are identified based on data extracted from UKCP18 for the climate parameters identified in 19.4.31.

Significance Criteria

19.4.20 For the Proposed Development operational phase, once potential impacts have been identified, the likelihood and consequence of each impact occurring to each receptor (where relevant) have been assessed for the selected future time frame for operation.

19.4.21 The criteria which have been used to determine the likelihood of a climate change impact occurring is detailed in Table 19-13.

Table 19-13: Description of Climate Impact Likelihood

LIKELIHOOD OF CLIMATE IMPACT OCCURRING	DESCRIPTION (PROBABILITY OF OCCURRENCE)
Very Likely	90 - 100% probability that the hazard will occur.
Likely	66 - 90% probability that the hazard will occur.
Possible, about as likely as not	33 - 66% probability that the hazard will occur.
Unlikely	10 - 33% probability that the hazard will occur.
Very Unlikely	0 - 10% probability that the hazard will occur.

19.4.22 Following identification of the likelihood of the climate impact occurring, the consequences of the impact have been assessed according to Table 19-14. The categories and descriptions provided are based on the IEMA climate change resilience and adaptation guidance.

Table 19-14: Climate Impact Consequence Descriptions

CONSEQUENCE OF IMPACT	DESCRIPTION
Very High	• Permanent damage to structures/assets; • Complete loss of operation/service; • Complete/partial renewal of infrastructure; • Serious health effects, possible loss of life; • Extreme financial impact; and • Exceptional environmental damage.
High	• Extensive infrastructure damage and complete loss of service; • Some infrastructure renewal; • Major health impacts; • Major financial loss; and • Considerable environmental impacts.
Medium	• Partial infrastructure damage and some loss of service; • Moderate financial impact; • Adverse effects on health; and • Adverse impact on the environment.
Low	• Localised infrastructure disruption and minor loss of service; • No permanent damage, minor restoration work required; and • Small financial losses and/or slight adverse health or environmental effects.
Very Low	• No damage to infrastructure; • No impacts on health or the environment; and • No adverse financial impact.

19.4.23 Engagement has been undertaken with relevant environmental disciplines as included within this PEI Report and the engineering design team to discuss the CCRA and identify mitigation measures for incorporation into the Proposed Development design. Measures to adapt the Proposed Development are identified where potential climate change consequences are identified as being potentially significant.

19.4.24 The significance is determined by:

Likelihood of climate hazard occurring x Consequence to receptor if climate hazard occurs

19.4.25 The significance level of the identified climate risk is determined through a combination of the likelihood of the hazard occurring and the severity of the potential consequence, as outlined in Table 19-15.

Table 19-15: Climate Change Impact Significance Matrix

		LIKELIHOOD OF CLIMATE CHANGE HAZARD OCCURRING				
		VERY UNLIKELY	UNLIKELY	POSSIBLE	LIKELY	VERY LIKELY
CONSEQUENCE	Very Low	Negligible	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Minor	Minor	Minor	Minor
	Medium	Negligible	Minor	Moderate	Moderate	Moderate
	High	Negligible	Minor	Moderate	Major	Major
	Very High	Negligible	Minor	Moderate	Major	Major

19.4.26 The overall methodology for the CCRA is summarised in Plate 19-3.

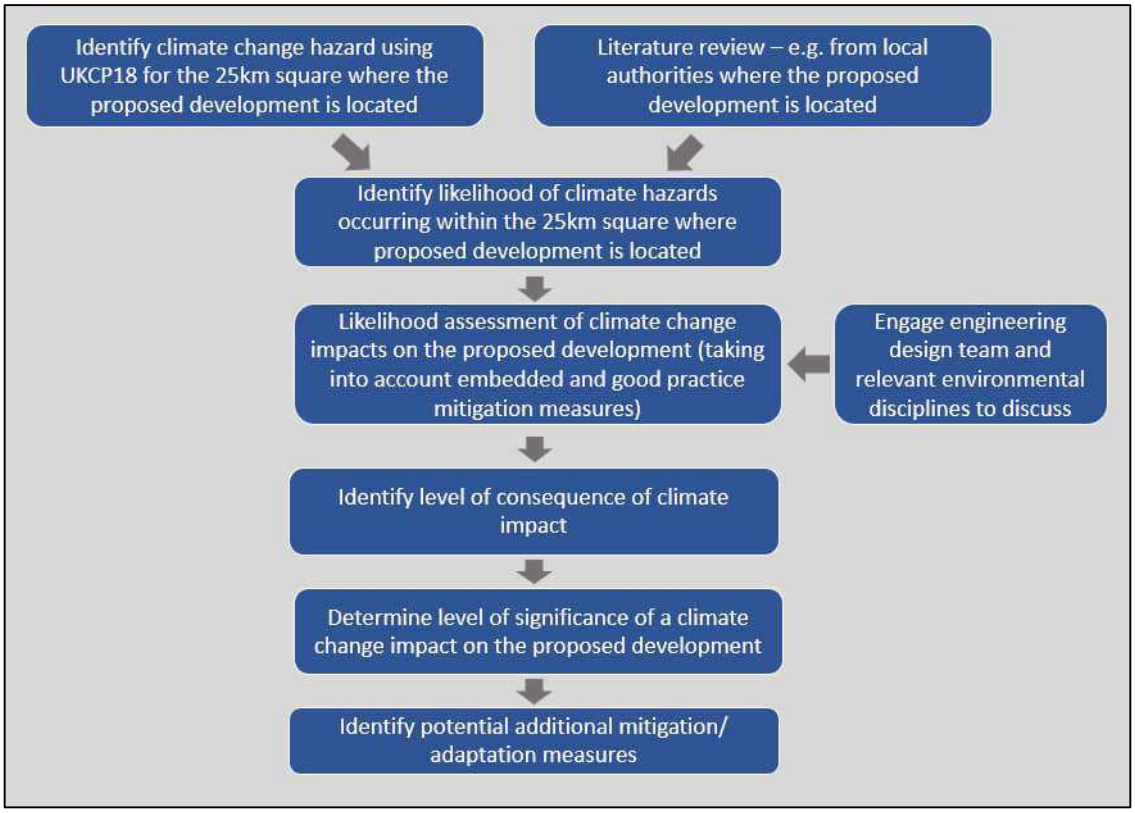

Plate 19-3: CCRA Methodology

Baseline Conditions

Existing Baseline

19.4.27 The current baseline for the CCRA is based on historic climate data obtained from the Met Office (2020) recorded by the closest meteorological station to the Proposed Development Site (Stockton-on-Tees located approximately 11 km from the Proposed Development Site) for the period 1981 – 2010 – refer to Table 19-16. This baseline considers how resilient the Proposed Development is to current and projected future climates.

Table 19-16: Historic Climate Data

CLIMATIC VARIABLE	MONTH	VALUE
Average annual maximum daily temperature (°C)	-	13.1
Warmest month on average (°C)	July	20.4
Coldest month on average (°C)	December and January	0.7
Mean annual rainfall levels (mm)	-	574.2
Wettest month on average (mm)	August	60.6
Driest month on average (mm)	February	32.9

19.4.28 The Met Office historic 10-year averages for the 'East and North East England' region identify gradual warming (although not uniformly so) between 1970 and 2019, with increased rainfall. Information on mean maximum annual temperatures and mean annual rainfall is summarised in Table 19-17.

19.4.29 In comparison to the historic climate data, Stockton-on-Tees appears somewhat drier than the average for the region. As described by the Met Office (2016), rainfall is greater across the Pennines and "*decreases as land falls eastwards, such that the east coast is one of the driest parts of the UK with less than 600 mm in places such as Tees-side and the Northumbrian coast*".

Table 19-17: Historic 10-year Averages for Temperature and Rainfall for the East and North East England

CLIMATE PERIOD	CLIMATE VARIABLE	
	MEAN MAXIMUM ANNUAL TEMPERATURES (^{O}C)	MEAN ANNUAL RAINFALL (MM)
1970 - 1979	12.0	698.2
1980 - 1989	12.0	748.2

CLIMATE PERIOD	CLIMATE VARIABLE	
	MEAN MAXIMUM ANNUAL TEMPERATURES (^{O}C)	MEAN ANNUAL RAINFALL (MM)
1990 - 1999	12.7	720.2
2000 - 2009	13.2	824.9
2010 - 2019	13.1	796.2

Future Baseline

19.4.30 The future baseline for the CCRA is based on future UKCP18 data from the Met Office for the Stockton-on-Tees area (The Met Office, 2019a). This projection data provides probabilistic indications of how global climate change is likely to affect areas of the UK using pre-defined climate variables and time periods.

19.4.31 For the purpose of the assessment, UKCP18 probabilistic projections for pre-defined 20-year periods for the following average climate variables have been obtained and analysed:

- mean annual temperature;
- mean summer temperature;
- mean winter temperature;
- maximum summer temperature;
- minimum winter temperature;
- mean annual precipitation;
- mean summer precipitation;
- mean winter precipitation; and
- sea level rise.

19.4.32 Projected variables are presented in Table 19-18 and Table 19-19. UKCP18 probabilistic projections have been analysed for the 25 km grid square in which the Proposed Development Site is located. These figures are expressed as temperature/ precipitation anomalies in relation to the 1981 - 2000 baseline. This baseline was selected as it provides projections for 20-year time periods (e.g. 2020 - 2039) for the parameters analysed within the assessment compared to the 30-year land-based projections that would be generated from the 1981 - 2010 baseline.

19.4.33 UKCP18 uses a range of possible scenarios, classified as Representative Concentration Pathways (RCPs), to inform differing future emission trends. These RCPs *"... specify the concentrations of greenhouse gases that will result in total radiative forcing increasing by a target amount by 2100, relative to preindustrial levels."* RCP 8.5 is considered to be the worst-case global scenario with the greatest

concentration of GHGs in the atmosphere and has been used for the purposes of this assessment as a worst-case scenario.

19.4.34 As the design life of the Proposed Development is relatively short (25 years from completion of phase 2) and does not extend far beyond the point where the emissions scenarios begin to differ significantly (2040), only the RCP 8.5 emissions scenario has been selected for analysis.

19.4.35 Construction of the Proposed Development is expected to take approximately five years. Construction of Phase 1 is likely to last approximately three years. Phase 2 works will commence thereafter (2028) and last a further two to three years, with construction expected to be completed by the end of 2030. Please refer to Chapter 5: Construction Programme and Management (PEI Report, Volume I) for further detail.

19.4.36 Power generation and carbon capture are expected from 2028 for up to 28 years (25 years from completion of phase 2). Therefore, the CCRA has considered a scenario that reflects a high level of GHG at the 10%, 50% and 90% probability levels up to the 2069 projection to assess the impact of climate change over as much of the lifetime of the Proposed Development as possible.

Table 19-18: Projected Changes in Temperature Variables (°C), 50% Probability (10% and 90% Probability in Parenthesis)

CLIMATE VARIABLE	TIME PERIOD		
	2020-2039	2030-2049	2050-2069
Mean annual air temperature anomaly at 1.5 m (°C)	+1.0 (+0.4 to +1.6)	+1.3 (+0.6 to +2.1	+2.1 (+1.0 to +3.2)
Mean summer air temperature anomaly at 1.5 m (°C)	+1.0 (+0.2 to +1.8)	+1.3 (+0.3 to +2.3)	+2.4 (+0.7 to +4.2)
Mean winter air temperature anomaly at 1.5 m (°C)	+1.0 (0.0 to +1.9)	+1.3 (+0.1 to +2.5)	+1.9 (+0.5 to +3.5)
Maximum summer air temperature anomaly at 1.5 m (°C)	+1.1 (+0.2 to +2.1)	+1.5 (+0.3 to +2.7)	+2.6 (+0.8 to +4.6)
Minimum winter air temperature anomaly at 1.5 m (°C)	+1.0 (+0.0 to +2.0)	+1.3 (+0.2 to +2.4)	+1.9 (+0.5 to +3.3)

Table 19-19: Projected Changes in Precipitation Variables (%), 50% Probability (10% and 90% Probability in Parenthesis)

CLIMATE VARIABLE	TIME PERIOD		
	2020-2039	2030-2049	2040-2059
Annual precipitation rate anomaly (%)	+4.5 (-1.5 to +11.2)	+1.5 (-3.5 to +6.9)	+0.8 (-6.0 to +8.3)
Summer precipitation rate anomaly (%)	-2.0 (-16.8 to +14.7)	-5.1 (-19.9 to +11.3)	-16.4 (-36.6 to +5.5)
Winter precipitation rate anomaly (%)	+9.5 (-3.0 to +22.8)	+12.0 (-1.2 to +26.3)	+14.6 (-4.3 to +35.7)

19.4.37 Sea level rise may increase up to 14 cm when Proposed Development operations start (approximately 2028 and up to 33 cm when operations are completed, decommissioning starts (from 2056). The ranges of projected sea level rise from the 1981 - 2000 baseline are detailed in Table 19-20.

Table 19-20: Sea Level Rise Projections

	YEAR			
	2022	2028	2056	2071
Sea level anomaly (m)	+0.08 (+0.06 to +0.11)	+0.11 (+0.08 to +0.14)	+0.26 (+0.19 to +0.33)	+0.39 (+0.29 to +0.53)

19.4.38 Sea temperature change projections are more variable, but under RCP 8.5 a rise in global sea surface temperature of 1.5°C by 2050 is predicted, and 3.2°C by 2100, relative to 1870 - 1899 temperatures. In UK waters, mean annual sea temperatures have risen by 0.8°C since 1870, and have shown a consistent warming trend from the 1970s onwards (Genner et al., 2017). According to Lowe et al., (2009), the seas around the UK are projected to be 1.5 - 4 °C warmer by 2100.

19.4.39 Using the climate variable likelihood data for future baselines and the definitions for likelihood (Table 19-13), the likelihood of occurrence of potential climate hazards is detailed in Table 19-21.

Table 19-21: Potential Climate Hazards and Likelihood of Occurrence (from UKCP18 Projections)

CLIMATE VARIABLE	POTENTIAL HAZARD	2020-2039 LIKELIHOOD	2030-2049 LIKELIHOOD	2050-2069 LIKELIHOOD
Mean annual air temperature anomaly at 1.5 m (°C)	Increase in mean annual air temperature	Very likely	Very likely	Very likely
Mean summer air temperature anomaly at 1.5 m (°C)	Increase in mean summer air temperature	Very likely	Very likely	Very likely
Mean winter air temperature anomaly at 1.5 m (°C)	Increase in mean winter air temperature	Very likely	Very likely	Very likely
Maximum summer air temperature anomaly at 1.5 m (°C)	Increase in maximum summer air temperature	Very likely	Very likely	Very likely
Minimum winter air temperature anomaly at 1.5 m (°C)	Increase in minimum winter air temperatures	Very likely	Very likely	Very likely
Annual precipitation rate anomaly (%)	Decrease in annual precipitation rate	Unlikely	Unlikely	Possible
Summer precipitation rate anomaly (%)	Decrease in summer precipitation rate	Possible	Likely	Likely
Winter precipitation rate anomaly (%)	Increase in winter precipitation rate	Very likely	Very likely	Very likely
Sea level rise (m)	Increase in sea level	Very likely	Very likely	Very likely

CLIMATE VARIABLE	POTENTIAL HAZARD	2020-2039 LIKELIHOOD	2030-2049 LIKELIHOOD	2050-2069 LIKELIHOOD
Sea temperature rise (°C)	Increase in sea surface temperature	Very likely	Very likely	Very likely

19.4.40 The 2019 State of the UK Climate Report (Kendon et al., 2020) states that there are *"no compelling trends in storminess when considering maximum gust speeds over the last five decades"*, therefore an increase in storm intensity is currently considered unlikely.

19.4.41 Kendon et al., (2020) states that there has been a decline in the longest sequence of consecutive dry days. However, projected drier summers are suggestive of a drying trend. Therefore, an increase in droughts is currently considered possible.

19.4.42 Research by Sanderson et al., (2017) into the historical trends of heatwave frequency in the UK found variable results, with some weather stations recording a decline in very long heatwaves and others an increase in short heatwaves. Accordingly, the likelihood of an increase in heatwaves is considered possible.

Proposed Development Design and Impact Avoidance

Construction

19.4.43 Full details of design measures embedded in the Proposed Development design that reduce its vulnerability to climate change are detailed Chapter 9: Surface Water, Flood Risk and Water Resources and Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I) - examples of these measures include:

- storage of topsoil and other construction materials stored outside of the 1 in 100-year floodplain to protect materials from high rainfall and flooding events or sea level rise;
- suitable storage and bunding of pollutants to protect from high rainfall events or sea level rise. This will be further supported by a Water Management Plan and a Site Emergency Response Plan;
- laydown and welfare areas will be laid with permeable membranes to protect the site from high rainfall and flooding events or sea level rise;
- the Contractor will monitor weather forecasts and receive Environment Agency flood alerts and plan works accordingly, protecting workers and resources from any extreme weather conditions such as storms, flooding or heatwaves.

19.4.44 In addition to the above, mitigation measures to reduce the vulnerability of the Proposed Development construction phase to climate change will be detailed in the Framework CEMP which will be included within the ES and will accompany the DCO Application.

Operation

19.4.45 Full details of embedded design measures that reduce the vulnerability of the Proposed Development are contained within other technical disciplines within this PEI Report, such as Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I). Examples of such measures include:

- Suitable storage and bunding of pollutants to protect from high rainfall events or sea level rise. This will be supported by a Site Emergency Response Plan.
- Cabling will be buried underground, insulating against overheating during heatwaves.
- Installation of a suitable surface water drainage network and management system through the Surface Water Drainage Strategy, Sustainable drainage systems (SuDS), to protect the Proposed Development Site from high rainfall events or sea level rise. This will be supported by a Surface Water Maintenance and Management Plan.
- To mitigate flood risk associated with sea level rise, a raised development platform will be provided for the Proposed Development to ensure the Finished Floor Levels will be no lower than 7.5m, allowing for continued operation in the occurrence of a flood event. This raised platform will also allow for additional below ground attenuation and gravity discharge to support the proposed drainage system.

Decommissioning

19.4.46 At this stage, limited specific mitigation measures have been identified for the decommissioning phase of the Proposed Development. A DEMP would be produced to appropriate guidance and legislation at the time and is likely be similar to that of the construction phase but reflect future climatic conditions at that point in time.

Likely Impacts and Effects

19.4.47 This section presents a summary of the findings of the CCRA for the construction, operation and decommissioning of the Proposed Development. Components of the Proposed Development that have been considered include all infrastructure, plant and machinery, all workers, staff or visitors on-site and materials.

19.4.48 This section identifies any likely significant effects that are predicted to occur and then highlights any additional mitigation and enhancement measures that could add an additional beneficial contribution on top of the embedded measures.

Description of Potential Effects

19.4.49 The potential impacts and effects of projections for climate change to the Proposed Development are detailed in Appendix 19A: Climate Change Resilience Assessment (PEI Report, Volume III), and are based upon that scoped into the assessment (Table 19-12).

19.4.50 Potential climate change impacts, the likelihood and consequences to the construction, operation and decommissioning of the Proposed Development,

together with the adaptation methods to increase the resilience of the Proposed Development are detailed in Appendix 19A: Climate Change Resilience Assessment (PEI Report, Volume III).

Summary of CCR Impacts

19.4.51 A range of climate change hazards and their potential impact upon the Proposed Development have been identified. The measures embedded within the Proposed Development design as detailed herein are deemed sufficient to reduce the likelihood or consequence of an impact occurring as a result of these projected climate hazards. As such, no significant resilience risks have been identified.

Mitigation and Enhancement Measures

19.4.52 The management of impacts and the application of mitigation/adaption measures during Proposed Development construction will be enforced through the Framework CEMP.

19.4.53 No additional mitigation measures are required due to the lack of significant climate change risks to the Proposed Development.

Limitations and Difficulties

19.4.54 The CCRA assumes that the defined mitigation measures will be incorporated into the Proposed Development design. No additional mitigation has been identified as necessary for any stage of the Proposed Development.

19.4.55 While modelled climate change projections represent anticipated average weather conditions, they do not capture the full range of possible future severe weather events (e.g. droughts, heatwaves and prolonged heavy rainfall).

19.4.56 The CCRA is limited by the availability of data and Proposed Development design information at the date this assessment was prepared.

Residual Effects and Conclusions

19.4.57 No residual CCR effects have been identified. As a result of this, no further mitigation measures are recommended.

19.5 In-Combination Climate Change Impact (ICCI) Assessment

19.5.1 This ICCI assessment aims to identify any impacts to receptors in the surrounding environment or communities that occur due to the combined impacts of climate change and the construction and operation of the Proposed Development. Given that the preliminary nature of the assessment, it is not currently possible to undertake a full ICCI assessment. As such, discussions with design and technical assessment teams will be undertaken between the issue of this PEI Report and the issue of the ES to identify any possible in-combination impacts and effects. The results will be presented in the ES.

Methodology

Study Area

19.5.2 The Study Areas used for the ICCI assessment comprises the Study Areas defined in each of the relevant topic chapters in this PEI Report (Chapters 8 – 24: PEI Report Volume I). This assessment aims to determine the influence of climate change and related impacts to the identified receptors in each of the assessments in those chapters.

19.5.3 The ICCI assessment considers the ways in which projected climate change will influence the significance of the effects of the Proposed Development on receptors in the surrounding environment.

Project Environment

19.5.4 The ICCI considers a '*do something*' scenario with the delivery of the Proposed Development, including its construction, operation and decommissioning.

Sensitive Receptors

19.5.5 The ICCI assessment considers the sensitive receptors as identified by each technical discipline in Chapters 8 to 24 of this PEI Report (PEI Report, Volume I). The ICCI assessment is undertaken by individual technical disciplines in regard to the identified sensitive receptors in each assessment.

Determining Effects

19.5.6 The methodology for determining climate change impact effects can be considered the same as the CCRA and is undertaken by technical specialists responsible for their applicable chapter.

Scope

19.5.7 The scope of the ICCI is considered the same as that of the CCRA, as presented in Table 19-12.

Significance Criteria

19.5.8 Once climate hazards are identified for the receptors associated with the Proposed Development, the likelihood of their occurrence and the sensitivity of the receptor is considered in order to determine the likelihood of a climate impact occurring during the Proposed Development's lifespan is categorised as per Table 19-22.

Table 19-22: ICCI Climate Impact Likelihood Descriptions

LEVEL OF LIKELIHOOD OF CLIMATE IMPACT OCCURRING	QUALITATIVE DESCRIPTION	QUANTITATIVE DESCRIPTION
Very likely	Likely that the impact will occur many times (reoccurs frequently).	90-100% probability that the impact will occur during the life of the Proposed Development.

LEVEL OF LIKELIHOOD OF CLIMATE IMPACT OCCURRING	QUALITATIVE DESCRIPTION	QUANTITATIVE DESCRIPTION
Likely	Likely that the impact will occur sometimes (reoccurs infrequently).	66-90% probability that the impact will occur during the life of the Proposed Development.
Possible, about as likely as not	Possible that the impact will occur (has occurred rarely).	33-66% probability that the impact will occur during the life of the Proposed Development.
Unlikely	Unlikely that the impact will occur (not known to have occurred).	10-33% probability that the impact will occur during the life of the Proposed Development.
Very unlikely	Almost inconceivable that the impact will occur.	0-10% probability that the impact will occur during the life of the Proposed Development.

19.5.9 The likelihood of a climate hazard occurring and the likelihood of an impact to a receptor is then combined to determine the likelihood of an ICCI occurring. This matrix is illustrated in Table 19-23.

Table 19-23: ICCI Occurrence Matrix

LEVEL OF LIKELIHOOD OF CLIMATE IMPACT OCCURRING	DEFINITION OF LIKELIHOOD
High	Likelihood of climate hazard occurring is high and impact is always/almost always going to occur.
Moderate	Likelihood of climate hazard occurring is high and impact occurs often or the likelihood of climate hazard occurring is moderate and impact is likely to occur always/almost always.
Low	Likelihood of climate hazard occurring is high, but impact rarely occurs or the likelihood of climate hazard occurring is moderate and impact sometimes occurs or the likelihood of climate hazard occurring is low and impact is likely to occur always/almost always.
Negligible	All other eventualities - highly unlikely but theoretically possible.

19.5.10 Once the likelihood of an ICCI has been identified, the assessment then considers how this will affect the significance of the identified effects.

19.5.11 The ICCI consequence criteria are defined in Table 19-24 and are based on the change to the significance of the effect already identified by the applicable environmental discipline. To assess the consequence of an ICCI each discipline has assigned a level of consequence to an impact based on the criteria description and their discipline assessment methodology.

Table 19-24: ICCI Consequence Criteria

CONSEQUENCE	CONSEQUENCE CRITERIA
High	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the effect of the Proposed Development on the resource/receptor, as defined by the topic, to increase from negligible, low, or moderate to major.
Moderate	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of effect defined by the topic to increase from negligible or low, to moderate.
Low	The climate change parameter in-combination with the effect of the Proposed Development, causes the significance of effect defined by the topic, to increase from negligible to low.
Negligible	The climate change parameter in-combination with the effect of the Proposed Development does not alter the significance of the effect defined by the topic.

19.5.12 The significance of potential effects is determined using the matrix in Table 19-25. Where an effect has been identified as moderate or high is classed as a significant ICCI effect. If significant ICCI effects are assessed, then appropriate additional mitigation measures are identified.

Table 19-25: ICCI Significance Matrix

CONSEQUENCE	LIKELIHOOD			
	NEGLIGIBLE	LOW	MODERATE	HIGH
Negligible	Not Significant	Not Significant	Not Significant	Not Significant
Low	Not Significant	Not Significant	Not Significant	Significant
Moderate	Not Significant	Not Significant	Significant	Significant
High	Not Significant	Significant	Significant	Significant

Baseline Conditions

19.5.13 The existing and future baseline conditions for the ICCI are the same as those described for the CCRA (see paragraphs 19.4.18 to 19.4.22) and in topic chapters.

Likely Impacts and Effects

19.5.14 Given that the preliminary nature of the assessment, it is not currently possible to undertake a full ICCI assessment. As such, discussions with design and technical assessment teams will be undertaken between the issue of this PEI Report and the issue of the ES to identify any possible in-combination impacts and effects. The results will be presented in the ES.

Mitigation and Enhancement Measures

19.5.15 Discussions with design and technical assessment teams will be undertaken between the issue of this PEI Report and the issue of the ES to identify any possible mitigation and enhancement measures as associated with ICCI effects. These results will be presented in the ES.

Assumptions and Limitations

19.5.16 While modelled climate change projections represent anticipated changes to average weather conditions, they cannot predict the frequency and severity of acute events such as droughts, heatwaves and prolonged heavy rainfall. Therefore, the ICCI assessment is based upon UKCP18 predictions for general changes in climate conditions, and only a high-level assessment of acute events will be included in this assessment.

19.5.17 The ICCI assessment is limited by the availability of data and information at this stage of the assessment. The full ICCI assessment will be detailed in the ES.

Residual Effects and Conclusions

19.5.18 No residual effects or conclusions can be presented at this stage. The full ICCI assessment results and conclusions will be presented in the ES.

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20.0 MAJOR ACCIDENTS AND DISASTERS

20.1 Introduction

20.1.1 This chapter of the Preliminary Environmental Information (PEI) Report presents an assessment of the potential Major Accidents and Disasters (MA&Ds) being considered as part of the Environmental Impact Assessment (EIA) for the Proposed Development. The assessment has been undertaken in accordance with best practice guidance, including "Major Accidents and Disasters in EIA: An IEMA Primer", published by the Institute of Environmental Management and Assessment (IEMA) (IEMA, 2020).

20.1.2 This chapter includes:

- an assessment of reasonably foreseeable worst-case MA&D scenarios that could credibly arise during the construction, operation and decommissioning of the Proposed Development;
- the potential environmental consequences;
- the measures envisaged to prevent or mitigate potentially significant adverse effects of such events on the environment; and
- details of the preparedness for, and proposed response to, MA&D hazards.

20.1.3 The assessment of MA&Ds has incorporated the findings of a number of other key studies, carried out in support of the PEI Report, including the identification of environmental and human health receptors in the vicinity of the Proposed Development, Appendix 9A: Preliminary Flood Risk Assessment (PEI Report, Volume III), and the assessment of the sensitivity of receptors such as ground, groundwater and others.

20.1.4 The main objective of this preliminary assessment is to identify appropriate precautionary actions to prevent, or mitigate, potentially significant risks associated with MA&Ds.

20.1.5 This chapter is supported by the following figure (PEI Report, Volume II) and technical appendix (PEI Report, Volume III):

- Figure 20-1: Major Accidents and Disasters Study Area; and
- Appendix 20A: Long List of MA&Ds Risk Events.

20.2 Legislation and Planning Policy Context

Legislative Background

International Legislation

The Environmental Impact Assessment Directive 2014/ 52/ EU

20.2.1 The topic of MA&Ds was introduced into the EIA Regulations as a result of EU Directive 2014/ 52/ EU, which states, *"In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which,*

because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment."

National Legislation

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations')

20.2.2 Regulation 5, paragraph 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 states that: *"The significant effects to be identified, described and assessed include, where relevant, the expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to that development."*

20.2.3 Schedule 4, paragraph 8 requires an Environmental Statement (ES) to provide: *"A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned."*

The Health and Safety at Work etc. Act 1974 (HSWA)

20.2.4 The HSWA provides a regulatory framework to ensure the provision of a safe working environment of those in the UK. It also includes provision for those visiting a worksite and those who may be affected offsite by workplace emergencies. It includes the requirement to undertake a risk assessment of occupational hazards and apply the hierarchy of controls to mitigate identified risks such that the residual risks are reduced to a level that is As Low As Reasonably Practicable (the 'ALARP' principle).

20.2.5 Many associated regulations have been made under the HSWA including, but not limited to the following of relevance to the control of MA&Ds of the Proposed Development:

- The Pipelines Safety Regulations (PSR) (SI 1996 No. 825) (HMSO, 1996) (as amended SI 2023 No. 284);
- The Gas Safety (Management) Regulations (SI 1996 No. 551) (HMSO, 1996);
- The Management of Health and Safety at Work Regulations (SI 1999 No. 3242) (HMSO, 1999);
- The Dangerous Substances and Explosive Atmospheres Regulations (SI 2002 No. 2776) (HMSO, 2002);
- The Control of Substances Hazardous to Health Regulations (SI 2002 No. 2677) (HMSO, 2002);
- The Construction (Design and Management) (CDM) Regulations (SI 2015 No. 51) (HMSO, 2015); and

- The Control of Major Accident Hazards (COMAH) Regulations (SI 2015 No. 483) (HMSO, 2015).

20.2.6 The Proposed Development will be subject to the HSWA and associated regulations, including those listed in paragraph 20.1.5. These regulations will be referenced where appropriate throughout the assessment, however, this assessment does not seek to duplicate the assessment of matters covered by these regulatory regimes. Instead, it assumes that they are embedded in the design and operation of the Proposed Development and are effective in their intent to reduce residual risks to ALARP.

Other Relevant Legislation

20.2.7 The legislative basis for issues which may influence the control of, or responsibility for, MA&Ds, in the UK, includes, but is not limited to, the following regulations. This legislation is referenced where appropriate in the course of this assessment, but, as above, this assessment does not substitute for the appropriate assessment of matters required by these regulations:

- Occupier's Liability Act (SI 1984 No. 3) (HMSO, 1984);
- Civil Contingencies Act (SI 2004 No. 36) (HMSO, 2004);
- The Supply of Machinery (Safety) Regulations (SI 2008 No. 1597) (HMSO, 2008);
- The Provision and Use of Work Equipment Regulations (SI 1998 No. 2306) (HMSO 1998);
- Classification, Labelling and Packaging (CLP) Regulations (SI 2015 No. 21) (HMSO, 2015), which have been retained in law with modifications due to the UK exit from the EU within:
  - The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use) (Amendment etc.) (EU Exit) Regulations (SI 2019 No. 720) (HMSO, 2019) (as amended);
- The Planning (Hazardous Substances) Regulations (SI 2015 No. 627) (HMSO, 2015);
- The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations (SI 2016 No. 1107) (HMSO, 2016);
- The Pressure Equipment (Safety) Regulations (SI 2016 No. 1105) (HMSO, 2016); and
- The Environmental Permitting (England and Wales) Regulations (EPR) (SI 2016 No. 1154) (HMSO, 2016).

Planning Policy Context

National Planning Policy

The National Policy Statement for Energy (EN-1) (2011)

20.2.8 The National Policy Statements (NPSs) for energy infrastructure set out the Government's policy for delivery of major energy infrastructure (Department of Energy and Climate Change (DECC), 2011).

20.2.9 The overarching NPS for Energy (EN-1) (Department of Energy & Climate Change, 2011a) provides the primary policy framework within which the Proposed Development will be considered. Published in 2011, this policy statement pre-dates the EIA Regulations and does not contain any specific requirements in relation to MA&D assessment. Of relevance, however, are Section 4.11 of NPS EN-1 'Safety', Section 4.12 'Hazardous Substances', and Section 4.15 'Security Considerations. Section 4.11 states that the HSE is responsible for enforcing health and safety legislation, some of which is relevant to energy infrastructure, and that some energy infrastructure will be subject to the COMAH Regulations. Section 4.12 states that all establishments wishing to hold stocks of certain hazardous substances above a threshold need Hazardous Substances consent. Section 4.15 states that the Department of Energy and Climate Change (now the Department for Energy Security and Net Zero, (DESNZ) works closely with UK Government security agencies to reduce the vulnerability of the most 'critical' infrastructure assets in the sector to terrorism and other national security threats.

The National Policy Statement for Energy (EN-4) (2011)

20.2.10 The NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Department of Energy & Climate Change, 2011b) references Major Accidents in Section 2.5 'Control of Major Accident Hazards', which refers back to Section 4.11 of EN-1 with respect to the COMAH Regulations; and in Section 2.19 'Gas and Oil Pipelines', which states that the HSE enforces the Pipeline Safety Regulations which are the principal legislation governing the safety of pipelines.

The National Policy Statement for Energy (EN-5) (2011)

20.2.11 The NPS for Electricity Networks Infrastructure (EN-5) (Department of Energy & Climate Change, 2011c) makes no reference to MA&D assessment.

Draft National Policy Statement for Energy (EN-1) (2023)

20.2.12 A revised draft of the NPS for Energy (EN-1) (Department for Energy Security and Net Zero, 2023a) was published in March 2023. No specific requirements in relation to MA&D assessment are included. Sections 4.12 'Safety', 4.13 'Hazardous Substances' and 4.15 'Security Considerations' are analogous to those described above with no major relevant updates.

Draft National Policy Statement for Energy (EN-4) (2023)

20.2.13 A revised draft of the NPS for Energy (EN-4) (Department for Energy Security and Net Zero, 2023b) was published in March 2023. No specific requirements in relation to

MA&D assessment are included. Sections 2.6 'Control of Major Hazards' is analogous to that described above with no major relevant updates.

Draft National Policy Statement for Energy (EN-5) (2023)

20.2.14 A revised draft of the NPS for Energy (EN-5) (Department for Energy Security and Net Zero, 2023c) was published in March 2023. No specific requirements in relation to MA&D assessment are included.

The National Planning Policy Framework (2011)

20.2.15 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government (MHCLG), 2021) refers to hazards in the context of planning decision making in paragraphs 45 and 97 as follows:

> *"Local planning authorities should consult the appropriate bodies when considering applications for the siting of, or changes to, major hazard sites, installations or pipelines, or for development around them."*
>
> *"Planning policies and decisions should promote public safety and take into account wider security and defence requirements by … anticipating and addressing possible malicious threats and natural hazards, especially in locations where large numbers of people are expected to congregate…this includes appropriate and proportionate steps that can be taken to reduce vulnerability, increase resilience and ensure public safety and security."*

The Planning Practice Guidance (PPG) for Hazardous Substances (2019)

20.2.16 The Planning Practice Guidance (PPG) for Hazardous Substances (MHCLG, 2019) explains land use planning controls relating to the storage of hazardous substances in England and how to handle development proposals around hazardous establishments. This includes guidance on:

- hazardous substances consent;
- dealing with hazardous substances in plan-making; and
- handling development proposals around hazardous installations.

Local Planning Policy

Redcar and Cleveland Borough Council (RCBC) Local Plan (2018)

20.2.17 The RCBC Local Plan (RCBC, 2018) does not set out any principles for the assessment of MA&Ds. However, it does consider public safety within the context of local development within Policy SD4 – General Development Principles, which states:

> *"In assessing the suitability of a site or location, development will be permitted where it… avoids locations that would put the environment, or human health or safety, at unacceptable risk."*

Stockton-on-Tees Borough Council (STBC) Local Plan (2019)

20.2.18 The STBC Local Plan (STBC, 2019) does not set out any principles for the assessment of MA&Ds. However, it does consider public safety within the context of local development within Policy SD8 – Sustainable Design Principles, which states:

"All proposals will be designed with public safety and the desire to reduce crime in mind, incorporating, where appropriate, advice from the Health and Safety Executive, Secured by Design, or any other appropriate design standards."

20.2.19 Further, hazardous installations are considered in Policy EG4 – Seal Sands, North Tees and Billingham, which states:

"Proposals which require hazardous substance consent will be designed and located to prevent an unacceptable increase in the level of risk to human health and the environment from an industrial accident or prejudice adjacent operational facilities or allocated sites."

Hartlepool Borough Council (HBC) Local Plan (2018)

20.2.20 The HBC Local Plan (HBC, 2018) does not set out any principles for the assessment of MA&Ds. However, it does consider public safety within the context of local development within Policy QP5 – Safety and Security which states inter-alia:

"The Borough Council will seek to ensure that all developments are designed to be safe and secure.

Developers will be expected to have regard to the following matters, where appropriate:

1) Adhering to national safety and security standards as set out by central government…"

20.3 Assessment Methodology and Significance Criteria

Definitions

20.3.1 "Major Accidents and Disasters in EIA: An IEMA Primer" published by IEMA (IEMA, 2020) defines 'major accidents' and 'disasters' as follows:

"A major accident is an event (for instance, train derailment or major road traffic incident) that threatens immediate or delayed serious effects to human health, welfare and/or the environment and requires the use of resources beyond those of the client or its appointed representatives (e.g., contractors) to manage.

A disaster is a man-made/external hazard (such as an act of terrorism) or a natural hazard (such as an earthquake) with the potential to cause an event or situation, which meets the definition of a major accident above."

20.3.2 Both natural and accidental causes of MA&Ds are considered in this preliminary assessment to determine the potential impact on sensitive receptors.

20.3.3 The definition of a "major accident" in the context of the PSR (HMSO, 1996) means death or serious injury involving a dangerous fluid (where 'dangerous fluid' encompasses certain flammable, toxic, and oxidising fluids, and fluids which react violently with water as specified in Schedule 2 of the PSR) from a fire, explosion or uncontrolled emission from a pipeline.

20.3.4 More specifically, the criteria included in this assessment to define an accident or disaster as 'major', has been chosen to align with the criteria for an incident which

would be notifiable to the European Commission as listed within Schedule 5 of the COMAH Regulations. This notification is no longer required following the UK's exit from the EU, however the criteria are still considered relevant to the identification of MA&D, in that it causes:

- an injury to a person which is fatal;
- up to six persons are injured within the establishment and hospitalised for at least twenty-four hours (hrs);
- one person outside the establishment is hospitalised for at least twenty-four hrs;
- a dwelling outside the establishment is damaged and is unusable as a result of the accident;
- the evacuation or confinement of persons for more than two hrs, where the value (persons × hrs) is at least five hundred;
- the interruption of drinking water, electricity, gas or telephone services for more than two hrs, where the value (persons × hours) is at least one thousand;
- damage to property in the establishment, to the value of at least EUR two million;
- damage to property outside the establishment, to the value of at least EUR five hundred thousand;
- permanent or long-term damage to terrestrial habitats involving:
  - 0.5 hectares (ha) or more of a habitat of environmental or conservation importance protected by legislation; or
  - 10 ha or more of more widespread habitat, including agricultural land.
- significant or long-term damage to freshwater and marine habitats involving:
  - 10 km or more of river or canal;
  - 1 ha or more of a lake or pond;
  - 2 ha or more of delta; or
  - 2 ha or more of a coastline or open sea; or
- significant damage to an aquifer or underground water of 1 ha or more.

Guidance

20.3.5 There is no specific guidance available which sets out the approach for undertaking a MA&Ds assessment within an EIA. However, the scope of the assessment has been developed with reference to "Major Accidents and Disasters in EIA: An IEMA Primer" (IEMA, 2020) which lays out emerging best practice. In addition to this guidance, there is a considerable amount of information and guidance available to developers on the identification and control of major hazards associated with industrial chemical

processes, the storage and use of chemicals, and major accident hazard pipelines conveying hazardous fluids.

20.3.6 The Health and Safety Executive (HSE) publishes a number of applicable guidance notes on its website, including:

- Emergency Planning for Major Accidents (HSG 191): COMAH Regulations 2015 (HSE, 2015a);
- Further Guidance on Emergency Plans for Major Accident Hazard Pipelines (HSE, 1996); and
- Reducing Risks, Protecting People: HSE's Decision Making Process (HSE, 1999).

20.3.7 Other guidance that is of relevance to the assessment of MA&Ds includes:

- Chemicals and Downstream Oil Industries Forum Guidelines, Environmental Risk Tolerability for COMAH Establishments (CDOIF, 2017); and
- Chapter 4 of the Cabinet Office's Emergency Preparedness Guidance on Part 1 of the Civil Contingencies Act 2004 (HM Government, 2006).

Study Area

20.3.8 The study area for assessment of MA&Ds is not defined within regulatory guidance or standardised methodology.

20.3.9 A preliminary 5 km study area around the Proposed Development Site (the 'Study Area') has been considered, based on professional judgement, taking into consideration that this area of Teesside includes several installations regulated by the COMAH Regulations (HMSO, 2015) and major accident hazard pipelines regulated by the PSR (HMSO, 1996).

20.3.10 There have been no changes to the MA&Ds Study Area since the publication of the Scoping Report. The Study Area may be refined during the ES stage, as information on the location and risks associated with particular hazards are developed.

Impact Assessment Methodology

20.3.11 MA&Ds scenarios are being considered for each phase of the Proposed Development, namely construction, operation and decommissioning.

20.3.12 The following steps are being followed to identify credible MA&D scenarios for detailed assessment:

- Baseline information relevant to MA&Ds is being collated, including the potential for natural disasters (e.g., as a result of seismic activity or climate change), and the presence of neighbouring industrial facilities, for example, any sites regulated by the COMAH Regulations (HMSO, 2015).
- An assessment of the substances which will be present within the Proposed Development Site is being carried out to identify those classified as hazardous, in accordance with the CLP Regulations (HMSO, 2015). The storage requirements and process uses of hazardous substances are being identified to determine the potential for Risk Events which could constitute a MA&D related to these

substances. Substances which are not classified as hazardous, or are present in relatively minor quantities, can be discounted at this stage.

- A review of the operations and activities carried out throughout the lifecycle of the Proposed Development is being undertaken to determine the potential for Risk Events which could constitute a MA&D related to these activities.
- A long list of Risk Events for MA&Ds is being collated, considering the substances, process and baseline conditions that have been identified. The MA&Ds long list has been updated since the publication of the Scoping Report. The long list of credible MA&D Risk Events is subject to change as more information becomes available over the course of the assessment.
- The long list will not include:
  - Risk Events which could have relatively minor consequences, regardless of the likelihood of occurrence, as they do not fall into the definition of a MA&D; or
  - Risk Events with a high likelihood of occurrence and significant consequences; legislation including COMAH (HMSO, 2015) and PSR (HMSO, 1996) ensures that facilities with this category of risk are not permitted.
- The resulting long list will be subject to a screening assessment. Those MA&D Risk Events which are considered very unlikely to occur (for example, due to the location of the Proposed Development) or for which there is no credible source-pathway-linkage, will not be taken forward for further assessment.
- All remaining MA&D Risk Events will be shortlisted for further assessment. The MA&Ds shortlist has been updated following receipt of the Scoping Opinion dated 17th May 2023 (Appendix 1B: Scoping Opinion, PEI Report, Volume III). The shortlist of MA&D Risk Events is subject to change as more information becomes available during the assessment.

20.3.13 For those MA&D Risk Events which have been scoped in for detailed assessment, the following assessment process is being followed:

- identify Credible Scenarios related to the Risk Event - these constitute a reasonably foreseeable worst-case incident of the identified Risk Event;
- determine the potential impact of Credible Scenarios on receptors using the source – pathway – receptor model;
- assess the magnitude of potential impacts of Credible Scenarios, considering the severity of harm, its duration, and its consequences, as well as its probability of occurrence;
- identify mitigation measures to eliminate the risk where possible; and if not possible, to reduce the risk to a level demonstrated to be ALARP; and
- qualitatively consider the tolerability of any residual risk.

Significance Criteria

20.3.14 The MA&Ds chapter provides a qualitative assessment of the tolerability of the residual risk of a significant effect, determined by combining the reasonably foreseeable worst-case consequence and probability categories. Residual risks are categorised via the application of professional judgement as:

- tolerable;
- tolerable if ALARP (acceptable if appropriate mitigation is enacted to reduce risk to as low as reasonably practicable); or
- intolerable.

20.3.15 The definitions of the above terms are contained in the document, 'Reducing Risks, Protecting People' (HSE 2001).

20.3.16 As a general rule, 'tolerable' and 'tolerable if ALARP' risks are considered as being Not Significant in the context of MA&Ds. 'Intolerable risks' are considered to be Significant and require further consideration. Based on professional judgement, a deviation from the general rule may be necessary on a case-by case basis.

20.3.17 Risks categorised as 'tolerable if ALARP' generally require further assessment, typically carried out as part of the development of a Safety Report or Safety Case, which may include detailed study, such as a Quantitative Risk Assessment (QRA) or similar, for review by the regulatory authorities. A QRA can demonstrate if the proposed mitigation measures result in an appropriate level of risk reduction based on reasonable practicability. A quantitative assessment of this kind has not been carried out for this preliminary assessment but may be included within the engineering design phase of the project.

Sources of Information and Data

20.3.18 The following data sources are being used to inform the assessment, where relevant, supplemented by the knowledge and experience of the assessor who has spent over 20 years working in process engineering and safety for organisations based in Teesside:

- National Risk Register of Civil Emergencies (Cabinet Office, 2017);
- British Geological Survey (BGS) GeoIndex Onshore (BGS, 2020);
- HSE's COMAH 2015 Public Information Search (HSE, 2020); and
- Google aerial and street view maps covering the Study Area (Google, 2020).

Consultation

20.3.19 An EIA Scoping Opinion was requested from the Planning Inspectorate ('the Inspectorate') in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to major accidents and disasters is outlined in Table 20-1.

Table 20-1: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	17th May 2023 – Scoping Opinion	An assessment of the potential for leaks and spills of specified substances (including diesel and aqueous ammonia) to the water environment due to road traffic accident or similar should be conducted.	A risk event concerning a loss of containment due to a road traffic accident has been considered at the long list stage. A Traffic Management Plan will be in place for the Proposed Development's operational phase which will mitigate against a road traffic accident resulting in a spill. This matter will be addressed in more detail at the ES stage if more information becomes available.
The Inspectorate	17th May 2023 – Scoping Opinion	Marine accidents may be scoped out.	This matter has been scoped out.
The Inspectorate	17th May 2023 – Scoping Opinion	Given that hydrogen is an emerging technology, the risk of a failure of electricity supply or other systems / utilities should be assessed, including information on how the risks would be managed, including design standards proposed and why these are appropriate, alongside an outline of any management plans.	A risk event concerning a failure in electricity supply has been considered at the long list stage. Backup power generation will be included in the final detailed design to mitigate against a loss of power. Process equipment and instrumentation will be designed to fail to a safe condition. If available, further detail regarding the proposed backup generation will be provided in the ES.
The Inspectorate	17th May 2023 – Scoping Opinion	An assessment of the potential significant effects of meteorological hazards should be conducted.	Risk events concerning extreme meteorological conditions have been considered at the long list stage. The Proposed Development will be designed in accordance with appropriate engineering standards to mitigate against meteorological impact. Operating and

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
			Emergency Strategies and Procedures will be developed to ensure, as far as reasonably practicable, that the event will not escalate resulting in further environmental impact. Further information will be included in the ES if available at that time.
The Inspectorate	17th May 2023 – Scoping Opinion	Earthquakes and ground stability may be scoped out.	This matter has been scoped out.
The Inspectorate	17th May 2023 – Scoping Opinion	Poor air quality in operational phase may be scoped out of MA&D as accidental release of toxic and / or asphyxiant gas is separately scoped in.	Poor air quality has been scoped out. Release of toxic and asphyxiant gases has been scoped in.
The Inspectorate	17th May 2023 – Scoping Opinion	Wildfires may be scoped out.	This matter has been scoped out.
The Inspectorate	17th May 2023 – Scoping Opinion	Malicious attack may be scoped out.	This matter has been scoped out.
The Inspectorate	17th May 2023 – Scoping Opinion	A summary of consents and licences required, the aspects they cover and the application status should be included within the ES and mitigation measures should be clearly described, including how they will be secured and where this is through the Other Consents and Licences document submitted with the DCO application.	The site is anticipated to be an Upper Tier COMAH installation and as such require COMAH notification. Further details on these and other consents, licences and mitigation measures identified will be provided in the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	17th May 2023 – Scoping Opinion	Construction hazards to waterways and rail should be assessed, where significant effects are likely to occur.	No construction hazards to the waterways are anticipated. The pipelines will pass under existing rail lines and Horizontal Directional Drilling (HDD), a trenchless construction methodology, is proposed at these locations. Discussions are ongoing with the asset protection team at Network Rail regarding agreement on wayleaves and other mitigation measures.
The Inspectorate	17th May 2023 – Scoping Opinion	Hazards to and from nuclear facilities (Hartlepool Power Station) should be assessed, where significant effects are likely to occur.	Risk events concerning nuclear facilities have been considered at the long list stage. The Proposed Development is not likely to be directly affected in the case of a nuclear release from Hartlepool Power Station. Process equipment and instrumentation will be designed to fail to a safe condition in the event of an evacuation order.
The Inspectorate	17th May 2023 – Scoping Opinion	The Health and Safety Executive and other relevant consultation bodies should be consulted to agree the scope and methodology of assessment.	Noted.

Use of the Rochdale Envelope

20.3.20 This assessment has applied the Rochdale Envelope principles, which assesses credible, worst-case MA&D Risk Events associated with the Proposed Development. This conservative methodology establishes the worst-case scenarios, the risk of which would be reduced to ALARP by the design and operation of the facilities. At this stage in the project, safety and control systems have not yet been designed for the Proposed Development, however, standard industry approaches to managing risk will be used. In addition, equipment such as process monitoring and safeguarding systems, and embedded mitigation, such as fire, flammable gas, toxic gas and leak detection, fire protection systems and emergency shutdown systems, will be installed as required.

20.4 Baseline Conditions

20.4.1 This section presents a description of the baseline environmental characteristics within the Study Area.

Existing Baseline

Sensitive Environmental Receptors

20.4.2 The following sensitive receptors which could be vulnerable to MA&Ds risks include:

- private residences (and their inhabitants) within the local area;
- local economic receptors, including businesses and employees;
- community receptors, including Public Rights of Way (PRoWs), community land, and community buildings;
- the historic and cultural environment, including archaeology and built heritage;
- designated ecological sites, primarily the Teesmouth and Cleveland Coast Ramsar Site, Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI);
- the water environment, including groundwater, the River Tees and the North Sea;
- infrastructure and the built environment, including transport infrastructure, industrial infrastructure and energy infrastructure; and
- the interactions between the receptors above.

Environmental Baseline

20.4.3 The Main Site is located at the mouth of the River Tees, approximately 150 m from the North Sea coast. The surrounding area is predominantly industrial, with a number of protected ecological sites associated with the Tees Estuary, as well as some residential areas.

20.4.4 The Teesmouth and Cleveland Coast Ramsar Site, SPA and SSSI fall within the Study Area, to the immediate north of the Main Site. This covers the Teesmouth estuary, part of the North Sea and important coastal habitats such as sand dune and saltmarsh, supporting invertebrates, waterbirds, and harbour seals and other

protected species. There are no other SPAs, Special Areas of Conservation (SACs) or Ramsar Sites within the 5 km Study Area. Lovell Hill Pools SSSI is located approximately 2.4 km to the south-east of the Proposed Development Site. For further information relating to sensitive environmental receptors, refer to Chapter 3: Description of the Existing Environment (PEI Report, Volume I) and Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I).

20.4.5 Also present within the Study Area are the residential population centres of Middlesbrough, Hartlepool, Stockton-on-Tees, Redcar, Billingham and Seaton Carew. The Main Site is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 1.3 km east of the Main Site in Warrenby. The next closest residential areas to the Main Site are Dormanstown and Coatham, within the district of Redcar and Cleveland. There are further residential receptors close to the Hydrogen Pipeline Corridor, within the districts of Middlesbrough. The estimated total populations of Middlesbrough, Redcar and Cleveland, Stockton-on-Tees, and Hartlepool are 143,900, 136,500, 196,600, and 92,300, respectively (Office for National Statistics (ONS), 2022).

20.4.6 Teesside has a temperate oceanic climate typical of the UK. Four earthquakes (of maximum magnitude 3.1) have been recorded in the Study Area since 1994, but none of these were classified by the BGS as significant.

20.4.7 As described in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I), the main risk of flooding to the Proposed Development Site is tidal/fluvial, associated with the North Sea and watercourses in and around the Proposed Development Site. Whilst the Main Site, the CO_2 Export Corridors and the Natural Gas Connections Corridor are located entirely in Flood Zone 1, a significant amount of the Hydrogen Pipeline Corridor is located within Flood Zones 2 and 3. Small areas of the Electrical Connection Corridor, the Other Gases Connection Corridor and the Water Connections Corridor are also located within Flood Zones 2 and 3.

Infrastructure and Industrial Sites

20.4.8 The Teesside area is a significant industrial hub, with the chemical industry operating in this location for over a century. Chemical manufacturing still makes up a large proportion of the industrial sites in the area, along with oil and gas facilities and the nearby Hartlepool nuclear power station.

20.4.9 There are currently a number of COMAH regulated sites within the Study Area with operations in the following categories:

- bulk and fine chemical installations, with operations including manufacture / production, disposal, storage / warehousing and distribution;
- fuel processing and storage installations, including refining and distribution;
- waste storage, treatment and disposal sites;
- wastewater and sewage collection, supply and treatment; and
- power generation, supply and distribution.

20.4.10 These sites include:

- Hartlepool Power Station;
- Bran Sands Wastewater Treatment Works;
- Seal Sands and North Tees, Billingham and Wilton Industrial Areas, including (but not limited to):
  - Chemoxy International Ltd.;
  - CF Fertilisers Ltd.;
  - PX (TGPP) Ltd.;
  - Sabic UK Petrochemicals Ltd.;
  - INEOS Nitriles (UK) Ltd.;
  - Inter Terminals Seal Sands Ltd. (Exolum);
  - Vertellus Ltd.;
  - Navigator Terminals; and
  - British Oxygen Co. Ltd.

20.4.11 Due to the nature of industry in Teesside, there is an existing network of buried and above ground pipelines present within the Study Area, including major hazard pipelines, regulated in accordance with the PSR (HMSO, 1996).

20.4.12 As described in Section 10.4 of Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I), there are existing operational and redundant underground brinefield cavity storage systems at North Tees and Wilton areas. These store large volumes of substances associated with the industrial installations. In addition, they have historically been utilised for natural gas storage, as part of the national grid system.

20.4.13 There is also significant infrastructure associated with the transmission and distribution of energy in the Study Area, including high voltage 400 kilovolt overhead power lines.

20.4.14 Transport infrastructure within the Study Area includes ports, road and rail. Teesport, located approximately 1 km to the south-west of the Main Site, is the UK's fifth largest seaport, handling approximately 28 million tonnes of cargo annually. Primary roads in the area include the A19, A174, A66 and A689. Middlesbrough, Billingham, South Bank, Seaton Carew and South Bank train stations, and their associated rail lines, also fall within the Study Area. Teesside Airport is the nearest airport, located approximately 11.5 km to the south-west of the Proposed Development Site.

Summary of Current MA&D Risks for the Existing Locality

20.4.15 The Proposed Development Site is located within an area which has a number of COMAH installations, forming a 'domino group' as described in Regulation 24 of

COMAH. These are groups of sites where the risks or consequences of a major accident may be increased due to the proximity of the sites to each other. Potential risks include, but are not limited to, fire, explosion, release of (flammable, toxic, asphyxiant, corrosive, environmentally harmful etc.) substances to air, water, ground and groundwater.

20.5 Proposed Development Design and Impact Avoidance

20.5.1 The following impact avoidance measures will either be incorporated into the Proposed Development design or are standard construction or operational measures. These measures have been taken into account during the impact assessment process described in this chapter.

Construction

20.5.2 In compliance with the CDM Regulations 2015 (HSE, 2015b) the client will develop and provide pre-construction information as soon as is practicable and formally appoint a Principal Designer and Principal Contractor.

20.5.3 In compliance with Regulation 6 of the CDM Regulations 2015 (HSE, 2015b) Notification of Construction Works will be submitted to the HSE prior to the commencement of construction. All Project duty holders will comply with the regulations to ensure the Proposed Development construction is carried out in a way that secures health and safety.

20.5.4 Any appointed Principal Contractor will develop the Construction Phase Plan prior to commencing construction works.

20.5.5 The Principal Designer, or where there is no Principal Designer, the Principal Contractor, will ensure that a final Health and Safety File is drawn up and handed to the Client. This will identify any Environmental, Health and Safety information about the project likely to be needed during any subsequent work activities.

20.5.6 The use of suitably experienced contractors, risk assessments, working method statements, operating procedures and personnel training will minimise the risk of accidental scenarios occurring during Proposed Development construction. A Framework Construction Environmental Management Plan (CEMP) will be prepared to accompany the ES submitted with the DCO Application. This will set out how construction activities will be managed and controlled in compliance with accredited health and safety and environmental management systems, relevant legislation and environmental permits, consents and licences.

20.5.7 A Final CEMP will be prepared by the Principal Contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

Operation

20.5.8 The engineering design of the Proposed Development will incorporate a number of philosophies with regard to process safety and safeguarding, isolation, emergency shutdown and depressurisation. The layout of the Main Site will give due

consideration to safety-in design principles with respect to both on-site and off-site receptors.

20.5.9 During Proposed Development design, the future operational risks will be managed via a number of studies such as hazard identification (HAZID) and Hazard and Operability (HAZOP). These studies have been, and will continue to be, carried out for the Proposed Development during the ongoing design process. This is a standard approach for the identification of hazards and the development of risk mitigation measures for preventing, or otherwise minimising, hazardous scenarios through appropriate design during the Front-End Engineering Design (FEED) and detailed design stages.

20.5.10 The Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

20.5.11 The Production Facility will require an Environmental Permit from the Environment Agency (EA) and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. The Environmental Permit requires a number of stipulations and requirements to be fulfilled to the satisfaction of the regulators, including use of appropriate control and monitoring procedures, risk assessments, management systems and control measures to minimise the risk of accidents occurring and to minimise the effects of any such accidents on off-site receptors as well as the operational workforce. The permit requires the approach to managing accidents and emergencies to be in accordance with the use of Best Available Techniques (BAT).

20.5.12 Due to the expected inventory of dangerous substances which will be present on-site, the Proposed Development is anticipated to be an Upper Tier COMAH installation. The COMAH status will be reviewed as the design develops. The appropriate COMAH notifications are required to be submitted to the Competent Authority (CA), which comprises the HSE and the EA, 3 to 6 months prior to the start of the construction phase. Major accident assessments and studies will be prepared over the course of the design development, and a Safety Case Report and a Major Accident Prevention Plan (MAPP) will be prepared to support the COMAH notification. The COMAH Safety Case Report will include appropriate risk assessment in relation to Major Accidents To The Environment (MATTEs) in line with appropriate HSE Safety Report Assessment Manual (SRAM) criteria used to demonstrate that the application is duly made.

20.5.13 Other consents which will be required which are relevant to the design and impact avoidance with respect to MA&Ds include, but are not limited to:

- Hazardous Substances Consent will be obtained from the local planning authority (RCBC) who would consult with the HSE in compliance with The Planning (Hazardous Substances) Regulations (HMSO, 2015);

- A Gas Safety Case will be submitted to the HSE prior to the start of construction of the Natural Gas Connection in compliance with The Gas Safety (Management) Regulations (HMSO, 1996);
- Pipeline Safety Notifications will be submitted to the HSE a minimum of 6 months prior to the start of construction and 14 days before first use of the proposed hydrogen, natural gas and CO_2 pipelines in compliance with the PSR (HMSO, 1996).

20.5.14 Specific operational mitigation measures are also indicated in Table 20-4.

Decommissioning

20.5.15 At the end of its design life, decommissioning of the Proposed Development would see the removal of all above ground equipment down to ground level to enable future re-use. It is assumed that all underground infrastructure would remain in-situ; however, all connection and access points would be sealed or grouted to ensure disconnection.

20.5.16 All decommissioning and demolition activities will be controlled as applicable in relation to The Dangerous Substances and Explosive Atmospheres Regulations (SI 2002 No. 2776) (HMSO, 2002); The Control of Substances Hazardous to Health Regulations (SI 2002 No. 2677) (HMSO, 2002) and The Construction (Design and Management) (CDM) Regulations (SI 2015 No. 51) (HMSO, 2015).

20.5.17 The use of suitably experienced contractors, risk assessments, working method statements, operating procedures and personnel training will minimise the risk of accidental scenarios occurring during Proposed Development decommissioning. The demolition activities will be considered as a HSE notifiable project under The CDM Regulations 2015.

20.5.18 A Decommissioning Environmental Management Plan (DEMP) would be produced and agreed with the EA as part of the Environmental Permitting and site surrender process at the appropriate time. The DEMP would set out how decommissioning activities would be managed and controlled in compliance with accredited health and safety and environmental management systems, relevant legislation and environmental permits, consents and licences.

20.6 Likely Impacts and Effects

Construction

Assessment of Hazardous Substances

20.6.1 Diesel would be used on the Main Site during construction for fuel for vehicles, plant and mobile power generators. Diesel is classified as flammable and harmful to the aquatic environment. A release which is ignited could cause harm to people via exposure to thermal radiation in a fire. A release which is unignited can cause harm to people if inhaled, ingested or exposed to skin. A release of diesel to the environment such as the River Tees could result in harm to flora and fauna. Quantities of diesel present on the Main Site will, however, be relatively minor.

20.6.2 Liquid concrete could be present in significant quantities during construction of the Proposed Development. It may be produced on the Main Site from cement powder, which is classified as an irritant to skin as contact can cause alkali burns. This substance can harm the eyes and the respiratory system via inhalation of dust. If cement or wet concrete enters drains or watercourses, there is the potential for it to cause harm to the aquatic environment by increasing the pH of the water.

20.6.3 Smaller quantities of other potentially dangerous and / or hazardous materials may also be present on-site. These substances will not be expected to initiate or exacerbate MA&Ds but could be harmful in the event of a major accident that causes loss of containment.

20.6.4 There is the potential for ground contamination to exist within the Proposed Development Site as a legacy of its historic industrial nature. This could include substances which, if released to the environment, have the potential to cause harm.

Review of Activities

20.6.5 Site preparation and remedial works at the Main Site would be completed by Teesworks prior to the commencement of construction of the Proposed Development. Teesworks would obtain the necessary consents and permits to do this work.

20.6.6 The proposed remediation works will be subject to further review following the assessment of ground condition information (a programme of Ground Investigation (GI) works which will include soils and groundwater testing to assess the degree to which the Proposed Development Site is contaminated). The GI will be carried out in accordance with appropriate specifications and standards as laid out in Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I). Further remedial measures may be required during the construction phase of the Proposed Development. These would be localised, targeted remediation works.

20.6.7 Two phases of construction will then commence as outlined in Chapter 5: Construction Programme and Management (PEI Report, Volume I).

20.6.8 Phase 1 would consist of the construction of the Production Facility at the Main Site, including civil, mechanical and electrical work, connections to the relevant utility networks, including major pipelines, and the majority of the construction of the hydrogen pipeline.

20.6.9 Phase 2 construction at the Main Site would commence once Phase 1 is operational and consist of an additional Hydrogen Unit to increase the capacity of the Production Facility, and three additional spurs of the hydrogen pipeline, amongst other works. Phase 2 would be constructed adjacent to Phase 1 at a suitable safety distance.

Assessment of Shortlisted MA&D Scenarios

20.6.10 Considering the baseline conditions, the hazardous substances present and the identified likely construction activities, a long list of MA&D Risk Events has been prepared. This long list can be found in Appendix 20A: Long List of MA&Ds Risk Events (PEI Report, Volume III), along with justification for the shortlisting of the following MA&D Risk Events:

- ground instability;
- structural collapse / accidental impact;
- utility (pipeline or electrical cable) strike / unexploded ordnance (UXO) impact; and
- release of ground contamination.

20.6.11 Credible Scenarios for construction Risk Events are summarised in Table 20-2. The level of risk presented by all Credible Scenarios has been assessed as 'tolerable', taking into consideration the proposed mitigation measures.

20.6.12 Scenarios associated with an accidental release of diesel or liquid concrete were not considered to reach the threshold for a major accident and have not been included within a more detailed assessment.

Table 20-2: Credible Scenarios Related to the Construction of the Proposed Development

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
C-1	**Ground Instability** Construction activity results in disturbance of manmade or naturally occurring ground related hazards. Vibration causes ground instability / collapse / settlement.	Localised collapse and subsidence of ground at the surface / surface settlement could lead to uncontrolled movement affecting objects /people / materials / plant / equipment which could cause injury / fatality to persons on site and /or lead to secondary impacts e.g., damage to utilities leading to explosion.	A GI with appropriate testing undertaken according to appropriate specifications and standards will be carried out to understand the potential risks and inform the construction methods to be used. To reduce risks associated with ground instability, there will be use of industry standard construction methods / design features appropriate to the context of the Proposed Development.	Tolerable (Not Significant)
C-2	**Structural Collapse / Accidental Impact** Construction activity results in damage to structures or impact with workers.	Collapse of new and existing buildings, structures and excavations via accidental impact with vehicles or via other failure mechanism. Other hazards associated with construction traffic movements on site include accidental impact to workers.	Thorough structural engineering design of new structures, assessments of existing structures and temporary structures such as excavations will be in accordance with industry codes and standards. The CEMP will be in place to control potential impacts of construction works. Construction Traffic Management Plan to be submitted with the ES will also be in place.	Tolerable (Not Significant)
C-3	**Utility / pipeline / UXO Strike** Construction activity such as excavation accidentally	Impact with gas pipeline or UXO, potential risk of fire / explosion and release of harmful gas leading to	Consultation with appropriate stakeholders such as National Grid Gas Transmission, the operator of the Central Area Transmission System (CATS) Pipeline and the EA will be	Tolerable (Not Significant)

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
	impacts underground gas pipeline or UXO.	fatality / injury to person(s) on site and member(s) of public. Risk of fire /explosion causes damage to environmental receptor or structural damage to buildings and / or infrastructure. Firewater run-off containing contaminants could contaminate groundwater and / or land or sea habitats including the Teesmouth and Cleveland Coast Ramsar Site, SPA and SSSI.	undertaken to manage interfaces and define appropriate control measures when working close to live pipelines. The DCO Application will be accompanied by a Gas Connection and Pipelines Statement. The CEMP will be in place to control potential environmental impacts of construction works. Control measures will be implemented to prevent fires and procedures will be prepared and implemented to respond to fires, in the event that they were to arise. Possible control measures could include, for example, GPR surveys and magnetometer surveys of site and positive ID of all pipelines prior to construction, in accordance with PAS 120, and will be determined by the Principal Contractor.	
C-4	**Release of ground contamination** Accidental release of pollutants into groundwater / surface water due to construction activities	Contamination of groundwater. Loss of water supply. Contamination of land or sea habitats including the Teesmouth and Cleveland Coast Ramsar Site, SPA and SSSI, and impacts on dependent species leading to irreversible damage.	A GI including soils testing will be carried out to identify the presence of areas of ground on-site with the potential to contain contaminants. If remedial measures are required based on the GI these may include the placement of clean cover, soil treatment, soil stabilisation,	Tolerable (Not Significant)

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
			and/or removal of localised 'hotspots of identified contamination' as described in Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I). Contaminated land removed as part of remediation works will be disposed of as hazardous waste as described in Chapter 21: Materials and Waste (PEI Report, Volume I). The CEMP will be in place to control the potential environmental impacts of construction works. Protective measures related to leaks and spills are presented in PEI Report Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I).	

Operation

Assessment of Hazardous Substances

20.6.13 The key substances which will be present within the Proposed Development Site during operation are summarised in Table 20-3, along with their properties and arrangements for storage and use.

Table 20-3: Key Hazardous Substances Likely to be Present during Operation of the Proposed Development

SUBSTANCE	USE	TRANSPORTATION / STORAGE	HAZARDS	POTENTIAL EFFECTS
Hydrogen (H_2)	The production of H_2 from natural gas is the purpose of the Proposed Development.	H_2 will be exported off-site using a gaseous phase pipeline network at a maximum operational rate of 44,350 kg/hr. Hydrogen will be stored at the Main Site in an area to the north-west of the main plant area. The storage layout is subject to adjustment following safety engineering consequence modelling. The hydrogen storage will have a capacity of 5 tonnes usable volume (up to 10.3 tonnes total inventory for 100 bar storage pressure or up to 6.4 tonnes at 250 bar storage pressure). Multiple cylinder assemblies are proposed.	Extremely flammable. A qualifying substance under COMAH.	Fire and / or explosion.
Natural gas (comprising a mixture of hydrocarbons; primarily methane (CH_4))	Raw material for manufacture of H_2.	Natural gas will be imported via a pipeline, with a diameter expected to be 24" and connected to the UK high pressure gas supply network. Storage of natural gas on-site is not proposed.	Extremely flammable. A qualifying substance under COMAH.	Fire and / or explosion.
Syngas ('Synthesis Gas') comprising a mixture of hydrogen (H_2), carbon monoxide (CO), and carbon dioxide (CO_2)	Produced in an intermediate process stage.	Syngas is a process intermediate and as such transportation and storage of syngas on-site is not proposed.	Toxic and flammable. A qualifying substance under COMAH.	Fire and / or explosion. Harm to people via inhalation if exposed to gas.

SUBSTANCE	USE	TRANSPORTATION / STORAGE	HAZARDS	POTENTIAL EFFECTS
Oxygen (O_2)	Used in the production process.	O_2 will be produced on-site in an Air Separation Unit (ASU) or may be supplied from a site nearby. On-site storage of O_2 is not proposed.	Oxidant. A qualifying substance under COMAH.	May intensify fire. Harm to people via inhalation if exposed to gas in high concentrations.
CO_2	By-product.	CO_2 will be compressed and exported off-site using a pipeline network at a maximum rate of 323,420 kg/hr. On-site storage of CO_2 is not proposed.	Asphyxiant. Not currently a qualifying substance under COMAH.	Harm to people via inhalation if exposed to gas.
Aqueous ammonia (NH_3)	Used within abatement system to reduce emissions from combustion equipment.	NH_3 will be imported by road tanker and stored in a chemical storage facility on-site. The initial fill is expected to be 20 m^3 with an annual consumption of 628 m^3.	Very toxic to aquatic life; Harmful if swallowed; Causes skin burns and eye damage; May cause respiratory irritation. A qualifying substance under COMAH.	Harm to the environment if released to ground / water / groundwater; Harm to people via inhalation if exposed to vapour or in contact with skin or eyes.
Activated methyldiethanolamine (aMDEA)	Used within carbon capture system.	Amine solution will be imported by road tanker and stored in a chemical storage facility on-site. The initial fill is expected to be 380 m^3 with an annual consumption of 3.1 m^3.	Causes serious eye irritation. Not a qualifying substance under COMAH.	Minor harm to people if released.

SUBSTANCE	USE	TRANSPORTATION / STORAGE	HAZARDS	POTENTIAL EFFECTS
aMDEA antifoam	Antifoam for use with aMDEA	aMDEA antifoam will be imported by road tanker and stored in a chemical storage facility on-site. The initial fill is expected to be 0.07 m^3 with an annual consumption of 0.1 m^3.	Toxic to aquatic life with long lasting effects. Not a qualifying substance under COMAH.	Harm to the environment if released to ground / water / groundwater.
Sodium hypochlorite (NaOCl)	Within the cooling water package	Sodium hypochlorite will be imported by road tanker and a limited quantity will be stored in a chemical storage facility on-site. The initial fill is expected to be 3.4 m^3 with an annual consumption of 46.5 tonnes.	Harmful if swallowed; Causes severe skin burns and eye damage; May cause respiratory irritation; Very toxic to aquatic life with long lasting effects. A qualifying substance under COMAH.	Harm to the environment if released to ground / water /groundwater; Harm to people via inhalation if exposed to vapour or in contact with skin or eyes.

SUBSTANCE	USE	TRANSPORTATION / STORAGE	HAZARDS	POTENTIAL EFFECTS
Bromine (Br)	Within the cooling water package	Bromine will be imported by road tanker and a limited quantity will be stored in a chemical storage facility on-site. The initial fill is expected to be 0.2 m^3 with an annual consumption of 6.5 tonnes.	Fatal if inhaled; Causes severe skin burns and eye damage; Very toxic to aquatic life. A qualifying substance under COMAH.	Harm to the environment if released to ground / water / groundwater; Harm to people via inhalation if exposed to vapour or in contact with skin or eyes.
Sulphuric acid (H_2SO_4)	Within the cooling water package	Sulphuric acid will be imported by road tanker and a limited quantity will be stored in a chemical storage facility on-site. The initial fill is expected to be 7.2 m^3 with an annual consumption of 153 tonnes.	Causes severe skin burns and eye damage. Not a qualifying substance under COMAH.	Harm to people via inhalation if in contact with skin or eyes.
Carbohydrazide	Within the Boiler Feed Water dosing package	Carbohydrazide will be imported by road tanker and a limited quantity will be stored in a chemical storage facility on-site. The initial fill is expected to be 2.0 m^3 with an annual consumption of 7.9 tonnes.	Harmful if swallowed; Causes skin irritation; May cause an allergic skin reaction; Toxic to aquatic life with long lasting effects.	Harm to the environment if released to ground / water / groundwater; Harm to people in contact with skin.

SUBSTANCE	USE	TRANSPORTATION / STORAGE	HAZARDS	POTENTIAL EFFECTS
			A qualifying substance under COMAH.	
Morpholine	Within the Boiler Feed Water dosing package	Morpholine will be imported by road tanker and a limited quantity will be stored in a chemical storage facility on-site. The initial fill is expected to be 2.0 m^3 with an annual consumption of 17.3 m^3.	Flammable liquid and vapour; Harmful if swallowed; Harmful in contact with skin; Causes severe skin burns and eye damage; Harmful if inhaled. Not a qualifying substance under COMAH.	Harm to people via inhalation if in contact with skin or eyes.
Hydrogenation catalyst	Process catalyst	Hydrogenation catalyst will be imported by road tanker. The installed volume is expected to be 49.4 m^3.	Material is considered to be toxic to humans – acute; Material is considered to be a hazard to the aquatic environment chronic.	Harm to the environment if released to ground / water / groundwater; Harm to people in case of release.

SUBSTANCE	USE	TRANSPORTATION / STORAGE	HAZARDS	POTENTIAL EFFECTS
Sulphur removal catalyst	Process catalyst	Sulphur removal catalyst will be imported by road tanker. The installed volume is expected to be 58.4 m^3.	Material is considered to be a hazard to the aquatic environment -acute.	Harm to the environment if released to ground / water / groundwater;
Ultrapurification sulphur removal catalyst	Process catalyst	Ultrapurification sulphur catalyst will be imported by road tanker. The installed volume is expected to be 6.8 m^3.	Material is considered to be a hazard to the aquatic environment – acute.	Harm to the environment if released to ground / water / groundwater;
Pre-reforming catalyst	Process catalyst	Pre-reforming catalyst will be imported by road tanker. The installed volume is expected to be 15.3 m^3.	Material is considered to be toxic to humans – acute. Material is considered to be a hazard to the aquatic environment – chronic. A qualifying substance under COMAH.	Harm to the environment if released to ground / water / groundwater; Harm to people in case of release.

SUBSTANCE	USE	TRANSPORTATION / STORAGE	HAZARDS	POTENTIAL EFFECTS
Isothermal shift catalyst	Process catalyst	Isothermal shift catalyst will be imported by road tanker. The installed volume is expected to be 15.3 m^3.	Material is considered to be a hazard to the aquatic environment acute and chronic. A qualifying substance under COMAH.	Harm to the environment if released to ground / water / groundwater.
Low temperature shift catalyst	Process catalyst	LT shift catalyst will be imported by road tanker. The installed volume is expected to be 146.4 m^3.	Material is considered to be a hazard to the aquatic environment acute and chronic. A qualifying substance under COMAH.	Harm to the environment if released to ground / water / groundwater.
Diesel	Fuel for backup generators.	Diesel will be imported by road tanker and stored on-site.	Flammable. Harmful to the aquatic environment. A qualifying substance under COMAH.	Minor harm to people on-site in event of release and / or fire; Minor harm to environment if released.

20.6.14 Smaller quantities of other potentially dangerous and / or hazardous materials may also be present on-site. These substances will not be expected to initiate or exacerbate MA&Ds but could be harmful in the event of a major accident that causes loss of containment. For example, if hazardous substances were released during a fire event, due to the failure of storage vessels, which resulted in the hazardous substances being present in the firewater runoff.

Review of Activities

20.6.15 The technology used for the manufacture of H_2 from natural gas is well established and the equipment to be used will be designed and constructed to precise industry standards. This industry is subject to rigorous safety and environmental regulations, with operators of such facilities required to demonstrate integrity via the submission of Safety Case documentation to comply with regulations including COMAH Regulations and PSR. There is a very low risk of failure where that failure could result in the loss of containment of hazardous substances.

20.6.16 Within the Production Facility, natural gas would be treated with heat and steam to break down higher hydrocarbons, primarily to carbon oxides and H_2. This syngas would then be reformed further using pure O_2 and more steam over catalysts in an Auto Thermal Reformer (ATR). After cooling, the syngas would be reacted in water-gas shift reactors to generate H_2 and CO_2. The CO_2 would be removed from the gas via scrubbing with an amine solution.

20.6.17 The pipeline corridors associated with the Proposed Development would contain:

- natural gas and 'other gases' (N_2 and O_2) supplied to the Main Site;
- H_2 delivered to offtakers within the Teesside industrial area; and
- CO_2 which would be exported for storage.

Assessment of Shortlisted MA&D Scenarios

20.6.18 Considering the baseline, the hazardous substances likely to be present, and the operational activities identified, a long list of MA&D Risk Events has been prepared. This long list can be found in Appendix 20A: Long List of MA&Ds Risk Events (PEI Report, Volume III), along with justification for the shortlisting of the following MA&D Risk Events:

- fire caused by loss of containment of flammable gas (H_2 or natural gas), potential for intensification due to presence of O_2;
- explosion;
- toxic gas release (depending on concentration, syngas, CO, CO_2 or O_2);
- asphyxiant gas release (primarily CO_2);
- domino effect (from and to neighbouring industrial facilities); and
- flooding (Coastal, fluvial, pluvial and groundwater).

20.6.19 Credible Scenarios for these Risk Events are drawn up and assessed in Table 20-4. The Credible Scenarios associated with an accidental release of gas have been

assessed as 'tolerable if ALARP' given that at this stage in the assessment process the mitigation measures considered in this assessment are primarily the standard engineering design controls typically included within industrial facilities such as the Proposed Development. These measures are to be confirmed further as the detailed design of the Proposed Development progresses and a QRA or similar detailed safety study(s) produced to assess the level of residual risk. Domino effect and flooding scenarios have been assessed as Tolerable (Not Significant).

20.6.20 A risk event associated with a release of environmentally harmful liquids was considered at the long list stage but was not considered to reach the threshold for a MA&D, due to the proposed mitigation measures. Consequently, a potential release of environmentally harmful liquids was not considered to cause significant harm and is assessed as being Tolerable (Not Significant).

20.6.21 Another risk event that was considered at the long list stage is a road traffic accident occurring during transport of substances to and from the Main Site via the road network. During operation, the primary raw materials are gaseous and transported via pipeline. Other substances, including catalyst materials and other chemicals in smaller quantities will be transported by road. On public highways, losses in containment of these materials are controlled by regulations for the carriage of dangerous goods including an emergency response plan in case of release of material. Once on site, a Traffic Management Plan will be in place to mitigate the likelihood of a road traffic accident occurring. This may include induction procedures for visiting drivers at site entrance, one-way routes on site, requirements for PPE, and supervision by local staff. Consequently, a road traffic accident resulting in loss of containment of hazardous materials was not considered to cause significant harm and is assessed as being Tolerable (Not Significant).

20.6.22 A risk event associated with an incident at the Hartlepool Nuclear Power Station, located approximately 2 km west of the Main Site across the River Tees, was considered at the long-list stage. An incident at this power station could potentially result in a halt of operations associated with the Proposed Development, if it were to fall within any assigned evacuation zone. However, the Proposed Development will be designed to be safe in the event of an extended shutdown and any other effects from an incident at the power station, i.e., thermal radiation and explosion overpressure, are not expected to have a significant impact at the proposed development due to the distance. The Hartlepool Nuclear Power Station has its own set of robust mitigation measures to reduce the risk of a major accident, as such the effect of incident at the power station was assessed as being Tolerable (Not Significant).

20.6.23 Accidents as a result of meteorological conditions were also considered as at the long list stage, including consideration of high windspeed, low temperatures and heavy snow, high temperatures / heatwaves, drought, and electrical storms. Operating and Emergency Strategies and Procedures will be developed as part of the Project FEED and Execution Phases to address the Facility's Design Capability and Organisational response to a forecast of a developing Natural Hazards event to ensure, as far as reasonably practicable, that the event will not escalate resulting in further

environmental impact. This will include defining a minimum safe resourcing level for continuing operations which might be appropriate in the event of a natural hazard event or local restrictions to site access, an appropriate basis of design and engineering mitigations to address credible ranges in environmental conditions be that temperature, wind speed, changes in sea level or excess rainfall which could impact continuing safe operations and a range of access routes for the emergency services and site personnel in abnormal conditions. The strategies will define design criteria and the procedures will provide guidance on the actions to be taken at certain threshold levels, including in advance of the event occurring where practicable which may include plant partial or full shutdown, lockdown of the facility or the temporary reduction in activities across the site to ensure the continuing safety of personnel and protection of the environment. Consequently, extreme meteorological conditions were not considered to cause significant harm and is assessed as being Tolerable (Not Significant).

Table 20-4: Credible Scenarios Related to the Operation of the Proposed Development

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
O-1	**Fire and / or Explosion** Fire due to loss of containment of natural gas (e.g., by mechanical failure or impact damage) from supply pipeline or process equipment. Ignition of escaped natural gas.	Fire and / or explosion could result in significant harm to people on-site, with the potential for fatal injuries. There is also the potential for harm to people and businesses off-site, such as radiant heat burns and impact injuries from explosions. The environmental impact of a major fire could affect the Teesmouth and Cleveland Coast Ramsar Site, SPA and SSSI, as a result of thermal radiation and run-off of firewater. It is unlikely that this type of accident could impact listed buildings or other heritage sites based on distance. Firewater run-off reaching areas of unmade ground could contain contaminants which	Design of the natural gas systems to industry codes and standards to include separation and segregation of pipework and equipment containing natural gas; inventory isolations and Integrated Control and Safety Systems (ICSS); and minimising operator complexity of operating equipment. Locating occupied buildings away from hazardous zones; and designing occupied buildings within hazardous zones, such as the control room, to withstand a hazardous event and protect the people within for a specific period of time, usually one hour. Compliance with the Pressure Equipment (Safety) Regulations 2016 and the PSR (HSE, 1996). Selection of pipeline routes, depth of cover in areas of higher risk, use of existing established pipe racks and the construction of safety systems to prevent pipeline damage, such as the installation of barriers. Pipeline safety systems and gas / liquid pressure regulation to be installed along with operational controls and monitoring. Leak / natural gas detection systems at the Proposed Development Site and in the vicinity of high hazard areas.	Tolerable if ALARP (Not Significant)

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
		would be potentially harmful to ground and groundwater.	Minimising the storage volumes of natural gas by design. Fire detection and fire protection systems will be installed on the Main Site, including passive and active fire suppression systems. The Proposed Development will be designed to contain firewater runoff and prevent material reaching unmade ground or other environmental receptors.	
O-2	**Fire and / or Explosion** Fire due to loss of containment of H_2 (e.g., by mechanical failure or impact damage) from storage tanks, export pipeline or process equipment.	Immediate ignition of H_2 gas would lead to a localised flash or jet fire depending on gas volume and pressure. Delayed ignition could lead to an explosion and / or fire. Fire and / or explosion could result in significant harm to people on-site, with the potential for fatal injuries. There is also the potential for harm to people and businesses off-site, such as radiant heat burns and impact injuries from explosions. The environmental impact of a major fire could affect the	The H_2 storage location and layout will be subject to adjustment following safety engineering consequence modelling. Design of the hydrogen systems, including storage, to industry codes and standards, including the selection of compatible materials for storage vessels, pipework and process equipment; separation and segregation of pipework and equipment containing hydrogen; inventory isolations and ICSS; and minimising operator complexity of operating equipment. Locating occupied buildings away from hazardous zones, reinforcing and designing occupied buildings within hazardous zones, such as the control room to withstand a hazardous event (safe refuge) and protect the people within for a specific period of time, usually one hour.	Tolerable if ALARP (Not Significant)

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
	Explosion following release of H_2.	Teesmouth and Cleveland Coast Ramsar Site, SPA and SSSI, as a result of thermal radiation and run-off of firewater. It is unlikely that this type of accident could impact listed buildings or other heritage sites based on distance. Firewater run-off reaching areas of unmade ground could contain contaminants which would be potentially harmful to groundwater.	Compliance with the Pressure Equipment (Safety) Regulations 2016 and the PSR (HSE, 1996). Selection of pipeline routes, depth of cover in areas of higher risk, use of existing established pipe racks and the construction of safety systems to prevent pipeline damage, such as the installation of barriers. Pipeline safety systems and gas / liquid pressure regulation to be installed along with operational controls and monitoring. Gas leak detection systems such as pressure monitoring instrumentation are to be installed at the Proposed Development Site and in the vicinity of high hazard areas. The details of the containment strategy for the hydrogen storage vessels are not yet known but these will be designed in accordance with industry codes and standards. Fire detection and fire protection systems will be installed on the Main Site, including passive and active fire suppression systems. The Proposed Development will be designed to contain firewater runoff and prevent material reaching unmade ground or other environmental receptors.	

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
			Detailed emergency plans will be produced for the Proposed Development in accordance with all applicable regulations.	
O-3	**Fire and / or Explosion** Fire or exacerbation of fire due to loss of containment of oxygen (e.g., by mechanical failure or impact damage) from process equipment.	O_2 is an oxidant and promotes rapid combustion of fuels and other organic materials in the event of ignition. An accidental release of O_2 could worsen a fire or cause an explosion in a fire scenario, and therefore worsen harm to people and the environment on and off-site, with the potential for fatal injuries.	Design of the O_2 systems to industry codes and standards. O_2 will be segregated from flammable materials. Compliance with the Pressure Equipment (Safety) Regulations 2016 and the PSR (HSE, 1996). Pipeline safety systems and gas / liquid pressure regulation to be installed along with operational controls and monitoring. Gas detection and pressure monitoring at the Proposed Development Site and in the vicinity of high hazard areas. Minimising the storage volumes of O_2. Fire detection and fire protection systems will be installed on the Proposed Development Site, including passive and active fire suppression systems. Detailed emergency plans will be produced for the Proposed Development in accordance with the Environmental Permit and all applicable Regulations.	Tolerable if ALARP (Not Significant)
O-4	**Toxic Gas Release**	Release of syngas could result in significant harm to people on the Main Site. The impact	Design of the process systems to industry codes and standards.	Tolerable (Not Significant)

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
	Release of syngas containing CO (e.g., by mechanical failure or impact damage) from process equipment.	of the release on people and the environment depends on the pressure, temperature and mass of material that is lost, however, there is the potential for fatal injuries from inhalation of toxic material. The potential for harm to people off-site is low due to the additional levels of containment that would have to be breached and the dispersal and dilution of any toxic materials over the distances involved.	Compliance with the Pressure Equipment (Safety) Regulations 2016 and the PSR (HSE, 1996). Pipeline safety systems and gas / liquid pressure regulation to be installed along with operational controls and monitoring. Gas detection and pressure monitoring at the Proposed Development Site and in the vicinity of high hazard areas. Isolation valves in the pipeline system to minimise inventory release to the atmosphere. Use of containment measures and barriers to prevent further loss of containment. Detailed emergency plans will be produced for the Proposed Development in accordance with the Environmental Permit and all applicable Regulations.	
O-5	**Asphyxiant Gas Release** Release of CO_2 (e.g., by mechanical failure or impact damage) from export pipeline or	Release of CO_2 could result in significant harm to people on-site. The impact of the release on people and the environment depends on the pressure, temperature and mass of material that is lost, however, there is the potential for fatal injuries from	Design of the process systems to industry codes and standards. Compliance with the Pressure Equipment (Safety) Regulations 2016 and the PSR (HSE, 1996). Pipeline safety systems and gas / liquid pressure regulation to be installed along with operational controls and monitoring.	Tolerable (Not Significant)

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
	process equipment.	asphyxiation as CO_2 is odourless and heavier than air. The potential for harm to people off-site is low due to the additional levels of containment that would have to be breached and the dispersal and dilution of any asphyxiant materials over the distances involved.	Gas detection and pressure monitoring at the Proposed Development Site and in the vicinity of high hazard areas. Isolation valves in the pipeline system to minimise inventory release to the atmosphere. Use of containment measures and barriers to prevent further loss of containment. Detailed emergency plans will be produced for the Proposed Development in accordance with the Environmental Permit and all applicable Regulations.	
O-6	**Domino Effects** Domino effects from incidents at neighbouring facilities	Fire and / or explosion, toxic release, discharges to air and water from neighbouring facilities such that these impact on the Proposed Development triggering further fire, explosion, or release of toxic or asphyxiant materials from the Proposed Development.	The Cleveland Emergency Planning Unit (CEPU) provides an emergency planning service to ensure that local authorities are prepared to respond to emergencies and to support the emergency services and the community. This organisation provides information to businesses and has many years' experience working with COMAH sites and operators of major pipelines in Hartlepool, Middlesbrough, Stockton on Tees and Redcar and Cleveland. It is a requirement of the COMAH Regulations that neighbouring upper tier sites should review and update their off-site emergency plans and Safety Reports to take into consideration potential impact of domino sites, which could potentially include this Proposed	Tolerable (Not Significant)

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
			Development. This ensures that domino effects are assessed in detail by major accident installations. It is expected that existing safety precautions at neighbouring industrial sites will mitigate the risk of domino effects occurring. Should new developments take place near to the Proposed Development in the future these will need to be sited to prevent domino effects from occurring by following the HSE standard land use planning methodology (Planning Advice for Developments near Hazardous Installations (PADHI) assessment (HSE, 2023).	
O-7	**Flooding** A tidal or river flood event causes the Proposed Development to flood	The consequences of flooding the Main Site could include contamination with polluting substances, destabilising assets and compromising the integrity of plant and equipment. Floodwater reaching electrical equipment could trigger knock-on impacts to the electrical systems and present a risk to health due to electrocution.	A Preliminary Flood Risk Assessment (FRA) is included with the PEI Report (Appendix 9A: Flood Risk Assessment (PEI Report, Volume III)). This will be used to inform the detailed design of the Proposed Development in terms of surface water management and selection of finished floor levels. Mitigation measures are described in the FRA include identifying a suitable level of the development platform for the Main Site, building the Proposed Development using Flood Resistant and Resilient Design standards, a system for monitoring flood warnings, and the development of a Flood Emergency Response Plan.	Tolerable (Not Significant)

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
			Electrical equipment such as transformers and switchgear are to be located above predicted flood levels. Flooding guidance is provided by the EA for sites regulated under the EPR (2016).	

Decommissioning

Assessment of Substances

20.6.24 During decommissioning there is the potential for process fluids to remain in-situ in the event of a failure to fully de-inventory process systems and pipework. An accidental release of these substances could result in a fire and / or explosion in the event of contact with an ignition source, with the potential for significant harm to persons on-site.

20.6.25 Waste materials would be generated during the decommissioning and demolition process. However, these would be recycled wherever possible and managed in accordance with the legislation applicable at the time. For further information regarding waste management, refer to Chapter 21: Materials and Waste (PEI Report, Volume I).

Review of Activities

20.6.26 Activities carried out during decommissioning would be similar to those carried out during construction, with the significant potential hazards including ground stability and vehicle impacts on-site. Decommissioning would involve a significant process of dismantling above and below-ground structures and the removal or capping off of pipelines. This activity has the potential for an accidental loss of containment of process fluids as described in Section 20.5.

Assessment of Shortlisted MA&D Scenarios

20.6.27 Considering the baseline, the hazardous substances likely to be present, and the identified decommissioning and demolition activities, a review of credible MA&D Risk Events contained in Appendix 20A: Long List of MA&Ds Risk Events (PEI Report, Volume III), concluded that the only MA&D Risk Event shortlisted for further assessment is fire / explosion.

20.6.28 Credible Scenarios for decommissioning Risk Events are summarised in Table 20-5. The level of risk presented by all Credible Scenarios has been assessed as ‘tolerable’, taking into consideration the proposed mitigation measures.

Table 20-5: Credible Scenarios Related to the Decommissioning of the Proposed Development

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
D-1	**Fire and / or Explosion** Demolition activity results in a loss of containment of gas as a result of failure to de-inventory process systems.	Process pipework and equipment containing extremely flammable gases (H_2, natural gas) and/or O_2, which is not fully removed prior to demolition activities has the potential to result in a fire and / or explosion causing significant harm to persons carrying out this work.	There are legislative requirements to control this work to ensure it is carried out safely. The demolition phase will be a notifiable project under CDM Regulations. Risk assessments will be produced prior to demolition activities, which are only to be carried out by suitably trained and experienced personnel. Activities with a high level of risk such as hot work (activities such as welding or using tools where there is a risk of ignition in a hazardous area) will be strictly controlled. Job method statements will include gas testing systems to ensure they have been fully vented and are clean prior to demolition. Compliance with safety legislation by the implementation of controls is considered to be sufficient to reduce risks to a level which is tolerable.	Tolerable (Not Significant)
D-2	**Exposure to toxic catalyst material as a result of failure to de-inventory process systems**	Catalyst material which is not fully removed from the catalyst beds prior to demolition activities has the potential to result in the	There are legislative requirements to control this work to ensure it is carried out safely. Risk assessments will be produced prior to demolition activities, which are only to be carried	Tolerable (Not Significant)

SCENARIO REFERENCE	CREDIBLE SCENARIO	POTENTIAL IMPACTS	EMBEDDED MITIGATION	TOLERABILITY
		dispersion of this material as dust causing significant harm to persons carrying out this work.	out by suitably trained and experienced personnel. Job method statements will include checks to ensure process equipment has been fully de-inventoried and are clean prior to demolition. Compliance with safety legislation by the implementation of controls is considered to be sufficient to reduce risks to a level which is tolerable.	

20.7 Mitigation and Enhancement Measures

Construction

20.7.1 All assessed Credible Scenarios during the construction phase of the Proposed Development have been assessed as having a Tolerable level of risk (which is Not Significant). The embedded mitigation measures proposed during construction are considered to be sufficient and secondary mitigation is not proposed at this point. This will be reviewed as the EIA progresses and confirmed in the ES.

Operation

20.7.2 The assessed Credible Scenarios identified during the operational phase of the Proposed Development have been assessed as having a level of risk which is Tolerable or Tolerable if ALARP (Not Significant). The embedded mitigation measures are considered to be sufficient and secondary mitigation is not proposed at this point.

20.7.3 However, further measures will be defined as the design of the Proposed Development design progresses and will be detailed in the ES. Further analysis may be carried out which includes detailed QRA and / or modelling assessments to determine whether the level of residual risk to people, both on-site and off-site, and to the environment, is ALARP.

Decommissioning

20.7.4 The Credible Scenario identified during the decommissioning phase of the Proposed Development has been assessed as having a Tolerable level of risk (Not Significant). The embedded mitigation measures are considered to be sufficient and secondary mitigation is not proposed at this point. This will be reviewed as the EIA progresses and confirmed in the ES.

20.8 Limitations and Difficulties

20.8.1 This assessment is based on construction, preliminary design, process and decommissioning information that is currently available and early appraisal of potential hazards. These will be refined and reappraised as the Proposed Development's design progresses and reported in the ES.

20.9 Residual Effects and Conclusions

20.9.1 It is considered that all MA&D Risk Events identified during the construction, operation and decommissioning of the Proposed Development would be Tolerable or Tolerable if ALARP (Not Significant). No additional mitigation is considered necessary at this stage. Therefore, the residual effects are Not Significant.

Cumulative Effects

20.9.2 The MA&Ds assessment has implicitly considered cumulative effects that may arise due to other major accident hazard installations and pipelines in the area (domino effects) which are knock-on impacts (e.g., fire at one installation which causes an explosion at another installation).

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21.0 MATERIALS AND WASTE

21.1 Introduction

21.1.1 This chapter of the Preliminary Environmental Information (PEI) Report provides a preliminary assessment of the potential impacts and effects as a result of the construction, operation (including maintenance) and decommissioning of the Proposed Development on materials and waste.

21.1.2 The assessment has been undertaken in accordance with current best practice guidance and follows the methodology set out in the Institute of Environmental Management and Assessment (IEMA) Guide to Materials and Waste in Environment Assessment, Guidance for a Proportionate Approach (referred from herein as the 'IEMA Guidance') (IEMA, 2020).

21.1.3 This chapter is supported by Figure 21-1: Historic and Authorised Landfills and Waste and Mineral Sites (PEI Report, Volume II).

21.2 Legislation and Planning Policy Context

21.2.1 This preliminary assessment has been undertaken taking into account relevant legislation, planning policy and guidance as set out in national, regional and local planning policy as summarised below.

Legislative Background

21.2.2 The assessment has taken account of relevant waste management legislation, including, but not limited to:

- Waste Framework Directive (EU, 2008);
- The Environmental Protection Act (1990) (Her Majesty's Stationary Office (HSMO), 1990);
- The Hazardous Waste (England and Wales) Regulations (2005) as amended (HMSO, 2005);
- The Waste (England and Wales) Regulations (2011) as amended (HMSO, 2011);
- The Environmental Permitting (England and Wales) Regulations (2016) (HMSO, 2016); and
- The Environment Act 2021 (HMSO, 2021).

21.2.3 The Waste (England and Wales) Regulations 2011 (as amended) (HMSO, 2011) transpose the requirements of the Waste Framework Directive (Waste FD) (EU, 2008) in England and Wales and require the Secretary of State to establish waste prevention programmes and waste management plans that apply the waste hierarchy. The waste hierarchy is defined in the Waste FD and prioritises waste prevention, followed by preparing for reuse, recycling, recovery and finally disposal as means of managing waste.

21.2.4 The Waste (England and Wales) Regulations 2011 (as amended) (HMSO, 2011) require businesses to apply the waste hierarchy when managing waste, and require

that measures are taken to ensure that, by the year 2020 and beyond, at least 70% by weight of non-hazardous construction and demolition waste is subjected to material recovery. The target specifically excludes naturally occurring materials with European Waste Catalogue (EWC) Code 17 05 04 (17 05 04 soil and stones other than those mentioned in 17 05 03* (soils and stone containing dangerous substances)).

21.2.5 A departure from the waste hierarchy can be undertaken to achieve the best overall environmental outcome where this is justified by lifecycle thinking on the overall impacts of the generation and management of the waste. However, the following considerations must also be taken into account:

- environmental protection principles of precaution and sustainability;
- proximity principle for treatment and disposal of waste to be as close to its source as possible;
- technical feasibility and economic viability;
- protection of resources; and
- overall environmental, human health, economic and social impacts.

Planning Policy Context

National Planning Policy

21.2.6 The Proposed Development materials and waste assessment will take into consideration national policy that concerns the use of material and waste generation and its management. The following national policies are relevant to the Proposed Development.

Overarching National Policy Statement (NPS) for Energy (EN-1) (2011)

21.2.7 The National Policy Statements (NPSs) for energy infrastructure set out the Government's policy for delivery of major energy infrastructure (Department of Energy and Climate Change (DECC), 2011). The Overarching NPS for Energy (EN-1) published in 2011 is of relevance to the materials and waste assessment (refer to Section 5.14 Waste Management).

21.2.8 A further update was published in March 2023 by the Department for Energy Security and Net Zero (DESNEZ). This document outlines what is required for an applicant's materials and waste assessment, including (refer to Section 5.15 Resource and Waste Management):

- 5.15.6 Applicants must demonstrate that development proposals are in line with Defra's policy position on the role of energy from waste in treating municipal waste.
- 5.15.8 The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a report that sets out the sustainable management of waste and use of resources throughout any relevant demolition, excavation and construction activities.

- 5.15.9 The arrangements described and a report setting out the sustainable management of waste and use of resources should include information on how re-use and recycling will be maximised in addition to the proposed waste recovery and disposal system for all waste generated by the development. They should also include an assessment of the impact of the waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation.
- 5.15.10 The applicant is encouraged to refer to the 'Waste Prevention Programme for England' and should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this is the best overall environmental outcome.
- 5.15.11 If the applicant's assessment includes dredged material, the assessment should include other uses of such material before disposal to sea, for example through reuse in the construction process.
- 5.15.12 The UK is committed to moving towards a more '*circular economy*'. Where possible, applicants are encouraged to source materials from recycled or reused sources and use low carbon materials, sustainable sources and local suppliers. Construction best practices should be used to ensure that material is reused or recycled onsite where possible.
- 5.15.13 Applicants are encouraged to use construction best practices in relation to storing materials in an adequate and protected place on site to prevent waste, for example, from damage or vandalism. The use of Building Information Management tools (or similar) to record the materials used in construction can help to reduce waste in future decommissioning of facilities, by identifying materials that can be recycled or reused.

National Policy Statement (NPS) for Gas and Oil Pipelines (EN-4) (2011))

21.2.9 NPS EN-4 does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS unless stated otherwise.

National Policy Statement (NPS) for Electrical Networks Infrastructure (EN-5) (2011)

21.2.10 NPS EN-5 does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS unless stated otherwise.

Draft National Policy Statements

21.2.11 The Government is currently reviewing and updating the Energy NPSs to reflect its policies and strategic approach that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions. As part of the review process, the Government published Draft Energy NPSs for consultation on 30th March 2023. The details of these provisions are subject to consultation. However, these emerging documents and any subsequent formal adoption of new NSPs for energy infrastructure have been considered where relevant

during the production of this PEI Report. A summary of the relevant draft NPSs is below.

Draft Overarching NPS for Energy (EN-1) (2023)

21.2.12 Section 5.15 of the Draft NPS (EN-1) relates to the resources and waste management. The Draft NPS states:

- 5.15.2 Sustainable waste management is implemented through the waste hierarchy, which sets out the priorities that must be applied when managing waste.
- 5.15.3 Disposal of waste should only be considered where other waste management options are not available or where it is the best overall environmental outcome.
- 5.15.4 All large infrastructure projects are likely to generate some hazardous and non-hazardous waste. The EA's EP regime incorporates operational waste management requirements for certain activities. When an applicant applies to the EA for an EP, the EA will require the application to demonstrate that processes are in place to meet all relevant EP requirements.

Draft NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (2023)

21.2.13 NPS EN-4 does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS unless stated otherwise.

21.2.14 The Draft NPS EN-4 states:

- 2.13.26 Due to risk of contamination, dredged spoil should not only be deposited responsibly using the waste disposal hierarchy, but also the applicant should seek beneficial use of dredged spoil wherever possible in accordance with policy commitments within the Marine Plans (see Section 4.4 of EN-1).

Draft NPS for Electricity Networks Infrastructure (EN-5) (2023)

21.2.15 NPS EN-5 does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS unless stated otherwise.

National Planning Policy Framework (2021) (Ministry of Housing, Communities & Local Government (MHCLG), 2021)

21.2.16 The National Planning Policy Framework (NPPF) does not contain specific waste policies as these are detailed within the revised Waste Management Plan for England (2021) and the National Planning Policy for Waste (2014b), however the following overarching policies are relevant to waste and resources:

- The environmental objective set out at paragraph 8 of the NPPF is '*to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy'.*

- The environmental objective set out in paragraph 210 of the NPPF is to *'so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously'.*

National Planning Policy Guidance (NPPG) for Minerals (2014) (MHCLG, 2014a) and NPPG for Waste (2015) (MHCLG, 2015)

21.2.17 The NPPG for Minerals and Waste were published to provide more in-depth guidance than the NPPF. It aims to make planning guidance more accessible and ensures that it is kept up to date.

National Planning Policy for Waste (2014) (MHCLG, 2014b)

21.2.18 The National Planning Policy for Waste sets out detailed waste planning policies to be applied in conjunction with the NPPF. It states that '*when determining planning applications for non-waste development, local planning authorities should, to the extent appropriate to their responsibilities, ensure that:*

- *the likely impact of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities;*
- *new, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development…; and*
- *the handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal'.*

The Waste Management Plan for England (2021) (Department for Environment, Food and Rural Affairs (Defra), 2021a)

21.2.19 The Waste Management Plan for England provides an overview of waste management in England and reiterates the requirement for all waste producers and waste management providers to implement the waste hierarchy. It also highlights the need for waste to be managed using the proximity principle and confirms England's commitment to recovering at least 70% by weight of non-hazardous construction and demolition waste by 2020 (excluding soils and stones). Recovery is assumed in the context of this policy to include reuse, recycling and incineration with energy recovery.

A Green Future: Our 25 Year Plan to Improve the Environment (2018) (Defra, 2018a)

21.2.20 A Green Future: Our 25 Year Plan to Improve the Environment (2018) '*sets out goals for improving the environment within a generation and leaving it in a better state than we found it'*. It details how the government will work with communities and businesses to do this. The following policies are of note:

- make sure that resources are used more efficiently and kept in use for longer to minimise waste and reduce its environmental impacts by promoting reuse, remanufacturing and recycling;
- work towards eliminating all avoidable waste by 2050 and all avoidable plastic waste by the end of 2042;
- reducing food supply chain emissions and waste;
- reducing litter and littering; and
- improving management of residual waste.

Our Waste, Our Resources: A Strategy for England (Resources and Waste Strategy for England) (2018) (Defra, 2018b)

21.2.21 The Strategy for England (2018) aims to help the government to meet the commitments outlined in the 25 Year Plan and '*sets out how we will preserve our stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. At the same time we will minimise the damage caused to our natural environment by reducing and managing waste safely and carefully, and by tackling waste crime'.*

21.2.22 The strategy combines actions to be taken now and commitments for the coming years. Key targets and milestones which could be relevant to the Proposed Development include:

- roll out of a deposit return scheme (subject to consultation) – 2023;
- legislation for mandatory separate food waste collections (subject to consultation) – 2023;
- 75% recycling rate for packaging (subject to consultation) – 2023;
- 65% recycling rate for municipal solid waste – 2035; and
- municipal waste to landfill 10% or less – 2035.

Local Planning Policy

21.2.23 The Proposed Development materials and waste assessment will take into consideration local policy that concerns the use of material and waste generation and management. Details of local planning policy relevant to the Proposed Development are presented below.

Tees Valley Joint Minerals and Waste Development Plan Documents (DPDs) Core Strategy DPD (Tees Valley, 2011a).

21.2.24 The Tees Valley Joint Minerals and Waste DPDs are prepared jointly by the boroughs of Darlington, Hartlepool, Middlesborough, Redcar and Cleveland and Stockton-on-Tees, bringing together the planning issues which arise from minerals and waste within the sub-region. The Minerals and Waste Core Strategy contains the long-term spatial vision and the strategic policies needed to achieve the key objectives for minerals and waste developments in the Tees Valley. Relevant policies include:

- Policy MWC11: Safeguarding of Port and Rail Facilities;
- Policy MWC4: Safeguarding of Minerals and Resources from Sterilisation; and
- Policy MWC8: General Locations for Waste Management Sites.

Tees Valley Joint Minerals and Waste DPDs: Policies and Sites DPD (Tees Valley, 2011b)

21.2.25 The Policies and Sites DPD, which conforms with the Core Strategy DPD, identifies specific sites for minerals and waste development and sets out policies which will be used to assess minerals and waste planning applications. Relevant policies include:

- Policy MWP5: Haverton Hill (Stockton-on-Tees);
- Policy MWP6: New Road, Billingham (Stockton-on-Tees);
- Policy MWP8: South Tees Eco-Park (Redcar and Cleveland); and
- Policy MWP10: Construction and Demolition Waste Recycling.

Other Relevant Policy, Standards and Guidance

21.2.26 Additional guidance documents relevant to the materials and waste assessment which have been considered include:

- Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering (WRAP, undated a); and
- WRAP Designing Out Waste: A Design Team Guide for Buildings (WRAP, undated b).

21.3 Assessment Methodology and Significance CriteriaFor this PEI Report, materials and waste comprise:

- the consumption of materials (key construction materials only); and
- the generation and management of waste during construction, operation and decommissioning.

21.3.2 Materials are defined in the IEMA Guidance (IEMA, 2020) as '*physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt and steel'*.

21.3.3 Other material assets considered include built assets such as landfill void capacity and allocated/safeguarded mineral sites (e.g., quarries, wharves, rail depots concrete plants) and waste sites.

21.3.4 Waste is defined as per the Waste FD (2008/98/EC) (European Union (EU), 2008) as '*any substance or object which the holder discards or intends or is required to discard'*.

21.3.5 Impacts upon Mineral Safeguarding Areas (MSAs) are not assessed in the materials and waste assessment in accordance with the IEMA Guidance (IEMA, 2020). MSAs are included for context in the baseline since MSAs are a planning consideration and would be considered further in the Planning Statement submitted with the DCO Application.

21.3.6 This section outlines the methodology that will be employed for assessing the likely significant effects associated with materials and waste. The IEMA Guidance (IEMA, 2020) offers two methods for the assessment of waste. Method W1 '*void capacity*' has been selected as this is a more detailed methodology and is appropriate for larger and more complex projects.

21.3.7 Some of the operational hazardous wastes likely to be generated by the Proposed Development may not be suitable for landfill disposal e.g., liquid waste. Therefore, in addition to Method W1 – void capacity, hazardous operational waste will be compared to national hazardous waste management facility waste inputs.

Study Areas

21.3.8 The study areas for the assessment of impacts related to materials and waste have been defined in line with the IEMA Guidance. Two study areas are defined: a Proposed Development Study Area (within which waste associated with the Proposed Development is generated, construction materials are used and allocated/safeguarded mineral and waste sites and MSAs are present), and an Expansive Study Area (within which landfills and other waste facilities that manage waste generated by the Proposed Development are likely to be located and constructional materials are available). Together the Proposed Development Study Area and Expansive Study Area are referred to in this Chapter as '*the Study Areas*'.

Proposed Development Study Area

21.3.9 The Proposed Development Study Area for construction and operational waste generation, and for use of construction materials (key construction materials only), comprises the Proposed Development Site (i.e., the footprint of the proposed works, together with any temporary land requirements during construction). This includes temporary offices, compounds and storage areas.

21.3.10 The Proposed Development Study Area for impacts on allocated/safeguard mineral and waste sites and MSAs is also the Proposed Development Site. Impacts on allocated/safeguarded waste sites are not included in the IEMA Guidance, however, they are included in this chapter for completeness.

Expansive Study Area

21.3.11 The Expansive Study Area for non-hazardous and inert waste management comprises the Yorkshire and Humber and North East regions. Both regions are included since the Proposed Development Site is close to the border between them, and waste could be managed in either. The Expansive Study Area includes the following sub-regions as outlined in the Environment Agency's (EA) 2021 Waste Summary Tables for England - Version 3 (EA, 2023a):

- former Humberside, North Yorkshire, South Yorkshire, West Yorkshire; and
- County Durham, Northumberland, Tees Valley Unitary Authorities and Tyne & Wear.

21.3.12 The Expansive Study Area for hazardous waste management is England.

21.3.13 The Study Area for hazardous waste management is defined based on professional judgement and informed by consideration of the proximity principle. The proximity principle for hazardous waste in England is outlined in 'Principle 2 - Infrastructure Provision in the Strategy for Hazardous Waste Management in England', and states '*We look to the market for the development of hazardous waste infrastructure, which implements the hierarchy for the management of hazardous waste and meets the needs of the UK to ensure that the country as a whole is self sufficient in hazardous waste disposal, facilities are put in place for hazardous waste recovery in England, and the proximity principle is met'* (Defra, 2010). Planning for hazardous waste management is also undertaken at a national level.

21.3.14 The Expansive Study Areas for the availability of key construction materials (aggregates, asphalt, concrete and steel) are national (United Kingdom (UK) or Great Britain (GB), dependent upon baseline information availability) and Yorkshire and the Humber and the North East regions.

Impact Assessment Methodology

Scope of Assessment

21.3.15 The assessment of materials and waste considers the following:

- waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the site where it is generated is transferred to a suitably licensed facility for further treatment or disposal;
- facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a license, and impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for these facilities themselves;
- as part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas; and
- Mineral Planning Authorities (MPAs) are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs.

21.3.16 The following matters are not considered in the assessment of materials and waste:

- Waste arising from extraction, processing and manufacture of construction components and products. This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and therefore outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed as they relate to procurement decisions that cannot be assured. Waste arising from extraction, processing and manufacture of construction

components and products are scoped out of the assessment as agreed by the Planning Inspectorate (the Inspectorate) as outlined in Table 21-10.

- Other environmental impacts associated with the management of waste from the Proposed Development (e.g., on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste) are not included in this assessment, as they are addressed separately in other relevant chapters of this PEI Report. Other environmental impacts associated with the management of waste from the Proposed Development are scoped out of the assessment as agreed by the Inspectorate as outlined in Table 21 10.
- Direct impacts on MSAs. The Proposed Development Site lies within MSAs for salt and gypsum (anhydrite), however, impacts on MSAs are not assessed in the materials and waste assessment in accordance with IEMA Guidance (IEMA, 2020). MSAs are included for context in the baseline since MSAs are a planning consideration. The Proposed Development uses previously developed industrial land and where possible. The Connection Corridors including the pipeline routes have been selected to avoid environmentally sensitive areas and utilise existing, established pipeline routes. The Proposed Development is unlikely to sterilise or prejudice the future extraction of the mineral resource, because the anhydrite and salt resources occur at depth and can be extracted by alternative means (e.g., mining or brine solution). Part of the anhydrite has already been removed by mining by Imperial Chemical Industries (ICI) prior to the 1970s (Mindat, 2023). Gypsum (anhydrite) is scoped out of the assessment as agreed by the Inspectorate as outlined in Table 21-10.
- Effects associated with decommissioning of the Proposed Development. The Proposed Development has a long design life and as such it is not considered possible to reliably forecast decommissioning requirements and infrastructure far in the future. A Decommissioning Environmental Management Plan (DEMP) will be prepared which would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated. Effects associated with the decommissioning phase would be no worse than those experienced during the construction of the Proposed Development as agreed by the Inspectorate as outlined in Table 21-10.
- Effects on the availability of materials during the operation of the Proposed Development. Forecast material and waste effects are (using professional judgement) considered negligible in relation to the scale and nature of the Proposed Development as agreed by the Inspectorate as outlined in Table 21-10.

21.3.17 Table 21-1: provides the outline scope of the material and waste assessment.

Table 21-1: Outline Scope of the Material and Waste Assessment

PROPOSED DEVELOPMENT PHASE	POTENTIAL EFFECTS	SCOPE IN/ OUT
Construction	Changes in demand for materials	Scoped in
	Changes in available landfill void capacity	Scoped in
	Changes to allocated/safeguarded mineral site	Scoped in
	Changes to allocated/safeguarded waste site	Scoped in
Operation	Changes in availability of materials	Scoped out
	Changes in available landfill void capacity	Scoped in
	Changes in available hazardous waste management facility capacity	Scoped in
Decommissioning	Changes in demand for materials	Scoped out
	Changes in available landfill capacity	Scoped out
	Changes to allocated/safeguarded mineral site	Scoped out
	Changes to allocated/safeguarded waste site	Scoped out

Sensitive Receptors

21.3.18 The sensitive receptors for the assessment of the construction phase material and waste impacts are:

- Landfill void capacity in the Expansive Study Area of Yorkshire and the Humber and North East (non-hazardous and inert landfill void capacity), and England (hazardous landfill void capacity) – as defined in the IEMA Guidance (IEMA, 2020) '*landfill is a finite resource, and hence – through the ongoing disposal of waste – there is a continued need to expand existing and develop new facilities, This requires the depletion of natural and other resources which, in turn, adversely impacts the environment'*; and
- Materials, national and regional availability of key construction materials – as outlined in the IEMA Guidance (IEMA, 2020) '*materials are, in their own right, sensitive receptors. Consuming materials impacts upon their immediate and (in the case of primary material) long-term availability; this results in the depletion of natural resources and adversely impacts the environment'.*

21.3.19 The sensitive receptors for the assessment of operational phase material and waste impacts are:

- Landfill void capacity in the Expansive Study Area of Yorkshire and the Humber and the North East (non-hazardous and inert landfill void capacity), and England (hazardous landfill void capacity).

21.3.20 The IEMA Guidance (IEMA, 2020) '*does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources'.* However, since some of the operational hazardous wastes likely to be generated by the Proposed Development may not be suitable for landfill disposal (e.g. liquid waste), hazardous operational waste is compared to national hazardous waste management facility capacity in this assessment.

Baseline Conditions

21.3.21 A baseline has been developed in accordance with IEMA Guidance (IEMA, 2020) and consists of:

- national (UK or GB) and regional (consumption/sales) data for key construction materials (steel, aggregates, asphalt and concrete);
- MSAs and allocated/safeguarded mineral and waste sites;
- landfill void capacity in Yorkshire and the Humber and the North East (non-hazardous and inert landfill void capacity), and England (hazardous landfill void capacity); and
- waste received at relevant hazardous waste management facilities nationally.

Methodology for Determining Construction Effects

21.3.22 Materials will be used during the construction of the Proposed Development - the key construction materials expected to be used are steel, aggregates, asphalt and concrete.

21.3.23 Waste will be generated during construction of the Proposed Development. A large proportion of this waste will be recycled, with the remainder disposed off-site by a licensed waste contractor.

Materials

21.3.24 Effects upon materials during construction of the Proposed Development will be assessed by:

- establishing the baseline for national consumption of key construction materials by weight;
- assessing the sensitivity of materials as related to the availability and types of materials to be consumed by the Proposed Development in construction;
- establishing the quantities of key construction materials required for the construction of the Proposed Development; and
- comparing the total quantities of key construction materials with the most recent national demand (utilising a percentage approach).

Waste

21.3.25 Effects upon waste during construction of the Proposed Development will be assessed by:

- establishing the baseline landfill void capacity in the Expansive Study Areas;
- assessing the sensitivity of landfill void capacity;
- establishing the quantities of construction, demolition and excavation waste to be generated during the construction of the Proposed Development;
- comparing the total waste arising from the construction of the Proposed Development against the landfill void capacity (using a percentage approach) assuming a worst case that waste goes to landfill.

Methodology for Determining Operational Effects

21.3.26 As described in Chapter 4: The Proposed Development (PEI Report, Volume I), operational waste will predominantly comprise of process waste, which will be managed in accordance with the relevant environmental regulations using licensed waste contractors. The estimated volumes and waste management methods for these operational wastes are considered in this assessment.

21.3.27 Effects upon waste during operation of the Proposed Development will be assessed by:

- establishing the baseline landfill void capacity in the Expansive Study Areas;
- assessing the sensitivity of landfill void capacity;
- establishing the quantities of operational waste to be generated during the operation of the Proposed Development;
- comparing the total waste arising from the operation of the Proposed Development against the landfill void capacity (using a percentage approach); and
- comparing operational hazardous waste arising from the operation of the Proposed Development against national hazardous waste management facility waste inputs (using a percentage approach).

Significance Criteria

Sensitivity

Materials

21.3.28 The sensitivity of materials relates to the availability and type of construction material to be consumed by the Proposed Development. The IEMA Guidance (IEMA, 2020) criteria described within Table 21-2: is used to determine the sensitivity of materials.

Table 21-2: Materials Receptor Sensitivity

EFFECTS	CRITERIA FOR MATERIALS RECEPTOR SENSITIVITY
Negligible	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock. *And/or* are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials.*
Low	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. *And/or* are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock. *And/or* are available comprising some sustainable features and benefits compared to industry-standard materials.
High	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock. *And/or* comprise little or no sustainable features and benefits compared to industry-standard materials.
Very High	On balance, the key materials required for the construction of the Proposed Development are forecast are known to be insufficient in terms of production, supply and/or stock. *And/or* comprise no sustainable features and benefits compared to industry-standard materials.
** Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.*	

Waste

21.3.29 The sensitivity of waste relates to availability of landfill capacity in the absence of the Proposed Development as outlined in the IEMA Guidance (IEMA, 2020) *"landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste"*. The sensitivity of landfill capacity is assessed based on a review of historic landfill void capacity trends where available and information from relevant policy documents.

21.3.30 The criteria described within Tables 21-3 and 21-4 will be used to determine the sensitivity of landfill capacity.

Table 21-3: Inert and Non-hazardous Landfill Capacity Sensitivity

EFFECTS	CRITERIA FOR INERT AND NON-HAZARDOUS LANDFILL CAPACITY SENSITIVITY
Negligible	Across construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity expected to remain unchanged, or is expected to increase through a committed change in capacity.
Low	Across construction and/or operation phases, the baseline/future baseline (i.e., without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce minimally by <1% as a result of wastes forecast.
Medium	Across construction and/or operation phases, the baseline/future baseline (i.e., without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce noticeably by 1-5% as a result of wastes forecast.
High	Across construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce considerably by 6-10% as a result of wastes forecast.
Very High	Across construction and/or operation phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is: • expected to reduce very considerably (by >10%); • end during construction or operation; • is already known to be unavailable; or • would require new capacity or infrastructure to be put in place to meet forecast demand.

Table 21-4: Hazardous Landfill Capacity Sensitivity

EFFECTS	CRITERIA FOR HAZARDOUS LANDFILL CAPACITY SENSITIVITY
Negligible	Across the construction and/or operation phases, the baseline/future baseline (i.e., without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to remain unchanged or is expected to increase through a committed change in capacity.
Low	Across the construction and/or operation phases, the baseline/future baseline (i.e., without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to reduce minimally by <0.1% as a result of wastes forecast.
Medium	Across the construction and/or operation phases, the baseline/future baseline (i.e., without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to reduce noticeably by 0.1-0.5% as a result of wastes forecast.
High	Across the construction and/or operation phases, the baseline/future baseline (i.e., without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to reduce considerably by 0.5-1% as a result of wastes forecast.
Very High	Across the construction and/or operation phases, the baseline/future baseline (i.e., without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is: • expected to reduce very considerably (by >1%); • end during construction or operation: • is already known to be unavailable; or, • would require new capacity or infrastructure to be put in place to meet forecast demand.

Magnitude of Impact

21.3.31 The magnitude of impact describes the degree of variation from the baseline conditions as a result of the Proposed Development. The IEMA guidance (IEMA, 2020) for assessing the magnitude of impact from materials comprises a percentage-based approach that determines the influence of construction materials use on the baseline national demand from the construction of the Proposed Development. The criteria used to assess the magnitude of impact for materials are provided in Table 21-5.

Table 21-5: Materials Magnitude of Impacts

	CRITERIA FOR MATERIALS MAGNITUDE OF IMPACTS
No change	Consumption of no materials is required.
Negligible	Consumption of no individual material type is equal to or greater than 1% by volume of the national* baseline availability.
Minor	Consumption of one or more materials is between 1-5% by volume of the national* baseline availability; and The development has the potential to adversely and substantially** impact access to one or more allocated mineral site (in their entirety), placing their future use at risk.
Moderate	Consumption of one or more materials is between 6-10% by volume of the national* baseline availability; and One allocated mineral site is substantially** sterilised by the development rendering it inaccessible for future use.
Major	Consumption of one or more materials is >10% by volume of the national* baseline availability; and More than one allocated mineral site is substantially** sterilised by the development rendering it inaccessible for future use.
*a national baseline is used in the absence of regional construction material consumption data. **justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed.	

21.3.32 The IEMA Guidance (IEMA, 2020) methodology for assessing the magnitude of impact for waste comprises a percentage-based approach that determines the influence of waste generation from the construction of the Proposed Development on the baseline landfill capacity. The criteria used to assess the magnitude of impact for resources and waste are provided within Table 21-6 and Table 21-7.

Table 21-6: Inert and Non-hazardous Waste - Magnitude of Impact

	CRITERIA FOR WASTE MAGNITUDE OF IMPACTS
No change	Zero waste generation and disposal from the development.
Negligible	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by <1%.
Minor	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by 1-5%.
Moderate	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by 6-10%.

	CRITERIA FOR WASTE MAGNITUDE OF IMPACTS
Major	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by >10%.
# forecast as the worst-case scenario, during a defined construction and/or operational phase.	

Table 21-7: Hazardous Waste - Magnitude of Impact

	CRITERIA FOR WASTE MAGNITUDE OF IMPACTS
No change	Zero waste generation and disposal from the development.
Negligible	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by <0.1%.
Minor	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by <0.1-0.5%.
Moderate	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by <0.5-1%.
Major	Waste generated by the development will reduce Expansive Study Area landfill capacity baseline# by >1%.
# forecast as the worst-case scenario, during a defined construction and/or operational phase.	

Significance of Effect

21.3.33 Table 21-8 describes the effect thresholds used in determining the significance of potential effects, whilst Table 21-9 indicates which effects are deemed to be significant. Materials and waste have specific IEMA Guidance (IEMA, 2020) and does not use the thresholds outlined in Chapter 2: Assessment Methodology (PEI Report, Volume I).

Table 21-8: Effect Thresholds

		MAGNITUDE OF IMPACT				
		NO CHANGE	NEGLIGIBLE	MINOR	MODERATE	MAJOR
SENSITIVITY	VERY HIGH	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	HIGH	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large

		MAGNITUDE OF IMPACT				
		NO CHANGE	NEGLIGIBLE	MINOR	MODERATE	MAJOR
	MEDIUM	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	LOW	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	NEGLIGIBLE	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Table 21-9: Significance of Effect

EFFECT	MATERIALS	WASTE
Neutral	Not Significant	Not Significant
Slight		
Moderate	Significant	Significant
Large		
Very large		

Sources of Information/Data

21.3.34 The following sources of information have been reviewed and have informed the materials and waste assessment:

- Tees Valley Joint Minerals and Waste DPD[1]: Core Strategy and Polices and Sites (Tees Valley, 2011a and Tees Valley, 2011b);
- EA's 2021 Waste Summary Tables for England - Version 3 (EA, 2023a) including remaining land capacity;
- EA's 2021 Waste Data Interrogator (EA, 2023b);
- EA's Permitted Waste Sites - Authorised Landfill Site Boundaries (EA, 2022a);
- EA's Historic Landfill Sites (EA, 2022b);
- EA's Environmental Permitting Regulations - Waste Sites (EA, 2022c);
- Make UK's A New Deal for Steel: Laying the Foundations for a Vibrant UK steel industry, 2018 data (Make UK, 2019);
- MPA's Minerals and mineral products sales in Great Britain, 2018 data (MPA, 2020); and

[1] Covers Redcar, Stockton-on-Tees and Hartlepool local authority areas together with Darlington and Middlesborough.

- Relevant legislation and national policy.

Consultation

21.3.35 An EIA Scoping Opinion was requested from the Inspectorate in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to material and waste is provided in Table 21-10.

Table 21-10: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	17th May 2023 Scoping Opinion	The following can be scoped out of the materials and waste assessment: • Waste arising from extraction, processing and manufacture of construction components and products. • Environmental impacts associated with the management of waste (adequate cross referencing is to be made to where it is addressed elsewhere in the ES). • Effects associated with decommissioning (providing the commitment to producing a Decommissioning Environmental Management Plan (DEMP) is secured within the dDCO. • Operation – changes in availability of materials • Effects on MSAs (gypsum (anhydrite))	Noted
The Inspectorate	17th May 2023 Scoping Opinion	Effects on MSAs (salt) should be assessed. Potential impacts on sterilisation of salt resource should be assessed within the Socio-economics and Land-use ES	The Proposed Development is unlikely to sterilise or prejudice the future extraction of the mineral resource, because the anhydrite and salt resources occur at depth

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		Chapter or further information should be presented to demonstrate that significant effects are not likely to occur.	and can be extracted by alternative means (e.g., mining or brine solution). Existing salt caverns (from previous mining) will be subject to a separate application (by others) for use for hydrogen storage.
Environment Agency	17th May 2023 Scoping Opinion	Reuse of the made ground on this development is unlikely to be suitable for use under the CL:AIRE Definition of Waste Code of Practice (DoW CoP).	Noted.

Use of the Rochdale Envelope

21.3.36 In order to ensure a robust assessment of the likely significant environmental effects of the Proposed Development Site, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with the Inspectorate's Advice Note 9: Rochdale Envelope (The Planning Inspectorate, 2018). This involves assessing the maximum (or where relevant, minimum)/worst case parameters for the elements of the Proposed Development where flexibility needs to be retained (building dimensions or operational modes for example).

21.4 Baseline Conditions

Existing Baseline

Regional and National Availability of Key Construction Materials

21.4.1 UK and GB data has been used to establish a quantitative national baseline of the consumption of key constructional materials.

21.4.2 Table 21-11 summarises national consumption and sales (providing an indication of availability) in 2018 for steel, aggregates, asphalt and concrete (the most recent years for which data is available), which are the key construction materials expected to be used during Proposed Development construction.

21.4.3 Regional data is presented in Table 21-12. Construction material sales by region are provided for the regions surrounding the Proposed Development. It is assumed that the majority of key construction materials (aggregates, asphalt and concrete) will be sourced locally (e.g., within the region), taking into account the proximity principle. Other materials may be sourced from the rest of the UK or imported into the UK.

Table 21-11: National Consumption and Sales for Key Construction Materials

MATERIAL	NATIONAL CONSUMPTION (MILLION TONNES, YEAR)	BASELINE DATA YEAR	DATA DESCRIPTION
Steel	17	2018	UK total consumption (Make UK, 2019)
Aggregates of which:	251	2018	Minerals and mineral products sales in Great Britain (MPA, 2020)
• Crushed rock	117.3		
• Sand and gravel - land won	48.9		
• Sand and gravel - marine	13.7		

MATERIAL	NATIONAL CONSUMPTION (MILLION TONNES, YEAR)	BASELINE DATA YEAR	DATA DESCRIPTION
• Recycled and secondary	71		
Asphalt	25.4		
Concrete of which:	86.2		
• Ready-mixed concrete	54.2		
• Concrete products	32		

Table 21-12: Construction Material Sales by Region (MPA, 2020)

CONSTRUCTION MATERIAL	YORKSHIRE AND THE HUMBER	NORTH EAST	TOTAL
Crushed rock (million tonnes)	11.5	5.3	16.8
Sand and gravel (million tonnes)	2.3	2.0	4.3
Ready-mixed concrete (million m^3)	1.2	0.6	1.8
Asphalt (million tonnes)	2.1	0.8	2.9

21.4.4 Potential recycled contents for the main construction materials are outlined in Table 21-13. These *'good practice'* rates are derived from WRAP's Designing Out Waste Tool for Civil Engineering (WRAP, undated c).

Table 21-13: Potential Recycled Content (Percentage by Weight)

MATERIAL TYPE	POTENTIAL RECYCLED CONTENT (% BY WEIGHT)
Concrete	16
Asphalt	25
Aggregates	50
Steel reinforcement	100
Structural steel	60

Mineral Safeguarding Areas, Allocated/Safeguarded Mineral and Waste Sites

21.4.5 The Proposed Development Site lies within MSAs for:

- marine dredged sand and gravel at Tees Dock;

- gypsum (anhydrite) across the whole of the Tees Valley Plan area (Tees Valley, 2011a); and
- salt, across the whole of the Redcar and Cleveland Local Plan area (Redcar and Cleveland Borough Council, 2018).

21.4.6 MSAs are scoped out of the assessment.

21.4.7 As outlined in Figure 21- Historic and Authorised Landfills and Waste and Mineral Sites (PEI Report, Volume II), the Proposed Development Site lies within:

- a safeguarded wharf at Tees Dock (Redcar and Cleveland) and a safeguarded wharf at Billingham Reach Industrial Estate (Stockton-on-Tees) (Tees Valley, 2011a);
- a General Location for Large Waste Management Facilities, covering industrial areas to the north and south of the River Tees (Tees Valley, 2011a); and
- safeguarded waste sites at Haverton Hill (Stockton-on-Tees, construction and demolition waste recycling) and South Tees Eco-Park (Redcar and Cleveland).

21.4.8 The Proposed Development Site is also adjacent to New Road, Billingham (Stockton-on-Tees, construction and demolition waste recycling) (Tees Valley, 2011b).

Landfill Capacity

21.4.9 The EA's Waste Management Information includes information about waste sent to landfills and remaining landfill capacity. Remaining landfill capacities at the end of 2021 as outlined on the EA's 2021 Waste Summary Tables for England – Version 3 (EA, 2023a) for the non-hazardous and inert waste Expansive Study Area (Yorkshire and the Humber and the North East) and the hazardous waste Expansive Study Area (England) are shown in Table 21-14.

21.4.10 Merchant landfills are operated for commercial purposes accepting waste from construction projects and operating businesses. Merchant landfills are therefore considered to form the baseline. In contrast, restricted landfills are sites that deal with their own produced waste (i.e., not operating for commercial purposes). Therefore, additional capacity is excluded from the baseline. Some non-hazardous landfills have a Stable Non-Reactive Hazardous Waste (SNHRW) Cell (e.g., for asbestos). SNHRW cells usually form only a small fraction of the overall capacity. Therefore, for assessment purposes non-hazardous landfills with SNRHW cells are considered in the same way as non-hazardous landfills.

Table 21-14: Landfill Capacity (end of 2021) in Yorkshire and the Humber, the North East and England

LANDFILL TYPE	SUB-REGION			
	YORKSHIRE AND THE HUMBER	NORTH EAST	TOTAL IN YORKSHIRE AND THE HUMBER AND THE NORTH EAST	ENGLAND
	LANDFILL CAPACITY ('000s m^3)			
Hazardous merchant	700	4,486	5,186	12,107
Non-hazardous with SNRHW cell	1,243	1,486	2,729	52,006
Non-hazardous	45,196	7,959	53,155	162,369
Inert	25,283	8,171	33,454	129,078

21.4.11 The EA has published landfill capacity data each year since 2005. The historic capacity trend for 2005-2021 for inert and non-hazardous waste in the Yorkshire and Humber and North East regions, and for hazardous waste in England, are presented in Plate 21-1, Plate 21-2 and Plate 21-3.

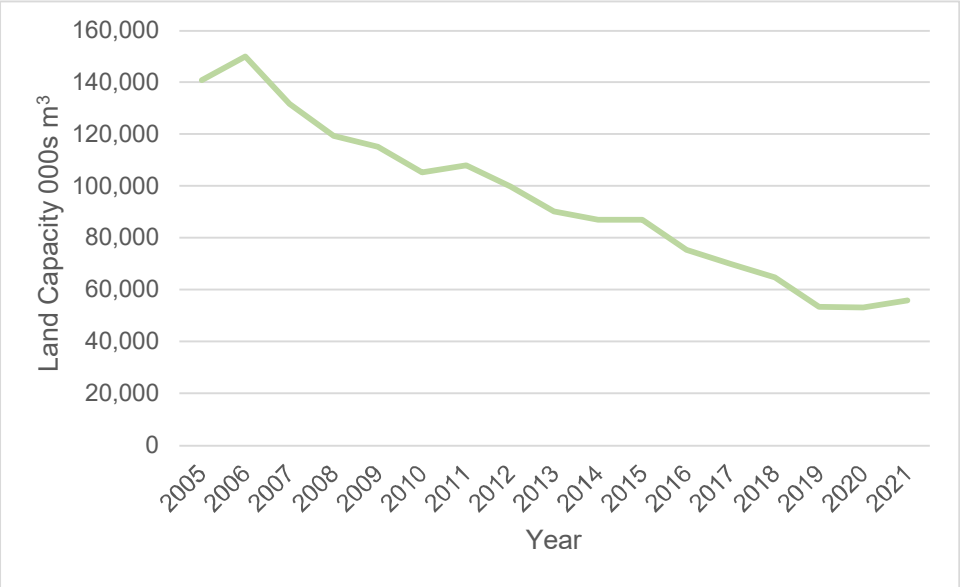

Plate 21-1: Historic Landfill Capacity Trend (2005-2021) for Non-hazardous Waste in the Yorkshire and Humber and North East Regions ('000s m^3)

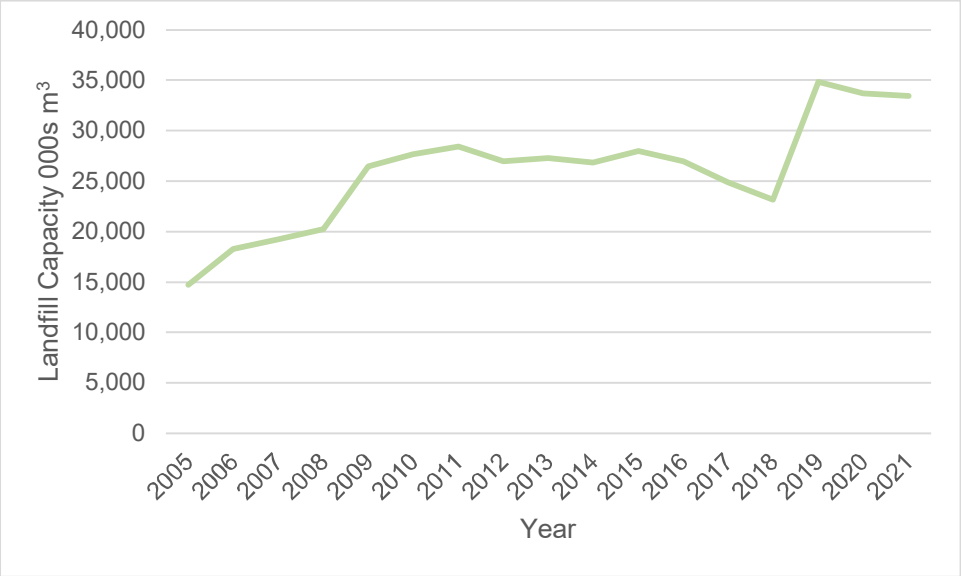

Plate 21-2: Historic landfill Capacity Trend 2005-2021 for Inert Waste in Yorkshire and the Humber and North East ('000s m^3)

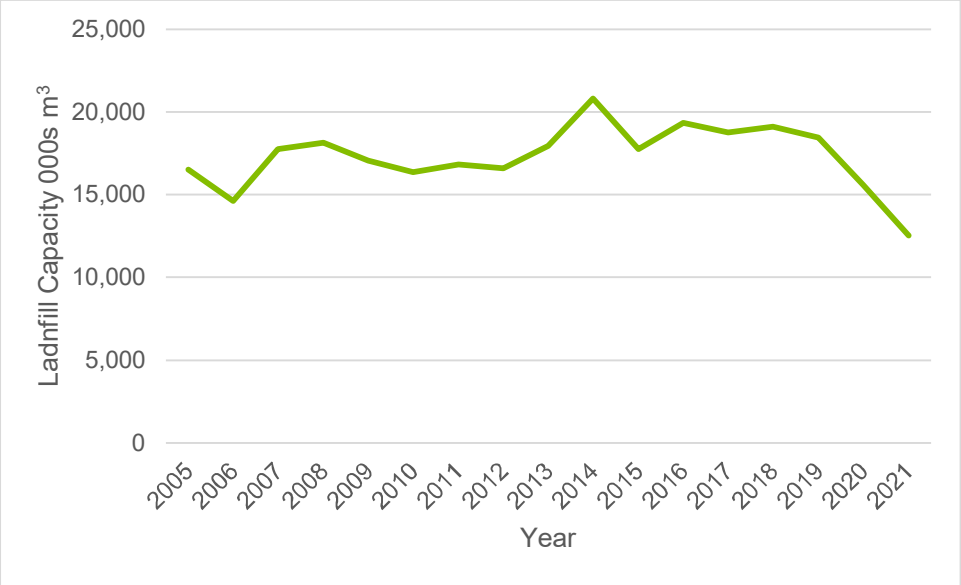

Plate 21-3: Historic Landfill Capacity Trend 2005-2021 for Hazardous Waste in England ('000s m^3)

Waste Management Infrastructure

21.4.12 There are a number of permitted waste sites and waste applications within the Proposed Development Site as shown in Figure 21-1: Historic and Authorised Landfills and Waste and Mineral Sites (PEI Report, Volume II) (licence numbers provided). These sites are listed in the EA's Environmental Permitting Regulations - Waste Sites dataset (EA, 2022c).

21.4.13 Capacity data for other types of waste infrastructure is publicly available (e.g., Environmental Permitting Regulations - Waste Sites (EA, 2022c). However, the permitted capacity is not necessarily representative of the actual operational

capacity of the infrastructure. Therefore, inputs data are collated from the EA's Waste Data Interrogator for 2021 – Waste Received (Excel) – Version 2 (EA, 2022b) and presented in Table 21-15 for the Yorkshire and Humber and North East regions. Inputs are not totalled since the double counting of waste moving between the site types listed in the Waste Data Interrogator cannot be discounted.

Table 21-15: Summary of Waste Inputs by Facility, for the Yorkshire and Humber and North East Regions

FACILITY TYPE	YORKSHIRE AND THE HUMBER (TONNES RECEIVED)	NORTH EAST (TONNES RECEIVED)
Landfill	4,501,192	2,917,864
Metal Recycling Site (MRS)	1,817,180	961,482
On/in land	1,397,745	575,817
Transfer	5,394,163	2,753,718
Treatment	14,703,527	3,582,850
Combustion	71,810	-
Incineration	2,908,832	1,307,642
Mobile plant	-	-
Mining	752	-
Storage	315,692	157,719
Processing	534,065	125,167

National Hazardous Waste Management Facilities

21.4.14 Since some of the operational hazardous wastes likely to be generated by the Proposed Development will not be suitable for landfill disposal (e.g., liquid waste), hazardous operational waste is compared to national hazardous waste management facility capacity in this assessment.

21.4.15 Liquid hazardous waste from the Proposed Development operation may be managed by high-temperature incineration or by physical-chemical treatment.

21.4.16 Due to the specialised nature of hazardous waste management, hazardous waste facilities typically receive wastes from a wide region, and therefore this assessment considers the national capacity for managing hazardous wastes.

21.4.17 The EA's 2021 Waste Summary Tables for England – Version 3 (EA, 2022a) reported that the remaining merchant (non-restricted) hazardous landfill capacity in England was 12.1 million m^3 in 2021.

21.4.18 There are a number of high-temperature hazardous waste incinerators in England (excluding facilities which manage only clinical waste and received less than 500 tonnes), as well as cement kilns which are permitted to accept hazardous waste.

These facilities as reported in the EA's Waste Data Interrogator for 2021 (EA, 2022b), and are shown in Table 21-16.

Table 21-16: Hazardous Waste Incineration Facilities and Cement Kilns Accepting Hazardous Waste

FACILITY	LOCATION	2021 WASTE RECEIVED (TONNES OF HAZARDOUS WASTE)
Hazardous Waste Incinerators		
Avonmouth Treatment Centre	Bristol	6,318
East Kent Waste Recovery Facility	Kent	4,615
Ellesmere Port Incinerator	Cheshire	56,488
Fawley HT Incinerator	Hampshire	30,287
Kirk Sandall Thermal Treatment Plant	Doncaster	5,304
Fine Environmental Services – Seal Sands	Tees Valley	19,018
Twinwoods Co-incinerator	Bedford	3,583
Cement Kilns accepting Hazardous Waste		
Cauldon Cement Plant	Staffordshire	117,323
Ketton Works	Rutland	26,195
Tunstead Cement and Lime Works	Derbyshire	14,881
Rugby Cement Plant	Rugby	19,480
Ribblesdale Cement Works	Ribble Valley	23,968
Whitwell Quarry Lime Works	Derbyshire	31,730
Total	359,190	

21.4.19 The EA's Waste Data Interrogator for 2021 (EA, 2022b) shows that the following quantities of liquid hazardous waste were treated by permitted facilities in England (excluding waste in EWC Code Chapter 13 'Oil Wastes and Wastes of Liquid Fuels') – refer to Table 21-17. Inputs are totalled, however, double counting of waste in the Waste Data Interrogator cannot be discounted.

Table 21-17: Hazardous Liquid Waste Treatment Facilities in England

FACILITY PERMIT TYPE	2021 WASTE RECEIVED (TONNES)
T05: Physico-chemical treatment installation	290,279
T06: Chemical treatment installation	143,314
T10: Haz waste treatment installation	178,591
T11: Haz waste transfer/treatment installation	32,651
Total	644,835

Historic and Authorised Landfills

21.4.20 The EA's Permitted Waste Sites - Authorised Landfill Site Boundaries spatial data (EA, 2022a) identifies authorised landfills within the Proposed Development Site as shown in Figure 21-1: Historic and Authorised Landfills and Waste and Mineral Sites (PEI Report, Volume II):

- Cowpen Bewley Landfill Site;
- Bran Sands Landfill;
- Warrenby Landfill; and
- Wilton, Perimeter Mounds.

21.4.21 Historic landfills are potentially relevant to this assessment since excavations in historic landfill can give rise to waste that require appropriate management. The EA's Historic Landfill Sites spatial data (EA, 2022b) identifies a number of historic landfill sites both within the Proposed Development Site, as detailed in Table 21-18: and shown in Figure 21-1: Historic and Authorised Landfills and Waste and Mineral Sites (PEI Report, Volume II).

Table 21-18: Historic Landfill Sites within the Proposed Development Site

HOLDER REFERENCE	SITE REFERENCE	SITE NAME	SITE ADDRESS	LICENCE HOLDER	FIRST INPUT	LAST INPUT	TYPES OF WASTE
EAHLD05492	0700/R20, CLE/R20	To the West of the Wolviston to Seal Sands Link Road	Saltholme Mounting, Billingham, Cleveland	Cleveland County Council	1981/11/03	1982/12/31	Inert, Industrial
EAHLD05490	CLE/R4/1, 0700/R4, CLE/170/1	South of the Seal Sands Road	Adjacent to the Monsanto site	Cleveland County Council	1973/12/31	1978/12/31	Inert, Industrial, Commercial
EAHLD05489	0700/CLE/019	Seal Sands	Agricultural Division, Billingham, Stockton-on-Tees	ICI Limited	-	-	Commercial
EAHLD05488	0700/CLE/032	Seal Sands	North Bank, Middlesborough, Cleveland	Tees and Hartlepool Port Authority	1978/02/01	1989/10/30	Inert, Industrial
EAHLD05497	0700/CLE/061	Seabanks Lagoon Site No.4	Seal Sands, North Bank, Middlesborough, Cleveland	ICI Limited	1978/03/06	1979/01/19	Inert, Industrial
EAHLD36066	-	B S Redcar Works	Steel House, Redcar, Cleveland	Corus Construction & Industrial (British Steel Plc)	-	-	Industrial
EAHLD05592	0700/CLE/255	West Coatham Lane	Dormanstown, Redcar, Cleveland	Chief Economic and Development Officer	1993/01/25	1993/02/01	Inert

HOLDER REFERENCE	SITE REFERENCE	SITE NAME	SITE ADDRESS	LICENCE HOLDER	FIRST INPUT	LAST INPUT	TYPES OF WASTE
EAHLD05591	0700/CLE/051	Redcar Trunk Road Landscaping	Redcar, Cleveland	British Steel Corporation	1977/09/14	1979/08/10	Inert and Industrial
EAHLD05578	0700/CLE/029/3	Teesport Eston Tip	Redcar, Cleveland	Tees and Hartlepool Port Authority	1977/12/31	1993/09/17	Inert, Industrial, Commercial and Household
EAHLD05579	0700/CLE/102	Bells Containers	Sludge Farm Teesport Refinery, Redcar, Cleveland	Shell (UK) Limited	-	1987/09/01	Liquid Sludge
EAHLD05589	0700/CLE/028/2	Bells Containers	Redcar, Cleveland	Tees and Hartlepool Port Authority	1977/07/29	1989/09/30	Inert, Industrial
EAHLD05586	0700/CLE/ST14	Mushroom Grove Allotments	Grangetown	Borough Engineer, Langbaurgh Borough Council	1984/04/14	1985/04/22	Inert, Commercial
EAHLD05662	0700/CLE/047	Perimeter Mounds / Perimeter of Wilton Works	Wilton, Middlesbrough	Imperial Chemicals and Polymers Limited	N/A	N/A	-
EAHLD05682	IPC 68, 0700/CLE/068, BRI002	Blast Furnace Plant	Redcar Complex, Cleveland	British Steel Corporation	N/A	N/A	Industrial

21.4.22 Further information regarding historic landfill sites within the Proposed Development Site is presented in Chapter 10: Geology, Hydrogeology and Land Contamination (PEI Report, Volume I).

Waste Targets

21.4.23 The national target for recovery of Construction and Demolition (C&D) waste is 70% by weight, as set out in the Waste FD (EU, 2008) and the Waste Management Plan for England (Defra, 2021a). The target specifically excludes naturally occurring materials with EWC Code 17 05 04 (17 05 04 soil and stones other than those mentioned in 17 05 03* (soils and stone containing dangerous substances)). Recovery is deemed to include reuse, recycling, and other recovery (e.g., energy recovery).

21.4.24 A good practice landfill diversion target of 90% has been achieved and exceeded by major UK developments as outlined in the IEMA Guidance (IEMA, 2020). In 2018, the UK generated 67.8 million tonnes of non-hazardous C&D waste, of which 62.6 million tonnes was recovered. This represents a recovery rate of 92.3% (Defra, 2021b).

21.4.25 Standard, good and best practice recovery rates by material are provided by WRAP (WRAP, 2007). Recovery rates for key construction materials and other construction wastes relevant to the Proposed Development are provided in Table 21-19.

Table 21-19: Standard, Good and Best Practice Recovery Rates by Material

MATERIAL	STANDARD PRACTICE RECOVERY (%)	GOOD PRACTICE RECOVERY (%)	BEST PRACTICE RECOVERY (%)
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical equipment	Limited information	70	95
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information, cannot be 100% since some hazardous waste (e.g. asbestos) must be landfilled.	

Future Baseline

21.4.26 There is no publicly available information on any potential changes to national or regional material availability by the time of the construction of the Proposed Development. Construction material demand such as ready mixed concrete is closely aligned to both the quantity of construction taking place and the general economy. It is deemed inappropriate to forecast future demand as the demand is unlikely to be linear and it is not possible to set a future baseline for material resources. As such, future consumption is assumed to remain the same as the current baseline as outlined in Table 21-11 and Table 21-12.

21.4.27 There is no publicly available information regarding any potential changes to landfill capacity by the time of Proposed Development construction.

21.4.28 Due to the cyclic nature of inert and hazardous landfill capacity (e.g., landfill capacity decreasing, and then new sites or landfill cells being opened with landfill capacity increasing), it is not realistic to forecast future landfill capacity. Therefore, inert and hazardous landfill capacity is assumed to remain the same as the current baseline as outlined in Table 21-14.

21.4.29 For non-hazardous waste, using the current rate of decline of landfill capacity and forecasting into the future would lead to the inevitable conclusion that there would be no void space remaining. However, this is not a credible scenario as if there is still a need for landfill, then the WPA will need to consent new landfill capacity to replace that which has been used up. Therefore, non-hazardous landfill capacity is assumed to remain the same as the current baseline as outlined in Table 21-14.

Receptor Sensitivity

Material Receptor Sensitivity

21.4.30 Material receptor sensitivity is determined as '*low*'. On balance, the key construction materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. Key materials required for construction and operation are likely to be available comprising a high proportion of sustainable features and benefits (e.g., recycled content).

21.4.31 Potential recycled content for the main construction materials is outlined in Table 21-13.

Waste Receptor Sensitivity

21.4.32 Waste receptor sensitivity is determined as '*very high*'. Since there is no publicly available information on any potential changes to landfill capacity by the time of the construction and operation of the Proposed Development, a worst-case scenario is considered (e.g., a very considerable reduction in capacity cannot be excluded).

21.5 Proposed Development Design and Impact Avoidance

21.5.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are

inherent in the design and construction of the Proposed Development (also known as '*embedded measures*'). Some embedded measures are required as a result of legislative requirements and/or standard sectoral practices. Some of these embedded mitigation measures as applicable to the material and waste assessment are described below.

21.5.2 Embedded measures are taken into account prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic (i.e., effects do not take account of measures even though they are likely to be standard practice and/or form part of the design of the Proposed Development). These have then been followed through the assessment to ensure that realistic likely environmental effects are identified.

Construction

21.5.3 The Proposed Development will aim to prioritise waste prevention, followed by preparing for re-use, recycling and recovery and lastly disposal to landfill as per the waste hierarchy as illustrated in Plate 21-4.

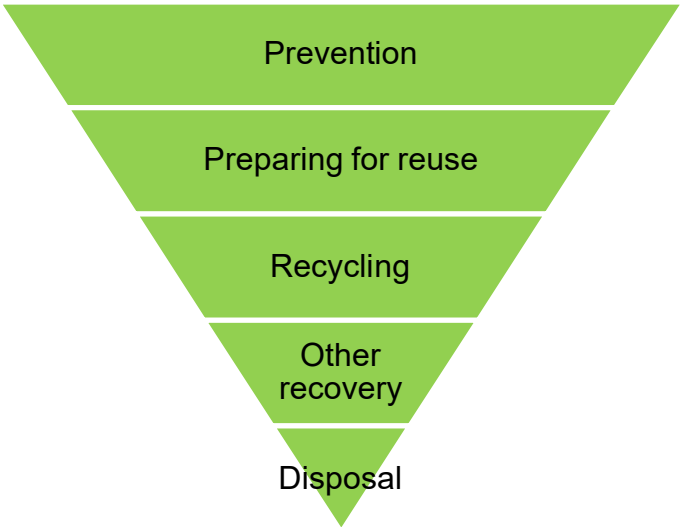

Plate 21-4: The waste hierarchy, from Defra's Guidance on Applying the Waste Hierarchy, recreated by AECOM (Defra, 2011)

21.5.4 The following mitigation measures will be implemented where practicable during the design and construction of the Proposed Development:

- design for reuse and recovery: identifying, securing and using materials that already exist on-site, or can be sourced from other projects (e.g., re-use of excavated soil for landscaping);
- design for materials optimisation: simplifying layout and form to minimise material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content;
- design for off-site construction: maximising the use of pre-fabricated structure and components, encouraging a process of assembly rather than construction;

- design for the future (deconstruction and flexibility): identify how materials can be designed to be more easily adapted over an asset lifetime and how de-constructability and de-mountability of elements can be maximised at end of first life;
- design for waste and material asset efficient procurement;
- identify and specify materials that can be acquired responsibly, in accordance with a recognised industry standard;
- implementation of a '*just-in-time*' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- attention to material quantity requirements to avoid over-ordering and generation of waste materials; and
- segregation of waste at source where practical.

21.5.5 A Framework Construction Environmental Management Plan (CEMP) will be included within the ES which will accompany the DCO Application. It will set out the key measures to be employed during the Proposed Development construction phase to control and minimise the impacts on the environment. The CEMP will set out how waste will be managed during construction, and opportunities to prevention, reuse materials and recycle waste will be explored in accordance with the waste hierarchy.

21.5.6 A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the DCO.

21.5.7 To manage and monitor waste generated on the Site during the construction of the Proposed Development, a Framework Site Waste Management Plan (SWMP) will be developed as part of the Framework CEMP which will allow for waste streams to be estimated and monitored. The Framework SWMP will require that the construction contractor segregates waste streams on-site, prior to them being taken to a waste facility for recycling or disposal. All waste removal from the Site will be undertaken by fully licensed waste carriers and taken to permitted waste facilities.

Operation

21.5.8 The Production Facility will require an environmental permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. The permit will include procedures for the management of materials and waste in accordance with relevant legislation.

The Proposed Development will be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

Decommissioning

21.5.9 A DEMP would be prepared which would consider potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated. The submission, approval, and implementation of a DEMP will be secured by a Requirement of the DCO.

21.6 Likely Impacts and Effects

21.6.1 This section identifies the likely impacts and effects resulting from the Proposed Development as described in Chapter 4: Proposed Development (PEI Report, Volume I). The magnitude of impacts is defined with reference to relevant baseline conditions, and effects determined in accordance with the identified methodology.

21.6.2 The prediction of impacts and the assessment of effects (and their significance) in relation to materials and waste associated with the Proposed Development takes into account the effectiveness of the mitigation measures as summarised in Section 21.5.

21.6.3 Where applicable, the assessment reports the temporary and permanent effects on materials and waste that would be directly or indirectly affected by the Proposed Development by virtue of their proximity to the Proposed Development Site, or through a shared relationship or inter-dependency.

Construction

21.6.4 Table 21-20: summarises the likely types of materials that will be used, and wastes that are likely to be generated, during the Proposed Development construction phase.

Table 21-20: Construction Material Use and Waste Types Arising from the Construction of the Proposed Development

CONSTRUCTION ACTIVITY	MATERIALS USED	WASTE TYPES GENERATED
Site preparation/ earthworks	• fill material for construction purposes; • primary/secondary/ recycled aggregates for ground stabilisation; • topsoil and subsoil for landscaping and restoration.	• surplus excavated materials; • surplus topsoil and subsoil; • unsuitable and contaminated soils and excavated materials; • vegetation from site clearance; • clearance of other materials; • construction worker wastes from offices and welfare areas/canteens.
Demolition	• materials are not required for demolition works.	• waste arisings from the required demolition of existing buildings and assets.

CONSTRUCTION ACTIVITY	MATERIALS USED	WASTE TYPES GENERATED
Site construction	• aggregates; • asphalt and bituminous materials; • in-situ cast concrete; • precast concrete products (structural components, kerbs, drainage pipes, shaft and tunnel lining, chambers and channels); • structural steel; • cabling; • drilling fluids.	• excess, offcuts and broken/damaged construction materials; • existing infrastructure removed during works; • packaging from materials delivered to site; • construction worker wastes from offices and welfare areas/canteens; • waste oils from construction plant; • drilling fluids; • waste from dewatering and testing (hydrotesting); and • paints and coatings.

Construction Materials

21.6.5 The estimated main types and quantities of materials to be used during Proposed Development construction are presented in Table 21-21. The table also includes estimates of potential material wastage. There is assumed to be no wastage from some of the construction materials as these will be delivered to specified sizes, therefore piling, piping, structural steel and major equipment are not included in the waste assessment.

21.6.6 It is not anticipated that excavation works will require a large quantity of construction material use.

21.6.7 The following data is sourced from the WRAP's Designing Out Waste Tool for Civil Engineering (WRAP, undated c):

- data on the bulk density of materials has been used to convert quantities between volume (m^3) and weight (tonnes) where required; and
- the estimated wastage rates for each material are based on the '*good practice*' rates.

Table 21-21: Construction Material Estimates for the Proposed Development

ACTIVITY	MATERIAL TYPE	MATERIAL DENSITY (T/M^3)	QUANTITY (M^3)	QUANTITY (TONNES)	WASTAGE RATE (%)	WASTAGE (M^3)	WASTAGE (TONNES)
Temporary construction facilities – backfill import	Aggregate	1.9	51,160	97,204	5	2,558	4,860
Early works – backfill import	Aggregate	1.9	117,600	223,440	5	5,880	11,172
Backfill import - other	Aggregates	2.4	66,570	126,483	5	3,329	6,324
Concrete – foundations	Steel	7.85	19,550	46,920	5	978	2,346
Rebar – foundations	Steel	7.85	517	4,060	5	26	203
Piping	Steel	7.85	6,307	49,510	0	-	-
Structural steel	Steel	7.85	280	2,200	0	-	-
Concrete - paving	Concrete	2.4	11,100	26,640	5	555	1,332
Sub-base course – roads	Aggregate	1.9	13,030	24,757	5	652	1,238
Base course – roads	Aggregate	1.9	9,775	18,573	5	489	929
Binder course - roads	Asphalt	2.4	3,265	7,836	5	163	163
Wearing course – roads	Asphalt	2.4	3,265	7,836	5	163	392
Total construction material wastage						14,792	29,187

21.6.8 For the construction of the Proposed Development, no individual construction material is equal to or greater than 1% by weight of the UK/GB baseline consumption (aggregates 0.2%, concrete 0.09%, steel 0.33% and asphalt 0.06%). The sensitivity of the receptor is classified as 'low' (as per Table 21-2:) whilst the magnitude of impact is considered to be 'negligible' (as per Table 21-5), resulting in a Neutral/Slight Adverse (Not Significant) effect.

21.6.9 Individual construction materials expected to be used for the construction of the Proposed Development equate to between 1-5% by weight (concrete measured in volume) of the regional baseline consumption (aggregates 2.3%, concrete 1.7% and asphalt 0.5%). The sensitivity of the receptor is classified as 'low' (as per Table 21-2) whilst the magnitude of impact is considered to be 'minor' (as per Table 21-5), resulting in a Neutral/Slight Adverse (Not Significant) effect.

Construction Waste

21.6.10 Since material quantities for all construction materials are not yet available, the estimates based on total wastage from construction material are likely to be an underestimation. Therefore, construction waste arisings have also been estimated based on the construction value of the Proposed Development.

21.6.11 This high-level estimate of construction waste (excluding demolition and excavation) has been calculated based on the construction value for the Proposed Development and a published benchmark based on average m^3 of waste per £100,000 (WRAP, undated d). The best practice benchmark for industrial buildings is 5.5 m^3 of waste per £100,000. A conversion factor of 1.497 tonnes/m^3 (Construction Resources and Waste Platform, 2010) has been used to convert m^3 into tonnes. The best practice benchmark has been used since waste generation is expected to be at the lower end of the scale, since much of the capital expenditure will be associated with modular process engineering components which will be manufactured off-site, hence the on-site waste generation from assembly of these components is expected to be relatively small.

21.6.12 The estimated construction waste volume associated with the Proposed Development is 35,750 m^3 (53,518 tonnes) based on a capital expenditure of £650 million. This volume is used in the assessment.

Excavated Material

21.6.13 At this stage, it is assumed that any remediation works required to create a suitable development platform would be undertaken by the landowner before the commencement of the construction of the Proposed Development on the Main Site, with the landowner obtaining all necessary consents and permits.

21.6.14 Remediation by the landowner will be subject to further review following assessment of ground condition information and permitting strategy. If a requirement for remedial measures to be undertaken during the construction phase of the Proposed Development is identified, for example based on the facility design, efficiency, or sustainability, the scope of those will be assessed by the Applicant.

21.6.15 Estimates of waste from the Proposed Development Site, conservatively, assume that some hazardous and non-hazardous material generated during the targeted remediation works before or during construction activities could require disposal from the Proposed Development Site, with re-use of some soil materials under appropriate permitting. The volume estimates will be further refined following supplementary site investigation.

21.6.16 The Proposed Development design is currently being progressed to optimise the requirements for cut and fill, and where possible, this will be minimised to reduce the import and export of materials and waste, although the current design is expected to generate excavated material that will require off-site treatment or disposal.

Total Construction Waste

21.6.17 A summary of construction waste associated with the Proposed Development is set out in Table 21-22.

Table 21-22: Construction Waste Summary

ACTIVITY	WASTE (M^3)
Excavation associated with the Proposed Development	Hazardous waste A proportion of potentially contaminated material assumed to be hazardous with off-site disposal (currently assumed as 39,255m^3 , the volume estimates will be further refined following supplementary site investigation).) Non-hazardous waste 170,067 m^3 of surplus excavated material (where possible the material will be recovered on-site under an appropriate permit).
Construction of the Proposed Development	35,750 m^3

21.6.18 Total non-hazardous and inert construction waste for the Proposed Development is estimated at 35,750 m^3 (construction waste) plus 170,067 m^3 (surplus excavated material). A worst-case scenario where all waste is disposed of to landfill has been applied. This volume equates to 0.27% of the 89.3 million m^3 of inert and non-hazardous landfill capacity within the waste management Expansive Study Area (the Yorkshire and Humber and North East regions).

21.6.19 In practice, a large proportion of non-hazardous and inert waste from the Proposed Development is likely to be recovered rather than disposed of to landfill, further reducing the overall quantities of waste for disposal. With a recovery rate of 70%, the

percentage of landfill capacity required reduces to 0.08%. With a recovery rate of 90%, the percentage of landfill capacity required reduces to 0.03%.

21.6.20 Based on the above, construction of the Proposed Development is estimated to result in less than a 1% reduction of landfill capacity within the non-hazardous waste management Expansive Study Area. Accordingly, for non-hazardous and inert waste, the sensitivity of the receptor is classified as 'very high' (as per Table 21-3 and Section 21.4) whilst the magnitude of impact is considered to be 'negligible' (as per Table 21-6), resulting in a Slight Adverse (Not Significant) effect.

21.6.21 At this stage, no estimate of general hazardous waste generation during Proposed Development construction is available (apart from contaminated material generated during excavation). Based on the size and scale of the Proposed Development the quantities of hazardous waste (e.g. oils, batteries, aerosol cans etc.) are anticipated to be small compared to the overall construction waste arisings and anticipated to be <0.1% of the hazardous waste landfill capacity in England (12,107 m^3). Many hazardous waste types have well defined waste management routes, including recovery, and are unlikely to be sent directly to landfill. Procedures for the storage and management of these wastes will be set out in the contractors' SWMP. Accordingly, for hazardous waste, the sensitivity of the receptor is classified as 'very high' (as per Table 21-4 and Section 21.4) whilst the magnitude of impact is considered to be 'negligible' (as per Table 21-7), resulting in a Slight Adverse (Not Significant) effect.

21.6.22 Construction site operations will also generate waste streams from temporary offices, welfare facilities, material packaging and construction plant maintenance. The quantities are anticipated to be small compared to the main construction wastes and are not included in this assessment. Procedures for the storage and management of these wastes will be set out in the contractors' SWMP.

21.6.23 The volume of hazardous waste generated by excavation requiring off-site disposal for the Proposed Development will be assessed further following a ground investigation. For an assumed volume of 39,255 m^3, under a worst-case scenario that all waste is disposed to hazardous landfill, this equates to 0.3% of the 12.1 million m^3 of the hazardous waste landfill capacity in England. Accordingly, for hazardous waste, the sensitivity of the receptor is classified as 'very high' (as per Table 21-4 and Section 21.4) whilst the magnitude of impact is considered to be 'minor' (as per Table 21-7), resulting in a Moderate Adverse (Significant) Effect.

21.6.24 In practice, a proportion of hazardous waste generated by excavation from the Proposed Development could be non-hazardous and/or likely to be sent to a waste management facility rather than disposed of to landfill, further reducing the overall quantities of waste for disposal to landfill (e.g. <0.1% of hazardous waste landfill capacity in England). This would reduce the resulting effect to Minor Adverse (Not Significant) however the worst case outlined in 21.6.23 is used in the assessment.

Operation

21.6.25 Operational (process) waste from the Proposed Development will comprise waste from site offices and waste from the Production Facility (including thermal

reclamation waste) processes which may be hazardous waste. The main waste types and quantities of waste associated with the operation of the Proposed Development are currently estimated to be nine tonnes per month for inert and non-hazardous wastes (108 tonnes per year) and 20 tonnes per month for hazardous waste (240 tonnes per year).

21.6.26 In the event that inert and non-hazardous wastes from the Proposed Development are disposed of to landfill, the annual quantity is likely to result in a reduction of <1% (893,380 m^3) of regional inert and non-hazardous waste landfill void capacity. Accordingly, for inert and non-hazardous waste, the sensitivity of the receptor is classified as 'very high' (as per Table 21-3 and Section 21.4) whilst the magnitude of impact is considered to be 'negligible' (as per Table 21-8), resulting in a Slight Adverse (Not Significant) effect.

21.6.27 IEMA Guidance (IEMA, 2020) recommends assessing impacts of hazardous waste with reference to the available landfill capacity nationally. In the event that hazardous wastes from the Proposed Development are disposed of to landfill, the annual quantity is likely to result in a reduction of <0.1% (12,107 m^3) of national hazardous waste landfill void capacity. Accordingly, for hazardous waste, the sensitivity of the receptor is classified as 'very high' (as per Table 21-4) whilst the magnitude of impact is considered to be 'negligible' (as per Table 21-7), resulting in a Slight Adverse (Not Significant) effect.

21.6.28 Since some of the operational hazardous wastes likely to be generated by the Proposed Development will not be suitable for landfill disposal (e.g., liquid waste), hazardous operational waste has been compared to national hazardous waste management facility capacity in this assessment. In the event that wastes are sent to a waste management facility, the annual quantity is likely to be small in the context of national capacity.

Decommissioning

21.6.29 The Proposed Development has a long design life and as such, it is not considered possible to reliably forecast decommissioning requirements and infrastructure that far in the future. A DEMP would be prepared which would consider potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated. Effects associated with the decommissioning phase would be no worse than those experienced during construction.

21.7 Mitigation and Enhancement Measures

Construction

21.7.1 A potential significant effect has been identified in relation to hazardous waste from excavation of contaminated material requiring disposal during construction of the Proposed Development. In practice, the proportion of contaminated material from the Proposed Development Site classed as hazardous may be lower; and any hazardous excavated material potentially be sent to a waste management facility rather than disposed of to landfill. This would further reduce the overall quantities of hazardous waste for disposal. Waste management routes will be confirmed by the

construction contractor. This potential significant effect will be re-evaluated as part of the assessment to be included in the ES.

21.7.2 No further or additional mitigation measures related to materials and waste are proposed at this stage.

Operation

21.7.3 No significant effects during operation of the Proposed Development were identified. Therefore, no further or additional mitigation measures as related to materials and waste are proposed.

21.8 Limitations and Difficulties

Construction

21.8.1 Construction waste volumes associated with the Proposed Development have been estimated based on the Proposed Development construction value, as detailed information regarding waste arisings is not available at this stage.

21.8.2 Worst case assumptions have been made to inform this assessment, in particular it is assumed that all waste is sent to landfill. This ensures that a robust, worst-case assessment of the waste impacts of the Proposed Development is provided.

21.8.3 The preliminary assessment is based on information available at the time of writing.

Operation

21.8.4 The types and quantities of operational waste are not yet available. Worst case assumptions have been made to inform this assessment, ensuring that a robust assessment is provided.

21.9 Residual Effects and Conclusions

21.9.1 The effects of the Proposed Development remaining following the implementation of available mitigation measures are known as 'residual effects.' A summary of the potential residual materials and waste effects are summarised in Table 21-23.

Construction

21.9.2 There is a potential residual Significant Adverse effect in relation to contaminated material during the Proposed Development construction phase requiring disposal, as outlined in Section 21.6. In practice, a proportion of contaminated material could be non-hazardous and/or likely to be sent to a waste management facility rather than disposed of to landfill.

21.9.3 No other Significant Adverse residual material and waste effects resulting from the Proposed Development's construction have been identified.

Operation

21.9.4 No significant adverse residual material and waste effects resulting during operation of the Proposed Development have been identified.

Table 21-23: Summary of Effects - Materials and Waste

PROPOSED DEVELOPMENT PHASE	DESCRIPTION OF EFFECT	SIGNIFICANCE OF EFFECT (BEFORE MITIGATION)	MITIGATION MEASURES	SIGNIFICANCE OF RESIDUAL EFFECT (AFTER MITIGATION)	DURATION (SHORT/ MEDIUM/ LONG TERM) AND REVERSIBILITY
Construction	Changes in demand for materials	Slight Adverse (Not Significant)	None required	Slight Adverse (Not Significant)	Short term, irreversible
	Changes in available landfill void capacity	Inert and non-hazardous waste: Slight Adverse (Not Significant) Hazardous waste: Moderate Adverse (Significant)	Inert and non-hazardous waste: None required. Hazardous waste: no additional mitigation measures are proposed at this time however the volume estimates will be further refined following supplementary site investigation and considered further within the design process.	Inert and non-hazardous waste: Slight Adverse (Not Significant) Hazardous waste: Moderate Adverse (significant)	Short term, irreversible
Operation	Changes in available landfill void capacity	Slight Adverse (Not Significant)	None required	Slight Adverse (Not Significant)	Short term, irreversible
	Changes in available hazardous waste management facility capacity	Slight Adverse (Not Significant)	None required	Slight Adverse (Not Significant)	Short term, irreversible
Decommissioning	Scoped out of the assessment	Not applicable	Not applicable	Not applicable	Not applicable

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22.0 HUMAN HEALTH

22.1 Introduction

22.1.1 This chapter of the Preliminary Environmental Information (PEI) Report identifies the potential impacts and effects on human health as associated with construction, operation (including maintenance) and decommissioning the Proposed Development. This preliminary assessment has been undertaken in accordance with guidance from the Institute of Environmental Management (IEMA) Determining Significance for Human Health in Environmental Impact Assessment (IEMA, 2022).

22.1.2 This chapter highlights key aspects of the technical assessments completed and presented within Chapter 8: Air Quality, Chapter 11: Noise and Vibration, Chapter 15: Traffic and Transport, Chapter 18: Socio-economics and Land Use, Chapter 19: Climate Change, and Chapter 20: Major Accidents and Disasters (PEI Report, Volume I), which are all relevant to human health.

22.2 Legislation and Planning Policy Context

Legislative Background

EIA Directive (2014) and Infrastructure Planning Regulations (2017)

22.2.1 The EIA Directive 2014 (Directive 2014/52/EU of the European Parliament and of the Council) and the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 provide the legislative background regarding the assessment of the effects of certain public and private projects on the environment. These specifically include a requirement that the Environmental Impact Assessment (EIA) must identify, describe, and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on human health (Regulation 5(2)(a)).

Health and Care Act (2022)

22.2.2 In April 2022, the Government passed a new Health and Care Act 2022 (HM Government, 2022)). The new Act proposes new health reforms in England, removes existing competition rules and formalises Integrated Care Systems (ICS). It also grants the health secretary authority over the health service. It emphasises the importance of health and care for the future and development of the country.

22.2.3 The Act aims to support the development of ICS and integration of all health bodies, by requiring them to strive towards the collective aims of better care for all patients; better health for everyone; and sustainable use of National Health Service (NHS) resources.

22.2.4 There are 42 ICSs across England (previously in April 2021, over 100 Clinical Commissioning Groups (CCGs) existed across the country), and each has been established with four strategic purposes:

- improve population health and healthcare;
- tackling unequal outcomes and access;

- enhance productivity and value for money; and
- helping the NHS to support broader social and economic development.

Control of Electromagnetic Fields at Work Regulations (2016)

22.2.5 Electromagnetic Field (EMF) effects must be controlled in accordance with the Control of Electromagnetic Fields at Work Regulations 2016, which sets out how employers must make and implement action plans to ensure compliance with the defined exposure limits (in Part 2 of the Schedule). Regulation 7(2) states that *"the action plan must include consideration of, where relevant –*

- *other working methods that entail lower exposure to electromagnetic fields;*
- *replacement equipment designed to reduce the level of exposure;*
- *technical measures to reduce the emission of electromagnetic fields, including, where necessary, the use of interlocks, screening or similar health protection mechanisms;*
- *demarcation and access control measures;*
- *maintenance programmes for work equipment, workplaces and workstation systems;*
- *the design and layout of workplaces and workstations;*
- *limitations on the duration and intensity of exposure; and*
- *the availability of suitable personal protective equipment."*

Planning Policy Context

National Planning Policy

National Policy Statement for Energy (EN-1) (2011)

22.2.6 Planning policy for Nationally Significant Infrastructure Projects (NSIPs) is primarily contained in National Policy Statements (NPSs). The NPS for Energy (EN-1) (Department for Energy and Climate Change (DECC), 2011a) requires the decision maker to consider potential benefits of development proposals including '*the potential to impact on the health and well-being of the population'*.

22.2.7 Section 4.13 'Health' states that an assessment should consider all relevant human health impacts, which may include the following:

- the direct impacts on health including increased traffic, air or water pollution, dust, odour, hazardous waste and substance, noise, exposure to radiation, and increases in pests; and
- the indirect health impacts of new energy infrastructure, such as if it in some way affects access to key public services, transport, or the use of open space for recreation and physical activity.

Draft Overarching National Policy Statement for Energy (EN-1) (2023)

22.2.8 In March 2023, the Department for Energy Security and Net Zero (previously the Department for Business, Energy, and Industrial Strategy) published an update of the existing statement (NPS EN-1). In addition to the health impacts of energy infrastructure development outlined in the 2011 NPS EN-1, the 2023 NPS EN-1 at paragraph 4.3.3 notes that "*New energy infrastructure may also affect the composition and size of the local population, and in doing so have indirect health impacts, for example if it in some way affects access to key public services, transport, or the use of open space for recreation and physical activity"*.

Draft National Policy Statement for Gas Supply Infrastructure and Oil and Gas Pipelines (EN-4) (2023)

22.2.9 In 2023, an update was made to NPS EN-4 (originally published in 2011). Taken together with the 'Overarching National Policy Statement for Energy' (EN-1), it provides the primary policy for decisions by the Secretary of State on applications it receives for natural gas supply infrastructure and gas and oil pipelines.

22.2.10 In regard to human health, it advises that developments should follow generic considerations on gas emissions set out in EN-1. In particular, Section 5.2 of EN-1 which provides guidance on the effects of emissions on air quality (which can have implications for human health).

Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023)

22.2.11 In 2023, an update was made to NPS EN-5 (originally published in 2011). NPS EN-5 provides specific policy in relation to EMF resulting from electricity networks and their known and potential effects on health, stating in EN-5 at paragraph 2.9.46 and 2.9.47: *"All overhead power lines produce EMFs, and these tend to be highest directly under a line, and decrease to the sides at increasing distance. Although putting cables underground eliminates the electric field, they still produce magnetic fields, which are highest directly above the cable (see para 2.10.12). EMFs can have both direct and indirect effects on human health. The direct effects occur in terms of impacts on the central nervous system resulting in its normal functioning being affected. Indirect effects occur through electric charges building up on the surface of the body producing a microshock on contact with a grounded object, or vice versa, which, depending on the field strength and other exposure factors, can range from barely perceptible to being an annoyance or even painful."*

National Planning Policy Framework (2021)

22.2.12 The National Planning Policy Framework (NPPF) (MHCLG, 2021) sets out the national government planning policies for England and how these are expected to be applied. This revised framework replaces the previous NPPF published in March 2012, revised in July 2018, and updated in February 2019 and July 2021. It provides a framework within which local people and their relevant councils produce their own local and neighbourhood plans. The NPPF contains policies that are applicable to human health.

22.2.13 Section 8 of the NPPF 'Promoting healthy and safe communities' states that policies should aim to achieve healthy, inclusive, and safe places which: promote social inclusion; are safe and accessible; and enable and support healthy lifestyles. In order to do this, paragraphs 93 and 97 of the NPPF says that planning policies and decisions should:

- *"plan positively for the provision of… local services to enhance the sustainability of communities and residential environments;*
- *take into account and support the delivery of local strategies to improve health, social and cultural well-being for all sections of the community;*
- *guard against the unnecessary loss of valued facilities and services, particularly where this would reduce the community's ability to meet its day-to-day needs;*
- *ensure that established shops, facilities, and services are able to develop and modernise, and are retained for the benefit of the community;*
- *ensure an integrated approach to considering the location of housing, economic uses and community facilities and services; and*
- *promote public safety and take into account wider security and defence requirements by anticipating and addressing possible malicious threats and natural hazards…This includes appropriate and proportionate steps that can be taken to reduce vulnerability, increase resilience and ensure public safety and security ."*

NHS Long Term Plan (2019)

22.2.14 The NHS Long Term Plan (NHS, 2019) sets out a ten-year programme of phased improvements to the NHS. It provides an insight into the priorities of the country regarding health (such as reducing health inequalities, obesity, smoking, and air pollution) which can also be used to guide development decisions.

22.2.15 The plan outlines how the NHS will attempt to reduce health inequalities through wider preventative action in deprived areas and improved integrated community-based care systems. This includes funding support to programmes which help to reduce smoking, obesity, and air pollution in vulnerable communities. There will also be an increased focus on digital General Practice (GP) consultations to provide more options and better support for patients.

22.2.16 Increases in NHS funding and the establishment of a new NHS Assembly are planned to help achieve better care quality and outcomes as well as helping to reduce workforce pressures. There will be a focus on population health which involves a new system hierarchy involving primary care networks, local authorities and larger integrated care systems. The NHS Long Term Plan stresses the importance of the NHS and the built environment sector continuing to work together to improve health and wellbeing.

Public Health England Strategy 2020 to 2025 (2020)

22.2.17 Public Health England (PHE) (now the UK Health Security Agency (UKHSA)) released the PHE Strategy 2020 to 2025 (PHE, 2020) in 2020. It sets out how the organisation

will work to improve public health and reduce health inequalities. The key aims for the five-year period are as follows:

- build and embed universal approaches to programme and project pipeline planning, reporting, and resource planning for use across PHE;
- improve governance structures around projects and programmes to support decision making, help identify barriers to progressing projects and ensuring that projects are properly evaluated throughout and closed when complete; and
- embed capacity planning within all programmes across PHE and, where relevant, agile approaches to bring greater flexibility and innovation to the work they do.

Spatial Planning for Health (2017)

22.2.18 In 2017, PHE published 'Spatial Planning for Health: An Evidence Resource for Designing Healthier Places' (PHE, 2017). The resource is an evidence base to explore the link between spatial planning and health in the current available literature. The review provided public health planners and local communities with evidence informed principles for designing healthy places.

22.2.19 The review addresses the relationship which exists between public health and the built environment. It identifies five aspects of the built and natural environment which can be influenced by local planning policy:

- neighbourhood design;
- housing;
- healthier food;
- natural and sustainable environment; and
- transport.

22.2.20 For each aspect identified above, the review provides the evidence base underpinning why they are important determinants of public health. It also sets out principles which public health professionals and planners should follow to ensure healthier places.

22.2.21 The two aspects deemed most relevant to the Proposed Development are 'neighbourhood design' and 'natural and sustainable environment'. For 'neighbourhood design', the review states that:

"neighbourhoods are places where people live, work, and play and have a sense of belonging. The design of a neighbourhood can contribute to the health and well-being of the people living there. Several aspects of neighbourhood design (walkability and mixed land use) can also maximise opportunities for social engagement and active travel. Neighbourhood design can impact on our day-to-day decisions and therefore have a significant role in shaping our health behaviours."

22.2.22 For the 'natural and sustainable environment', the review states that:

"there is a very significant and strong body of evidence linking contact and exposure to the natural environment with improved health and wellbeing. For the purpose of

this review, the natural and sustainable environment is comprised of neighbourhood ecosystems and the resulting co-benefits between the environment and health. Protecting the natural environment is essential to sustaining human civilization."

Local Planning Policy

Redcar and Cleveland Local Plan (2018)

22.2.23 The Redcar and Cleveland Local Plan (Redcar and Cleveland Borough Council (RCBC), 2018) sets out the vision and overall development strategy for the Redcar and Cleveland, and how it will be achieved for the period until 2032. The borough has faced significant challenges, such as the decline in its traditional employment base and the cessation of steel making in Redcar, a reducing population and increasing urban disadvantage. The Local Plan provides the policy framework to meet these challenges and to deliver sustainable development across the borough.

22.2.24 Under Policy SD 4 (General Development Principles), the Plan states that development will be permitted where it avoids locations that would put the environment, or human health or safety, at unacceptable risk. Development should also be designed, constructed and managed in ways that improve health and promote healthy lifestyles to help to reduce health inequalities.

22.2.25 The Plan also states at paragraph 2.31 that where a development is anticipated to have significant implications for people's health and wellbeing, a Health Impact Assessment (HIA) should be considered. The findings of a HIA are used to make recommendations as to how any positive health impacts of a development may be increased and any negative impacts reduced.

Stockton-on-Tees Local Plan (2019)

22.2.26 The Local Plan sets out the Stockton-on-Tees Borough Council's (STBC) policies and proposals to guide planning decisions and establishes the framework for the sustainable growth and development of the Borough up to 2032.

22.2.27 Within the Plan, a number of Strategic Priorities are established to work towards. Priorities relevant to human health are as follows:

- Strategic Priority 6: To promote equality and diversity whilst ensuring all of STBC's residents live in strong, prosperous, cohesive and sustainable communities in a safe, healthy and attractive environment; and
- Strategic Priority 10: To achieve a healthy, vibrant and successful low carbon community, resilient to the challenges of climate change and resource pressures.

22.2.28 In addition, it is noted at paragraph 4.75 that public safety is of key importance in the development process. This should be considered in terms of the impact on human health from new development, in particular installations in the North Tees and Billingham areas.

Hartlepool Local Plan (2018)

22.2.29 The Hartlepool Local Plan (Hartlepool Borough Council (HBC), 2018) sets out the spatial vision and strategic objectives for the Borough for the next 15 years. The plan

contains a suite of policies to assist in delivering the spatial vision and objectives - all of the policies contained within the plan are considered to be strategic policies.

22.2.30 Although no policies in the Plan relate directly to human health, one of the 'Hartlepool's Ambition' themes is "*Strengthening Communities, Community Safety, Housing, Health and Wellbeing*". The objectives within this theme include: to encourage healthier and more sustainable lives; to strengthen social cohesion and reduce inequalities; and to make Hartlepool a safer place.

Guidance

Determining Significance for Human Health in Environmental Impact Assessment (IEMA, 2022)

22.2.31 Where a project is subject to statutory or voluntary EIA, a health impact assessment may be merged into the EIA or undertaken as a stand-alone reporting process.

22.2.32 In November 2022, IEMA published guidance on assessing human health as part of EIA. Previously, there was no consolidated methodology or practice for the assessment of effects on human health. If a change in a wider determinant of health is likely due to a proposed development, it should be scoped into the human health assessment. The assessment must present the 'likely significant' human health effects of the applicable development.

22.2.33 The human health assessment undertaken for the Proposed Development is based on IEMA guidance and considers the potential effects for each phase of the development – construction, operation and decommissioning.

22.3 Assessment Methodology and Significance Criteria

Study Area

22.3.1 The Study Area for the human health assessment is defined to include features likely to be at risk from possible direct and indirect impacts that might arise from the Proposed Development. The Study Area is based on the extent and characteristics of the Proposed Development and the communities/wards directly and potentially indirectly affected by the Proposed Development. It is determined that human health impacts are likely to occur in an area which is composed of the following seven wards, which are together referred to as the 'Study Area':

- Fens and Greatham, and Seaton, in Hartlepool District;
- Billingham East and Billingham South, in Stockton-on-Tees District; and
- Dormanstown, Grangetown, and South Bank, in Redcar and Cleveland District.

22.3.2 Dependent on the human health indicator being analysed, some ward level data is available from the 2021 Census which has been used as the preferred dataset where possible. It is important to note that the electoral ward boundaries have changed in recent years and although the geographic extents of these may differ, both types of wards provide an indication of local health in proximity to the Proposed Development Site and are therefore considered suitable for assessing the existing baseline conditions for human health.

22.3.3 Where ward level data is not available, land within the boundaries of RCBC, STBC and HBC have been used as the Study Area, as referenced in the text.

Impact Assessment Methodology

22.3.4 The World Health Organisation (WHO) Europe defines health as a "*state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity*" (WHO, 2022). Public health therefore encompasses general wellbeing, not just the absence of illness.

22.3.5 The health and wellbeing of individuals is determined by a broad range of individual constitutional and behavioural factors (or 'determinants'), as well as broader environmental, social and economic factors. Some factors are direct and obvious, whilst others are indirect.

22.3.6 The determinants scoped into the assessment are as follows:

- risk-taking behaviour;
- open space, leisure, and play;
- transport modes, access, and connections;
- community safety;
- community identity, culture, resilience, and influence;
- social participation, interaction, and support;
- education and training;
- employment and income;
- climate change mitigation and adaptation;
- air quality;
- noise and vibration;
- health and social care services;
- built environment;
- housing[1]; and
- radiation[1].

22.3.7 The following determinants were scoped out of the EIA in the Scoping Report as they are deemed not relevant to the Proposed Development:

- diet and nutrition; and
- relocation.

22.3.8 Although previously being scoped in as determinants at Scoping Report stage, the following determinants will either be captured within the assessment of other

[1] Please note that this determinant was sought to be scoped out in the Scoping Report. After due consideration and consultation, it has been included as a determinant of human health and will be assessed further in the ES (see Table 22-4).

determinants or Chapters (in line with IEMA guidance) or are considered to unlikely have a significant effect on the environment:

- Physical activity: effects relate most directly to open space and transport and so are captured within the assessment of those determinants.
- Water quality or availability: water environment is assessed within Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I), however, as noted in Chapter 9, the Proposed Development Study Area is not within a Drinking Water Protected Area or Drinking Water Safeguard Zone and consequently there is no prospect of human health receptor impacts.
- Land quality: ground conditions are assessed within Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I). There are no prospect of human health receptor impacts and therefore no prospect of significant impacts to human health.
- Wider societal infrastructure and resources: considerations such as wider contributions to economic development are assessed under the 'employment and income', and 'education and skills' determinants.

Electromagnetic Fields (EMF)

22.3.9 The Electric and Magnetic Fields and Health website provides information on the EMF risks associated with the types of infrastructure proposed by the Proposed Development. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines (ICNIP, 2020) is the reference for the recommended limits of exposure of the general public, following current government policy.

22.3.10 It is likely that all electrical and control system cables will be installed below ground or at ground level with no new overhead transmission lines proposed. Therefore, it is considered that with appropriate Proposed Development design, significant effects associated with EMFs will be avoided. This will be assessed further in the Environmental Statement.

Significance Criteria

22.3.11 The assessment of potential human health effects uses the effect significance terms and definitions as described within IEMA guidance.

22.3.12 The human health assessment follows the general impact assessment methodology as set out in Chapter 2: Assessment Methodology (PEI Report, Volume I). However, the specific impact magnitude and impact sensitivity criteria for this assessment have been set out below.

22.3.13 Effects are defined as follows:

- Beneficial classifications of significance indicate an advantageous or positive effect on an area, which may be Minor, Moderate or Major;
- Negligible classifications of significance indicate imperceptible effects on an area;
- Adverse classifications of significance indicate a disadvantageous effect on an area, which may be Minor, Moderate or Major; and

- No effect classifications of significance indicate that there are no effects on an area.

22.3.14 Duration of effect is also considered, with more weight given to permanent changes than to temporary ones.

22.3.15 'Significance' reflects the relationship between the scale of effect (impact magnitude) and the sensitivity of the affected receptor. As such, the significance criteria of human health effects have been assessed based on the expert judgment and professional experience of the authors, and relies on the following considerations:

- Sensitivity of receptors: specific values in terms of sensitivity are not attributed to human health receptors due to their diverse nature and scale; however, the assessment takes account of the qualitative (rather than quantitative) sensitivity of relevant populations and sub-populations and their ability to respond to change; and
- Magnitude of impact: this entails consideration of the size of the impact on people or receptors in the context of the area in which impacts will be experienced.

22.3.16 The following criteria have been set to assess the effects on human health receptors. Table 22-1 identifies the sensitivity criteria that have been used.

Table 22-1: Sensitivity Criteria

SENSITIVITY	DESCRIPTION
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.

SENSITIVITY	DESCRIPTION
Very low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.

22.3.17 Table 22-2 identifies the magnitude of impact criteria which have been used.

Table 22-2: Magnitude Criteria

MAGNITUDE	DESCRIPTION
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.
Very low	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

22.3.18 Human health effects reflect the relationship between the sensitivity of the affected receptor (Table 22-1) and the magnitude of the impact (Table 22-2) in accordance with Table 22-3.

Table 22-3: Classification of Effect Matrix

		SENSITIVITY			
		HIGH	MEDIUM	LOW	VERY LOW
MAGNITUDE	HIGH	Major	Major	Moderate	Minor
	MEDIUM	Major	Moderate	Minor	Negligible
	LOW	Moderate	Minor	Negligible	Negligible
	VERY LOW	Minor	Negligible	Negligible	Negligible

22.3.19 In accordance with the methodology set out in IEMA guidance (IEMA, 2022) and Chapter 2: Assessment Methodology (PEI Report, Volume I), Major and Moderate effects are classed as Significant, whilst Minor and Negligible effects are classed as Not Significant.

Sources of Information/Data

22.3.20 Baseline data illustrating the existing health conditions surrounding the Proposed Development Site have been collected through a desk-based research exercise using publicly available sources, documents, and web-based applications. These sources include:

- Census 2021 (ONS, 2022a);
- Claimant Count (ONS, 2022b);
- Population Estimates (ONS, 2022c);
- Indices of Multiple Deprivation 2019 (MHLGC, 2019); and
- Local Health Profiles (PHE, 2022).
- The Electric and Magnetic Fields and Health website
- The International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines (ICNIP, 2020)

Consultation

22.3.21 An EIA Scoping Opinion was requested from the Planning Inspectorate (the Inspectorate) in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to human health is outlined in Table 22-4.

Table 22-4: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	17th May 2023 – Scoping Opinion	If significant effects are likely to arise from the requirement to temporarily accommodate construction workers, then then ES should also consider the effects on human health from reduced housing availability and increased housing costs.	The effect of temporary accommodation for construction workers has been considered under the 'housing' determinant of this assessment. Significant effects are not likely; however, this will be further assessed and reported in the ES.
The Inspectorate	17th May 2023 – Scoping Opinion	Potential health impacts, hazards and public health receptors surrounding private drinking water supplies during the construction phase, including the potential for contamination or disruption, should be scoped into further assessment work and reported upon within the human health chapter of the ES, where significant effects are likely.	As noted in Chapter 9: Surface Water, Flood Risk, and Water Resources (PEI Report, Volume I), the Proposed Development Study Area is not within a Drinking Water Protected Area or Drinking Water Safeguard Zone. Therefore, no significant effects are likely.
The Inspectorate	17th May 2023 – Scoping Opinion	Effects on mental health, including the potential for local public concern through understanding of risk/ risk perception for local communities and for the wider public in respect of the proposed hydrogen pipeline should be assessed and reported upon within the ES, where significant effects are likely.	IEMA guidance suggests the 'radiation' assessment should *"consider the mental health effects of widespread concerns about exposure from major electrical infrastructure or radiation sources.* Therefore, the assessment of impacts on mental health is considered under the 'radiation' determinant. Impacts have the potential to be Minor Adverse, which is Not Significant. This is discussed in Section 22.6. However, this will be further assessed and reported in the ES.

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	17th May 2023 – Scoping Opinion	The Scoping Report seeks to scope out a standalone assessment of EMF on the basis that these will be considered in the human health assessment.	EMF impacts to human health are assessed under the 'radiation' determinant. Impacts have the potential to be Minor Adverse, which is not Significant. This is discussed in Section 22.6. However, this will be further assessed and reported the ES.

Use of the Rochdale Envelope

22.3.22 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in line with The Inspectorate's Advice Note Nine: Rochdale Envelope (The Planning Inspectorate, 2018). This involves assessing the maximum (or where relevant, minimum)/worst case parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example).

22.4 Baseline Conditions

Existing Baseline

22.4.1 This section describes the baseline environmental characteristics for the Proposed Development Site and the defined Study Area, with specific reference to human health.

22.4.2 Firstly, a demographic and health profile of the local population is set out. Secondly, existing local infrastructure relevant to the health assessment is summarised; this draws largely on Chapter 18: Socio-economics and Land Use (PEI Report, Volume I) and includes residential properties, community facilities and recreational routes such as Public Rights of Way (PRoW).

Demographic Profile

Age

22.4.3 According to the most recent Census, the total population of the Study Area in 2021 was 43,145. Within this population, the proportion of working age residents (aged 16 to 64) was 59.8%, slightly lower than in the North East (61.9%) and England as a whole (63.0%). The Study Area has a slightly higher proportion of children (20.4%) compared to regional (17.7%) and national (18.6%) levels. However, the share of residents aged 65 and over in the Study Area (19.8%) is broadly in line with the comparator geographies (20.4%, and 18.4%). This is illustrated in Plate 22-1.

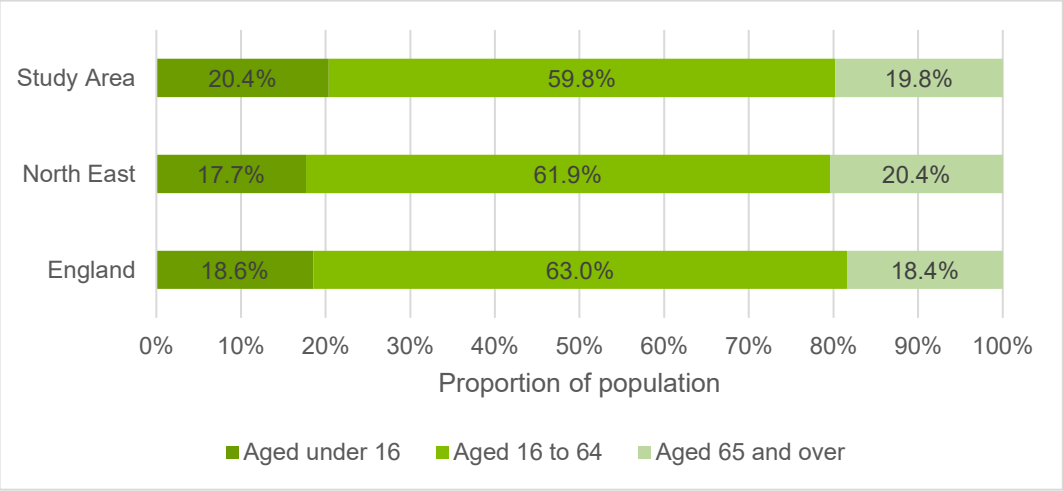

Plate 22-1: Age Breakdown (%) for the Study Area, North-East Region and England

Ethnic Group

22.4.4 In regard to ethnic group, Table 22-5 shows that 96.9% of residents in the Study Area are White, a higher proportion than the North East (93.0%), and considerably higher than in England (81.0%). There is also a lower proportion of all ethnic minority groups in the Study Area compared to regional and national figures. For example, 1.5% of residents in the Study Area are within the Asian, Asian British, or Asian Welsh group, compared to 3.7% in the North East, and 9.6% in England. People from minority ethnic groups may have a higher sensitivity to health effects arising from changes to social cohesion.

Table 22-5: Ethnic Group Breakdown (%) for the Study Area, North-East Region and England

ETHNIC GROUP (%)	STUDY AREA	NORTH EAST	ENGLAND
Asian, Asian British or Asian Welsh	1.5	3.7	9.6
Black, Black British, Black Welsh, Caribbean or African	0.3	1.0	4.2
Mixed or Multiple ethnic groups	0.8	1.3	3.0
White	96.9	93.9	81.0
Other ethnic group	0.5	1.0	2.2

Education

22.4.5 In 2021, the proportion of residents aged 16 or over who had gained a level 4 qualification (degree-level or equivalent) or above in the Study Area was 21.6%. This was lower than the proportion seen in the North East (28.6%) and particularly lower than the average for England (33.9%). In addition, 24.7% of residents in the Study Area have no qualifications, a higher rate than in the North East (20.3%) and nationally (18.1%).

Economic Activity

22.4.6 According to the Census, in 2021 the economic activity rate (amongst 16-to-64-year-olds) was 54.5% in the Study Area, similar to the rate in the North East (55.9%), but slightly lower than that across England as a whole (60.9%).

22.4.7 Claimant count data measures of the number of people claiming benefits principally for the reason of being unemployed. In January 2023, the claimant count for residents (as a proportion of residents aged 16 to 64) in the Study Area was 5.5%, higher than the rates in the North East (4.2%) and nationally (3.7%).

Income

22.4.8 Gross Disposable Household Income (GDHI) is the amount of money that individuals in the household sector can spend or save after income distribution measures. Data at ward level is unavailable for GDHI and so, the local authorities of Hartlepool,

Redcar and Cleveland, and Stockton-on-Tees have been used to form the Study Area for this indicator. GDHI in the Study Area in 2020 was £17,205, in line with the average for the North East (£17,416) but lower than the national average (£21,962).

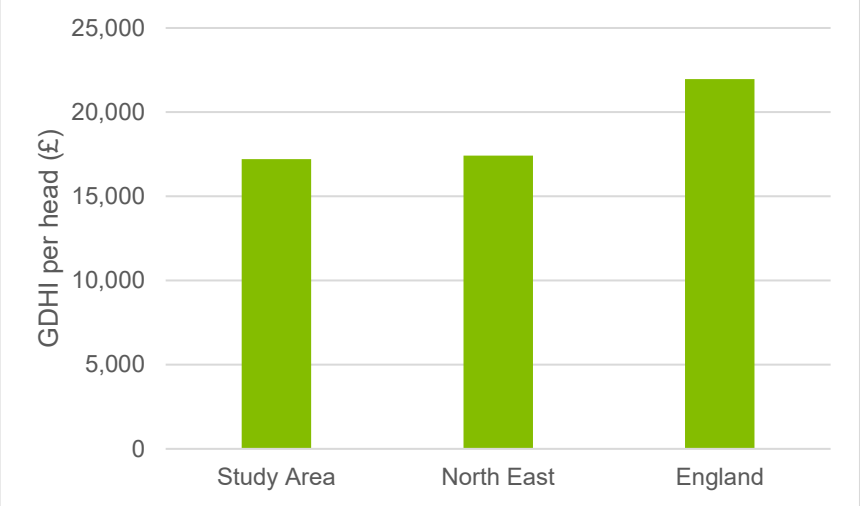

Plate 22-2: Gross Disposable Household Income (GDHI) per head (£) for the Study Area, North-East Region and England

Deprivation

22.4.9 The 2019 Indices of Deprivation (IoD) provide a set of relative measures of deprivation for local authorities across England. Ward level data is not available within this dataset and therefore, the local authorities of Hartlepool, Redcar and Cleveland, and Stockton-on-Tees have been used as the Study Area for deprivation.

22.4.10 In terms of overall deprivation (multiple deprivation), Hartlepool is the 25th most deprived, Redcar and Cleveland is the 62nd most deprived, and Stockton-on-Tees is the 113th most deprived local authority in England (where 1st is most deprived). This places all of these local authorities within the top 40% most deprived in the country.

22.4.11 The IoD also assess health deprivation as a domain. This domain measures the risk of premature death and the impairment of quality of life through poor physical or mental health. In regard to this, Hartlepool is the 21st most deprived, Redcar and Cleveland is the 26th most deprived, and Stockton-on-Tees is the 48th most deprived local authority in England. This places each local authority within the top 20% most health deprived in the country.

22.4.12 Further, the IoD contains data relating to barriers to housing and services as a domain. This measures the physical and financial accessibility of housing and local services. Hartlepool is the 284th most deprived, Redcar and Cleveland is the 283rd most deprived, and Stockton-on-Tees is the 286th most deprived local authority. This means that each local authority is within the top 15% least deprived in England in regard to this domain.

22.4.13 More granular deprivation data is available at Lower Super Output Area (LSOA) level[2]. Chapter 18: Socio-economics and Land Use (PEI Report, Volume I) selects a best fit LSOA Study Area to assess deprivation around the Proposed Development Site. This Study Area comprises the following LSOAs: E01012107, E01032560, E01032561, E01012114, E01012109, E01012198, and E01012279. Of these seven LSOAs, four are within the top 10% most deprived nationally (for overall deprivation), representing a high level of deprivation in the Study Area.

Community Cohesion

22.4.14 According to the Community Life Survey (Department for Digital, Culture, Media & Sport, 2020), in the North East (the most granular level of data) 69% of respondents felt like they belonged strongly or fairly strongly to their immediate neighbourhood. This is higher than the average for England (63%).

Health Profile

22.4.15 This section provides a human health profile of the Study Area, focusing on key determinants of health relevant to the assessment criteria. This local health baseline has been used to assess the potential health effects of the Proposed Development.

General Health

22.4.16 As part of the Census, respondents are asked to self-assess the state of their health, both physical and mental. Data for this shows that 76.0% of residents in the Study Area believed that they were living in 'good' or 'very good' health, a similar proportion to that in the North East (78.0%), but slightly lower than in England (82.8%). Further, 7.8% of the population in the Study Area rated their health as 'bad' or 'very bad', again similar to that in the North East (7.8%) but higher than nationally (5.2%). This is illustrated in Plate 22-3.

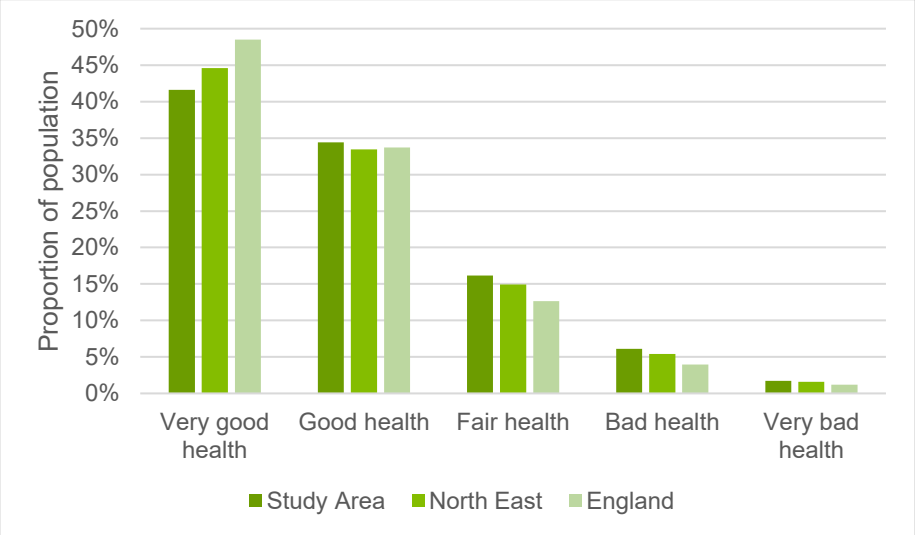

Plate 22-3: Self-Assessed Health for the Study Area, North-East Region and England

[2] LSOAs are ONS-defined small geographic areas across England designed to allow data reporting across small areas. Each LSOA in England is of a similar population size, with an average of 1,500 residents of 650 households.

Mental Health

22.4.17 Mental health and well-being profiles produced by PHE provide a summary of the mental health of people within local authority areas and a comparison of local mental health with average values for all areas of England. The most recent data published is from 2017 and is detailed in Table 22-6. Data at ward level is unavailable for this indicator and so, the local authorities of Hartlepool, Redcar and Cleveland, and Stockton-on-Tees have been used to form the Study Area.

22.4.18 Table 22-6 shows that the prevalence of mental health problems in the Study Area is higher than the average for both the North East and England.

Table 22-6: Mental Health Disorder Prevalence in the Study Area, North-East Region and England

LOCAL AUTHORITY	PEOPLE ESTIMATED TO HAVE ANY COMMON MENTAL HEALTH DISORDER (%)
Study Area	18.1
North East	16.9
England	16.9

Disability

22.4.19 The Census contains information relating to disability – refer to Table 22-7. In 2021, 22.6% of residents in the Study Area were classed as disabled under the Equality Act (2010), a similar proportion to that in the North East (21.4%), and higher than that in England as a whole (17.3%). 11.1% of residents believed that their day-to-day activities were limited a lot, a higher rate than regionally (9.9%) and nationally (7.3%).

Table 22-7: Disability Information for the Study Area, North-East Region and England

	STUDY AREA	NORTH EAST	ENGLAND
Disabled under the Equality Act (%)	**22.6**	**21.4**	**17.3**
Disabled under the Equality Act: Day-to-day activities limited a lot (%)	11.1	9.9	7.3
Disabled under the Equality Act: Day-to-day activities limited a little (%)	11.5	11.5	10.0
Not disabled under the Equality Act (%)	**77.4**	**78.6**	**82.7**
Not disabled under the Equality Act: Has long term physical or mental health condition but day-to-day activities are not limited (%)	6.3	7.1	6.8

	STUDY AREA	NORTH EAST	ENGLAND
Not disabled under the Equality Act: No long term physical or mental health conditions (%)	71.1	71.5	75.9

Wider Determinants of Health

22.4.20 Wider determinants of health can also be insightful in building the health profile of an area. The following indicators are also compared to regional and national figures to illustrate how the Study Area performs:

- Life expectancy: Between 2016 and 2020, the average life expectancy at birth in the Study Area for females was 80.2 years and for males it was 76.2. This was slightly lower than life expectancy in the North East (81.5 and 77.6) and lower than in England (83.2 and 79.5 respectively).
- Childhood obesity: The average proportion of children in reception school year who were obese in the Study Area in 2021 was 12.4%. This was slightly higher than the proportions in the North East (11.4%) and England (9.9%).
- Smoking prevalence: In the Study Area, an average of 14.4% of adults were regular smokers in 2021, compared to 14.8% in the North East, and 13.0% for England as a whole.
- Mortality rate from Chronic Obstructive Pulmonary Disease (COPD)[3]: In 2019, the mortality rate was on average 73.3 per 1,000 people, higher than the rate for the North East (54.8) England as a whole (52.8).
- Physically inactive adults[3]: On average, 29.2% of adults in the Study Area were 'physically inactive' in 2021. This was a higher proportion than in the North East (25.0%) and across England (23.4%).

Healthcare Facilities

22.4.21 The nearest hospital (with an accident and emergency department) to the Proposed Development Site is James Cook University Hospital, located approximately 5 km south of the Proposed Development Site.

22.4.22 There are multiple GP surgeries within proximity of the Proposed Development Site, the majority of which are located in Middlesbrough and Redcar. Those within 2 km of the Proposed Development Site are detailed in Table 22-8.

[3] Please note that ward level data is not available for this indicator. The Study Area has been formed of Hartlepool, Redcar and Cleveland, and Stockton-on-Tees.

Table 22-8: General Practice (GP) Surgeries within 2 km of the Proposed Development Site

GP SURGERY	DISTANCE FROM THE PROPOSED DEVELOPMENT SITE (APPROX. KM)
The Eston Surgery	1.6
South Grange Medical Centre	1.6
Normanby Medical Centre	1.6
Kingsway Medical Centre	1.7
Bentley Medical Practice	1.9
The Green House Surgery	2.0

22.4.23 The latest GP data published by NHS Digital (NHS Digital, 2022) indicates that the total patients registered at the GP surgeries in Table 22-8 was 61,689 in December 2022. Across these GP surgeries, there were 32 GPs working, averaging at 1,928 patients per GP, which is slightly above the Royal College of General Practitioners target of 1,800 patients per GP.

Social Infrastructure

22.4.24 Chapter 18: Socio-economics and Land Use (PEI Report, Volume I) details the educational facilities located in proximity of the Proposed Development Site (refer to Section 18.4 therein). These are clustered in Redcar, Middlesbrough, Billingham, and Stockton-on-Tees.

22.4.25 Police stations in the vicinity of the Proposed Development Site include:

- Cleveland Police Redcar, located approximately 0.8 km east of the Proposed Development Site;
- Cleveland Police South Bank Station, located approximately 1.5 km south-west of the Proposed Development Site;
- Cleveland Police Redcar Town Station, located approximately 2.5 km east of the Proposed Development Site; and
- Cleveland Police Middlesbrough HQ located approximately 2.9 km south of the Proposed Development Site.

22.4.26 There is one fire station located adjacent to the Proposed Development Site Boundary, namely Billingham Community Fire Station. Grangetown Community Fire Station is located approximately 1 km south-east of the Proposed Development Site, whilst Redcar Community Fire Station is located approximately 1.1 km east of the Proposed Development Site, with Cleveland Fire Brigade Headquarters located approximately 1.5 km north-west of the Proposed Development Site.

Community and Recreational Facilities

22.4.27 There is a range of community and recreational facilities located in proximity to the Proposed Development Site, including churches, greenspaces, public houses and hotels. These are detailed in Chapter 18: Socio-economics and Land Use (PEI Report, Volume I).

Public Rights of Way

22.4.28 Information relating to PRoWs located within the vicinity of the Proposed Development Site can be found in Chapter 18: Socio-economics and Land Use (PEI Report, Volume I).

Future Baseline

Age

22.4.29 According to ONS population projections, the Study Area is projected to experience a slight net age increase of 0.08% between 2021 and 2041 – refer to Table 22-9. Proportional losses are expected within the 0-15 age group, whilst the elderly population is expected to grow. These trends reflect both regional and national projections for which the total populations are likely to experience a slight net age increase, with decreases in younger populations and increases in the 65 and over category.

Table 22-9: Population Projections in the Study Area, North-East Region, and England

GEOGRAPHY	AGE GROUP	2021	2026	2031	2036	2041	COMPOUND ANNUAL GROWTH RATE (%)
STUDY AREA	All ages	430,610	433,983	435,171	435,894	437,074	0.08
	Aged 0 to 15	82,475	79,073	74,041	72,032	72,546	-0.67
	Aged 16-64	259,969	257,848	253,675	249,439	248,799	-0.23
	Aged 65+	88,167	97,065	107,459	114,421	115,727	1.44
NORTH EAST	All ages	2,681,149	2,709,320	2,731,853	2,747,811	2,761,406	0.16
	Aged 0 to 15	478,426	464,573	444,960	438,689	444,895	-0.38
	Aged 16-64	1,655,303	1,644,688	1,627,470	1,609,950	1,610,401	-0.14
	Aged 65+	547,424	600,060	659,431	699,167	706,105	1.35
ENGLAND	All ages	56,989,572	58,297,239	59,389,107	60,377,811	61,353,966	0.39
	Aged 0 to 15	10,913,822	10,739,627	10,387,050	10,307,811	10,524,366	-0.19
	Aged 16-64	35,406,739	35,880,054	36,056,306	36,052,368	36,228,027	0.12
	Aged 65+	10,668,992	11,677,597	12,945,733	14,017,594	14,601,606	1.67

22.5 Proposed Development Design and Impact Avoidance

22.5.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development (also known as 'embedded measures'). Embedded mitigation measures as applicable to this assessment includes minimising impacts on the PRoW that cross the Proposed Development Site.

22.5.2 As the human health assessment draws upon the information and conclusions reported in various chapters within this PEI Report, development design and impact avoidance measures, relevant to human health have been set out in each of these respective chapters as detailed below:

- Chapter 8: Air Quality (PEI Report, Volume I): adhering to the CEMP; covering vehicles leaving the construction site that are carrying waste materials; using water suppression and regular cleaning to control dust during earth moving activities; and prohibiting open fires on site.
- Chapter 11: Noise and Vibration (PEI Report, Volume I): abiding by agreed noise limits; avoidance of working in the more sensitive evening and night times where possible; and ensuring that a modern plant is used, complying with the latest European noise emission requirements.
- Chapter 15: Traffic and Transport (PEI Report, Volume I): implementation of the Construction Worker Travel Plan to encourage construction workers to reduce reliance on single occupancy car use; and implementation of the Construction Traffic Management Plan to control impacts of HGVs.
- Chapter 18: Socio-economics and Land Use (PEI Report, Volume I): minimising impacts on the PRoWs that cross the Proposed Development Site.
- Chapter 19: Climate Change (PEI Report, Volume I): minimising leakage of hydrogen and using trace systems; use of energy efficient lighting; and optimisation of overall auto thermal reforming process.

22.5.3 The human health assessment assumes that the construction works would be undertaken in accordance with a Construction Environmental Management Plan (CEMP) which will set out the key measures to be employed during the Proposed Development construction phase to control and minimise the impacts on the environment. A Framework CEMP will accompany the DCO Application, whilst and Outline Construction Environmental Management Plan (OCEMP) will be prepared as a supporting document to the ES. A Final CEMP will be prepared by the construction contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO.

22.5.4 The human health assessment assumes that the Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016. In addition, the Proposed Development will

be operated in line with appropriate standards, whilst the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

22.5.5 The human health assessment also assumes that a Decommissioning Environmental Management Plan (DEMP) would be prepared which would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated. The DEMP would consider potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated.

22.6 Likely Impacts and Effects

22.6.1 This section sets out the potential health and wellbeing impacts associated with the Proposed Development during its construction, operation and decommissioning. These effects are described in accordance with the methodology as set out in Section 22.3.

Construction

22.6.2 Construction of the Proposed Development is anticipated to commence in 2025 and be split into two phases. Phase 1 will last no more than approximately three years, and Phase 2 will commence thereafter, with overall construction expected to be completed by 2030. However, allowing for flexibility, there is potential for there to be a slight overlap in construction phases. For the purposes of this assessment, the worst-case scenario has been considered which is continuous construction on the Main Sites and Connection Corridors over the anticipated 6-year construction period.

Risk Taking Behaviour

22.6.3 Construction activity has the potential to lead to risk taking behaviour by its workforce. It is expected that the construction workforce will be employed by contractors who hold high health and safety standards which employees are required to follow. Therefore, the sensitivity of these receptors is assessed to be Low.

22.6.4 As detailed in Section 22.5, the construction works would be undertaken in accordance with a CEMP which will set out how construction activities will be managed and controlled in compliance with accredited health and safety and environmental management systems, relevant legislation and environmental permits, consents and licences. In addition, Chapter 20: Major Accidents and Disasters (PEI Report, Volume I) indicated that no significant effects are expected during construction of the Proposed Development. Therefore, the magnitude of impact for risk taking behaviour by the workforce is assessed as Low.

22.6.5 Overall, the likely effect on human health arising from impacts on risk taking behaviour during the Proposed Development construction phase is assessed as Minor Adverse (Not Significant).

Open Space, Leisure and Play

22.6.6 The population of the Study Area contains a high proportion of children, and a higher-than-average proportion of 'physically inactive' adults. These groups may be more sensitive to changes to open space and therefore, sensitivity of the local population is assessed to be Medium.

22.6.7 Construction activities on-site may cross, or otherwise impact upon, the accessibility and safety of PRoW and active travel networks in the area. As indicated in Chapter 18: Socio-economics and Land Use (PEI Report, Volume I), the effect of the Proposed Development on recreational routes and PRoW during the construction phase has the potential to be Minor Adverse, but Not Significant. As such, it is anticipated that knock on human health effects will have a Low magnitude. This would produce a Minor Adverse effect (Not Significant). However, a full assessment regarding impacts on PRoW will be undertaken and reported in the ES.

Transport Modes, Access and Connections

22.6.8 A preliminary assessment of transport impacts during the Proposed Development's construction phase is provided in Chapter 15: Traffic and Transport (PEI Report, Volume I).

22.6.9 The Proposed Development has the potential to impact access to healthcare services, educational facilities and other social infrastructure. As noted in the baseline conditions section, there are seven GP surgeries and multiple schools and community facilities in proximity to the Proposed Development Site. In addition, the Study Area presents lower than average rates of good health and educational attainment levels. Therefore, the local population may be more reliant on access to these services. Due to this, sensitivity is assessed as Medium.

22.6.10 As noted in Chapter 15: Traffic and Transport (PEI Report, Volume I), additional traffic predicted to be generated by the construction activities associated with the Proposed Development (both the Main Site and the Connection Corridors) will result in small, temporary increases of traffic flows which are unlikely to affect access to services and social infrastructure. In addition, a number of traffic management measures will be implemented during construction of the Proposed Development to minimise traffic impacts upon the local road network. Therefore, the magnitude of impact is assessed as Low.

22.6.11 Therefore, the overall likely effect on human health arising from impacts on transport modes, access and connections during the Proposed Development construction phase is assessed to be Minor Adverse, which is Not Significant.

Community Safety

22.6.12 As noted in Section 22.4, there are multiple police and fire stations in proximity to the Proposed Development Site, plus one hospital with an accident and emergency department within 5 km. The population of the Study Area in general has poorer health than the rest of the country and therefore, may rely on emergency services to a greater extent. Therefore, sensitivity is assessed as Medium.

22.6.13 Impacts to roads during construction are expected to be limited and temporary due to the appropriate use of traffic management measures. It is unlikely that impacts on access to services, road users, and accidents and safety would occur. Therefore, the magnitude of impact is assessed as Low.

22.6.14 Therefore, the overall likely effect on human health arising from impacts on community safety during the Proposed Development construction phase is assessed to be Minor Adverse, which is Not Significant.

Community Identity, Culture, Resilience and Influence

22.6.15 Baseline data shows that a higher proportion of people in the North East feel like they belong strongly or fairly strongly to their immediate neighbourhood, compared to the proportion in England. This suggests a stronger than average sense of community in the area, compared to the rest of the country. Due to this, the sensitivity of the local population in relation to community identity, culture, resilience, and influence is assessed as Medium.

22.6.16 Through the Proposed Development, the Applicant aims to support local people and help to reverse the impact of recent industrial closures in the region. The Applicant is currently working with local councils, authorities and educators to support social mobility and enable a just transition that engages the local community. This includes establishing a community fund that will provide grants annually for net zero-focused community projects, offering scale and business development services to local businesses focused on net zero and launching a low carbon community hub (bp, 2022). The magnitude of the impact is therefore assessed as Low. This is due to the level of community engagement expected by the Applicant during construction of the Proposed Development, which will be temporary.

22.6.17 The overall likely effect on human health arising from impacts on community identity, culture, resilience and influence during the Proposed Development construction phase is assessed to be Minor Beneficial (Not Significant).

Social Participation, Interaction and Support

22.6.18 The sensitivity of the local population in relation to social participation, interaction and support is assessed as Medium.

22.6.19 Roads bordering the Proposed Development Site may be used by construction traffic which could impact on travel between settlements and cause community severance (e.g., PRoW). Severance could affect access to community and other social facilities. However, as discussed in Chapter 15: Traffic and Transport (PEI Report, Volume I), changes in traffic during construction would be limited and severance impacts on all links are unlikely. In addition, Chapter 18: Socio-economics and Land Use (PEI Report, Volume I), reports that the effect of the Proposed Development on recreational routes and PRoWs during the construction phase has the potential to be Minor Adverse, but Not Significant. Therefore, the magnitude of impact on this determinant of human health is assessed as Low.

22.6.20 The overall likely effect on human health arising from impacts on social participation, interaction and support during the Proposed Development construction phase is assessed to be Minor Adverse, which is Not Significant.

Employment and Income

22.6.21 An assessment of the number of jobs created during the Proposed Development's construction phase is provided in Chapter 18: Socio-economics and Land Use (PEI Report, Volume I). It is estimated that the Proposed Development will support, on average, a minimum of 900 full-time employment construction jobs per annum[4]. Once leakage, displacement and multiplier effects have been accounted for, this results in a net total of 675 jobs during the construction phase, 506 of which are expected to be taken up by residents within the Travel to Work Area (TTWA).

22.6.22 There is evidence that employment matters to health, not only from an economic standpoint, but also in terms of quality of life (PHE, 2019). Good quality work protects against social exclusion through the provision of income, social interaction, a core role and identity and purpose. Therefore, the generation of jobs is assessed to be a beneficial outcome.

22.6.23 The sensitivity of the local workforce to employment and income changes has been assessed as Medium, due to the higher-than-average claimant count and lower-than-average GDHI in the area.

22.6.24 The jobs arising from the construction phase of the Proposed Development will be temporary, over the six-year construction period. This will represent local job growth (creating an estimated 506 jobs for workers living with a 60-minute drive time), although the overall change will be small in the context of the overall number of jobs available locally. Therefore, the magnitude of impact is assessed to be Low.

22.6.25 Overall, the likely effect on human health arising from impacts on employment and income during the construction phase of the Proposed Development is assessed to be Minor Beneficial (Not Significant).

Housing

22.6.26 As noted in Chapter 18: Socio-economics and Land Use and under the 'Employment and Income' assessment above, it is expected that the majority of construction employment will be sourced from within the study area and so, most workers will not require temporary accommodation.

22.6.27 Therefore, based on professional judgement, the impact on housing is currently assessed as Minor Adverse, but Not Significant. As such, it is anticipated that knock on human health effects will also be Not Significant as these are related to housing impacts. A full assessment regarding impacts on temporary accommodation will be undertaken and reported in the ES. This will include an assessment of the availability of temporary accommodation.

[4] As stated in Chapter 5: Construction Programme and Management (PEI Report, Volume I), Section 5.3 peak construction workforce numbers will be approximately 1,300 people per day for both Phases 1 and 2.

Education and Training

22.6.28 Jobs created by the Proposed Development will be in the energy sector. As such, they will contribute to the development of skills needed for the UK's transition to net zero (PWC, 2022). Where possible, there will be a preference for local staffing. It is likely that the appointed contractors will employ trainees and apprentices as part of the Proposed Development construction workforce.

22.6.29 Baseline data shows that the population of the Study Area is generally educated to a lower level than regional and national levels, suggesting a need for local education and training provision. Therefore, sensitivity is assessed as Medium.

22.6.30 The Applicant will invest in green skills by launching a dedicated education skills programme for the Proposed Development. The programme aims to reach more than 5,000 people, ensuring that local people benefit from job opportunities and advancing social mobility (bp, 2022).

22.6.31 The Applicant already has a partnership with Redcar and Cleveland College, which aims to support education initiatives in Teesside, and will provide funding for the development of the new Clean Energy Education Hub at the College. The Hub will specialise in clean energy and renewable industry training for school leavers, apprentices and adult learners (bp, 2022).

22.6.32 The Proposed Development will create a substantial number of jobs and training opportunities, with a considerable proportion going to people in the local area. However, these will be temporary during the construction period. Therefore, the magnitude of change anticipated with respect to education and training during the construction phase is assessed as Low.

22.6.33 Overall, the likely effect on human health arising from impacts on education and training during the Proposed Development construction phase is assessed as Minor Beneficial (Not Significant).

Health and Social Care Services

22.6.34 As discussed in Chapter 18: Socio-economics and Land Use (PEI Report, Volume I), in a worst case scenario, the Proposed Development will create an average of 900 gross direct full-time equivalent (FTE) jobs during construction at. This results in a net total of 675 jobs during the construction phase (after considering leakage and indirect employment), 506 of which are expected to be taken up by residents within the TTWA. In Chapter 5: Construction Programme and Management (PEI Report, Volume I), Section 5.3 indicates that it is likely that construction workforce peak numbers will be approximately 1,300 people per day for both Phases 1 and 2. The construction workers working on the Proposed Development may place extra demand on health and social care services if they move to the area, or if emergency treatment is required.

22.6.35 Baseline analysis shows that GP practices local to the Proposed Development Site are, on average, operating in line with benchmark patient to GP ratios. The Study Area also generally experiences low levels of deprivation with respect to the IMD barriers to housing and services domain. Despite this, levels of poor health among

the local population are higher than average. Therefore, existing healthcare services and their users have been assessed as Medium sensitivity.

22.6.36 Workers already residing locally will be registered at a local GP and will not therefore place additional demand for services upon local GPs. It is not expected that many workers will move to live in the immediate area and access the surgeries located within 2 km of the Proposed Development Site (Table 22-8). Due to the limited impact expected upon healthcare services, the magnitude of these impacts is assessed to be Low.

22.6.37 Overall, the likely effect on human health arising from impacts on health and social care services during the Proposed Development construction phase is assessed as Minor Adverse (Not Significant).

Climate Change Mitigation and Adaptation

22.6.38 A preliminary assessment of potential climate change effects of the Proposed Development during construction is provided in Chapter 19: Climate Change (PEI Report, Volume I).

22.6.39 As discussed in the baseline conditions section, the Study Area contains a higher-than-average mortality rate from COPD and higher than average proportion of residents who are in poor health generally. Therefore, the local population may be more susceptible to impacts arising from greenhouse gas (GHG) emissions and so has been assessed as having Medium sensitivity.

22.6.40 As detailed in Chapter 19: Climate Change (PEI Report Volume I), the Proposed Development construction phase would result in some GHG emissions. Such emissions need to be further quantified and further broken down into relevant construction activities such as worker commuting, transport of materials, fuel and electricity use. However, GHG emissions during the construction phase are limited such that the magnitude of impact is assessed as Low.

22.6.41 Therefore, the overall likely effect on human health arising from impacts on climate change, mitigation and adaptation during the Proposed Development construction phase is assessed to be Minor Adverse, which is Not Significant.

Air Quality

22.6.42 A preliminary assessment of potential air quality effects during the construction of the Proposed Development is provided in Chapter 8: Air Quality (PEI Report, Volume I).

22.6.43 As discussed in the baseline conditions section, the Study Area contains a higher-than-average COPD mortality rate which affects breathing and the respiratory system. Therefore, the sensitivity of the general population is assessed as Medium.

22.6.44 Chapter 8: Air Quality (PEI Report, Volume I) assesses that there is the potential for construction dust to have a Low to Medium impact on human health. However, with the application of appropriate mitigation measures, such as those outlined in the Framework CEMP in accordance with the Institute of Air Quality Management (IAQM) guidance, dust impacts are expected to be of Low magnitude.

22.6.45 Therefore, the overall likely effect on human health arising from impacts on air quality during the Proposed Development construction phase is assessed to be Minor Adverse, which is Not Significant. There may be a slightly greater effect on some of the more vulnerable members of the population (children and the elderly) given these groups are likely to be more sensitive to air quality changes.

Noise and Vibration

22.6.46 A preliminary assessment of potential noise and vibration effects during the construction of the Proposed Development is provided in Chapter 11: Noise and Vibration (PEI Report, Volume I).

22.6.47 The Study Area contains a high proportion of children and proportionally suffers more from poor health than the wider region and country. Therefore, the general population is assessed to have a Medium sensitivity in regard to noise and vibration effects.

22.6.48 Chapter 11: Noise and Vibration (PEI Report, Volume I) finds that there is potential for significant noise effects during construction of the Connection Corridors. However, following the application of additional mitigation, these effects become Not Significant. Further detailed assessment will be undertaken and reported in assessment of noise during the EIA. Therefore, it is expected that the magnitude of impact from a health perspective will be Low.

22.6.49 Therefore, the overall likely effect on human health arising from impacts on noise and vibration during the Proposed Development construction phase is assessed to be Minor Adverse (Not Significant). There may be a slightly greater effect on some of the more vulnerable members of the population (children and the elderly) given these groups are likely to be more sensitive to noise and vibration changes.

Built Environment

22.6.50 As set out in Section 22.4, social infrastructure in the local area includes schools, churches and community centres. Construction workers (net total of 1,702 on average each day, 426 of which are likely to come from outside of the TTWA, with peak numbers being approximately 1,300 people per day for both Phases 1 and 2) may place extra demand on these facilities if they move to the area, though in reality, many will likely stay in temporary accommodation and travel back to their permanent residence at the weekend.

22.6.51 There are generally low levels of deprivation in the Study Area with respect to the IMD barriers to housing and services domain, however, there are higher than average levels of poor health among the local population. Therefore, existing social infrastructure services and their users have been assessed as having a Medium sensitivity.

22.6.52 It is possible that local residents could experience adverse impacts due to increased demand for services and increased traffic flows. However, the construction of the Proposed Development will result in small, temporary increases of traffic flows which is unlikely to affect access to services and infrastructure. Therefore, the magnitude of impact is assessed as Low.

22.6.53 Therefore, the overall likely effect on human health arising from impacts on the built environment during the Proposed Development construction phase is assessed to be Minor Adverse, which is Not Significant.

Radiation

22.6.54 It is likely that all electrical and control system cables will be installed below ground or at ground level with no new overhead transmission lines proposed. Therefore, it is considered that with an appropriate design, effects associated with EMFs (including those related to mental health) have the potential to be Minor Adverse, but Not Significant. This will, however, be assessed further in the ES.

Operation

22.6.55 The Phase 1 and Phase 2 Production Facilities will each have a design life of 25 years. For the purposes of this assessment, the worst-case scenario has been considered which is the full 50-year operational life of the Proposed Development plus flexibility in case the operational life is longer due to potential changes in market conditions and plant condition.

Risk Taking Behaviour

22.6.56 Once the Proposed Development is operational, it is expected that the workforce required will be much smaller than in the construction phase. It is expected that the operational workforce will be employed with contracts that hold high health and safety standards which employees are required to follow. Therefore, the sensitivity of this receptor is assessed as Very Low.

22.6.57 Chapter 20: Major Accidents and Disasters (PEI Report, Volume I) states that no significant effects are expected during the operational phase of the Proposed Development, therefore, the magnitude of impact is assessed as Low.

22.6.58 Overall, the effect on human health arising from impacts on risk taking behaviour during the operational phase of the Proposed Development is assessed as Negligible, which is Not Significant.

Open Space, Leisure and Play

22.6.59 The sensitivity of the local population with respect to access to open space, leisure, and play is assessed to be Medium.

22.6.60 There is potential for the Proposed Development to impact PRoWs and active travel networks in the surrounding area. As indicated in Chapter 18: Socio-economics and Land Use (PEI Report, Volume I), the effect of the Proposed Development upon recreational routes and PRoWs during its operational phase is likely to be Minor Adverse, but not Significant. As such, it is anticipated that knock on human health effects will have a Low magnitude. This would produce a Minor Adverse effect (Not Significant). However, a full assessment regarding impacts on PRoWs will be undertaken and reported in the ES.

Transport Modes, Access and Connections

22.6.61 A preliminary assessment of the risk of transport impacts during the operational phase of the Proposed Development is provided in Chapter 15: Traffic and Transport (PEI Report, Volume I).

22.6.62 The Proposed Development has the potential to impact on access to healthcare services, educational facilities, and other social infrastructure. There are seven GP surgeries and multiple schools and community facilities in proximity to the Proposed Development Site. In addition, the Study Area presents lower than average rates of good health and educational attainment levels. Therefore, the local population may be more reliant on access to these services. Due to this, sensitivity is assessed as Medium.

22.6.63 Chapter 15: Traffic and Transport (PEI Report, Volume I) states that the generation of traffic during the operation of the Proposed Development is not considered to be severe and has not been assessed within this PEI Report. Therefore, the magnitude of impact is assessed as Very Low.

22.6.64 Overall, the effect on human health arising from impacts on transport modes, access, and connections during the Proposed Development operational phase is assessed to be Negligible, which is Not Significant.

Community Safety

22.6.65 There are multiple police and fire stations in proximity to the Proposed Development Site, and the population of the Study Area in general has poorer health than the rest of the country and therefore, may rely on emergency services more. Therefore, sensitivity to change is assessed to be Medium.

22.6.66 Impacts on road users, accidents and safety are unlikely during the operation of the Proposed Development due to very low traffic flows and vehicle numbers generated. Therefore, it is not likely that emergency services would be less accessible for the population. The magnitude of impact is therefore assessed as Very Low.

22.6.67 Overall, the likely effect on human health arising from impacts on community safety during the operational phase of the Proposed Development is assessed to be Negligible, which is Not Significant.

Community Identity, Culture, Resilience and Influence

22.6.68 The sensitivity of the local population in relation to community identity, culture, resilience and influence is assessed as Medium, due to the stronger than average sense of community in the area compared to the rest of the country.

22.6.69 The magnitude of impact is assessed as Low, due to the commitment of the Applicant to supporting local communities through various activities.

22.6.70 Therefore, the overall likely effect on human health arising from impacts on community identity, culture, resilience and influence during the operational phase of the Proposed Development is assessed to be Minor Beneficial (Not Significant).

Social Participation, Interaction and Support

22.6.71 The sensitivity of the local population to changes in social participation, interaction and support is assessed as Medium, due to the stronger than average sense of community in the Study Area.

22.6.72 As discussed in paragraph 22.6.10, it is expected that the Proposed Development will not affect current access to community assets and meeting places during operation. Therefore, the magnitude of impact is assessed as Very Low.

22.6.73 Overall, the likely effect on human health arising from impacts on social participation, interaction, and support, during the Proposed Development operational phase is assessed to be Negligible, which is Not Significant.

Employment and Income

22.6.74 As set out in Chapter 18: Socio-economics and Land Use (PEI Report, Volume I), the Proposed Development will support, on average, an estimated minimum of 60 full-time employment jobs per annum during the operational phase. Once leakage, displacement and multiplier effects have been accounted for, this results in a net total of 58 jobs during the construction phase, 44 of which are expected to be taken up by residents within the Travel to Work Area (TTWA).

22.6.75 The sensitivity of the local population with respect to employment and income is assessed to be Medium.

22.6.76 Direct jobs created will represent local job growth, although the overall change will be small in the context of the total number of jobs available locally. Therefore, the magnitude of impact is assessed as Low.

22.6.77 Overall, the likely effect on human health arising from impacts on employment and income during the Proposed Development operational phase is assessed to be Minor Beneficial (Not Significant).

Housing

22.6.78 As discussed in Chapter 18: Socio-economics and Land Use (PEI Report, Volume I) and under the assessment of 'employment and income' above, the Proposed Development is expected to generate a small number of operational jobs. Based on professional judgement, it is likely that workers will mostly be sourced from the local area. Due to this small number of workers and the large housing market, it is anticipated that there will not be a significant effect on housing. This will however be assessed further in the ES.

Education and Training

22.6.79 The Proposed Development will create employment and training opportunities during its operation. Many of these employment and training opportunities are expected to be taken by local residents.

22.6.80 The sensitivity of the local population to education and training changes has been assessed as Medium, due to the lower-than-average educational attainment levels in the area.

22.6.81 Due to the small number of jobs and training opportunities created in the context of the wider job market, the magnitude of impact is assessed to be Low.

22.6.82 Overall, the likely effect on human health arising from impacts on education and training during the Proposed Development operational phase is assessed to be Minor Beneficial, which is Not Significant.

Health and Social Care Services

22.6.83 With respect to health and social care services, GP practices are operating in line with benchmark patient to GP ratios and the Study Area experiences low levels of barriers to housing and services deprivation. However, there are higher than average levels of poor health in the Study Area. Therefore, sensitivity is assessed as Medium.

22.6.84 The Proposed Development will generate an estimated peak of 130 jobs during the operational phase. It is unlikely that all operational staff will relocate to the Study Area and so there will be minimal additional demand placed on health and social care services. Therefore, the magnitude of the impact is assessed as Very Low.

22.6.85 Overall, the likely effect on human health arising from impacts on health and social care services during the Proposed Development operational phase is assessed to be Negligible, which is Not Significant.

Climate Change Mitigation and Adaptation

22.6.86 The Study Area contains a higher than regional and national average mortality rate from COPD and higher than average proportion of residents who are in poor health generally. Therefore, the local population may be more susceptible to impacts arising from GHG emissions and so has been assessed as Medium sensitivity.

22.6.87 As detailed in Chapter 19: Climate Change (PEI Report, Volume I), the GHG emissions from the Proposed Development could produce an adverse effect when viewing the Proposed Development Site in isolation. However, when looking at the hydrogen product and its ability to enable a transition to a lower carbon economy however, the Proposed Development has a benefit due to its reduced footprint vs natural gas or other fuels such as diesel or coal. Therefore, the magnitude of impact is assessed as Low.

22.6.88 Overall, the likely effect on human health arising from impacts on climate change mitigation and adaptation during the Proposed Development operational phase is assessed to be Minor Adverse, which is Not Significant.

Air Quality

22.6.89 During the construction phase of the Proposed Development, the general population is assessed as having Medium sensitivity with respect to changes in air quality.

22.6.90 As stated in Chapter 8: Air Quality (PEI Report, Volume I), operational traffic flows are not anticipated to produce significant air quality impacts on human health receptors. The chapter also states that guidance on emerging techniques for hydrogen production with carbon capture has been released (EA, 2023) and will be considered as the environmental permit required for the operation of the Proposed

Development is developed. Confirmation of air quality effects during the operational phase will be confirmed in the ES. However, magnitude is likely to be Low.

22.6.91 Overall, the likely effect on human health arising from impacts on air quality during the operational phase is assessed to be Minor Adverse, which is Not Significant.

Noise and Vibration

22.6.92 As with the construction phase, the general population is assessed as having Medium sensitivity with respect to changes in noise and vibration due to levels of poor health and a high proportion of children in the Study Area.

22.6.93 Chapter 11: Noise and Vibration (PEI Report, Volume I) contains a preliminary assessment of noise and vibration associated with the operation of the Proposed Development. It states that the Proposed Development has the potential to produce significant effects on some residential properties. However, following the application of appropriate mitigation including limits on noise emissions from plant equipment, and further detailed design effects are likely to reduce to not significant. Therefore, magnitude of impact from a health perspective is assessed to be Low.

22.6.94 Overall, the likely effect on human health arising from impacts on noise and vibration during the Proposed Development operational phase is assessed to be Minor Adverse (Not Significant).

Built Environment

22.6.95 There are generally low levels of deprivation in the Study Area with respect to the IMD barriers to housing and services domain, however, there are higher than average levels of poor health compared to regional and national levels. Therefore, existing social infrastructure services and their users have been assessed as Medium sensitivity.

22.6.96 The Proposed Development will generate an estimated maximum of 130 FTE jobs during the operational phase. This is expected to place a minimal level of additional demand on the roads and is unlikely to impact access to services. The magnitude of impact has therefore been assessed to be Very Low.

22.6.97 Overall, the likely effect on the built environment during the Proposed Development operation phase is assessed to be Negligible, which is Not Significant.

Radiation

22.6.98 It is likely that all electrical and control system cables will be installed below ground or at ground level with no new overhead transmission lines proposed. Therefore, it is considered that with an appropriate design, effects associated with EMFs (including those related to mental health) have the potential to be Minor Adverse, but Not Significant. This will be assessed further in the ES.

Decommissioning

22.6.99 As outlined in Chapter 8: Air Quality, Chapter 11: Noise and Vibration, Chapter 15: Traffic and Transport, Chapter 18: Socio-economics and Land Use and Chapter 19: Climate Change (PEI Report, Volume I), effects during the decommissioning phase of

the Proposed Development are anticipated to be no worse than those experienced during the construction phase. The same applies to human health effects.

22.7 Mitigation and Enhancement Measures

22.7.1 Additional mitigation measures as set out in Chapter 8: Air Quality, Chapter 11: Noise and Vibration, Chapter 15: Traffic and Transport, Chapter 18: Socio-economics and Land Use and Chapter 19: Climate Change (PEI Report, Volume I) to reduce other environmental effects as applicable, will in turn mitigate the impacts on the local community and existing facilities from a human health perspective.

22.7.2 Where there are assessed to be adverse health impacts in the assessment, the implementation of additional mitigation measures has been considered to avoid or minimise the human health impact.

22.8 Limitations and Difficulties

22.8.1 This assessment is based on baseline and design information available at the time of writing this PEI Report. A full assessment will be undertaken and reported in the ES.

22.8.2 The assessment of the significance of effects has been carried out against a benchmark of current human health baseline conditions in the vicinity of the Proposed Development Site, as far as is possible within the limitations of such a dataset. Baseline data is also subject to a time lag between collection and publication. As with any dataset, these conditions may be subject to change over time which may influence the findings of the assessment.

22.8.3 The assessment of likely health effects arising from the Proposed Development is based on professional judgement, drawing on relevant guidance as set out in Section 22.2.

22.8.4 Effects on human health draw upon other PEI Report chapters, namely Chapter 8: Air Quality, Chapter 11: Noise and Vibration, Chapter 15: Traffic and Transport, Chapter 18: Socio-economics and Land Use and Chapter 19: Climate Change (PEI Report, Volume I). Relevant assumptions and limitations are set out in the respective chapters and as such are not repeated here.

22.9 Residual Effects and Conclusions

22.9.1 There are no anticipated significant residual human health effects associated with the Proposed Development following the application of additional mitigation, as detailed in Table 22-10.

Table 22-10: Residual Effects and Conclusions – Human Health

HEALTH DETERMINANT	SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT
CONSTRUCTION (AND DECOMMISSIONING)			
Risk taking behaviour	Low	Low	Minor Adverse (Not Significant)
Open space, leisure and play	Medium	Low	Effects not anticipated to be significant – likely Minor Adverse. Will be further assessed and reported in the ES.
Transport modes, access and connections	Medium	Low	Minor Adverse (Not Significant)
Community safety	Medium	Low	Minor Adverse (Not Significant)
Community identity, culture, resilience and influence	Medium	Low	Minor Beneficial (Not Significant)
Social participation, interaction, and support	Medium	Low	Minor Adverse (Not Significant)
Employment and income	Medium	Low	Minor Beneficial (Not Significant)
Housing	This will be further assessed and reported in the ES.	It is anticipated that construction workers would not require temporary accommodation, as most will be sourced from within	Effects not anticipated to be significant. Likely Minor Adverse but this will be assessed during the EIA and reported in the ES.

HEALTH DETERMINANT	SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT
		the Study Area. This will be further assessed and reported in the ES.	
Education and training	Medium	Low	Minor Beneficial (Not Significant)
Health and social care services	Medium)	Low	Minor Adverse (Not Significant)
Climate change and adaptation	Medium	Low	Minor Adverse (Not Significant)
Air quality	Medium	Low	Minor Adverse (Not Significant)
Noise and vibration	Medium	Low	Minor Adverse (Not Significant)
Built environment	Medium	Low	Minor Adverse (Not Significant)
Radiation	This will be further assessed and reported in the ES.	Potential for EMF effects (including those related to mental health) due to major electrical infrastructure required however this will be assessed and reported in the ES.	Effects not anticipated to be significant. Likely Minor Adverse but this will be further assessed and reported in the ES.
OPERATION			
Risk taking behaviour	Very Low	Low	Negligible (Not Significant)
Open space, leisure and play	Medium	Low	Effects not anticipated to be significant. Likely to be Minor Adverse but this will be further assessed and reported in the ES.

HEALTH DETERMINANT	SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT
Transport modes, access, and connections	Medium	Very Low	Negligible (Not Significant)
Community safety	Medium	Very Low	Negligible (Not Significant)
Community identity, culture, resilience and influence	Medium	Low	Minor Beneficial (Not Significant)
Social participation, interaction and support	Medium	Very Low	Negligible (Not Significant)
Employment and income	Medium	Low	Minor Beneficial (Not Significant)
Housing	This will be further assessed and reported in the ES.	Small number of operational workers expected who will likely be sourced from the local area, and so it is unlikely that accommodation will be required for workers however this will be assessed further in the ES.	Effects not anticipated to be significant. This will be further assessed and reported in the ES.
Education and training	Medium	Low	Minor Beneficial (Not Significant)
Health and social care services	Medium	Very Low	Negligible (Not Significant)
Climate change and adaptation	Medium	Low	Minor Adverse (Not Significant)
Air quality	Medium	Low	Minor Adverse (Not Significant)

HEALTH DETERMINANT	SENSITIVITY	MAGNITUDE OF IMPACT	SIGNIFICANCE OF EFFECT
Noise and vibration	Medium	Low	Minor Adverse (Not Significant)
Built environment	Medium	Very Low	Negligible (Not Significant)
Radiation	This will be further assessed and reported in the ES.	Potential for EMF and mental health impacts due to major electrical infrastructure required however this will be assessed further in the ES.	Effects not anticipated to be significant. Likely to be Minor Adverse but this will be further assessed and reported in the ES.

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23.0 CUMULATIVE AND COMBINED EFFECTS

23.1 Introduction

23.1.1 This chapter of the Preliminary Environmental Information (PEI) Report provides an overview of the approach to the assessment of potential cumulative and combined effects associated with the Proposed Development that will be presented in the Environmental Statement (ES) accompanying the Development Consent Order (DCO) Application. Cumulative and combined effects are defined as follows:

- cumulative effects: these occur when the environmental impacts of the Proposed Development interact with those associated with other planned projects and developments located within a realistic geographical scope, where environmental impacts could act together to result in a greater significance of effect on environmental resources and/or receptors; and
- combined effects: these are effects resulting from a single development (i.e., the effects of the Proposed Development) on any one environmental receptor or resource that may collectively cause an effect (or effects) of greater significance.

23.1.2 The information presented in this chapter at this preliminary assessment stage draws upon the assessment of impacts provided in Chapters 8 to 22 (PEI Report, Volume I), and information in the public domain relating to other known developments within the defined Zones of Influence (ZoI) (outlined at Section 23.3).

23.1.3 The cumulative impact assessment does not consider other developments that are already constructed and operating, as such existing developments are already accounted for in the baseline conditions established for the main assessments within Chapters 8 to 22 (PEI Report, Volume I).

23.1.4 This chapter is supported by the following figures (PEI Report, Volume II):

- Figure 23-1: Zones of Influence (Sheets 1 to 4); and
- Figure 23-2: Long List of Other Developments (Sheets 1 to 2).

23.2 Legislation and Planning Policy Context

23.2.1 Due to the potential for cumulative effects to occur as a result of the construction, operation and decommissioning of the Proposed Development, a cumulative assessment is being undertaken as part of the Environmental Impact Assessment (EIA) in accordance with the Infrastructure Planning (EIA) Regulations 2017 ('the EIA Regulations') and the assessment requirements of the National Policy Statement (NPS) for Energy (EN-1) (DECC, 2011).

23.2.2 The requirement for cumulative and combined impact assessments is stated in the relevant European Directive and domestic legislation/policy, as detailed below:

- European Directive 2014/52/EU on the assessments of effects of certain public and private projects on the environment requires an assessment of "*the direct effects and any indirect, secondary, cumulative, transboundary, short-term,*

medium term and long-term, permanent and temporary, positive and negative effects of the project";

- Schedule 4, paragraph 5 of the EIA Regulations requires: "*A description of the likely significant effects of the development on the environment resulting from, inter alia […] (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources*". The EIA Regulations state that this description of likely significant effects "*should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development*";
- Paragraph 4.1.3 of the Overarching NPS for Energy (EN-1) (DECC, 2011) states:

  "*In considering any proposed development, and in particular when weighing its adverse impacts against its benefits, the Infrastructure Planning Commission [now the Planning Inspectorate] should take into account:*

  - *its potential benefits including its contribution to meeting the need for energy infrastructure, job creation and any long-term or wider benefits; and*
  - *its potential adverse impacts, including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts*".

- Paragraph 4.2.5 of NPS EN-1 goes on to state that when considering cumulative effects "*the Environmental Statement (ES) should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence). The IPC may also have other evidence before it, for example from appraisals of sustainability of relevant NPSs or development plans, on such effects and potential interactions. […]*"; and
- Paragraph 4.2.6 of NPS EN-1 states that consideration should be given to "*how the accumulation of, and interrelationship between, effects might affect the environment, economy or community as a whole, even though they may be acceptable when considered on an individual basis with mitigation measures in place.*"

23.2.3 The UK Government is currently reviewing and updating the energy NPSs. The Draft NPS EN-1 published in March 2023 by the Department for Energy Security & Net Zero (DESNZ) (DESNZ, 2023) also states the need to assess potential cumulative effects and makes reference to the Planning Inspectorate's ('the Inspectorate'') 'Cumulative Effects Assessment – Advice Note Seventeen: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects' (The Inspectorate, 2019a).

23.3 Assessment Methodology and Significance Criteria

Impact Assessment and Significance Criteria

23.3.1 A combination of professional judgement and established guidance have been used to confirm the scope of the cumulative effects assessment, and to aid the identification and (where necessary) mitigation of likely significant effects.

23.3.2 The cumulative effects assessment is being undertaken taking into account guidance contained within The Inspectorate Advice Note Seventeen (the Inspectorate, 2019a), which provides advice on the identification and assessment of other planned developments.

23.3.3 The significance criteria set out in Table 23-1 build upon the policy and guidance documents outlined above, and the general EIA approach methods presented in Chapter 2: Assessment Methodology (PEI Report, Volume I).

Table 23-1: Combined and Cumulative Effects Significance Criteria

SIGNIFICANCE CRITERIA	TYPICAL DESCRIPTORS OF EFFECT
Very large (typically adverse only)	Where the combined impacts of the Proposed Development or cumulative impacts of the Proposed Development in association with other development upon an individual or collection of environmental receptors would be very highly significant (beneficial or adverse, though typically adverse only). Effects would be permanent for receptors of very high value.
Large (adverse or beneficial)	Where the combined impacts of the Proposed Development or cumulative impacts of the Proposed Development in association with other development upon an individual or collection of environmental receptors would be highly significant (beneficial or adverse). Effects would be: • widespread/large scale for a receptor of high value[1]; • permanent for a receptor or receptors of high value; • localised for a receptor or receptors of very high value; or • temporary for a receptor or receptors of very high value.
Moderate (adverse or beneficial)	Where the combined impacts of the Proposed Development or cumulative impacts of the Proposed Development in association with other development upon an individual or collection of environmental receptors would be significant (beneficial or adverse). Effects would be: • permanent for a receptor or receptors of medium value; • localised for a receptor or receptors of high value; or

[1] Note that the term 'value' refers here to both intrinsic value and sensitivity

SIGNIFICANCE CRITERIA	TYPICAL DESCRIPTORS OF EFFECT
	• temporary for a receptor or receptors of high value.
Slight (adverse or beneficial)	Where the combined impacts of the Proposed Development or cumulative impacts of the Proposed Development in association with other development upon an individual or collection of environmental receptors would be noteworthy but not significant (beneficial or adverse). Effects would be: • permanent for receptors of low value; • localised for a receptor or receptors of medium value; or • temporary for a receptor or receptors of medium value.
Neutral	Where the combined impacts of the Proposed Development or cumulative impacts of the Proposed Development in association with other development upon an individual or collection of environmental receptors would be negligible and not significant (beneficial or adverse).

23.3.4 Combined and cumulative effects that are of Moderate, Large or Very Large significance will be considered Significant effects.

23.3.5 Once further information has been gathered about the construction effects and programmes of the developments for inclusion in the cumulative effects assessment, a worst-case year of construction will be defined by determining when there is the greatest degree of overlap of construction with the Proposed Development.

23.3.6 The cumulative operational assessment will consider the total effects of the Proposed Development and the other identified developments operating concurrently.

23.3.7 As the Proposed Development has an estimated design life of up to 25 years (including Phase 2), cumulative effects during decommissioning are not being considered as it is not possible to predict the developments which would be in progress at that point in time. The potential for cumulative effects would be considered as part of decommissioning planning in accordance with the legislation applicable at that time. Any necessary mitigation measures would be included within the Decommissioning Environmental Management Plan (DEMP), which it is anticipated would be secured by a requirement in the draft DCO.

Assessment of Combined Effects

23.3.8 The assessment of combined effects considers whether an individual environmental receptor or resource would be affected by more than one type of impact as a result of the Proposed Development. For example, a residential occupant could be exposed to temporary increases in both noise and dust during construction phase of the Proposed Development.

23.3.9 The assessment method for combined effects involves the identification of impact interactions associated with the Proposed Development upon separate

environmental receptors and resources, the objective being to understand the overall environmental effect of the Proposed Development.

23.3.10 The potential interactions between individual effects on common receptors will be identified during the latter stages of the EIA by reviewing the final conclusions of the topic assessments as presented within the ES that accompanies the DCO Application. Given the preliminary nature of the assessment, it is not considered appropriate to undertake a combined effects assessment as part of this PEI Report.

23.3.11 The significance of combined effects upon environmental receptors and resources will be determined using professional judgement, assisted by the views and opinions of the competent experts responsible for undertaking the topic assessments.

Assessment of Cumulative Effects

23.3.12 The assessment of cumulative effects considers the effects on environmental resources and receptors that would likely occur from the changes arising from the Proposed Development in conjunction with those associated with other planned developments.

23.3.13 The four-stage approach in The Inspectorate's Advice Note Seventeen (The Inspectorate, 2019a) is being adopted for the assessment of potential cumulative effects:

- Stage 1: Establishing the long list of 'other existing development and/or approved development';
- Stage 2: Establishing a shortlist of 'other existing development and/or approved development';
- Stage 3: Information gathering; and
- Stage 4: Assessment.

23.3.14 The first stage of the assessment of cumulative effects has commenced, as is reported herein, and is being guided by the following principles:

- understanding the limits of the effects associated with the Proposed Development and those of other planned developments;
- the sensitivity, value or importance of environmental resources or receptors, and their susceptibility to effects;
- whether different types of effect would occur and interact in a way that alters their significance;
- whether effects would be temporary or permanent in duration, what their timescales would be, and whether such effects would be intermittent or constant; and
- the degree of certainty and confidence relating to the effects.

23.3.15 Stages 2 to 4 of the assessment will be reported in the ES.

Stage 1: Establishing the Long List of Other Developments

23.3.16 The cumulative effects assessment of the Proposed Development is currently at Stage 1. Given the scope and scale of the proposed works associated with the Proposed Development, Stage 1 activities include establishing the Proposed Development's likely ZoI, as associated with each of the environmental topic areas being assessed within the EIA.

23.3.17 Table 23-2 presents the proposed ZoIs, based on the largest study area identified for each environmental topic. Each ZoI is indicative and will be subject to further review as the individual assessments progress, based on professional judgement. Final ZoIs will be confirmed in the ES that accompanies the DCO Application.

Table 23-2: Summary of Indicative Zones of Influence

ENVIRONMENTAL TOPIC	ZONE OF INFLUENCE
Air Quality (Chapter 8, PEI Report, Volume I)	Construction: 350 m ZoI from the Proposed Development Site and 500 m for site entrances. Construction impacts would be due to construction dust and emissions from construction activities, which may affect human receptors up to approximately 350 m from the construction activities and 50 m for ecological receptors. At site entrances the ZoI increases to 500 m for both human and ecological receptors due to greater 'track out' of dust (e.g. on vehicle wheels). Operation: 10 km from the Main Site for ecological receptors; 2 km from the Main Site for human receptors. Traffic-related air quality: 200 m from affected roads[2]. During the EIA, the construction phase traffic data will include traffic associated with other developments. As such, the air quality impact assessment of traffic-related construction impacts that will be reported in the ES will be inherently cumulative. Refer to Chapter 8: Air Quality (PEI Report, Volume I) for more information.
Surface Water, Flood Risk and Water Resources (Chapter 9, PEI Report, Volume I)	Construction and Operation: 1 km ZoI from the Proposed Development Site. Refer to Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I) for more information.
Geology, Hydrogeology and Contaminated Land	Construction and Operation: 1 km ZoI from the Proposed Development Site.

[2] Affected roads are roads which are predicted by the traffic model to exceed threshold increases in traffic flows as set by the Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment, 1993) and where receptors have been identified that would be affected by the increases.

ENVIRONMENTAL TOPIC	ZONE OF INFLUENCE
(Chapter 10, PEI Report, Volume I)	Refer to Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I) for more information.
Noise and Vibration (Chapter 11, PEI Report, Volume I)	Construction Vibration: 100 m ZoI from the Proposed Development Site. Construction Noise: 2 km ZoI from the Main Site and 800 m from the Proposed Development Site where this extends beyond 2 km from the Main Site. Operational Noise: 2 km ZoI from the Main Site. Traffic-related Noise: 600 m ZoI from the traffic links identified within the traffic and transport assessment Study Area (refer to Chapter 15: Traffic and Transport (PEI Report, Volume I)). During the EIA, the construction phase traffic data will include traffic associated with other developments. As such, the noise and vibration assessment of traffic-related construction impacts that will be reported in the ES will be inherently cumulative. Refer to Chapter 11: Noise and Vibration (PEI Report, Volume I) for more information.
Ecology and Nature Conservation (including Aquatic Ecology) (Chapter 12, PEI Report, Volume I)	Construction and Operation: 15 km ZoI from the Proposed Development Site for international and national nature conservation designations. Construction and Operation: 2 km ZoI from the Proposed Development Site for all other ecology effects (other than for aquatic ecology (fish, aquatic macroinvertebrates, macrophytes, invasive species and crayfish) for which the ZoI extends beyond 2 km to consider downstream impacts, and where there are records of notable species outside 2 km in connected water bodies). Refer to Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I) for more information.
Ornithology (Chapter 13, PEI Report, Volume I)	Construction and Operation: 15 km ZoI from the Proposed Development Site for international and national nature conservation designations. Construction and Operation: 2 km ZoI from the Proposed Development Site for all other ornithological effects. Refer to Chapter 13: Ornithology (PEI Report, Volume I) for more information.

ENVIRONMENTAL TOPIC	ZONE OF INFLUENCE
Marine Ecology (Chapter 14, PEI Report, Volume I)	Construction and Operation: 10 km ZoI from the Proposed Development Site. Refer to Chapter 14: Marine Ecology and Nature Conservation (PEI Report, Volume I) for more information.
Landscape and Visual Amenity (Chapter 16, PEI Report, Volume I)	Construction and Operation: 10 km from the Main Site and 2 km from the Proposed Development Site. Refer to Chapter 16: Landscape and Visual Amenity (PEI Report, Volume I) for more information.
Cultural Heritage (Chapter 17, PEI Report, Volume I)	Construction and Operation (designated assets): 5 km ZoI from the Proposed Development Site. Construction and Operation (non-designated assets): 1 km ZoI from the Proposed Development Site. Refer to Chapter 17: Cultural Heritage (PEI Report, Volume I) for more information.

23.3.18 The assessment of construction traffic effects will be an assessment that is inherently cumulative as it will include any traffic generated by committed 'other developments.' At this stage, the traffic and transportation assessment (refer to Chapter 15: Traffic and Transportation, PEI Report, Volume I) does not include any traffic that would be generated by committed 'other developments', other than the proposed Net Zero Teesside project, as this will be completed during the EIA and reported in the ES.

23.3.19 The greenhouse gas (GHG) assessment is also inherently cumulative, as all GHG emissions have the potential to equally impact the receptor which is the global climate. Therefore, sources of emissions for assessment should not be constrained within a geographically defined location. The GHG assessment is included in Chapter 19: Climate Change (PEI Report, Volume I).

Search Area for Long List of Other Developments

23.3.20 In accordance with The Inspectorate's Advice Note Seventeen (The Inspectorate, 2019a), the maximum search area for the long list of other developments has been set at 15 km from the Proposed Development Site, consistent with the largest ZoI of the individual environmental topic chapters as detailed in Table 23-2.

Local Authority and Major Infrastructure Developments

23.3.21 For planned developments within the search area, the following search criteria has been applied during Stage 1:

- local authority planning applications that represent 'major developments', the definitions and thresholds for which are set out in The Town and Country Planning (Development Management Procedure) (England) Order 2015;

- DCO applications for Nationally Significant Infrastructure Projects (NSIPs) in England, contained in the Register of Applications on the National Infrastructure Planning website (The Inspectorate, 2019b);
- any major development projects being progressed through other statutory procedures;
- allocations identified in the adopted and emerging development plans of the Local Planning Authorities (LPAs); and
- other relevant development plans and projects.

23.3.22 In determining the possible significance of cumulative effects, the location and timing of the identified other developments and their associated impacts/effects will be taken into account wherever possible.

23.3.23 The cumulative effects assessment to be reported in the ES will only consider those receptors that would experience a likely residual effect associated with the Proposed Development. For receptors where the Proposed Development's residual effects are deemed to be Neutral/ Negligible, it is considered that such receptors are not able to experience cumulative effects.

Initial List of Developments

23.3.24 A long list of other developments within the vicinity of the Proposed Development Site has been identified following a search of the relevant planning databases (including that of the Inspectorate, Middlesbrough Council, Redcar and Cleveland Borough Council (RCBC), Hartlepool Borough Council (HBC), Stockton-on-Tees Borough Council (STBC), Durham County Council (DCC), Hambleton District Council (HDC), Darlington Borough Council (DBC), and the Marine Management Organisation (MMO)).

23.3.25 This initial search has focused on developments within the search area which meet the ZoI criteria as outlined above (refer to Table 23-2). The findings are presented in Table 23-4. This search is preliminary and based on information available from publicly accessible sources, including LPA's online planning portals, and may be extended as further work is carried out during Stage 1 to capture other developments within the adopted areas of search, and to ensure the most up to date information is used to inform the EIA. This will also be reviewed and updated if and where required following consultation on the PEI Report.

23.3.26 Based on a review of these developments, it is considered that potential exists for some of these to generate cumulative impacts in association with the Proposed Development based on their location, scale and/or their likely construction and operational timescales.

23.3.27 The long list of other developments will continue to be updated as the EIA progresses, with additional developments and information that emerges and presented in the ES. The cut-off date for the developments included within Table 23-4 was 11th August 2023. The cut-off date for the final long list of other developments will be agreed and clearly outlined within the cumulative chapter of the ES. Each development within the long list will then be reviewed to determine its status at the time of undertaking

the assessment and will be assigned a final status or tier as detailed in Table 23-3: Assigning Certainty to 'Other Existing Development and/or Approved Development'. This will be informed by the guidance presented within The Inspectorate's Advice Note Seventeen (The Inspectorate, 2019a) and feedback from the relevant LPAs to establish the level of certainty and detail available for each development. Current tiers have been added to the long list of planned developments and development allocations as detailed in Table 23-4.

Table 23-3: Assigning Certainty to 'Other Existing Development and/or Approved Development' (The Inspectorate, 2019a)

Tier 1	Under construction[3]	Decreasing level of information likely to be available 
	• permitted application(s), whether under the Planning Act 2008 or other regimes, but not yet implemented; or • submitted application(s) whether under the Planning Act 2008 or other regimes but not yet determined.	
Tier 2	• Projects in the Planning Inspectorate's Programme of Projects where a scoping report has been submitted.	
Tier 3	• Projects in the Planning Inspectorate's Programme of Projects where a scoping report has not been submitted.	
	• Identified in the relevant Development Plan (and emerging Development Plans—with appropriate weight being given as they move closer to adoption) recognising that there will be limited information on the relevant proposals.	
	• Identified in other plans and programmes (as appropriate) which set the framework for future developments consents/approvals, where such a development is likely to come forward.	

[3] Where other projects are expected to be completed before construction of the Proposed Development and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline and may be considered as part of both the construction and operational assessment. The ES will clearly distinguish between projects forming part of the dynamic baseline and those in the cumulative effects assessment.

Table 23-4: Planned Development and Development Allocations within the Search Area

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
1	TR030002	The Inspectorate	York Potash Limited. The York Potash Harbour Facilities Order 2016. The installation of wharf/jetty facilities with two ship loaders capable of loading bulk dry material at a rate of 12 million tons per annum (dry weight). Associated dredging operations to create berth. Associated storage building with conveyor to wharf/jetty. Including a materials handling facility (if not located at Wilton) served by a pipeline (the subject of a separate application) and conveyor to storage building and jetty.	Adjacent	Granted	1
2	EN010082	The Inspectorate	Sembcorp Utilities (UK) Limited. The Tees Combined Cycle Power Plant. A gas fired combined cycle gas turbine (CCGT) power station with a maximum generating capacity of up to 1,700 MWe (tbc). The project will utilise existing gas and National Grid connections.	0.5 km	Granted	1
3	EN010103	The Inspectorate	Net Zero Teesside. A full chain carbon capture, utilisation and storage project, comprising a CO_2 gathering network, including CO_2 pipeline connections from industrial facilities on Teesside to transport the captured CO_2 (including the connections under the tidal River Tees); a CCGT electricity generating station with an abated capacity circa 860 gigawatts output (gross), cooling water, gas and electricity	Adjacent	Submitted - not yet determined	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			grid connections and CO_2 capture; a CO_2 gathering/booster station to receive the captured CO_2 from the gathering network and CCGT generating station; and the onshore section of a CO_2 transport pipeline for the onward transport of the captured CO_2 to a suitable offshore geological storage site in the North Sea.			
4	R/2021/1048/FFM	RCBC	South Tees Development Corporation. Remediation of land to facilitate development of NZT.	Adjacent	Granted	1
5	NEP elements	OPRED and Secretary of State	Northern Endurance Partnership offshore elements to be consented by Petroleum Act licence (pipeline) and CO_2 storage permit, including CO_2 Export Pipeline below Mean High Water Springs (MHWS) and geological store and associated facilities.	Adjacent	Not yet determined	3
6	EN010051	The Inspectorate	Forewind Ltd. (formerly Dogger Bank Teesside B). Project previously known as Dogger Bank Teesside A&B. Dogger Bank Teesside A & B is the second stage of Forewind's offshore wind energy development of the Dogger Bank Zone (Zone 3, Round 3). Dogger Bank Teesside A & B will comprise up to two wind farms, each with an installed capacity of up to 1.2 GW, which are expected to connect to the National Grid at the existing National Grid substation at Lackenby, near Eston. It follows that Dogger Bank Teesside A & B could have a total	5.9 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			installed capacity of up to 2.4 GW Dogger Bank Teesside A & B is located within The Dogger Bank Zone which comprises an area of 8,660 km^2 located in the North Sea between 125 km and 290 km off the UK North East coast.			
7	EN010139	The Inspectorate	JBM Solar. Byers Gill Solar renewable energy scheme comprised of solar photovoltaic (PV) modules, onsite energy storage, associated infrastructure as well as underground cable connections between panel areas and to connect to the existing National Grid Substation at Norton. The Proposed Development will have the capacity to generate over 50 Megawatts (MW) alternating current (AC) of electricity.	Unknown	Not yet determined	1
8	EN010150	The Inspectorate	Lighthouse Green Fuels Ltd. 'Waste-to-sustainable aviation fuel' facility with on-site generating station capacity of up to 150 MW.	Unknown	Not yet Determined	1
9	EIA/2022/00037	MMO	South Tees Development Limited. Screening Request for proposed extension of the South Bank site to include reprofiling works involving the construction of an outfall into the River Tees, and the creation of an area of intertidal habitat.	Adjacent	Screening Response Issued	3
10	EIA/2022/00008	MMO	Northumbrian Water Group. Demolition of a jetty and associated buildings at Bran Sands, on the southern bank of the estuarine River Tees near Redcar.	Adjacent	Screening Response Issued	3

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
11	EIA/2022/00004	MMO	Able UK Ltd. Able Seaton Port Approach Channel Widening.	Unknown	Screening Response Issued	3
12	EIA/2020/00015	MMO	AV Dawson. Proposed quayside works and dredging at North Sea Supply Base and Dawson's Wharf.	1.6 km	Screening Response Issued	3
13	R/2015/0393/RSM	RCBC	Bellway Homes Ltd. Residential development (188 dwellings) with associated vehicular and pedestrian accesses including landscaping (resubmission).	5.7 km	Granted	1
14	R/2014/0455/OOM	RCBC	Redcar & Cleveland College and The William Turner Foundation Trust. Erection of 149 dwelling houses and associated parking, access and landscaping at the former Redcar& Cleveland College, Redcar Lane Campus (all matters reserved except access). Reserved matters application R/2015/0540/RMM has since been submitted.	2.4 km	Granted	1
15	R/2016/0142/FFM	RCBC	Bellway Homes NE. Detailed application for the development of 128 dwellings including associated access, infrastructure and open space.	5.3 km	Granted	1
16	R/2019/0403/FFM	RCBC	Beyond Housing. Demolition of 19 dwelling houses; hybrid application for full planning permission for refurbishment of	1.1 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			289 dwelling houses and alterations to existing road infrastructure to allow for new parking and open spaces; outline application for future residential development for 32 dwelling houses, dwellings, and land.			
17	R/2019/0150/FFM	RCBC	Priority Space. Erection of 17 industrial units ranging in size from 116 m^2 up to 210 m^2 with new vehicular access and associated parking.	0.7 km	Granted	1
18	R/2019/0045/FFM	RCBC	SK Chilled Foods Ltd. Proposed storage and distribution warehouse, with associated vehicle access and manoeuvring area.	1.9 km	Granted	1
19	R/2017/0876/FFM	RCBC	Peak Resources Ltd. Construction and operation of a mineral processing and refining facility including ancillary development, car parking and landscaping.	0.2 km	Granted	1
20	R/2016/0484/FFM	RCBC	CBRE. Proposed anaerobic biogas production facility and combined heat and power plant.	70 m	Granted	1
21	R/2016/0201/FFM	RCBC	Gleeson Developments Ltd. Gleeson Developments Ltd, 51 residential units including new vehicular and pedestrian accesses and associated landscaping, land at Fabian Road, Eston.	1.6 km	Granted	1
22	R/2019/0767/OOM	RCBC	Director of Regeneration & Neighbourhoods Hartlepool. Outline application for the construction of an energy recovery	0.6 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			facility and associated development, Grangetown Prairie Land east of John Boyle Road and west of Tees Dock Road, Grangetown.			
23	R/2016/0663/OOM	RCBC	Homes and Communities Agency. Outline planning application for up to 550 residential units with associated access, landscaping and open space, land north of Kirkleatham Business Park and west of Kirkleatham Lane, Redcar. Subsequent reserved matters application submitted by Galliford Try, reference R/2019/0485/RMM.	1 km	Granted	1
24	R/2016/0326/OOM	RCBC	Theakston Estates (Investments) Limited. Outline application for residential development including new vehicular and pedestrian accesses, infrastructure, open space and landscaping (all matters reserved except for access), land north of Woodcock Wood and west of Flatts Lane Normanby. Subsequent reserved matters application submitted reference R/2019/0443/RMM.	4 km	R/2016/0326/ OOM Granted, R/2019/0443/ RMM refused (appeal granted)	1
25	R/2018/0098/FF	RCBC	Rydberg Development Company Limited. Construction and operation of a 12 Mwe peaking power generation plant, ancillary equipment, parking and access (amended design and layout), land bound by A66 and Tees Dock Road, Grangetown.	Adjacent	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
26	R/2017/0329/FF	RCBC	Rydberg Development Company Limited. Construction and operation of a 12 Mwe peaking power generation plant, ancillary equipment, parking and access (amended design and layout), land bound by A66 and Tees Dock Road, Grangetown.	0.1 km	Granted	1
27	R/2016/0563/FF	RCBC	Rydberg Development Company Limited. Construction and operation of a 12 Mwe peaking power generation plant including ancillary equipment and new vehicular access off trunk Road, land bounded by Trunk Road and Tees Dock Road Grangetown.	Adjacent	Granted	1
28	R/2017/0564/FF	RCBC	EDF Energy Renewables. Installation of an energy storage facility (up to 49.9 MW), new access track and associated ancillary equipment and components, land at Crow Lane adjacent to Old Hall Farm and (A1053) Greystones Road Old Lackenby, Eston.	1.4 km	Granted	1
29	R/2019/0183/OOM	RCBC	Mr R Roberts. Demolition of existing outbuildings to allow outline planning permission (with some matters reserved) for residential development (52 dwellings), land south of Spencerbeck Farm Normanby Road, Ormesby.	3.2 km	Granted	1
30	R/2019/0031/FFM	RCBC	Tourian Renewables Ltd. Construction and operation of a plastic conversion facility including office and welfare	0.2 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			buildings, workshops, weighbridges and associated infrastructure, former Croda Site Wilton International, Redcar.			
31	R/2017/0730/FFM	RCBC	Tourian Renewables Ltd. Construction and operation of a plastic conversion facility including office and welfare buildings, workshops, weighbridges and associated infrastructure, former Croda Site Wilton International, Redcar.	0.4 km	Granted	1
32	R/2018/0587/FFM	RCBC	ICL Tees Dock. Refurbishment of redundant 'coal rail pit' for handling polysulphate products, potash conveyor, Tees Dock Terminal, Teesport.	0.5 km	Granted	1
33	R/2017/0906/OOM	RCBC	Sirius Minerals plc. Outline planning application for an overhead conveyor and associated storage facilities in connection with the York potash project, land between Wilton International and Bran Sands, Redcar.	Adjacent	Granted	1
34	R/2018/0139/VC	RCBC	Sirius Minerals plc. Full planning application: Variation of condition 2 (approved plans) of planning permission R/2014/0626/FFM to allow for minor material amendments to the approved layout and size of buildings; site mounding; on-site attenuation ponds, Swales and internal roads following the progression of more detailed design engineering.	Adjacent	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
35	R/2014/0627/FFM	RCBC	York Potash Ltd. Full planning application: The winning and working of polyhalite by underground methods including the construction of a minehead at Doves Nest Farm involving access, maintenance and ventilation shafts, the land forming of associated spoil, construction of buildings, access roads, car parking and helicopter landing site, attenuation ponds, landscaping, restoration and aftercare and associated works. In addition, the construction of an underground tunnel between Doves Nest Farm and land at Wilton that links to the mine below, comprising 1 shaft at doves nest farm, 3 intermediate access shaft sites, each with associated land forming of associated spoil, construction of buildings, access roads and car parking, landscaping, restoration and aftercare, the construction of a tunnel portal at Wilton comprising buildings, land forming of spoil and associated works.	Unknown	Granted	1
36	R/2016/0502/FFM	RCBC	Procomm Site Services Ltd. Erection of workshop, Wilton International Wilton Redcar.	60 m	Granted	1
37	R/2015/0678/OOM	RCBC	Forewind Ltd. Outline application (all matters reserved) for installation of two underground sections of high voltage electrical cables and fibre-optic cable associated with Dogger bank Teesside A & B offshore wind farms, land at Wilton International, Redcar.	0.4 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
38	R/2015/0466/FF	RCBC	Cofely UK. Energy Services, proposed energy centre to include steel framed building; chimney stack (45.3m high); cooling towers; plant and equipment to generate heat and power from natural gas and hydrogen and a water treatment plant, land at Huntsman Polyurethanes Wilton Site, Lazenby.	0.3 km	Granted	1
39	R/2014/0820/FFM	RCBC	Mr K Rutherford. Erection of 24 industrial units with associated infrastructure and perimeter fencing 2.0 m in height, land at Tod Point Road, Redcar.	0.4 km	Granted	1
40	R/2019/0427/FFM	RCBC	STDC. Full planning application: Demolition of structures and engineering operations associated with ground preparation and temporary storage of soils and its final use in the remediation and preparation of land for regeneration and development. Two Section 73 applications submitted, references R/2021/0057/VC and R/2021/0316/VC.	60 m	Granted	1
41	R/2014/0372/OOM	RCBC	The Lady Hewley Charity Trust Company Ltd & Taylor. Outline application for residential development (up to 1250 dwellings) (all matters reserved).	1 km	Granted	1
42	R/2020/0357/OOM	RCBC	South Tees Development Corporation (STDC). Outline planning application for demolition of existing structures on site and the development of up to 418,000 m^2 (gross) of general industry (use class B2) and storage or distribution	0.3 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			facilities (use class B8) with office accommodation (use class B1), HGV and car parking and associated infrastructure works all matters reserved other than access.			
43	R/2020/0270/FFM	RCBC	STDC. Full planning application: Engineering operations including widening of Eston Road, formation of new roundabout and internal access roads, works to enhance Holme Beck and associated hard and soft landscaping works.	0.6 km	Granted	1
44	R/2020/0318/FFM	RCBC	STDC. Full planning application: Engineering operations associated with ground remediation and preparation including removal of former railway embankment and works to Holme Beck and Knitting Wife Beck.	Adjacent	Granted	1
45	R/2020/0465/FFM	RCBC	STDC. Full planning application: Demolition of existing buildings/structures and engineering operations associated with ground remediation and preparation of land for development.	Adjacent	Granted	1
46	R/2020/0411/FFM	RCBC	Redcar Holdings Ltd. Full planning application: Construction of the Redcar Energy Centre consisting of a material recovery facility incorporating a bulk storage facility; an energy recovery facility; and an incinerator bottom ash recycling facility along with ancillary infrastructure and landscaping.	30 m	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
47	14/1106/EIS	STBC	Port Clarence Energy Ltd. Full planning application: Proposed 45 Mwe renewable energy plant.	1.7 km	Granted	1
48	R/2006/0433/OO	RCBC	PD Teesport. Outline application for development of a container terminal.	Unknown	Granted	1
49	21/1545/FUL	STBC	BOC Teesside. Application for the installation of a carbon dioxide capture plant plus ancillary and related equipment/works.	70 m	Granted	1
50	R/2020/0684/ESM	RCBC	STDC. Outline planning application for demolition of existing redundant quay structures, capital dredging and development of new quay and associated works (PHASE 1).	40 m	Granted	1
51	R/2020/0819/ESM	RCBC	STDC. Outline planning application for development of up to 139,353 m^2 (gross) of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E), HGV and car parking, works to watercourse including realignment and associated infrastructure works. All matters reserved.	0.2 km	Granted	1
52	R/2020/0820/ESM	RCBC	South Tees Development Corporation (STDC). Outline planning application for development of up to 92,903 m^2 (gross) of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office	0.2 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			accommodation (Use Class E), HGV and car parking and associated infrastructure works. All matters reserved.			
53	R/2020/0821/ESM	RCBC	STDC. Outline planning application for development of up to 464,515qm (gross) of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E), HGV and car parking and associated infrastructure works. All matters reserved.	Adjacent	Granted	1
54	R/2020/0822/ESM	RCBC	STDC. Outline planning application for the development of up to 185,806 m^2 (gross) of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E), HGV and car parking, works to watercourses including realignment and associated infrastructure works. All matters reserved.	Adjacent	Granted	1
55	R/2020/0823/ESM	RCBC	STDC. Outline planning application for the development of up to 15,794 m^2 (gross) of office accommodation (Use Class E) and car parking and associated infrastructure works. All matters reserved.	0.1 km	Pending	1
56	H3.1 Low Grange Farm Strategic Site	RCBC	Local Plan 2018, Up to 1,250 houses.	Unknown	Adopted	3
57	H3.2 Swan's Corner	RCBC	Local Plan 2018, Up to 128 houses.	Unknown	Adopted	3

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
58	H3.5 Longbank Farm	RCBC	Local Plan 2018, Up to 320 houses.	Unknown	Adopted	3
59	H3.6 Spencerbeck Farm	RCBC	Local Plan 2018, Up to 61 houses.	Unknown	Adopted	3
60	H3.8 Normanby High Farm	RCBC	Local Plan 2018, Up to 150 houses.	Unknown	Adopted	3
61	H3.9 Land at Former Eston Park School	RCBC	Local Plan 2018, Up to 100 houses.	Unknown	Adopted	3
62	H3.10 Corporation Road	RCBC	Local Plan 2018, Up to 86 houses.	Unknown	Adopted	3
63	H3.14 Land at Mickle Dales	RCBC	Local Plan 2018, Up to 100 houses.	Unknown	Adopted	3
64	H3.15 West of Kirkleatham Lane	RCBC	Local Plan 2018, Up to 550 houses.	Unknown	Adopted	3
65	MWP8 South Tees Eco-Park	RCBC	Tees Valley Joint Minerals and Waste Development Plan Documents. A site of approximately 27 ha is allocated for the development of the South Tees Eco-Park.	Unknown	Adopted	3
66	MWC9 Sewage Treatment	RCBC	Tees Valley Joint Minerals and Waste Development Plan Documents. Development involving the extension or upgrade	Unknown	Adopted	3

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			of existing sewage treatment facilities, including at the Bran Sands Regional Sludge Treatment Centre (Redcar and Cleveland) will be supported.			
67	MWC8 General Locations for Waste Management Sites	RCBC	Tees Valley Joint Minerals and Waste Development Plan Documents. Sustainable waste management will be delivered through a combination of large sites, which include clusters of waste management and processing facilities, and small sites for individual waste facilities.	Unknown	Adopted	3
68	H/2021/0248	HBC	Strabag AG. Demolition of buildings and the erection of a concrete batching plant with ancillary infrastructure. Section 73 application subsequently submitted, reference H/2022/0331.	Unknown	Granted	1
69	H/2022/0306	HBC	Mr J Wood. Demolition of Former Engineers Club & Registry Office (The Willows) and erection of 2, 3, 4 & 5 storey residential blocks with commercial units to ground floor providing 98 no. residential unit.	5.8 km	Pending	1
70	H/2022/0299	HBC	Robertson Homes. Full planning permission for the erection of 143no. dwellinghouses (Use Class C3) with associated infrastructure, access and landscaping.	7.7 km	Pending	1
71	H/2022/0284	HBC	Seymour Skills Academy. Expansion of facilities at existing skills academy including provision of modular classrooms,	4.4 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			offices, welfare facilities, tele handling tower, temporary timber framed bungalows (for training purposes), alterations to internal roads layout and car parking, including works to existing ponds and other associated works.			
72	H/2022/0281	HBC	C/O Lichfields. Erection of Northern Spine Road.	5.8 km	Granted	1
73	H/2022/0263	HBC	Clearstone Energy. Proposed construction, operation and maintenance of a Battery Energy Storage System (BESS) facility with associated infrastructure and works including earthworks, highway access, landscaping and biodiversity enhancements.	9.1 km	Granted	1
74	H/2022/0255	HBC	Duchy Homes. Full Planning permission for the erection of 84no. dwellinghouses (Class C3) with associated infrastructure, access and landscaping.	5.7 km	Pending	1
75	H/2022/0208	HBC	Beal Hire LTD. Outline planning permission with all matters reserved for B2 & B8 uses of the land.	2.2 km	Pending	1
76	H/2022/0181	HBC	Wynyard Park LTD. Outline planning application for the erection of up to 1400 no. dwellings and up to 750 m^2 of non-residential floorspace (comprising Use Class E and Sui Generis) with associated parking, landscaping and infrastructure with all matters reserved except access.	5.5 km	Pending	1

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77	H/2022/0049	HBC	Sterling Polymers LTD. Part-retrospective planning application to seek to regularise planning permission H/2018/0208 (development of waste recycling facility including erection of steel portal framed building and cycle store and associated works including parking, hardstanding, weighbridges and refurbishment of existing office building (part-retrospective) and for the erection of 2 no. additional buildings, renovation of an existing building, installation of concrete hard surfacing and formation of parking areas (including for cars and HGVs), installation of an electric substation (retrospective) and to allow for the recycling of plastic (in addition to the permitted paper recycling use).	Unknown	Granted	1
78	H/2021/0572	HBC	Port Homes LTD. Erection of 76 dwellings, associated infrastructure and landscaping.	2.6 km	Pending	1
79	H/2020/0175	HBC	CS UK Holdings III LTD. Solar farm and associated development.	8.6 km	Granted	1
80	H/2020/0276	HBC	Miller Homes and Bellway Homes. Erection of 570 dwellings and provision of a new roundabout and associated infrastructure.	Unknown	Granted	1
81	H/2019/0365	HBC	Duchy Homes/Wynyard Park. Residential development of 67 dwellings. Section 73 application submitted, reference H/2020/0288.	5.8 km	Granted	1

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82	H/2020/0387	HBC	Cecil M Yuill LTD. Outline application with all matters reserved, except for access, for residential development comprising up to 475 dwellings, and including a local centre comprising retail (400 m^2) and business incubator units (1,150 m^2), and associated infrastructure.	7.2 km	Pending	1
83	H/2015/0162	HBC	Tunstall Homes Ltd. Residential development comprising 39 dwellings and provision of a car park (and drop-off point) to serve West Park Primary School. Three Section 73 applications submitted, references H/2018/0227, H/2019/0246, and H/2021/0115.	6.4 km	Granted	1
84	21/0345/FUL	STBC	Thornex Ltd. Erection of local centre comprising of commercial use and 20 no residential apartments to include associated infrastructure works.	4.7 km	Pending	1
85	H/2015/0528	HBC	Cecil M Yuill LTD. Outline planning permission for up to 220 residential dwellings with associated access, all other matters reserved. One reserved matters application and two Section 73 application submitted, references H/2019/0352, H/2020/0104 and H/2020/0378.	7.2 km	Granted	1

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86	H/2019/0346	HBC	Thirteen Homes. Residential development comprising 81 No. affordable bungalows with associated parking, landscaping, and access.	4.4 km	Granted	1
87	H/2019/0139	HBC	Gus Robinson Dev Ltd. Residential development comprising the erection of 36 no. residential dwellings and associated access, infrastructure, and landscaping.	1.9 km	Granted	1
88	H/2021/0282	HBC	Wynyard Park LTD. Outline planning application with all matters reserved except for access for the erection of 25 no. residential plots (use class C3) with associated access (Amended site location plan and reduction in the number of proposed dwellings from 29 no. to 25 no).	5.8 km	Granted	1
89	H/2021/0315	HBC	Hartlepool Borough Council. Demolition of existing buildings (incl. former Market Hotel, Lynn Street Council depot and former Drug Rehabilitation Centre) and erection of 48 no. dwellings with associated access, infrastructure, and hard and soft landscaping.	5.6 km	Granted	1
90	H/2019/0473	HBC	Countryside Properties PLC. Residential development comprising erection of 186 dwellings and associated works including access and landscaping.	5.9 km	Granted	1
91	H/2014/0428	HBC	Tunstall Homes Ltd. Outline application with all matters reserved for residential development comprising up to 1,200	Unknown	Granted	1

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			dwellings of up to two and a half storeys in height and including a new distributor road, local centre, primary school, amenity open space and structure planting. Section 73 application submitted H/2021/0372.			
92	H/2021/0498	HBC	Keepmoat Homes. Demolition of all existing buildings and erection of 234 no. new dwellings and associated infrastructure and landscaping.	2.5 km	Granted	1
93	H/2019/0226	HBC	Barratt David Wilson Homes North East. Residential development comprising 243 houses including associated access, link road connection, infrastructure, and open space.	5.2 km	Granted	1
94	H/2019/0260	HBC	Port Homes. Residential development comprising 55 No. dwellings. Two Section 73 applications submitted, references H/2020/0315 and H/2022/0048.	2.7 km	Granted	1
95	H/2019/0275	HBC	Graythorp Energy Ltd. Energy recovery (energy from waste) facility and associated infrastructure.	0.9 km	Granted	1
96	Hartlepool Local Plan, Policy EMP3 General Employment Land	HBC	8.2 ha general employment uses, Tofts Farm West.	Unknown	Adopted	3

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97	Hartlepool Local Plan, Policy EMP4 Specialist Industries	HBC	44 ha reserved for potential expansion of existing occupier, West of Seaton Channel. Please note, as this policy area includes a range of developments which have not yet submitted planning applications.	Unknown	Adopted	3
98	Hartlepool Local Plan, Policy EMP4 Specialist Industries	HBC	4.1 ha available for development as a waste management and recycling facility, Graythorp Waste Management.	Unknown	Adopted	3
99	22/0570/MAJ	Middlesbrough Council	Lidl Great Britain Limited. Erection of a new discount foodstore (Use Class E) with access, car parking, landscaping and other associated works.	4.2 km	Pending	1
100	22/0524/MAJ	Middlesbrough Council	Stonebridge Homes LTD. Erection of 45 dwellings along with open space and associated infrastructure (Demolition of existing buildings).	7.1 km	Pending	1
101	22/0401/MAJ	Middlesbrough Council	C J Leonard & Sons. Construction of 10 no. B2/B8 warehouse units with associated works.	1.9 km	Pending	1
102	22/0217/MAJ	Middlesbrough Council	Aydin Holdings LTD. Erection of 18 no. industrial units associated 2.4 m high palisade fencing including new access road and landscaping (demolition of existing units).	Unknown	Pending	1
103	22/0195/MAJ	Middlesbrough Council	Miller Homes Teesside, Avant Homes NE, Weightman Farming Enterprises and PMH Weightman. Hybrid planning	5.9 km	Pending	1

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			application consisting of: Full planning permission for 432 no. dwellings (Use Class C3), Country Park, and associated landscaping, parking, access and boundary/drainage treatments. Outline planning permission with all matters except access reserved for up to 168 no. dwellings (Use Class C3) and Central Hub including approximately 1000 m^2 visitor centre (Use Class E and F) and car parking.			
104	22/0136/MAJ	Middlesbrough Council	JPL Developments LTD. Erection of 45 no. industrial units.	1.3 km	Pending	1
105	22/0451/FUL	Middlesbrough Council	Middlesbrough Development Company. Erection of 2 no. apartment blocks providing 76 no. dwellings (32 no. 1 bed, 44 no. 2 bed) with associated car parking, service amenities and landscaping.	2.3 km	Pending	1
106	22/0294/FUL	Middlesbrough Council	Sheet Anchor Evolve (London) Ltd. Erection of 2 units (Class E) with a total floor space of up to 5,111 m^2 (including a mezzanine floor within one unit) and an adjoining garden centre area. Reconfiguration of the car park and footpath (demolition of Dalby House).	7.7 km	Pending	1
107	21/1108/FUL	Middlesbrough Council	Muslim Federation of Cleveland. Erection of 4 storey mosque and cultural centre with integral car parking and associated landscaping.	3.2 km	Pending	1

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108	22/0052/FUL	Middlesbrough Council	Middlesbrough College. Erection of 2.5 storey engineering facility with associated landscaping	2.7 km	Granted	1
109	20/0650/FUL	Middlesbrough Council	Mr Sobti. Erection of 4 storey building incorporating 32 flats (16 no. one bed and 16 no. two bed) with associated parking (demolition of existing hotel).	Unknown	Pending	1
110	20/0764/FUL	Middlesbrough Council	Middlesbrough Council. Erection of 7 storey office building incorporating lecture theatre, cafe, swimming pool, gym, bar/event space with associated landscaping, public realm, cycle store and car parking.	Unknown	Granted	1
111	20/0658/FUL	Middlesbrough Council	Persimmon Homes Teesside. Erection of 69 no. residential dwellings with associated access, landscaping, and infrastructure.	6.2 km	Pending	1
112	20/0635/FUL	Middlesbrough Council	Mandale Homes North Yorkshire Ltd. Residential development comprising of 36 no bungalows with associated landscaping and external works.	5.4 km	Granted	1
113	20/0546/FUL	Middlesbrough Council	Thirteen Group. Erection of 296 dwellings with associated landscaping and parking.	4.5 km	Granted	1
114	20/0496/FUL	Middlesbrough Council	Middlesbrough Development Company. Mixed use development comprising retail use at ground floor with 24 no. apartments above with associated ancillary areas, parking and landscaping.	5 km	Granted	1

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115	20/0331/FUL	Middlesbrough Council	S. Lithgow & Sons Ltd. Demolition of the existing buildings and erection of a 5 storey building comprising of 2 no mixed use A1/A2/A3 units on the ground floor and 48 no student bedrooms (sui generis) with communal roof gardens and 2 car parking spaces.	2.5 km	Granted	1
116	20/0289/FUL	Middlesbrough Council	Thirteen Group. Erection of 145 residential dwellings with associated access, parking, landscaping, and amenity space.	Unknown	Granted	1
117	20/0198/FUL	Middlesbrough Council	Brightideas. Residential development (C3) comprising 45 no. apartments and 16 no. town houses (total 61no. units) with associated parking and landscaping.	2.3 km	Granted	1
118	20/0034/FUL	Middlesbrough Council	H.H Properties Ltd. Erection of part 10-storey, part 3-storey building for student accommodation use (sui generis) comprising 95 no. beds, with ground floor bar (A4) use.	2.9 km	Granted	1
119	20/0004/FUL	Middlesbrough Council	Avant Homes (North East). Demolition of existing caretaker's property and erection of 139 dwellings with associated improvements to St David's Way including access widening and landscaping.	5.4 km	Pending	1
120	21/0737/EIASCR	Middlesbrough Council	Middlesbrough Council. EIA Screening Opinion request in relation to proposed development on land at St Hilda's.	Unknown	Pending	1

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121	21/0594/EIASCP	Middlesbrough Council	The Mary Street Estate Limited a British Land Company. Redevelopment of land to provide urban logistics and industrial development. Scoping opinion also requested from Stockton-on-Tees Borough Council, reference 21/2124/SOR.	Unknown	Scoping Opinion Issued	2
122	17/0347/FUL	Middlesbrough Council	Gleeson Regeneration Ltd. Gleeson Regeneration Ltd, erection of 106no dwellings with associated works.	3.1 km	Granted	1
123	Middlesbrough Housing Local Plan, Policy H31 Housing Allocation	Middlesbrough Council	130 dwellings, Roworth Road.	Unknown	Adopted	3
124	Middlesbrough Housing Local Plan, Policy H31 Housing Allocation	Middlesbrough Council	180 dwellings, Land adjacent to MTLC.	Unknown	Adopted	3
125	Middlesbrough Housing Local Plan, Policy H31 Housing Allocation	Middlesbrough Council	83 dwellings, Beresford Crescent.	Unknown	Adopted	3
126	Middlesbrough Housing Local Plan,	Middlesbrough Council	100 dwellings, Former Erimus Training Centre. Site also allocated in the Middlesbrough Publication New Local Plan.	Unknown	Adopted	3

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	Policy H31 Housing Allocation					
127	22/0064/FUL	STBC	PX Limited. Provision of on shore gas compression facilities with ancillary infrastructure.	0.2 km	Granted	1
128	20/1894/DEM	STBC	INEOS Nitriles (UK) LTD. Application for the prior notification of demolition of Acrylonitrile AN6 plant, equipment and structures.	Unknown	Granted	1
129	20/0670/FUL	STBC	Teesside Gas & Liquids Processing. Resubmission of planning approval 15/2720/FUL – Construction and operation of stores and workshop building including hard standing storage area.	0.1 km	Granted	1
130	22/0074/FUL	STBC	RSPB. Application for the installation of new and replacement of existing drop board sluice structures on existing ditches and associated infrastructure.	0.1 km	Granted	1
131	22/2386/SOR	STBC	Tees Valley Net Zero (Protium Green Solutions Limited). Scoping opinion for Green Hydrogen Production Facility and Wind Turbine.	0.6 km	Scoping Opinion Issued	2
132	22/1420/SCO	STBC	Screening opinion for proposed 100 m wind turbine.	Unknown	EIA required	3
133	22/1388/FUL	STBC	FUJIFILM Diosynth Biotechnologies UK Ltd. Engineering operations associated with ground preparation works, including foundation piling, for end-use development.	0.7 km	Granted	1

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134	22/1085/FUL	STBC	Ford & Slater DAF. Erection of B2/B8 maintenance and storage building to include servicing and associated access, car parking and landscaping.	0.5 km	Granted	1
135	23/0090/EIS	STBC	Suez Recycling and Recovery UK Ltd. Carbon capture facility for existing Energy from Waste site.	0.2 km	Pending	1
136	22/0339/FUL	STBC	Navigator Terminals Seal Sands Ltd. Installation of 5 no. pressurised liquified petroleum gas (LPG) and 1 no. pressurised storage vessels with a new road tanker loading area and associated infrastructure.	60 m	Granted	1
137	21/2896/FUL	STBC	Modo Bloc Lagonda Road Ltd. Erection of 22 light industrial/employment units. Revised application submitted, reference 22/0868/REV.	0.6 km	Granted	1
138	21/2553/FUL	STBC	Arrowcruit Holdings Ltd. Erection of 1 no warehouse building and a two-storey office building with ancillary trade counter. Installation of hardstanding and creations of parking areas. Creation of a new vehicle access, erection of new fence and associated external alterations.	80 m	Granted	1
139	21/1910/FUL	STBC	Marlow Foods Limited. Installation of a new gas fired steam boiler package, including hot well tank, water treatment unit, enclosure for instrumentation and a 15 m high exhaust stack.	70 m	Granted	1

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140	21/1311/FUL	STBC	D.R.Caswell Pension Fund. Erection of 6 no industrial units with associated parking and access road.	Unknown	Granted	1
141	21/1092/FUL	STBC	Magnum Investments. Erection of 25 no. industrial units for B2/B8 use with associated parking.	Unknown	Granted	1
142	21/0848/FUL	STBC	Clean Planet Energy. Erection of waste pyrolysis plant building (plastics to fuel facility) to include apparatus, hardstanding, access and associated works.	0.4 km	Granted	1
143	20/2687/FUL	STBC	Johnson Matthey. Application for permanent 21 m high steel framed structure with cladding.	0.4 km	Granted	1
144	20/1890/FUL	STBC	Augean PLC. Erection of waste transfer building and associated hardstanding.	Unknown	Granted	1
145	20/1867/RET	STBC	North Tees Ltd. Part retrospective application for the erection of portacabin offices, weigh bridge office, weigh bridge and associated access road and palisade fencing (to support the Phase 4 reclamation works and a potential future aggregate recycling facility).	0.1 km	Granted	1
146	20/1054/FUL	STBC	Barraclough. Erection of 15 light industrial units (Use Class B1) with associated parking bays and sub-station.	0.7 km	Granted	1
147	20/0651/FUL	STBC	National Grid. Erection of an extension (approximately 28 m x 80 m) to the eastern side of the existing substation for the	Adjacent	Granted	1

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			installation of the Power Flow equipment; Installation of new high security fencing around the new extension and provision of a new access road. (Note: Reconfiguration of overhead lines to connect the new electrical equipment will fall under S37 of the Electricity Act and does not form part of this application).			
148	22/1387/FUL	STBC	Northumberland Estates. Erection of mixed-use development to include Use Classes E, B2, B8 and Sui Generis and the provision of associated access, car parking, servicing areas, landscaping, enclosures, drainage and infrastructure.	3.5 km	Pending	1
149	21/2620/FUL	STBC	Wynyard Golf Club. Hybrid application seeking: full planning permission for the development of 66 no residential units, a new Country Club and the conversion of an existing maintenance shed into local community and leisure facilities as well as access arrangements, reconfiguration of existing clubhouse car park, landscaping, reconfiguration of 16th, 17th and 18th holes of the golf course and associated works; and outline planning permission for the development of up to 60 no residential dwellings in the south-east of the site, with all matters reserved except for access.	4.7 km	Granted	1
150	13/0342/EIS	STBC	Cameron Hall Developments Ltd. Outline application for the construction of up to 500 houses, Primary School (incl. Sport	6.4 km	Granted	1

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			Facilities) and nursery, Retail Units (up to 500 m^2), Doctors Surgery, Community Facilities, access and associated landscaping, footpaths and open space (all matters reserved). Reserved matters application submitted, reference 21/1761/REM.			
151	20/2481/EIS	STBC	Northumberland Estates Ltd and Taradina Number Two Ltd. Erection of a class B8 storage and distribution unit with ancillary offices, parking, servicing, landscaping, and formation of new access roads plus associated ancillary works.	3.6 km	Granted subject to S106.	1
152	20/2483/FUL	STBC	Northumberland Estates Ltd and Taradina Number Two Ltd. Site levelling and re-grading works to create development plateau.	3.6 km	Granted	1
153	20/2107/FUL	STBC	Mets Services Limited. Erection of machinery storage shed, open air solid fuel storage area for logs and coal, and plant nursery (Sui Generis), laying of hardstanding and creation of parking area.	4.0 km	Granted	1
154	16/1603/OUT	STBC	Homes and Communities Agency. Outline application with some matters reserved except for access for the erection of up to 150 residential dwellings and associated access. Reserved matters application submitted, reference 20/2804/REM.	2.9 km	Granted	1

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155	20/2367/OUT	STBC	Sajid and Ahmed Baksh. Outline application with some matters reserved for the erection of a 66 bed hotel and banqueting/conference building with associated means of access.	7 km	Pending	1
156	20/2147/FUL	STBC	Thirteen Housing Group. Erection of 37 residential dwellings with associated highways, landscaping and infrastructure. Demolition of 2 existing tower blocks and associated ancillary buildings.	5.3 km	Granted	1
157	08/3644/EIS	STBC	Northshore Development Partnership Ltd. Outline planning application for residential (Class C3), employment (Class B1), health care facility (Class D1), leisure (Class A3, A4, A5, C1 and D2), ancillary retail and services (Class A1 and A2) and car dealership (sui generis) with car parking and associated landscaping and infrastructure improvements. Reserved matters applications submitted, references 21/1589/REM and 21/0927/REM.	3 km	Granted	1
158	20/2759/FUL	STBC	Gleave. Erection of class B8 industrial warehouse unit with ancillary office and associated parking, decked van storage, van staging areas and associated ancillary infrastructure, including the provision of a roundabout on Queen Elizabeth Way.	6.3 km	Pending	1

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159	20/1680/FUL	STBC	MBNL on behalf of Hutchinson 3G Limited. Installation of an 20 m monopole supporting 6 antennas with a wrap around equipment cabinet at the base of the column, installation of equipment cabinets and ancillary development thereto.	3.4 km	Granted	1
160	16/2445/FUL	STBC	GMI Investments Ltd. Hybrid planning application comprising 1) full planning application for A1 retail food store with car parking and associated ancillary development and 2) outline permission for circa 80 dwellings and associated access with all other matters reserved. Reserved matters application submitted, reference 20/0507/REM.	4.5 km	Granted	1
161	20/2639/FUL	STBC	Exemplar Health Care Service Ltd. Erection of a 30 bed care home with associated access and landscape. Demolition of existing bungalow.	2.4 km	Granted	1
162	19/2161/FUL	STBC	Lianhetech. Erection of new plant, new buildings and extensions to existing buildings. Works to include Warehouse D Extension, Boiler House Structure, Amenities & Workshop Building, Drum Storage Workshop Extension, Amenities extension, 2 Warehouse buildings, Contractors cabins, Gate House and Weighbridge, Receivers, Driers, Extension to existing Tank Farm, Tanker Offloading stations, Process and control buildings, Installation of new and replacement cooling	0.1 km	Granted	1

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			towers and industrial apparatus, Pipe Bridge, Swale and the demolition of old plant and buildings.			
163	15/2187/FUL	STBC	Air Products Renewable Energy Ltd. Proposed installation of a Gaseous Oxygen (GOX) Pipeline associated with Tees Valley 2 (TV2) Renewable Energy Facility (REF).	0.4 km	Granted	1
164	15/2181/FUL	STBC	SABIC UK Petrochemicals Ltd. Erection of new plants for supply of steam and compressed air including 3 boilers, 3 compressors, a water purification plant, storage bunds for chemicals. New pipelines to provide potable water and instrument air to the new plant, as well as to export steam and compressed air to the tank farm distribution system.	60 m	Granted	1
165	15/2799/FUL	STBC	Green North East Trading Bidco Ltd. Construct and operate an extension to the existing Materials Recovery Facility (MRF) building to process material produced by the existing MRF operation.	0.1 km	Granted	1
166	13/2892/EIS	STBC	O2N Energy (Billingham) LLP. Development of materials recycling facility and production of energy from waste, including demolition of the existing offices and erection of new buildings, tanks and silos with access taken from the existing access at New Road, Billingham. The main building will be portal frame, profiled steel clad with stacks at a maximum height of 80m and 28m. (Residual wastes will be	0.3 km	Granted	1

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			processed through an advance thermal treatment process, gasification, to produce renewable heat and power). Two Section 73 applications submitted, references 16/0195/VARY and 20/2620/VARY.			
167	22/1145/SCO	STBC	Screening opinion for proposed hydrogen production plant, battery storage and hydrogen re-fuelling point.	0.3 km	EIA required	3
168	Stockton-on-Tees Local Plan, Policy SD4 Economic Growth Strategy	STBC	Stockton-on-Tees Local Plan. Main growth location for hazardous installations including liquid and gas processing, bio-fuels and bio-refineries, chemical processing, resource recovery, and waste treatment, energy generation, carbon capture and storage and other activities, Seal Sands.	Unknown	Adopted	3
169	DM/21/02336/FPA	DCC	Lightsource Development Services. Construction of underground electricity cables, substation and associated infrastructure to connect Hulam Solar Farm (DM/19/03959/FPA) to the existing substation near Hart in Hartlepool.	10.9 km	Granted	1
170	DM/22/01679/FPA	DCC	Decerna. Construction and operation of a Synchronous Condenser located within an agricultural style steel frame building with associated transformer and cooling systems and other ancillary equipment located within a fenced compound and associated landscaping.	9.8 km	Granted	1

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171	22/01334/OUT	HDC	Saddington Taylor Ltd. Application for outline planning permission with some matters reserved (appearance, landscaping layout and scale) for the Construction of 35 dwellings including conversion of existing barn and 4 self-build plots together with associated highway works, new open space, play area and public car parking and demolition of a dwelling.	10.1 km	Pending	1
172	R/2020/0685/ESM	RCBC	STDC. Outline planning application for demolition of existing redundant quay structures, capital dredging and development of new quay and associated works (PHASE 2).	0.8 km	Granted	1
173	R/2022/0773/ESM	RCBC	Tees Valley Limited. Construction of a Lithium Hydroxide Monohydrate manufacturing plant and ancillary development	0.1 km	Granted	1
174	R/2014/0626/FFM	RCBC	York Potash Ltd. Mineral (Polyhalite) granulation and storage facility involving the construction of buildings, conveyor systems, substations, water treatment plant, internal access roads, car parking, attenuation ponds, landscaping, restoration and aftercare, and construction of a tunnel portal including the land forming of spoil and associated works.	Adjacent	Granted	1
175	R/2021/0608/PND	RCBC	Teesworks. Demolition works of former Redcar Steelworks buildings.	Adjacent	Prior Approval not required	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
176	R/2023/0390/SC	RCBC	Ensus UK Ltd. Screening Opinion for proposed new process equipment and pipework housed within a supporting structure tying into existing process equipment.	Unknown	EIA not required	3
177	R/2023/0404/OOM	RCBC	CTW Northern Limited. Outline planning application (with all matters reserved) for a data centre complex (B8) incorporating main data centre buildings, communications & power buildings, office, storage tanks, back-up bio-fuel generators and associated ancillary infrastructure.	0.1 km	Pending	1
178	R/2023/0291/ESM	RCBC	Green Lithium Refining Limited. Outline application (all matters reserved) for the development of a 3-line low-carbon lithium refinery and associated dock-side reception, handling, storage, and manufacturing facilities for the production of high-quality, battery-grade lithium hydroxide monohydrate, to include the construction of up to three production lines with the production capacity of up to 75,000 tonnes per annum. The proposed development will include an office and warehouse buildings, together with associated site infrastructure and utility supplies.	0.5 km	Granted	1
179	R/2021/0019/OOM	RCBC	Homes England. Outline application for residential development with associated access, landscaping and open space consisting of; A) 279 residential units (class C3) or;	1 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			B) 204 residential units (class C3) with 75 assisted living units (delivered as class C2 or C3).			
180	R/2023/0353/RMM	RCBC	Countryside Partnerships and Homes England. Reserved Matters application (appearance, layout, scale and landscaping) following outline approval R/2021/0019/OOM for 204 residential units (Class C3).	0.9 km	Pending	1
181	R/2023/0228/FFM	RCBC	Hitachi Energy UK Ltd. Construction of temporary laydown area to support construction of Dogger Bank C converter station.	0.5 km	Granted	1
182	R/2023/0181/FFM	RCBC	Taylor Wimpey and Earl of Ronaldshay. Erection of 114 residential dwellings; demolition of existing dwelling to form access.	3.1 km	Pending	1
183	R/2023/0143/FFM	RCBC	South Grange Medical Services LTD. Development of new primary health care centre including pharmacy & associated car parking.	0.8 km	Pending	1
184	R/2023/0157/FFM	RCBC	P Hughes Property LTD. Erection of 3no. Industrial buildings including ancillary office and laboratory space with associated car parking; landscaping and 2.4m high security galvanised perimeter fencing.	1.9 km	Pending	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
185	R/2023/0002/FFM	RCBC	EDF Energy Renewables LTD. Construction and operation of a solar photovoltaic ('PV') development with a capacity of up to 49.9 MW with associated infrastructure and landscaping	1.7 km	Pending	1
186	R/2022/0993/FF	RCBC	Tillicoultry Quarries. Construction of substation building and switchgear house.	1.8 km	Granted	1
187	R/2022/0920/F3M	RCBC	RCBC. Demolition of existing buildings and the erection of building for leisure and cultural uses (including library), and creation of an indoor street and public event space with associated works including solar panels to roof, landscaping and highways works.	2.5 km	Granted	1
188	R/2022/0816/FFM	RCBC	STDC. Formation of hardstanding, buildings, access roads from A1085 Trunk Road, associated facilities and landscaping works in association with the creation of a park and ride facility.	0.1 km	Granted	1
189	R/2022/0615/FFM	RCBC	Elgin Energy. Renewable energy generating station comprising ground-mounted photovoltaic solar arrays with primary substation and control building compound; point of connection masts; inverter stations; cabling; access gates; site access; internal tracks including ancillary infrastructure, landscaping and biodiversity enhancements.	4.7 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
190	DM/21/03348/FPA	DCC	Durham County Council. Hybrid planning application for the development of NETPark phase 3a.	13.8 km	Granted	1
191	DM/22/03757/FPA	DCC	Fishburn Solar Limited. Formation of solar farm including installation of solar panels, security fencing, CCTV cameras, an internal access track, underground cabling, invertors, substations, grid connection, environmental enhancement measures and other ancillary development.	14.7 km	Pending	1
192	DM/22/02389/FPA	DCC	Ramside Estates Ltd. Creation of a new Spa and Wellness facility with 35 new guest rooms.	13.8 km	Pending	1
193	23/0425/RES	Middlesbrough Council	Mr P Hall. Erection of 55 residential dwellings, repositioning of sports pitches and changing facilities.	3.9 km	Pending	1
194	23/5014/MAJ	Middlesbrough Council	C J Leonard & Sons. Construction of 10 B2/B8 warehouse units with associated works.	1.9 km	Pending	1
195	H/2022/0176	HBC	Gentoo Homes. Erection of 48 dwellings (class C3) including access, landscape works and associated infrastructure.	9.4 km	Pending	1
196	H/2022/0346	HBC	Methodist Housing Living Ltd. Erection of 59 single storey B2/B8 use class units with associated external works.	2.9 km	Pending	1
197	H/2022/0357	HBC	Gleeson Homes. Erection of 151 dwellings with associated landscaping and infrastructure.	3.8 km	Pending	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
198	H/2022/0382	HBC	Wynyard Homes. Erection of 51 dwellinghouses (Use Class C3) with associated infrastructure, access and landscaping (Amended Acoustic Bund and Noise Assessment received 27.07.23).	7.5 km	Pending	1
199	H/2022/0423	HBC	Gridserve Sustainable Energy Ltd. Erection of a Solar Electric Forecourt with ancillary commercial uses, and associated electrical infrastructure, a solar photo voltaic (PV) farm. energy storage, new access, car parking, landscaping and associated works.	10 km	Pending	1
200	H/2022/0432	HBC	Strabag AG. Erection of a concrete batching plant, gantry cranes, pre-storage shed, laboratory and ancillary infrastructure together with the demolition of a disused building.	7.1 km	Granted	1
201	H/2022/0459	HBC	Reliance Energy Limited. Proposed Construction, Operation and Maintenance of a Battery Energy Storage System (BESS) Facility and Associated Infrastructure.	9.4 km	Pending	1
202	H/2022/0470	HBC	TI ProjectCo 1 Limited. Installation and operation of a Grid Stability Facility consisting of Synchronous Compensators and associated Electrical Infrastructure, underground cabling, access tracks, drainage, temporary construction compounds, ancillary infrastructure and demolition of existing buildings.	9.3 km	Pending	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
203	H/2023/0099	HBC	Persimmon Homes. EIA Screening Opinion in relation to proposed erection of 236 residential units with associated infrastructure, landscaping and access.	Unknown	EIA required	3
204	H/2023/0126	HBC	Hartgen LTD. EIA screening opinion in relation to proposed gas powered standby electricity generation facility.	Unknown	EIA not required	3
205	H/2023/0128	HBC	Environment Agency. Scoping opinion in respect of Greatham North East Flood Alleviation Scheme.	Unknown	Scoping Opinion Issued	2
206	H/2023/0181	HBC	Forsa Energy Gas Holding Ltd. Construction and operation of a gas powered standby electricity generator and related infrastructure.	9.4 km	Pending	1
207	22/01329/FUL	DBC	Lightrock Power Ltd. Proposed ground mounted solar farm consisting of the Installation of 49.9MW solar photovoltaic array/solar farm with associated infrastructure (additional health impact assessment and battery safety management plan received 20th January 2022, response to Northern Gas objection received 9th February 2023, Written Scheme of Investigation received 16th March 2023, Trial Trench Evaluation report received 28th June 2023 and amened Trial Trench Evaluation report received 20th July 2023).	13.1 km	Granted	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
208	23/00733/SCO	DBC	Northumbrian Water Limited. Scoping Opinion request for a new 800mm diameter mains water pipeline for the Tees and Central Strategic Transfer Mains development on land from Dynance Beck to Long Newton Service Reservoir.	Unknown	Pending	2
209	22/01182/FUL	DBC	Teesside International Airport Ltd. Proposed aviation village incorporating 5 aircraft hangars for aircraft maintenance, repair, overhaul (MRO) and painting operations, 1 fixed base operation (FBO) building for business aviation, car parking with vehicular access, apron areas for aircraft dismantling, manoeuvring and parking, associated landscaping, security fencing, drainage and external lighting works (Geophysical Report, Landscape Masterplan and Strategy and Landscape & Visual Impact Assessment received 23 November 2022; External Lighting Report received 5 December 2022; amended plans and supporting information received 16 and 19 December 2022; archaeology report received 20 December 2022; amended Landscape Plan; amended Ecology Report and additional Justification Note received 25 January 2023; 7 February 2023 and 16 February 2023)).	13.6 km	Pending	1
210	22/2579/FUL	STBC	Cameron Hall Developments Ltd. Erection of 135 residential dwellings with associated landscaping and ancillary works.	7.7 km	Pending	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
211	22/2072/FUL	STBC	Aldi Stores Ltd. Erection of discount foodstore (Class E), works to part of the existing car parking to include EV charging bays, new pedestrian access, substation and landscaping.	1.7 km	Granted	1
212	22/1525/EIS	STBC	Teesside Green Energy Park Limited. Erection of an energy recovery facility and associated infrastructure for fuel receipt and storage, power generation, power export, process emissions control, maintenance, offices and car parking together with associated operations.	0.3 km	Pending	1
213	23/0891/SCO	STBC	Marshalls Mono Limited. Screening opinion for the installation of soil and aggregates recycling and washing facility.	Unknown	EIA not required	3
214	23/0838/SCO	STBC	Screening opinion for the siting of 75MW (2hr) battery energy storage facility.	Unknown	EIA not required	3
215	23/0752/FUL	STBC	Meadow Farm Battery Limited. Proposed Battery Energy Storage System (BESS) with associated landscaping, access works, infrastructure and development (including cable to connect to the existing Norton sub-station to the east).	7.4 km	Pending	1
216	23/0261/OUT	STBC	Cameron Hall Developments & Jomast Developments Ltd. Outline application with all matters reserved for the erection of up to 700 dwellings, community centre, care and medical	Unknown	Pending	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			facilities, open space, golf course improvements and associated works.			
217	23/0208/REV	STBC	Mandale Homes. Revised application for the erection of 215no. dwelling houses with associated infrastructure.	9.9 km	Pending	1
218	23/0046/OUT	STBC	Osborne House Group. Outline application for proposed development of up to 325,000 square feet (30,193 sq metres) of B2/B8 employment floorspace (maximum two storeys in height), with all matters reserved other than access.	0.6 km	Pending	1
219	23/1019/EIS	STBC	Greenergy International Ltd. Development of Greenergy Renewable Fuels and Circular Products Facility comprising a Sustainable Aviation Fuel Plant and Tyre Plant and associated infrastructure. A temporary construction laydown area, proposed services corridor, pipe bridge, ancillary buildings and car parking.	0.2 km	Pending	1
220	23/0997/FUL	STBC	Teesside Gas and Liquid Processing Limited. Application for the installation an additional 4-inch pipeline (primarily below ground) that will tie into a new 4-inch pipeline to the Navigator Terminal Pipeline System 75.	0.2 km	Pending	1
221	23/0866/OUT	STBC	Mandale Homes and Mr Javed Majid. Outline application with some matters reserved (Access) for the erection of an up to 68-bed care home (C2) with ancillary community facilities	9.8 km	Pending	1

ID	APPLICATION REFERENCE	DETERMINING AUTHORITY	APPLICANT FOR 'OTHER DEVELOPMENT' AND BRIEF DESCRIPTION	DISTANCE FROM PROPOSED DEVELOPMENT SITE	STATUS	TIER
			at ground floor level and associated infrastructure and landscaping.			

Stage 2: Establishing a Shortlist of Other Developments

23.3.28 This stage will involve a review of the long list of planned developments (Table 23-4, and any others identified through consultation and further searches undertaken up to the cut-off date defined in the ES) to identify those to be taken forward (shortlisted) into the cumulative assessment included in the ES.

23.3.29 Inclusion/exclusion criteria based on the temporal scope, scale and nature of the development, and other factors such as the nature of the receiving environment will be used for the shortlisting process, in line with the Inspectorate's guidance (The Inspectorate, 2019a). The shortlist will also be informed by engagement with the relevant LPAs and the professional judgement of the environmental specialists undertaking the EIA.

23.3.30 In determining which of the developments should be shortlisted, a minimum level of information will be necessary. Only those developments with at least an EIA Scoping Report, Environmental Assessment Report (or equivalent technical assessments) or ES available will be considered for shortlisting. Some exceptions to this may be made where it is considered there is a high potential for significant cumulative effects to occur based on professional judgement, for example due to proximity to the Proposed Development Site.

23.3.31 Land allocations (identified in adopted and emerging development plans) without associated planning applications will not be considered, as there is no certainty that developers will come forward with projects within the timescale for the delivery of these sites and the nature of such projects and their associated environmental effects is currently unknown.

23.3.32 In terms of temporal scale, developments and projects that are already in existence (i.e., those which are completed and operational) will be considered to form part of the baseline conditions within which the Proposed Development would be implemented (and will be treated as such within the EIA). Similarly, where other developments are expected to be completed prior to construction of the Proposed Development, and where the effects of those projects are fully determined, these be considered within the future baseline conditions adopted in the EIA and outlined in the ES.

23.3.33 In terms of the scale and nature of the development, only developments classed as major developments, as defined in The Town and Country Planning (Development Management Procedure) (England) Order 2015, will be included, as well as those above EIA screening thresholds.

Stage 3: Gathering Information

23.3.34 This stage will involve reviewing the available information relating to the shortlisted developments to establish details of their likely environmental effects.

23.3.35 This will consider factors including: the ZoI of environmental topics assessed; the planned timescales for construction, operation and (where relevant) decommissioning; and details of their potential or likely significant effects.

Stage 4: Assessment

23.3.36 Those developments which meet the criteria set out in the above stages will be incorporated into the cumulative assessment included within the ES. This will involve identifying where cumulative effects with the Proposed Development are likely to occur and assessing the likely significance of those effects upon environmental receptors and resources, taking into account any defined mitigation measures.

Consultation

23.3.37 The Inspectorate, on behalf of the Secretary of State (SoS), has provided comments on the scope of the cumulative assessment through the EIA Scoping process. Comments relating to the methodology of the assessment of cumulative and combined effects were made in section 3.16 of the EIA Scoping Opinion and have been addressed as outlined in Table 23-5 below. Where comments were received in relation to other environmental topic chapters, but with relevance to cumulative and combined effects, commentary is provided within the consultation tables within Chapters 8 - 22 as applicable (PEI Report, Volume I).

Table 23-5: Responses to Scoping Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion – 17.05.2023	The inspectorate concluded that the Proposed Development is unlikely to have a significant effect alone or cumulatively on the environment in a European Economic Area State, and that detailed transboundary screening is not warranted. The inspectorate directs the applicant's attention to Table 2 in the Planning Inspectorate's Advice Note 17 which sets out the expected approach to identifying projects to be included in a cumulative impact assessment. This approach includes projects wider than those with extant planning permission. The inspectorate outlines that for the revision of the long and short lists of projects to be included in the assessment, the ES should identify a "cut-off" date with respect to this so that the currency of it can be understood. The inspectorate noted that no justification was provided for the projects that were identified on Figure 15, stating that the ES should explain the reasoning behind the study area and the relationship with that which have informed the aspect chapters.	The methodology for the assessment of cumulative effects, in line with relevant guidance, is outlined at Section 23.3 of this PEI Report chapter. The long list of other developments to be considered is outlined at Section 23.3 and includes projects wider than those with extant planning permission, as per the Inspectorate's Advice Note 17 (The Inspectorate, 2019a). As outlined at Section 23.3, an appropriate cut-off date for the revision of the long and short lists will be outlined in the ES. The ZoIs for each environmental topic have been included within Table 23-2, based on the largest study area identified for each environmental topic. Each ZoI is indicative and will be subject to further review as the individual assessments progress, based on professional judgement. The search area for 'other developments' is equal to the largest ZoI for an environmental topic, in accordance with Advice Note Seventeen (The Inspectorate, 2019a).
Natural England	Scoping Opinion – 17.05.2023	Natural England acknowledges the applicant's description of projects needing to be assessed for	No response required.

		cumulative and in combination effects alongside the proposal. They state that they are not aware of additional projects needing assessment.	
Lichfields on behalf of South Tees Developments Limited (STDL)	Scoping Opinion – 17.05.2023	Lichfields note that the projects identified within Teesworks land are correct but that the commentary in respect of the applications / permissions is not. Lichfield further wish to engage with H2Teesside to ensure the list of cumulative schemes is kept up to date, that the scope of the cumulative assessment is appropriate, and to ensure that the development proposed on Teesworks is assessed accurately.	As stated in Section 23.3, the long and short list of developments will be updated and reviewed until an appropriate cut-off date to be defined in the ES, with the status of applications being updated as required. The STDL applications referenced by Lichfields and included within Table 23-4 have been checked on the RCBC website to ensure they show the correct status and commentary.

23.4 Summary

23.4.1 This preliminary assessment has indicated that there are several developments in the vicinity of the Proposed Development Site that have the potential to generate cumulative effects when considered in combination with the Proposed Development.

23.4.2 The assessment of cumulative and combined effects will continue to be progressed and a full assessment will be prepared and included in the ES submitted as part of the DCO Application for the Proposed Development.

23.5 References

- DECC (2011). *Department of Energy and Climate Change. Overarching National Policy Statement for Energy (EN-1).* London: The Stationery Office.
- Department for Energy Security & Net Zero (DESNZ) (2023). *DRAFT: Overarching National Policy Statement for Energy (EN-1).* Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147380/NPS_EN-1.pdf
- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (2014). Official Journal L124 p. 1.
- The Planning Inspectorate (2019a). *Advice Note Seventeen: Cumulative Effects Assessment* [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/Advice-note-17V4.pdf
- The Planning Inspectorate (2019b). *Register of Applications* [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/projects/register-of-applications/
- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017/572). London: The Stationery Office. Available at: http://www.legislation.gov.uk/uksi/2017/572/contents/made
- The Town and Country Planning (Development Management Procedure) (England) Order 2015 (SI 2015/595). London: The Stationery Office. Available at: http://www.legislation.gov.uk/uksi/2015/595/pdfs/uksi_20150595_en.pdf

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NORTH SEA
SUNDERLAND
WASHINGTON
SEAHAM
HOUGHTON-LE-SPRING
CHESTER-LE-STREET
STANLEY
ANNFIELD PLAIN
Burnopfield
Lanchester
Langley Park
DURHAM
Esh Winning
New Brancepeth
Brandon
PETERLEE
HARTLEPOOL
The Headland
Seaton Carew
WILLINGTON
CROOK
SPENNYMOOR
Bishop Middleham
Sedgefield
BISHOP AUCKLAND
SHILDON
NEWTON AYCLIFFE
REDCAR
MARSKE-BY-THE-SEA
SALTBURN-BY-THE-SEA
MIDDLESBROUGH
STOCKTON-ON-TEES
DARLINGTON
GUISBOROUGH
SKELTON
LOFTUS
WHITBY
RICHMOND
NORTHALLERTON
Romanby
Brompton
Catterick Garrison
Scotch Corner
Middleton St George
Teesside International Airport
CLEVELAND HILLS
NORTH YORK MOORS NATIONAL PARK
Roseberry Topping
Whorlton Moor
Snilesworth Moor
Arden Great Moor
Spaunton Moor
Danby Low Moor
Glaisdale Moor
Egton High Moor
Wheeldale Moor
Fylingdales Moor
Burn Howe
Rigg
Hole of Horcum
Goathland
Goathland Moor
Beacon Point
England Coast Path
Cleveland Way
Teesmouth
Teesside Wind Farm
Saltholme
Seal Sands
Billingham
Greatham
Newton Bewley
Coatham
Dormanstown
Redcar
Skinningrove
Staithes
Port Mulgrave
Runswick Bay
Kettleness
Sandsend
Whitby
Ruswarp
Egton
Glaisdale
Grosmont
Littlebeck
Sneaton
Hawsker
Fylingthorpe
Robin Hood's Bay
Goathland
Beck Hole
Egton Bridge
Aislaby
Sleights
Ugglebarnby
Newton Dale Trail
Saltergate
Hunt House
Rosedale Abbey
Thorgill
Lastingham
Keldy Castle
Stape
Harwood
Danby
Castleton
Commondale
Kildale
Ingleby Greenhow
Great Broughton
Battersby
Carlton in Cleveland
Great Ayton
Stokesley
Middleton-on-Leven
Seamer
Hilton
Newby
Ingleby Barwick
Eaglescliffe
Yarm
Thornaby-on-Tees
Ormesby
Acklam
Marton
Nunthorpe
Coulby Newham
Stainton
Thornton
Malby
Hemlington
Newton under Roseberry
Charltons
Stainthorpe
Low Worsall
Low Dinsdale
Neasham
Girsby
Kirklevington
Picton
Sockburn
Hornby
Appleton Wiske
Great Smeaton
Hutton Rudby
Potto
Kirkby
Whorlton
Swainby
Ingleby Arncliffe
Osmotherley
Mount Grace Priory
Chop Gate
Seave Green
Urra
Faceby
Carlton Bank
Cockayne
Cockayne Ridge
Famdale Moor
Westerdale Moor
Ralph Cross
Church Houses
Fangdale Beck
The Grange
Thimbleby
Over Silton
Nether Silton
Kepwick
Cowesby
Thornton-le-Beans
Leeming
Leeming Bar
Aiskew
Morton-on-Swale
Wariby
Crosby Court
Arrathorne
Hunton
Patrick Brompton
Crakehall
Constable Burton
Leyburn
Hipswell Moor
Catterick
Scotton
Tunstall
Kirkby Fleetham
Great Fencote
Little Fencote
Scruton
Langthorne
Hackforth
Bolton-on-Swale
Catterick Bridge
Colburn
Brompton-on-Swale
Streetlam
Whitwell
Lovesome Hill
Danby Wiske
Kiplin Hall
Great Langton
Ellerbeck
Kirby Sigston
Thirnby
Yafforth
Thirnfloft
Ainderby Steeple
Bradbury
Thorpe Larches
Wynyard Village
Mordon
Foxton
Thorpe Thewles
Carlton
Stillington
Whitton
Norton
Wolviston
Billingham
Bishopton
Redmarshall
Little Stainton
Sadberge
Great Burdon
Barmpton
Walworth
Headlam
Gainford
Winston
Piercebridge
Piercebridge
Ovington
Caldwell
Eppleby
Cleasby
Manfield
Stapleton
Hutton Magna
Lane Head West
Farcett
Aldbrough St John
Stainwick-St-John
Stainwick Camp
Hurworth-on-Tees
Low Dinsdale
Neasham
Melsonby
Newton Morrell
Barton
Croft-on-Tees
Dalton-on-Tees
Eryholme
Girsby
Middleton Tyas
Scotch Corner Services
Scotch Corner
Kirby Hill
Whashton
Hartforth
Gilling West
Ashe Hall
Moulton
North Cowton
East Cowton
Uckerby
Skeeby
Richmond Castle
Easby Abbey
Hudswell
Downholme
Hipswell
Colburn
Brompton-on-Swale
Catterick Bridge
Bolton-on-Swale
Whitwell
Streetlam

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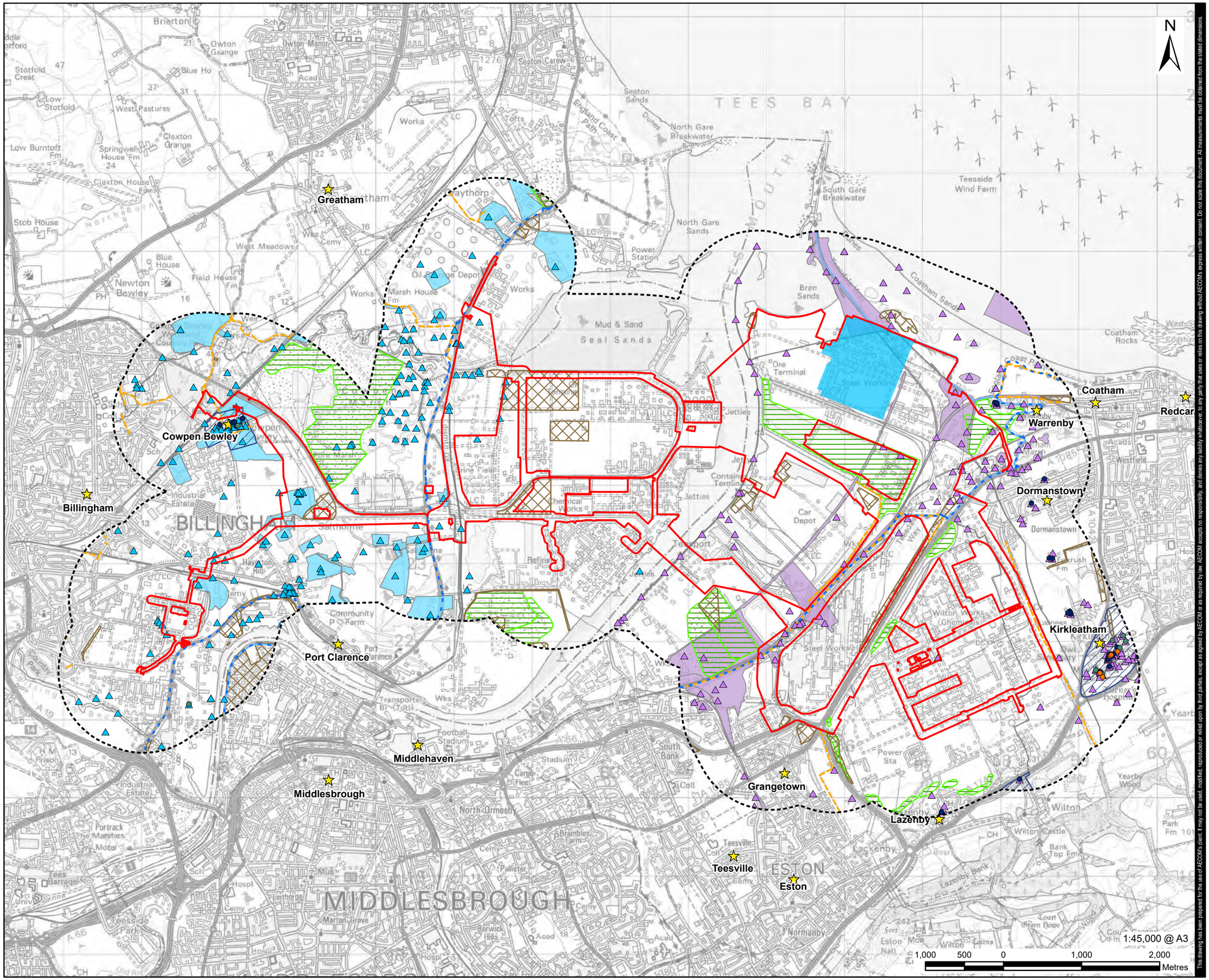

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site
- Residential Area
- Public Rights of Way
- England Coast Path
- Long Distance Route
- Historic Landfill
- Authorised Landfill

Cultural Heritage

- Conservation Area

Listed Building

- Grade I
- Grade II*
- Grade II

Historic Environment Record (HER)

- Redcar and Cleveland Borough Council HER Heritage Asset (Point)
- Tees Archaeology HER Heritage Asset (Point)
- Redcar and Cleveland Borough Council HER Heritage Asset (Polygon)
- Tees Archaeology HER Heritage Asset (Polygon)

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Environmental Constraints within 1 km of the Proposed Development Site Boundary

FIGURE NUMBER

Figure 3-1

Revision: 0 Drawn: AC Checked: MAB Approved: KS Date: 2023-08-04

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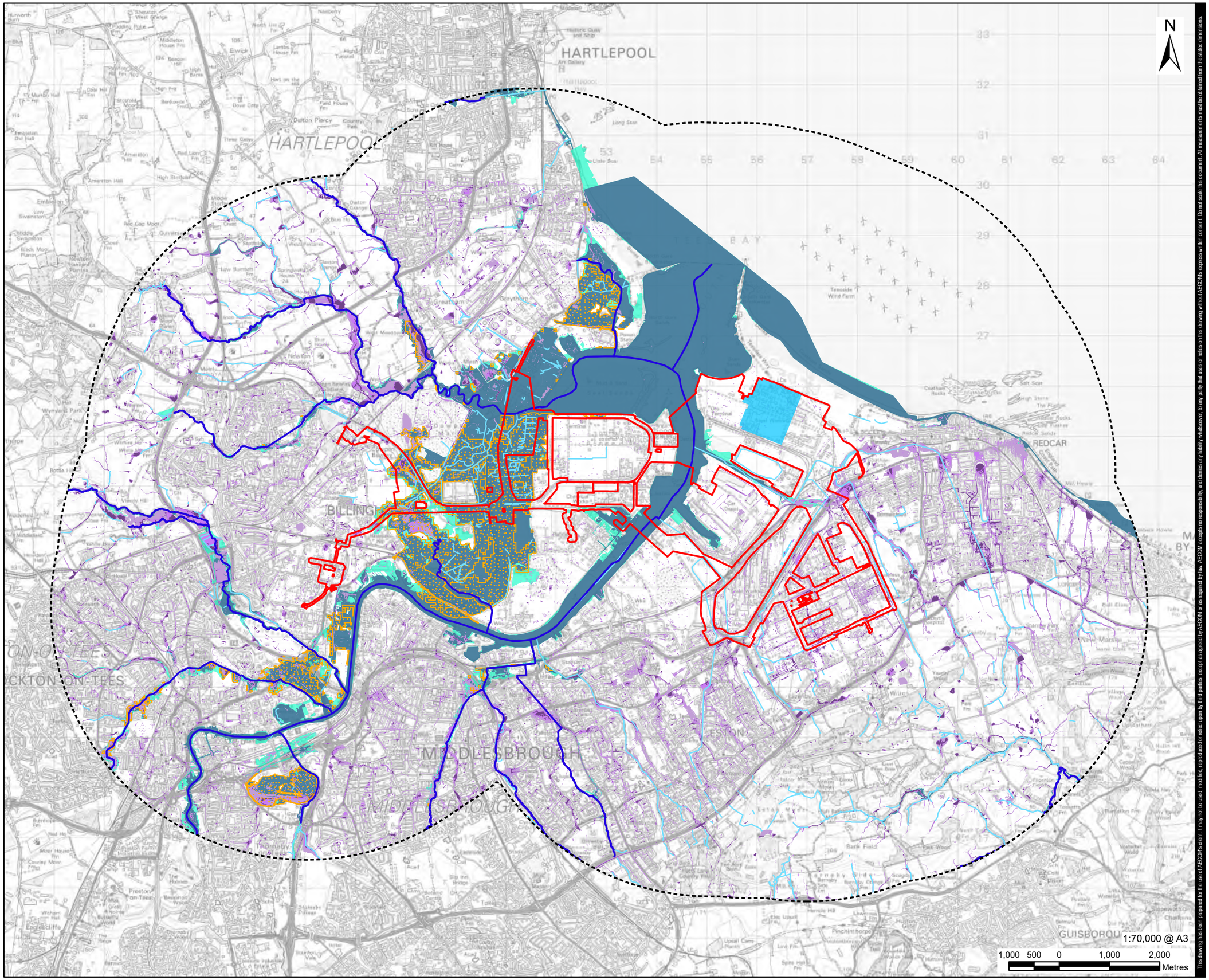

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 5 km Buffer
- Main Site
- Main River
- Ordinary Watercourse
- Flood Zone 2
- Flood Zone 3
- Reduction in Risk of Flooding from Rivers and Sea due to Defences

Risk of Flooding from Surface Water

- 3.3% Annual Chance
- 1% percent annual chance
- 0.1% Annual Chance

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Water Constraints within 5 km of the Proposed Development Site Boundary

FIGURE NUMBER

Figure 3-2

Revision: 0 Drawn: AC Checked: MAB Approved: KS Date: 2023-08-04

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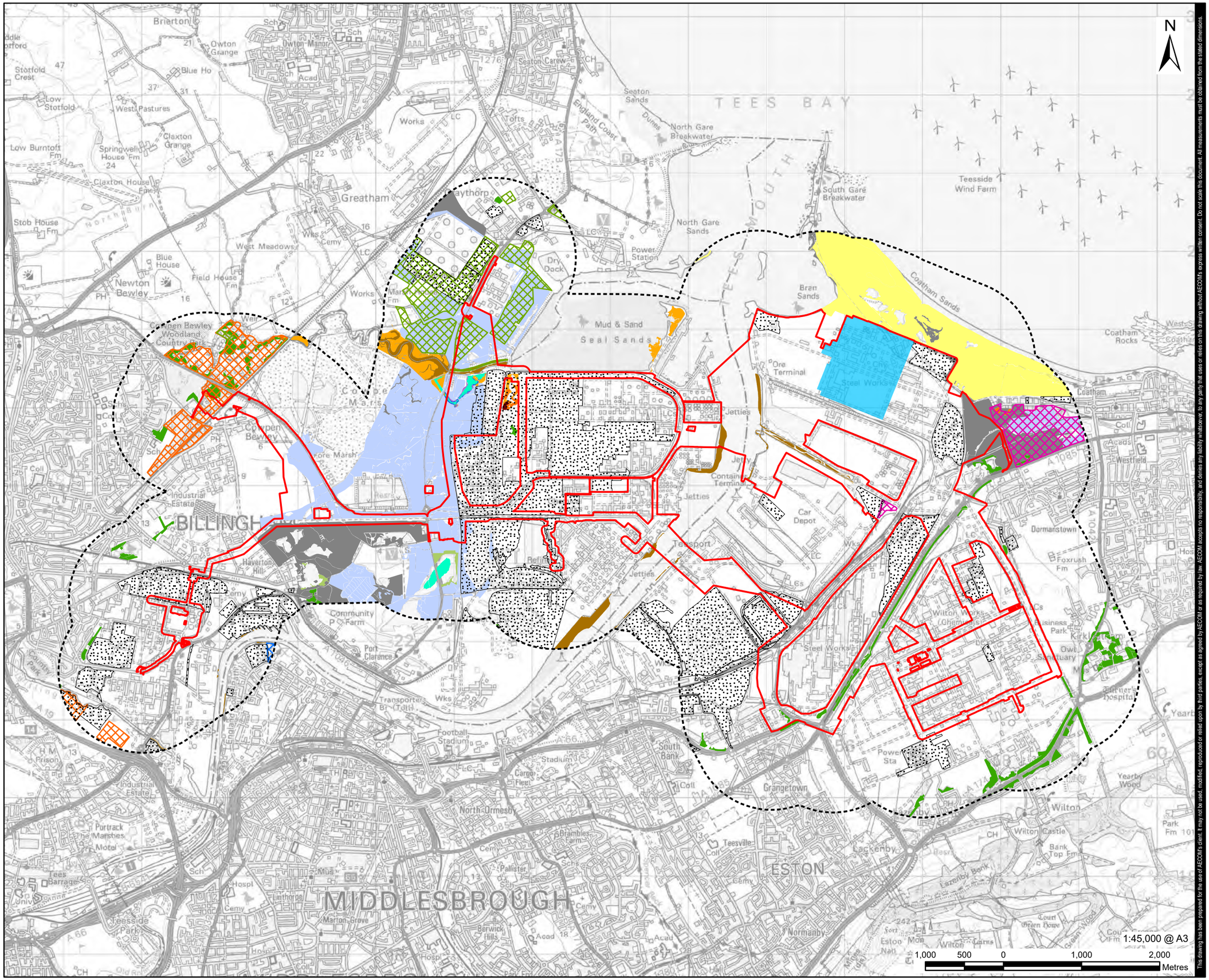

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APPLICANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site

Priority Habitat

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal sand dunes
- Deciduous woodland
- Lowland fens
- Mudflats
- No main habitat but additional habitats present
- Reedbeds
- Saline lagoons
- Coastal and floodplain grazing marsh,Coastal saltmarsh
- Coastal saltmarsh,Saline lagoons
- Reedbeds,Coastal saltmarsh
- Open Mosaic Habitat

Local Wildlife Site (LWS)

- Stockton
- Redcar and Cleveland
- Middlesborough
- Hartlepool

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Non-Statutory Ecological Constraints within 1 km of the Proposed Development Site Boundary

FIGURE NUMBER

Figure 3-3

Revision: 0 Drawn: AC Checked: MB Approved: LK Date: 2023-08-04

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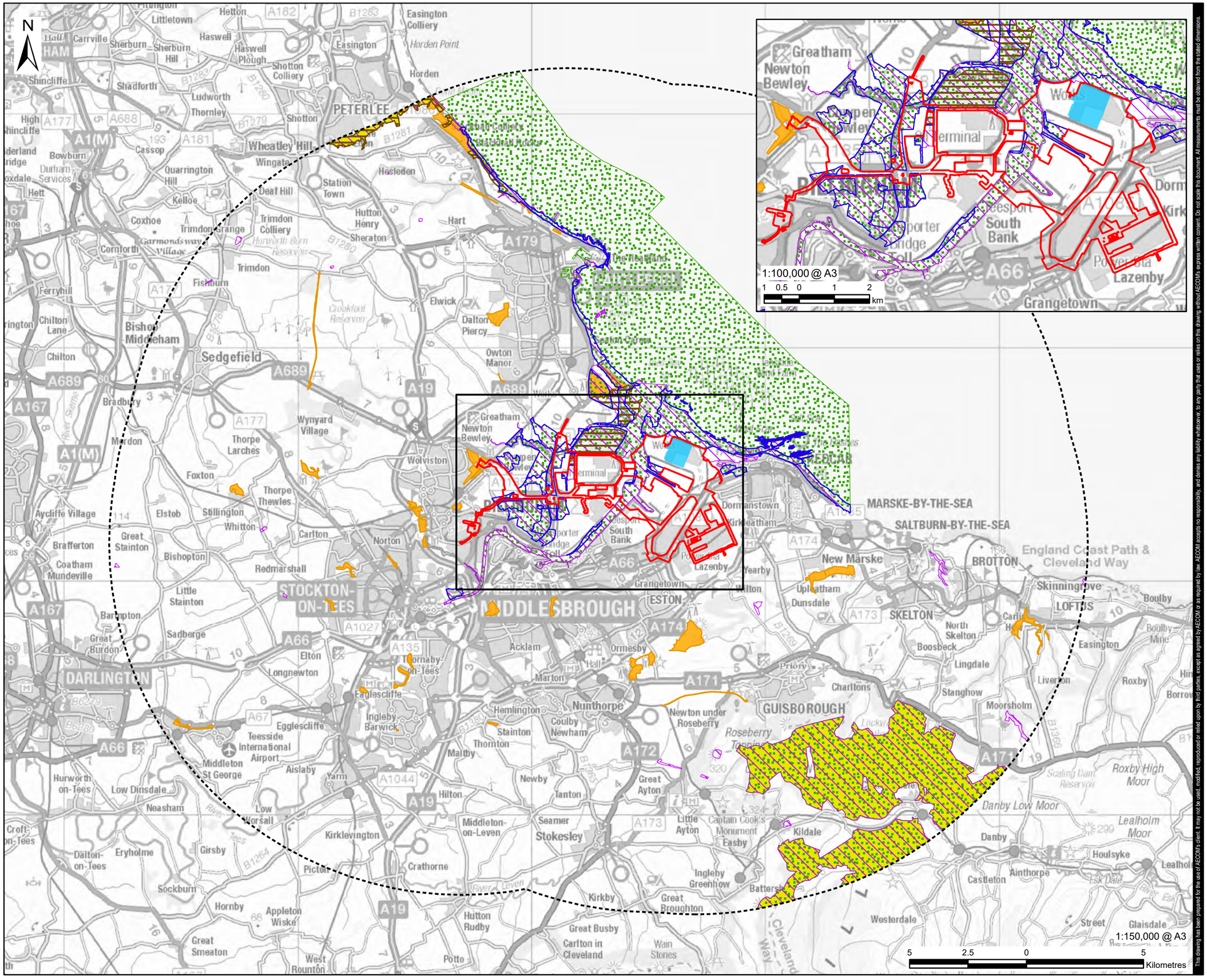

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 15 km Buffer
- Main Site
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Ramsar
- Special Areas of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Statutory Designated Ecological Sites within 15 km of the Proposed Development Site Boundary

FIGURE NUMBER

Figure 3-4

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04

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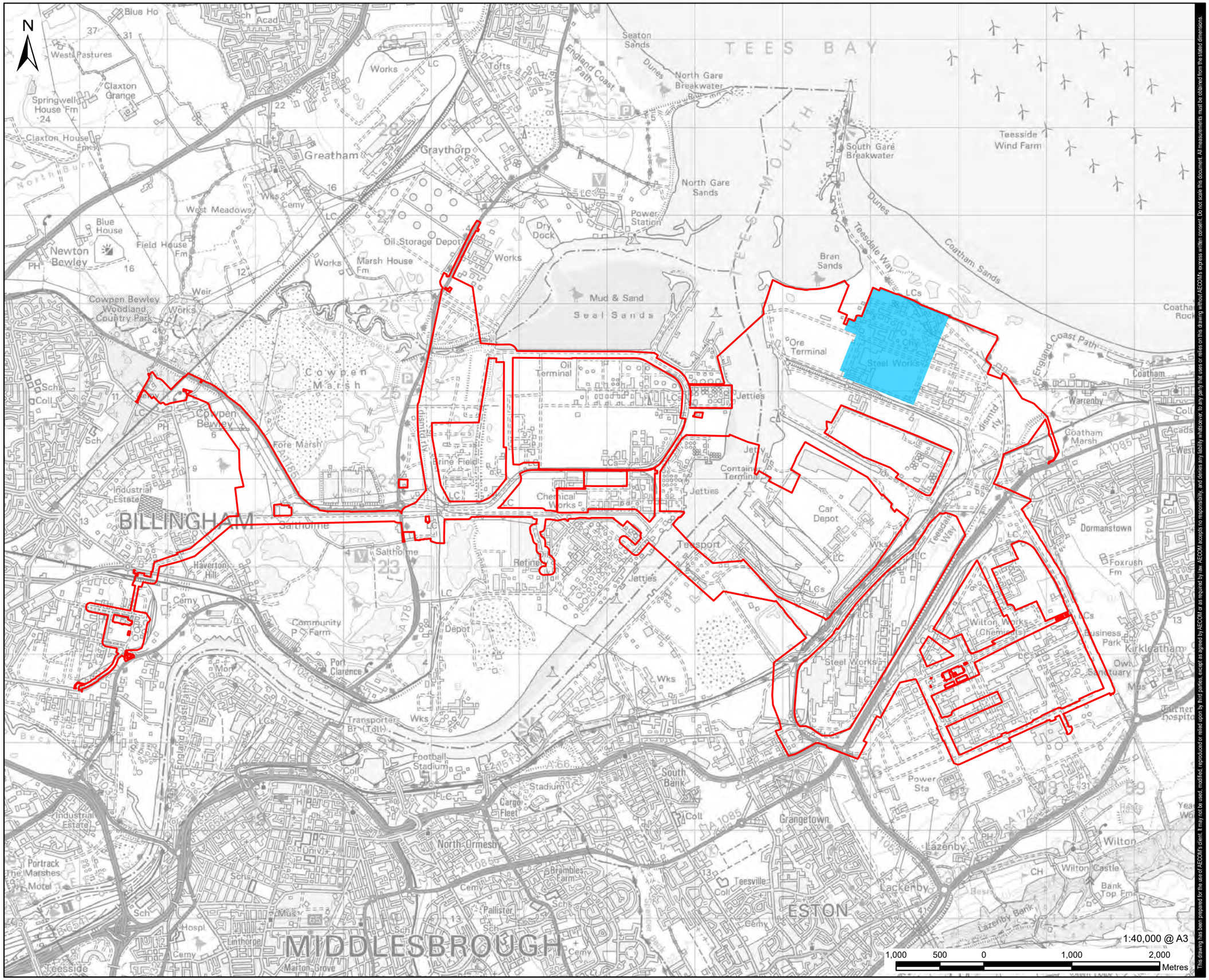

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LEGEND

- Proposed Development Site Boundary
- Main Site

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PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Proposed Development Site Boundary (including location of the Main Site)

FIGURE NUMBER

Figure 4-1

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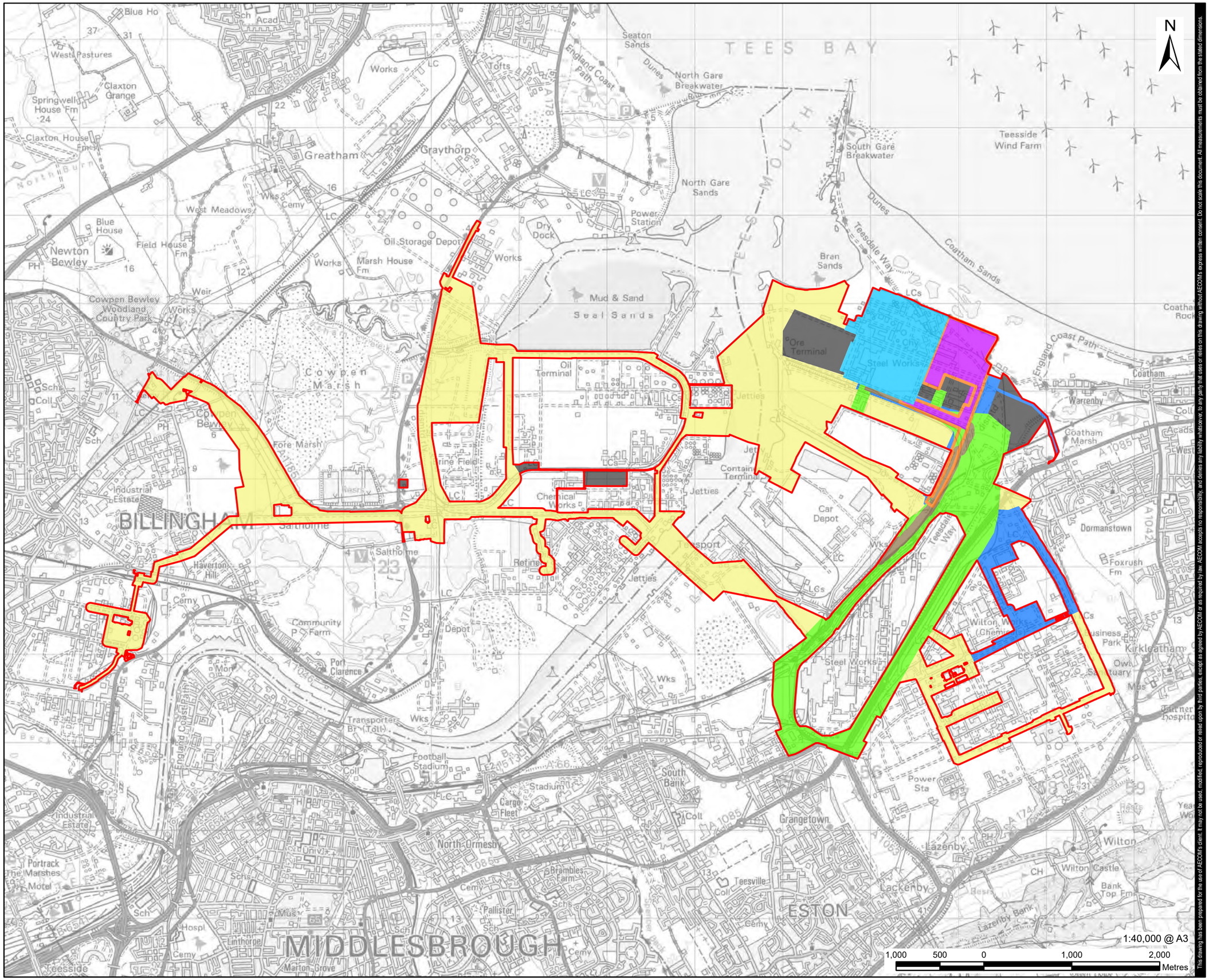

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LEGEND

- Proposed Development Site Boundary
- Main Site
- CO_2 Export Corridor
- Electrical Connection Corridor
- Hydrogen Pipeline Corridor
- Indicative Temporary Construction Laydown Areas
- Natural Gas Connection Corridor
- Other Gases Connection Corridor (O_2 and N_2)
- Water Connection Corridor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Parts of the Proposed Development Site

FIGURE NUMBER

Figure 4-2

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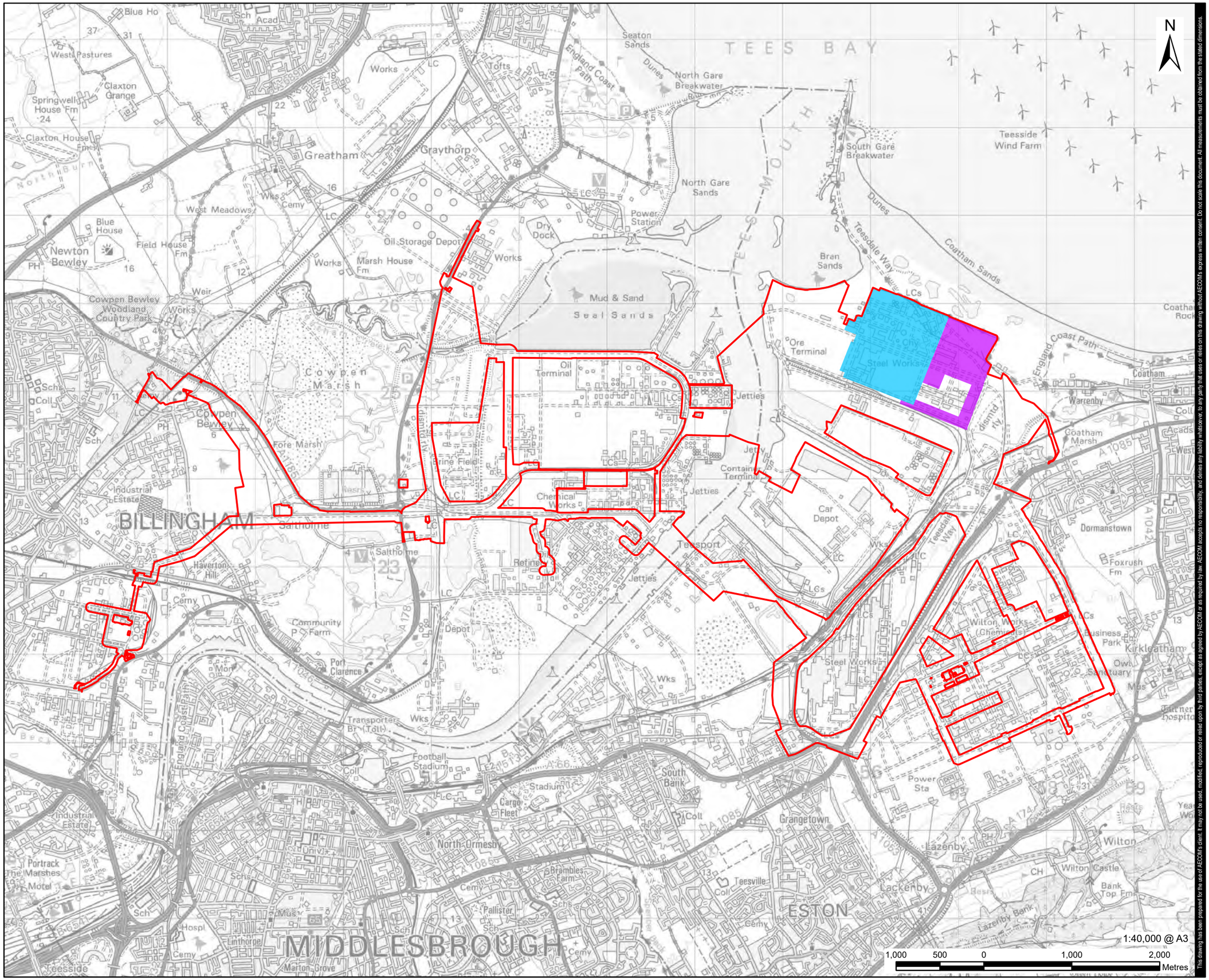

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LEGEND

- Proposed Development Site Boundary
- Main Site
- CO_2 Export Corridor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

CO_2 Export Corridor

FIGURE NUMBER

Figure 4-3

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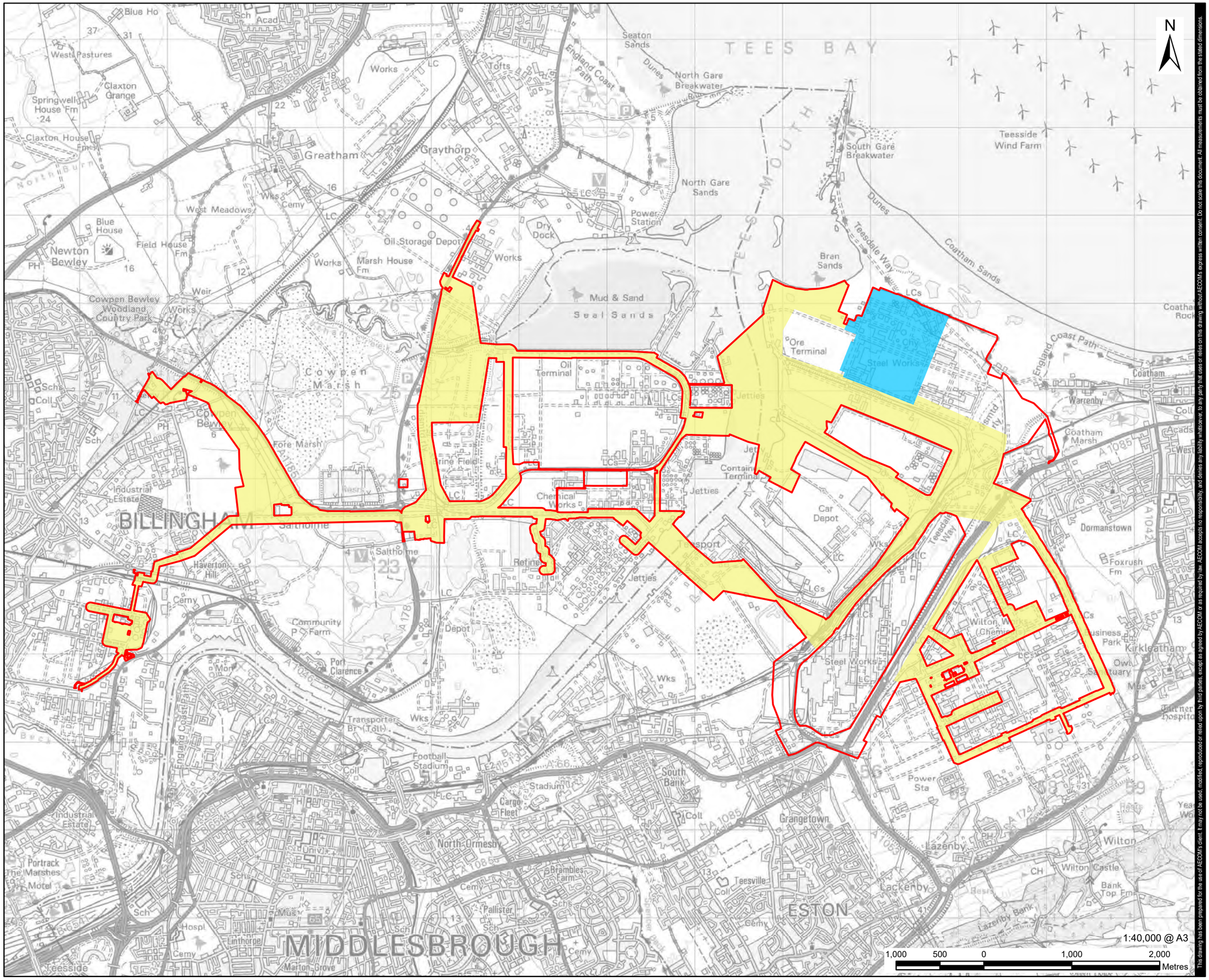

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APPLICANT

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Hydrogen Pipeline Corridor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Hydrogen Pipeline Corridor

FIGURE NUMBER

Figure 4-4

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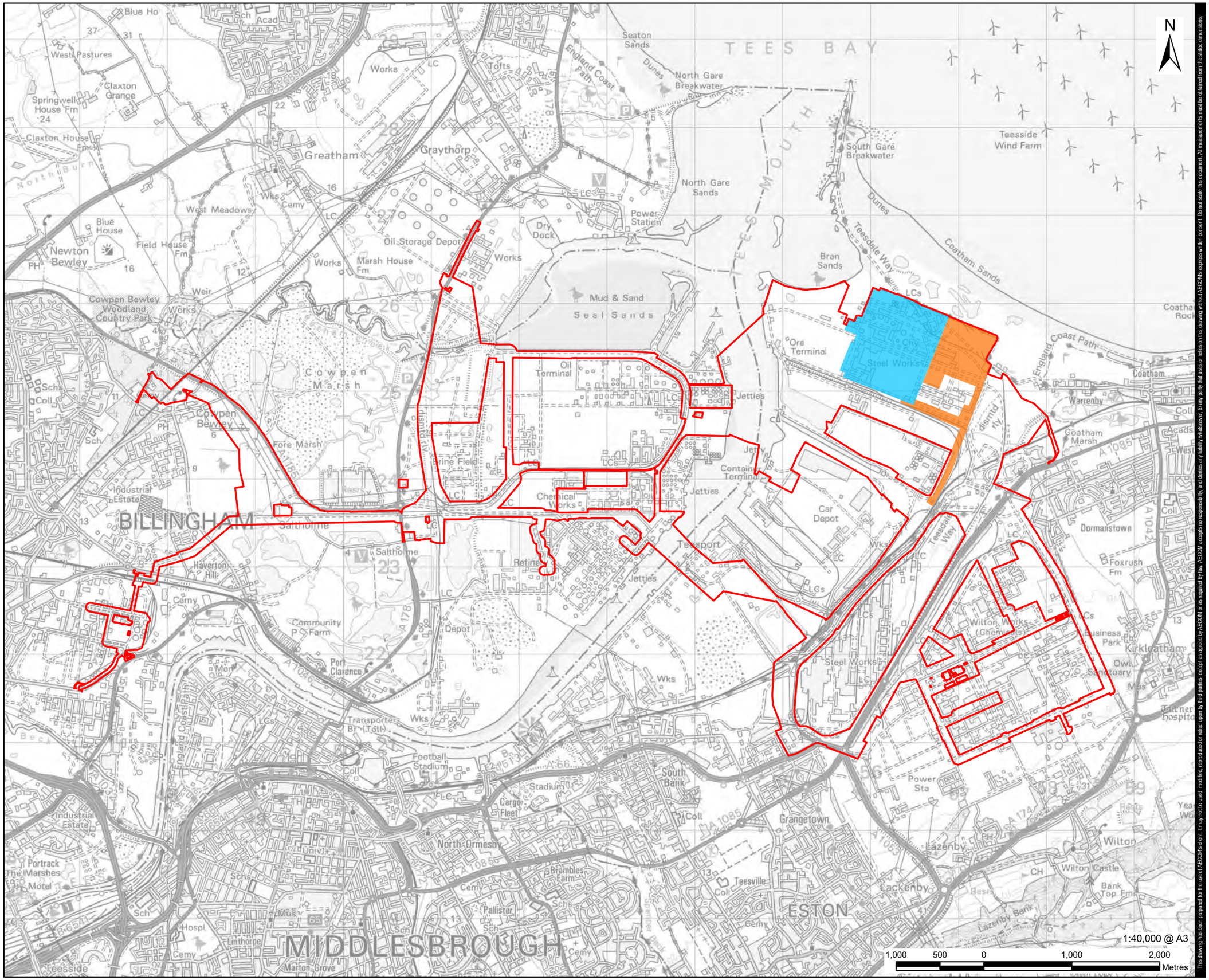

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Natural Gas Connection Corridor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Natural Gas Connection Corridor

FIGURE NUMBER

Figure 4-5

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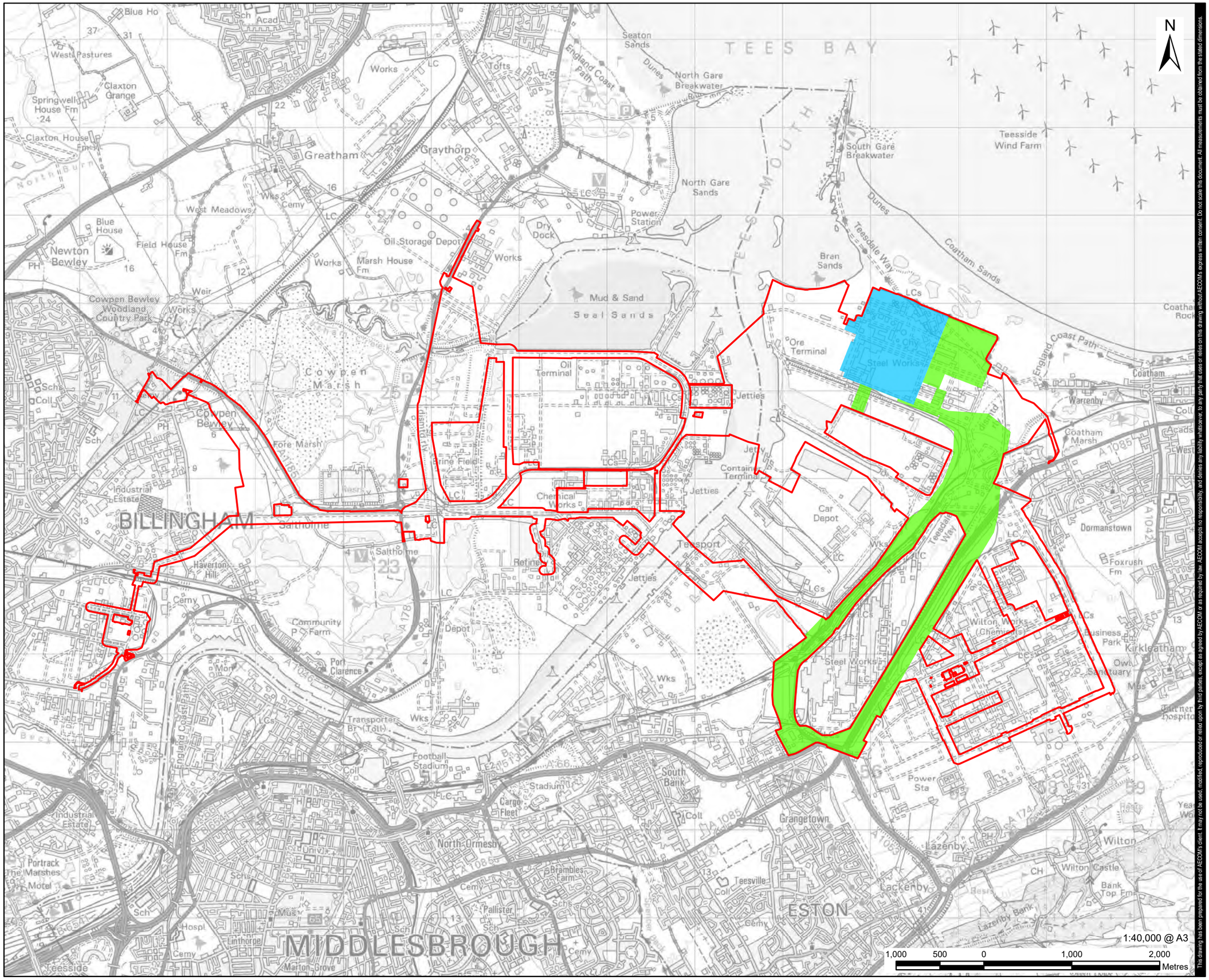
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TEESMOUTH
Seaton Sands
North Gare Breakwater
South Gare Breakwater
North Gare Sands
Teesside Wind Farm
Dunes
England Coast Path
Teesdale Way
Coatham Sands
Bran Sands
Mud & Sand
Seal Sands
Dry Dock
Power Station
Oil Storage Depot
Marsh House Fm
Greatham
Graythorp
West Meadows
Cowpen Bewley Woodland Country Park
Cowpen Marsh
Newton Bewley
Blue House
Field House Fm
Claxton Grange
Springwell House Fm
Claxton House Fm
West Pastures
Oil Terminal
Ore Terminal
Steel Works
Jetties
Container Terminal
Chemical Works
Car Depot
Teesport
Retinery
Fore Marsh
Brine Field
Coatham
Coatham Marsh
Warrenby
Dormanstown
Foxrush Fm
Wilton Works (Chemicals)
Business Park
Kirkleatham
Wilton
Lazenby
Lackenby
Grangetown
South Bank
Cargo Fleet
North Ormesby
Brambles Farm
Pallister
Teesville
ESTON
BILLINGHAM
MIDDLESBROUGH
Salthouse
Haverton Hill
Port Clarence
Transporter Br (Toll)
Football Stadium
Industrial Estate
Portrack
The Marshes
Motel
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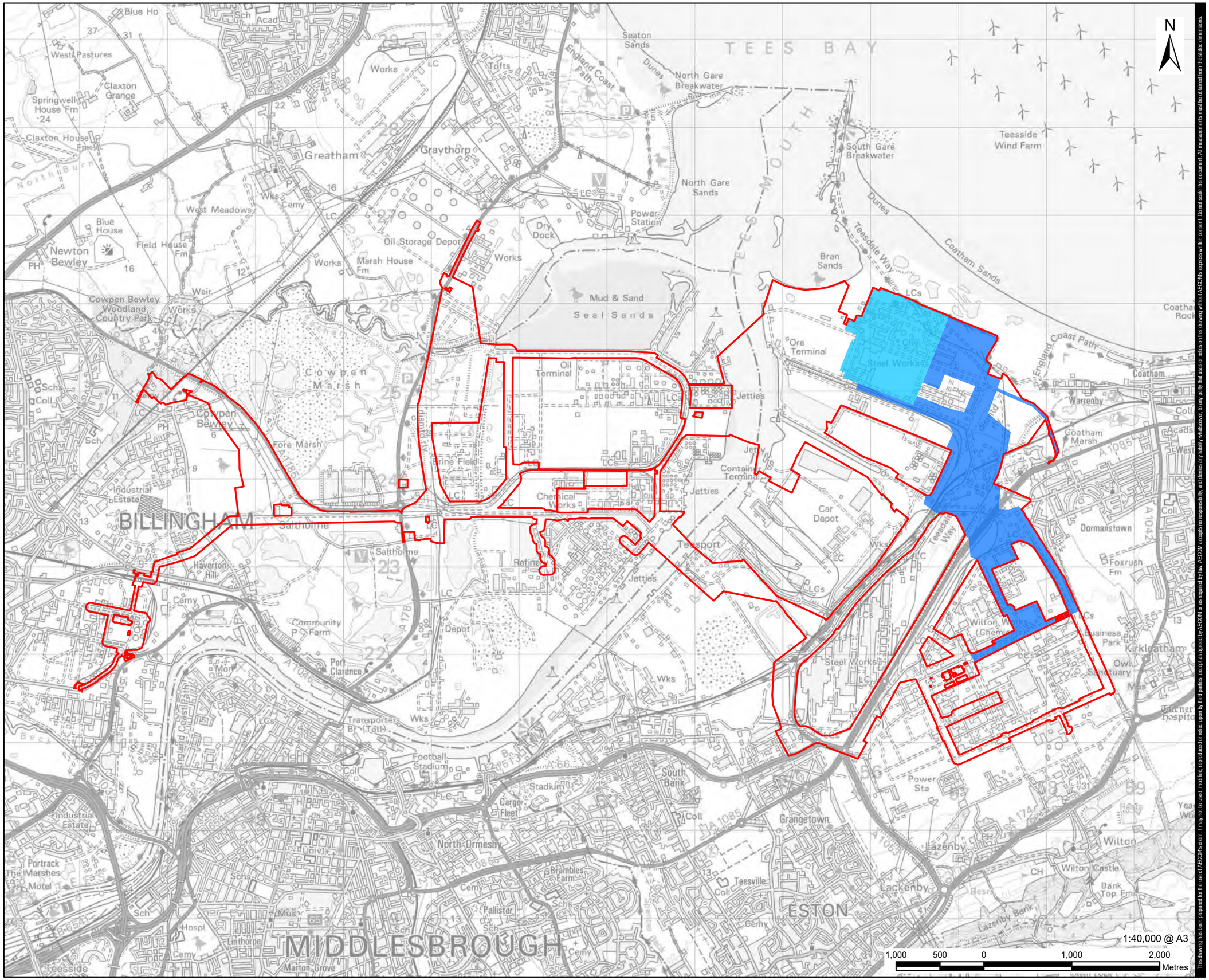

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1,000 500 0 1,000 2,000 Metres

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APPLICANT

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CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Water Connection Corridor

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PEI Report

PROJECT NUMBER

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FIGURE TITLE

Water Connections Corridor

FIGURE NUMBER

Figure 4-7

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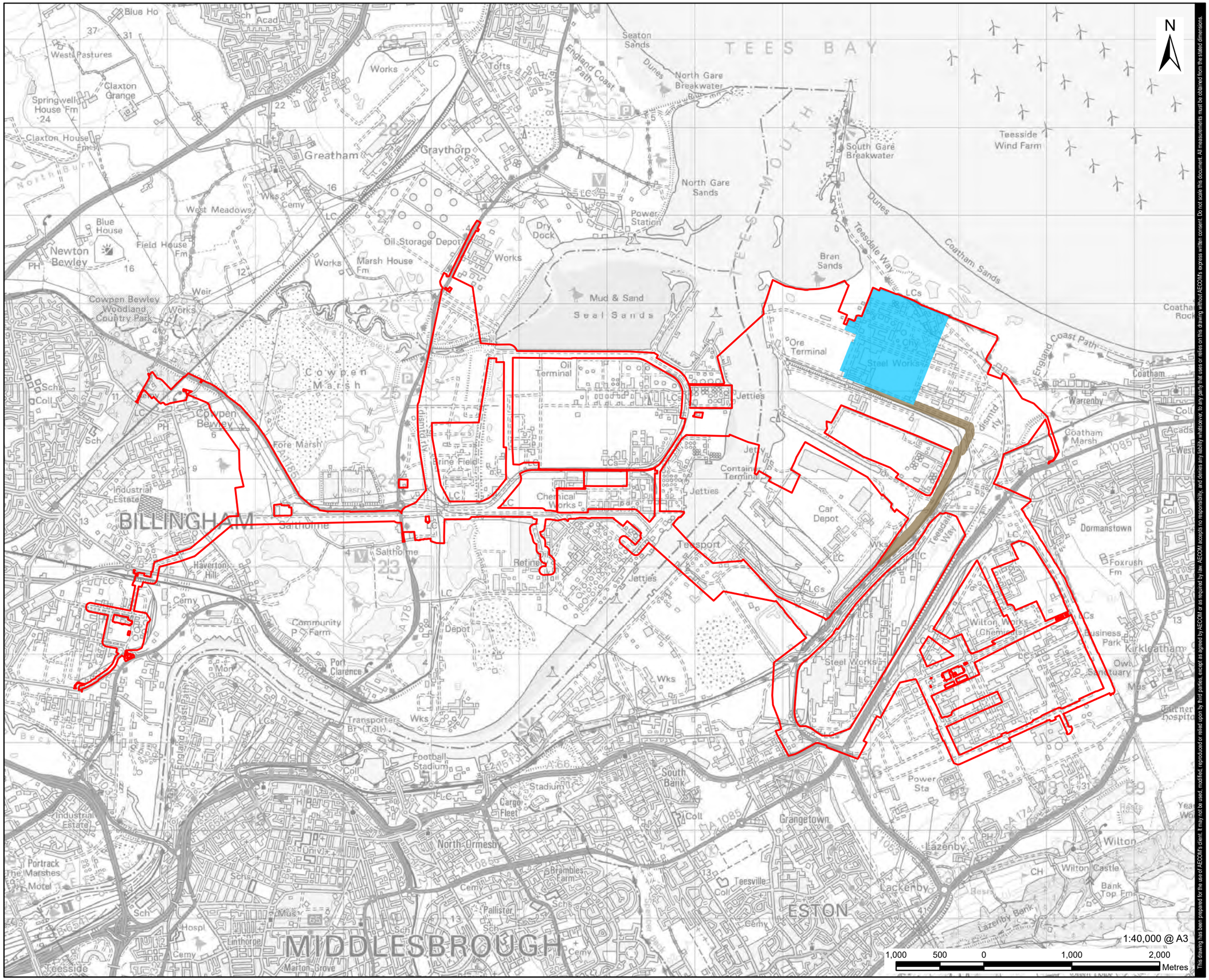

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Other Gases Connection Corridor (O_2 and N_2)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Other Gases Connection Corridor (O_2 and N_2)

FIGURE NUMBER

Figure 4-8

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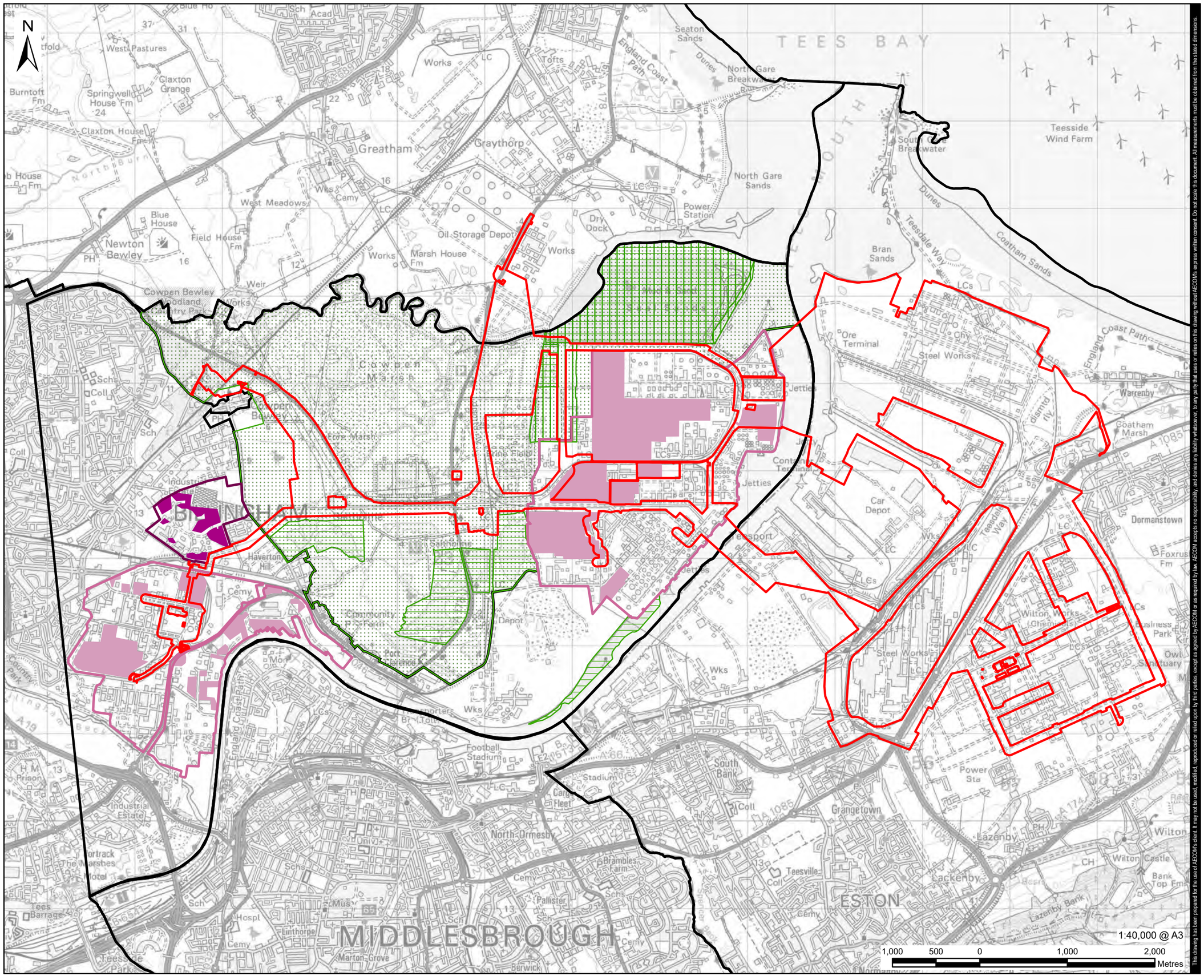

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LEGEND

- Proposed Development Site Boundary
- Local Authority District

Stockton-on-Tees Local Plan

- SD3, SD4 & SD5 Limits to Development
- SD4 & EG4 Specialist Employment Allocations
- SD4 EG4 Specialist Use Locations
- SD4 & EG1 General Employment Allocations
- SD4 & EG1 General Employment Locations
- SD3, SD4 & SD5 Countryside
- SD5 & ENV5 Internationally Designated Sites (SPA and Ramsar)
- SD5 & ENV5 Nationally Designated Sites (SSSI)

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ISSUE PURPOSE

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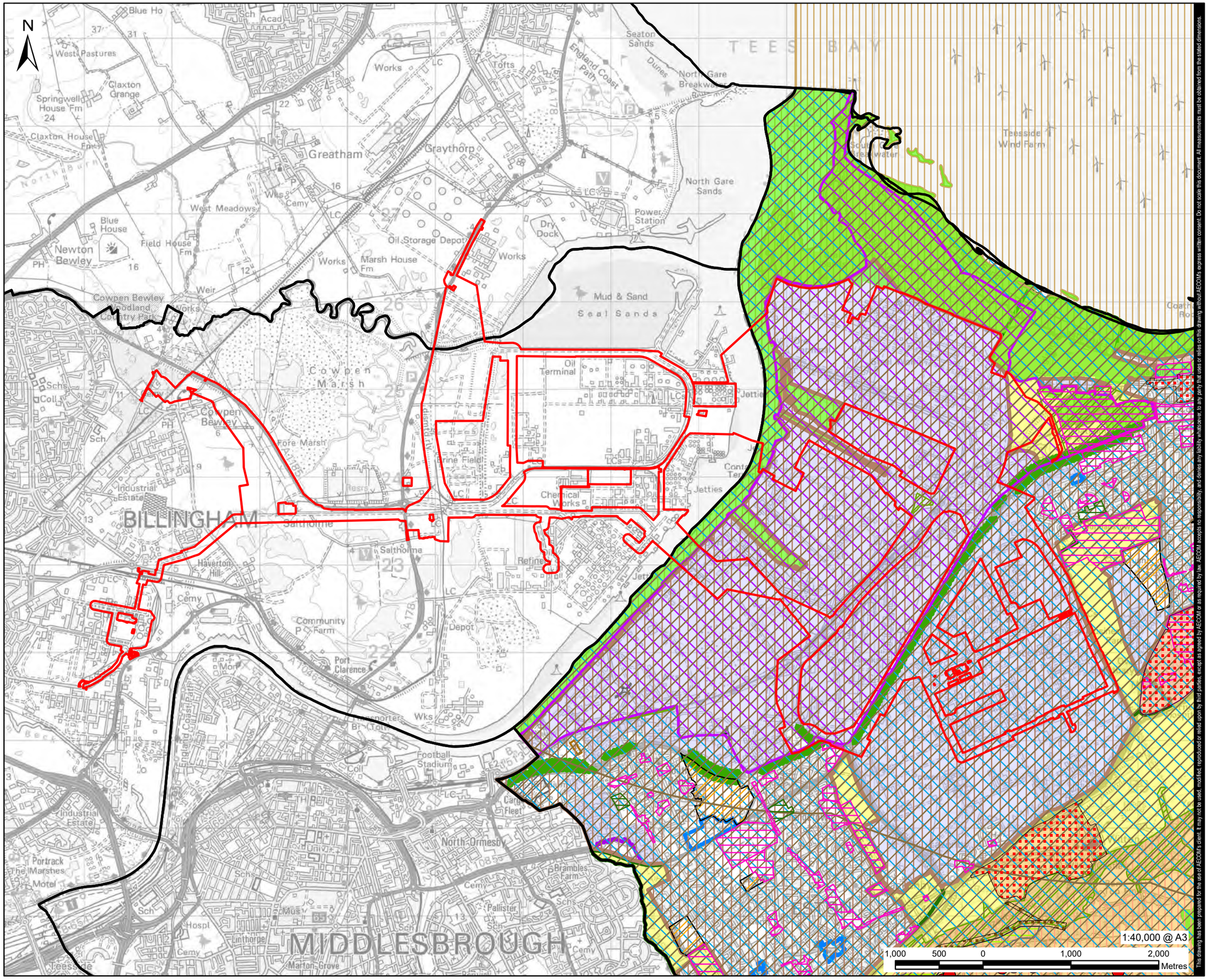
FIGURE TITLE

Stockton-on-Tees Local Plan

FIGURE NUMBER

Figure 7-1a



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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary

Redcar and Cleveland Local Plan

- HE 3 Scheduled Monuments
- Boundary of Redcar & Cleveland Local Plan
- ED 1 Protecting and Enhancing the Borough's Centres
- ED 2 Cleveland Retail Park
- ED 6 Protecting Employment Areas
- ED 10 South Tees Motorsports Park
- H 3 Housing Allocations
- H 7 Gypsy, Traveller and Travelling Showpeople Accommodation
- HE 1 Conservation Areas
- LS 4_ED 6 South Tees Development Corporation
- N 1 Historic Landscape - Eston Hills
- N 1 Restoration Landscape Areas
- N 1 Sensitive Landscape Areas
- N 2 Green Wedges
- N 2 Strategic Landscape Areas
- N 3 Primary Open Spaces
- N 3 Secondary Open Spaces
- N 4 6km Special Protection Areas (SPA) Buffer Zone
- N 4 Local Geological Sites (LGS)
- N 4 Local Nature Reserves (LNR)
- N 4 Local Wildlife Sites (LWS)
- N 4 Sites of Special Scientific Interest (SSSI)
- N 4 Special Protection Areas (SPA)
- N 4 Wildlife Corridors
- REG 1 Coatham, REG 2 Kirkleatham, REG 3 Skelton
- SD 3 Development Limits
- SD 6 30km wind farm safeguarding area for Durham Tees Valley Airport
- TA 3 Extension to Dockside Road

NOTES

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2: Local Plan data obtained from Redcar and Cleveland Brough Council, May 2018.

ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Redcar and Cleveland Local Plan

FIGURE NUMBER

Figure 7-1b

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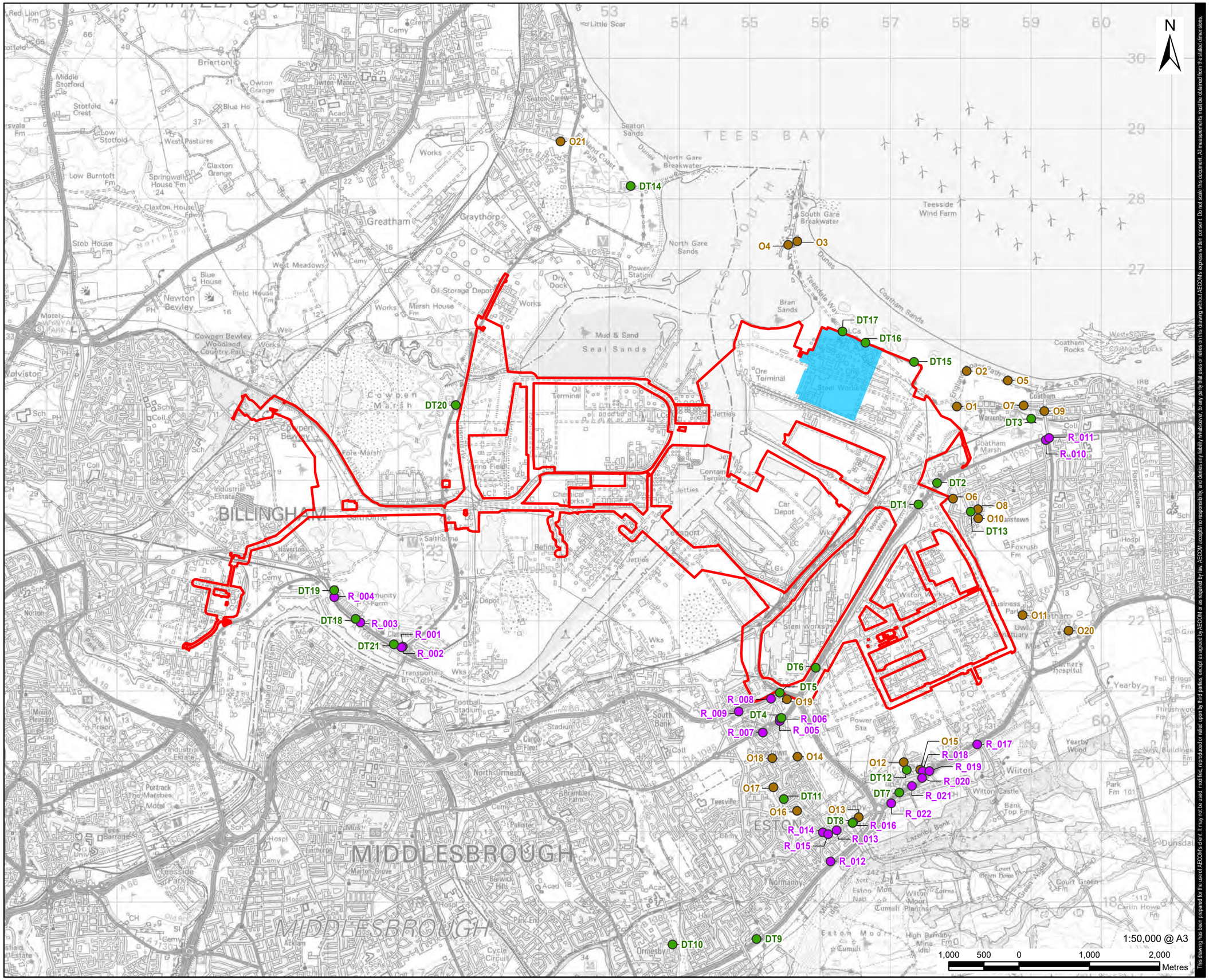

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LEGEND

- Proposed Development Site Boundary
- Main Site
- AECOM Diffusion Tube Monitoring
- Human Health Receptor (Construction Phase)
- Human Health Receptor (Operational Phase)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Air Quality Study Area
Human Health Receptors and Monitoring

FIGURE NUMBER

Figure 8-1

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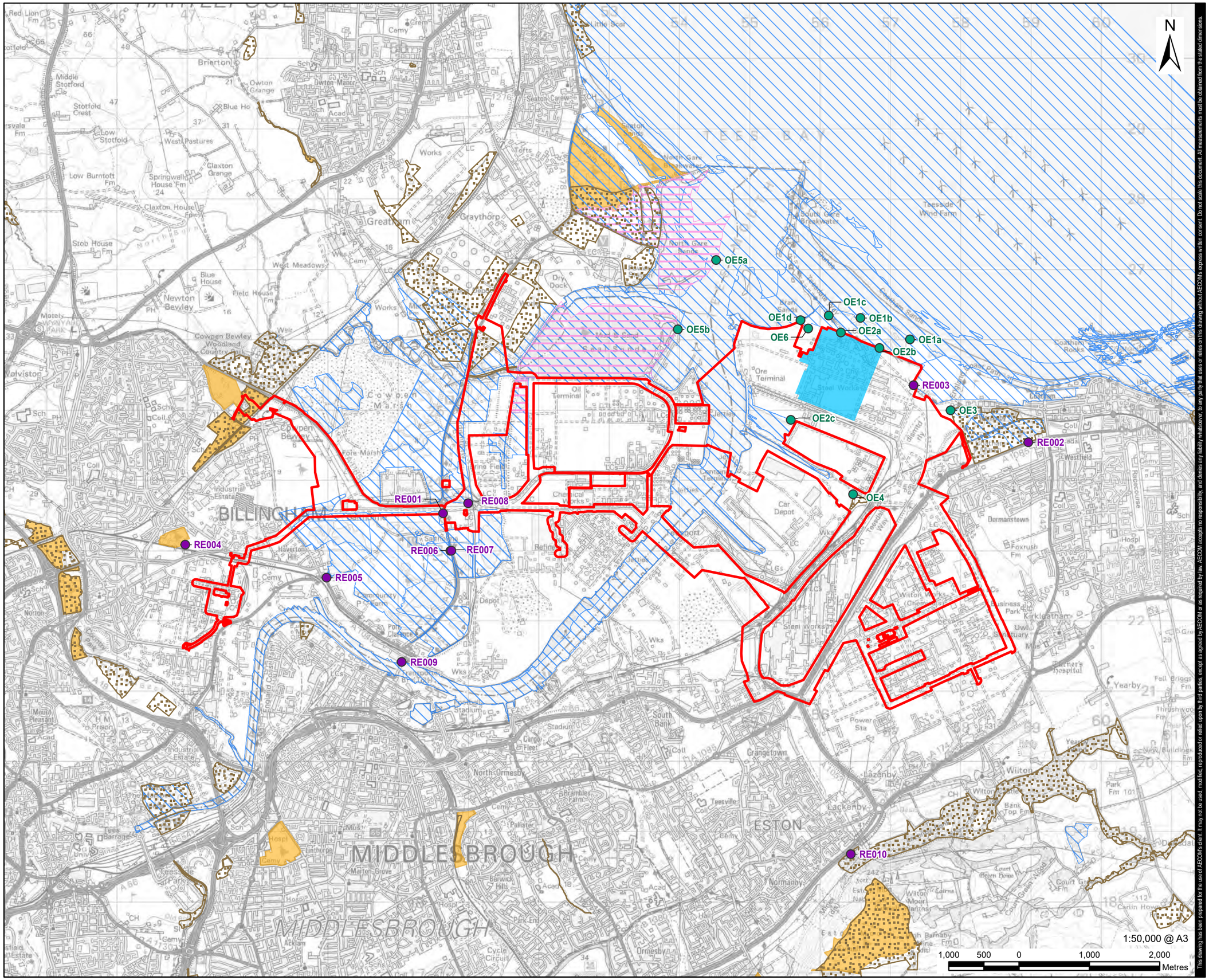

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Ecological Receptor (Operational Phase)
- Ecological Receptor (Construction Phase)
- Local Wildlife Site (LWS)
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Ecological Designations (SPA, SSSI, Ramsar)

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3: Local Wildlife Sites provided by Environmental Records Information Centre North East (ERIC), (2022). Data licensed through Public Sector Mapping Agreement © Crown Copyright.

ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Air Quality Study Area
Ecological Receptors

FIGURE NUMBER

Figure 8-2

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N

RE001 RE002 RE003 RE004 RE005 RE006 RE007 RE008 RE009 RE010

R_001 R_002 R_003 R_004 R_005 R_006 R_007 R_008 R_009 R_010 R_011 R_012 R_013 R_014 R_015 R_016 R_017 R_018 R_019 R_020 R_021 R_022

1:50,000 @ A3

1,000 500 0 1,000 2,000 Metres

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PROJECT

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H2 Teesside Limited

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Ecological Receptor
- Human Health Receptor
- Modelled Road Network
- Local Nature Reserve (LNR)
- Ecological Designations (SPA, SSSI, Ramsar)

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3: Local Wildlife Sites provided by Environmental Records Information Centre North East (ERIC), (2022). Data licensed through Public Sector Mapping Agreement © Crown Copyright.

ISSUE PURPOSE

PEI Report

PROJECT NUMBER

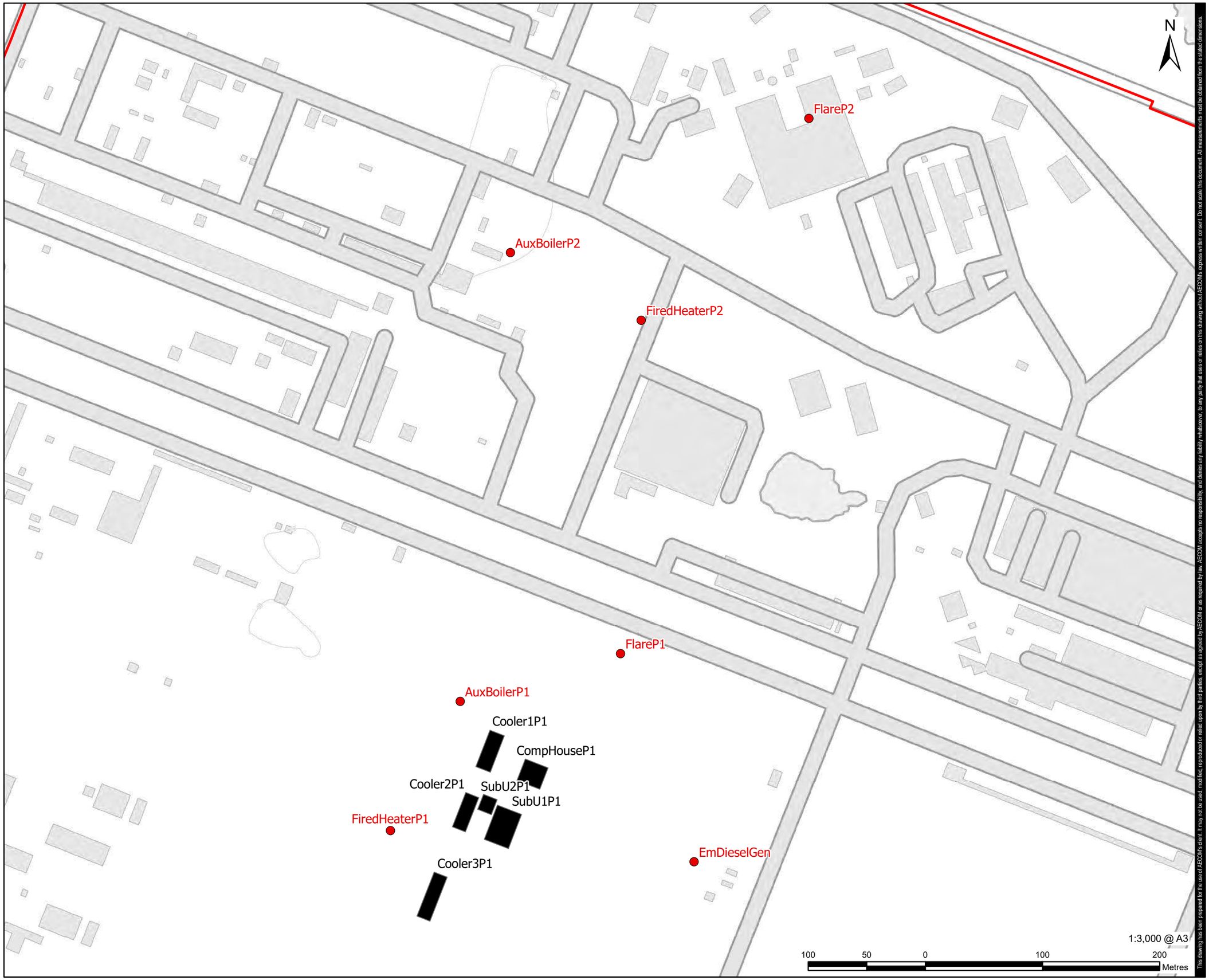
60689030

FIGURE TITLE

Air Quality Study Area – Construction Road Traffic Locations

FIGURE NUMBER

Figure 8-3



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LEGEND

- Proposed Development Site Boundary
- Modelled Phase 1 Building
- Phase 1 Emission Source

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

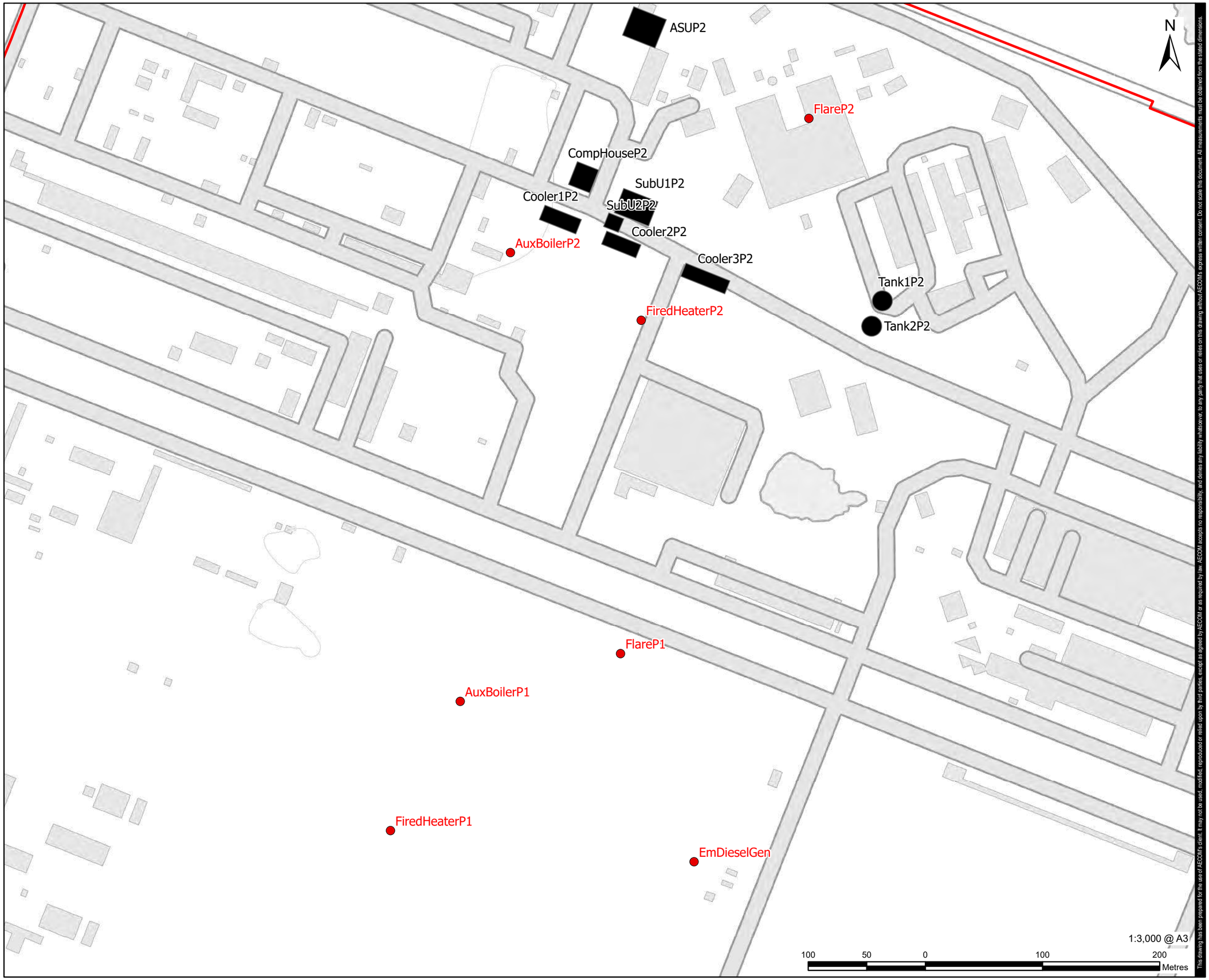
60689030

FIGURE TITLE

Air Quality Study Area – Operational Model Inputs Phase 1

FIGURE NUMBER

Figure 8-4



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LEGEND

- Proposed Development Site Boundary
- Modelled Phase 2 Building
- Phase 2 Emission Source

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ISSUE PURPOSE

PEI Report

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60689030

FIGURE TITLE

Air Quality Study Area – Operational Model Inputs Phase 2

FIGURE NUMBER

Figure 8-5

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Modelled Domain
- Annual Mean NO2 Process Contribution (µg/m3)
- Human Health Receptor (Operational Phase)

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Annual Mean NO2 Process Contribution for the Proposed Development during Normal Operations for Phase 1 and 2 Combined – Case B, for the Worst Affected Meteorological Year of 2022

FIGURE NUMBER

Figure 8-6

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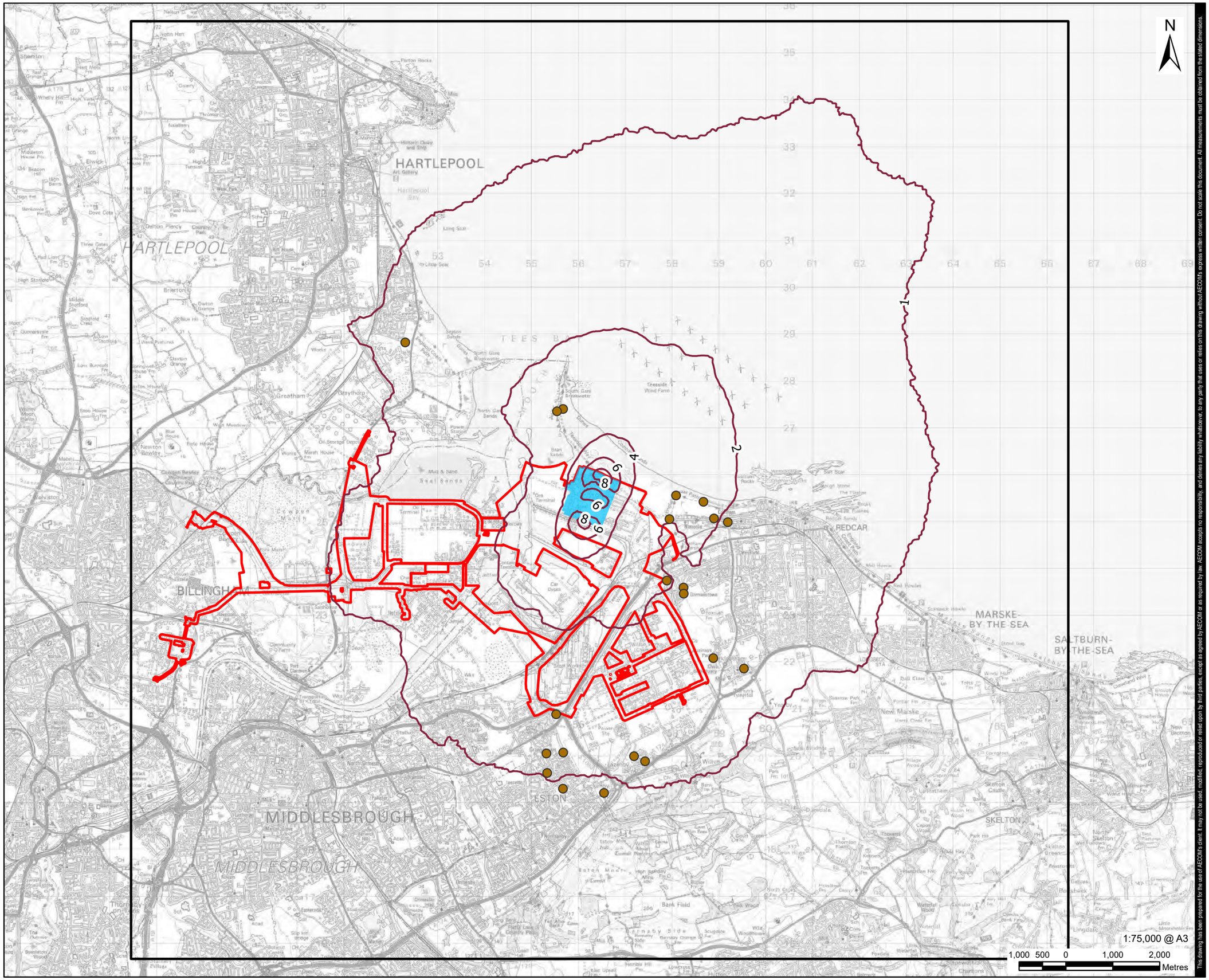

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Modelled Domain
- 99.79th Percentile 1h NO2 Process Contribution (µg/m3)
- Human Health Receptor (Operational Phase)

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

99.79th Percentile 1h NO2 Process Contribution for the Proposed Development during Normal Operations for Phase 1 and 2 Combined – Case B, for the Worst Affected Meteorological Year of 2022

FIGURE NUMBER

Figure 8-7

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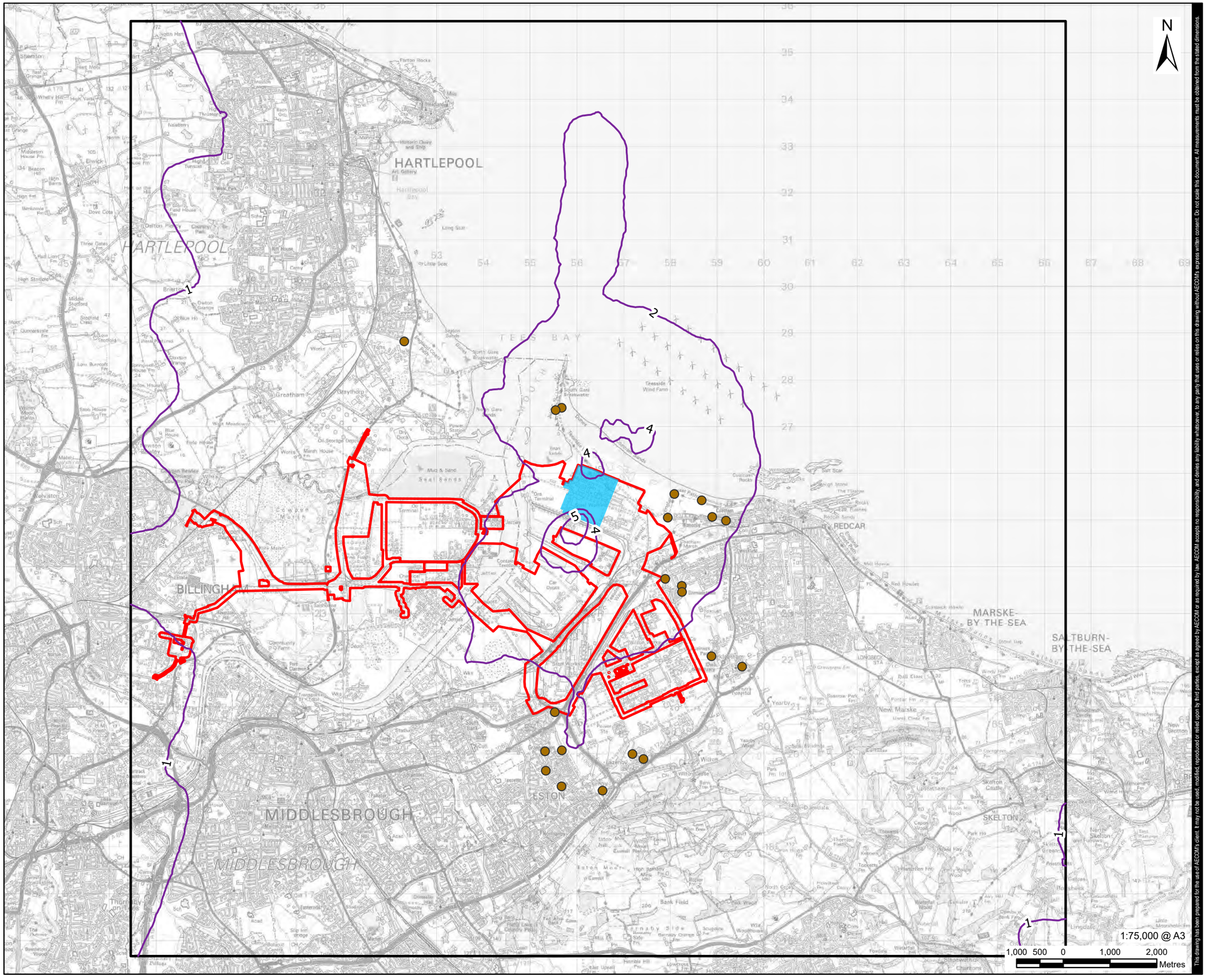

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Modelled Domain
- 99.79th Percentile 1h NO2 Process Contribution (µg/m3)
- Human Health Receptor (Operational Phase)

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

99.79th Percentile 1h NO2 Process Contribution for the Proposed Development during Start Up for Phase 1 and 2 Combined – Case A, for the Worst Affected Meteorological Year of 2021

FIGURE NUMBER

Figure 8-8

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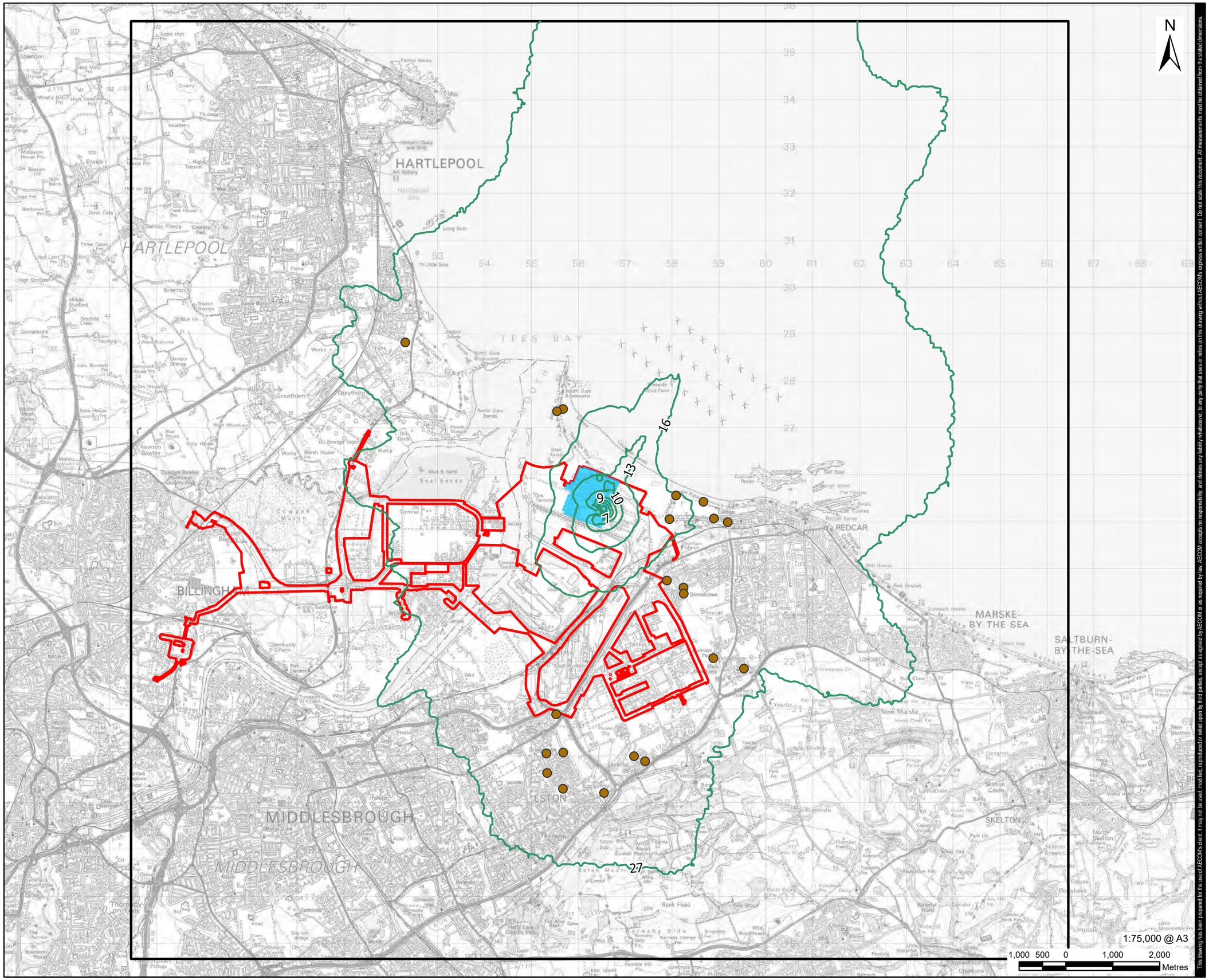

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Modelled Domain
- 99.79th Percentile 1h NO2 Process Contribution (µg/m3)
- Human Health Receptor (Operational Phase)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

99.79th Percentile 1h NO2 Process Contribution for the Proposed Development during Emergency Operations for Phase 1 and 2 Combined – Case B, for the Worst Affected Meteorological Year of 2022

FIGURE NUMBER

Figure 8-9

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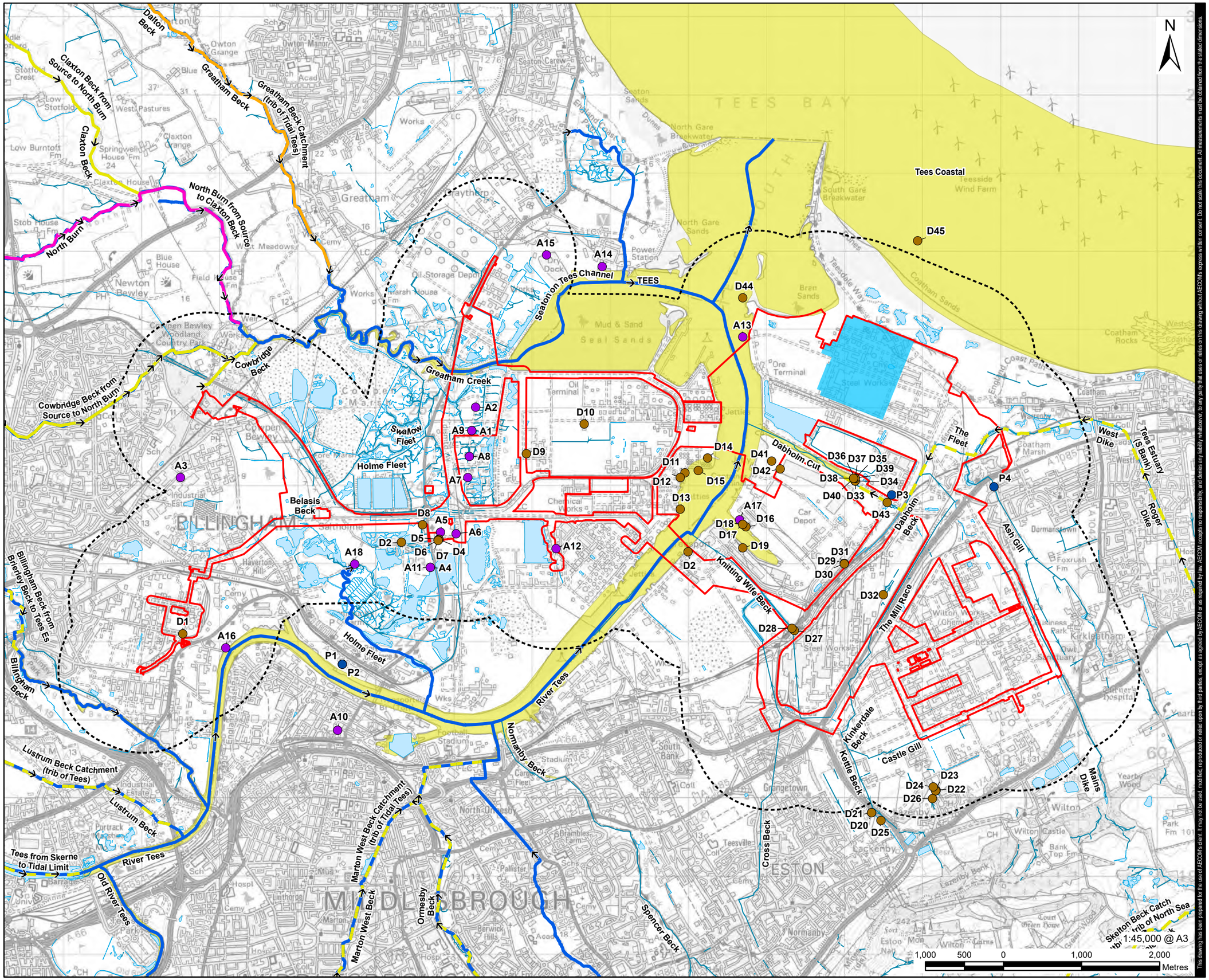

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APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site
- Pollution Incident
- Consented Discharge Location (i.e Water Activity Permit)
- Abstraction Location (Licenced)
- Main River
- Ordinary Watercourse
- Surface Water Area

WFD Surface Water - Ecological Class

- Moderate
- Moderate (Heavily Modified)
- Poor
- Bad
- Moderate (Heavily Modified)

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5: Contains data derived from the NZT scheme and will be updated for the Proposed Development at the ES stage, pending a response to a data request to the Environment Agency.

ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Surface Water Features and their Attributes

1:45,000 @ A3

FIGURE NUMBER

Figure 9-1

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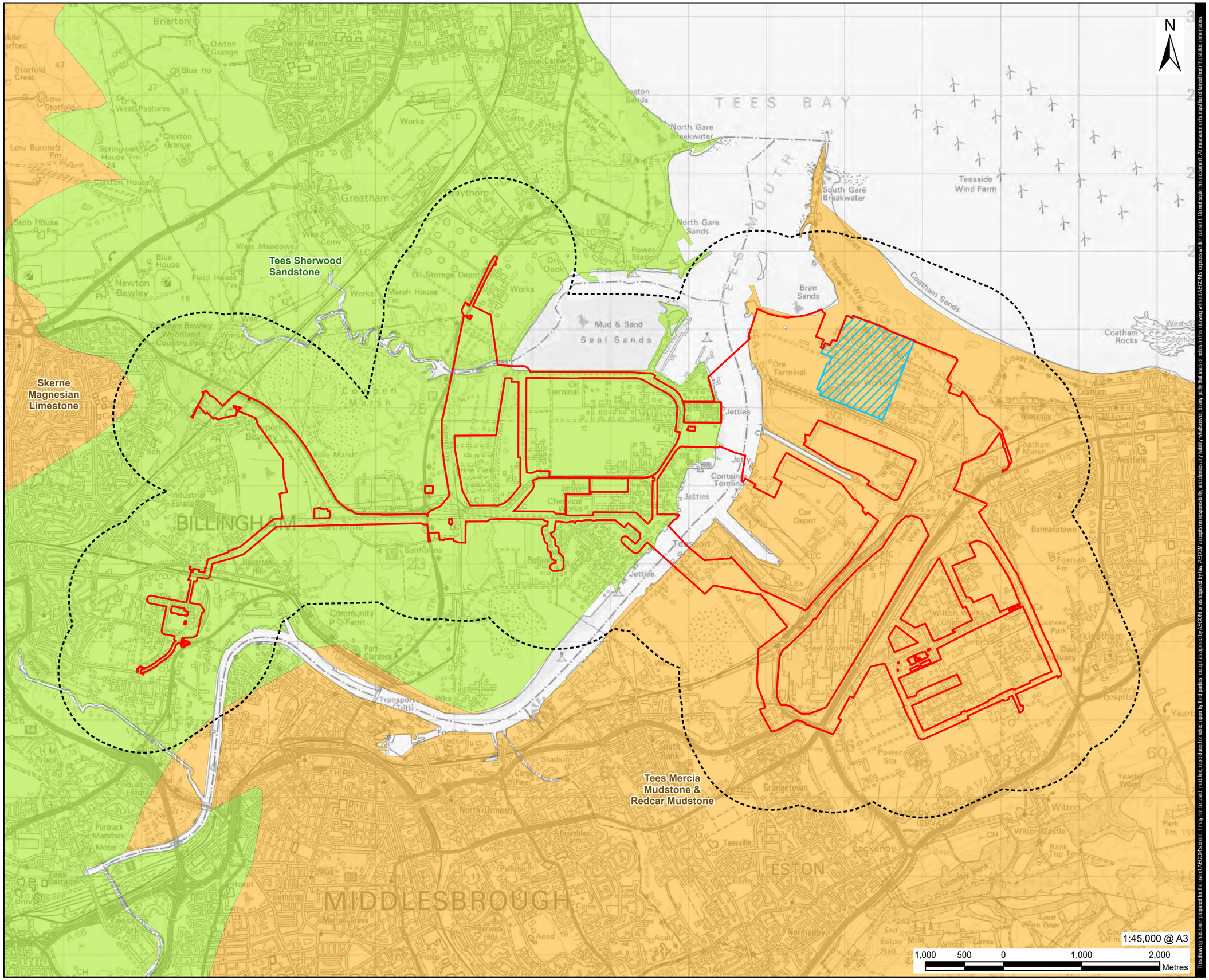

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APPLICANT

H2 Teesside Limited

CONSULTANT

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Cathedral Approach,
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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site

WFD Ground Water - Overall Status

- Good
- Poor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Groundwater Features and their Attributes

FIGURE NUMBER

Figure 9-2

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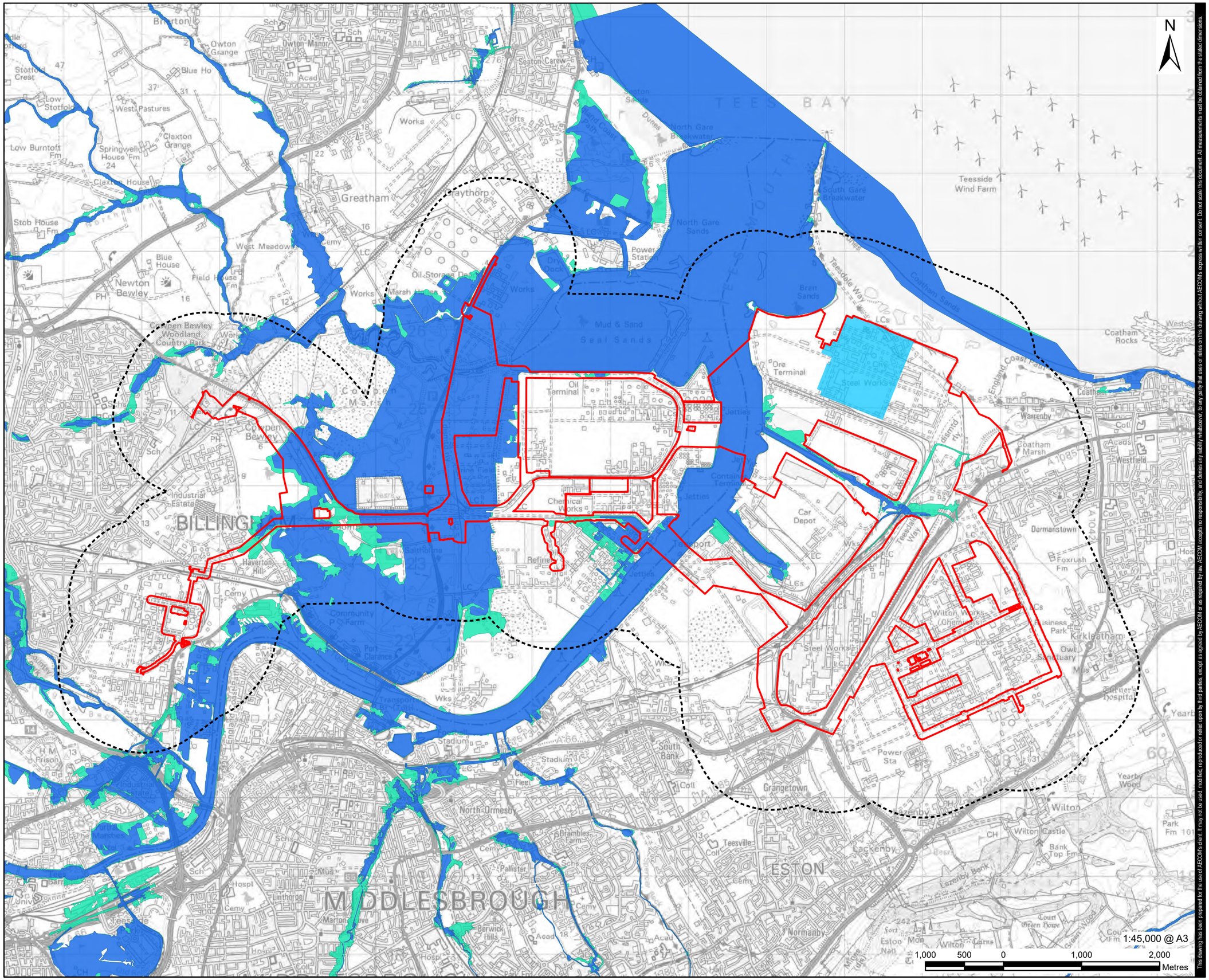

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site
- Flood Zone 3
- Flood Zone 2

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Fluvial Flood Risk

FIGURE NUMBER

Figure 9-3

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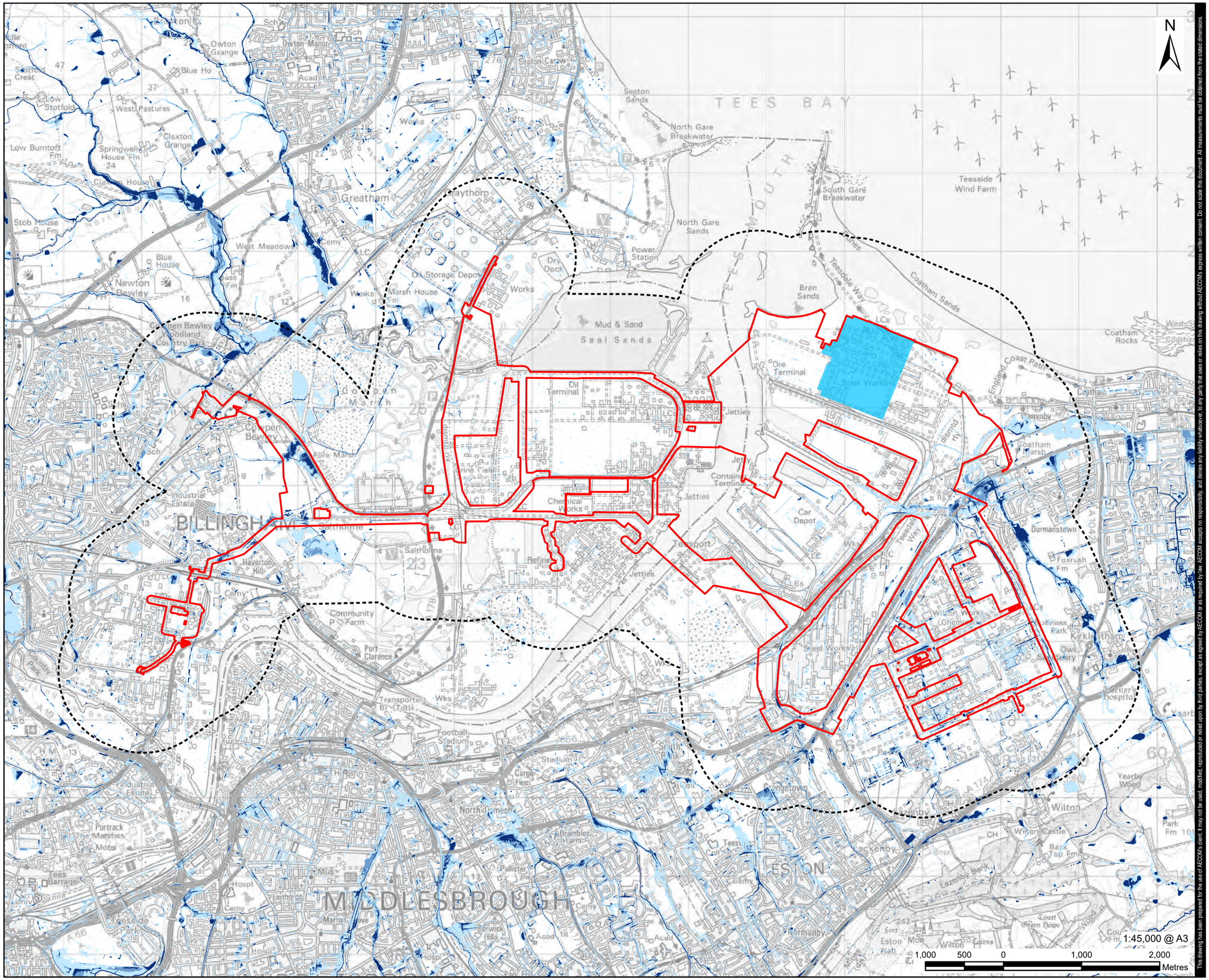

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site

Risk of Flooding from Surface Water*

- 3.3% Annual Chance (High)
- 1% Annual chance (Medium)
- 0.1% Annual Chance (Low)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Surface Water Flood Risk

FIGURE NUMBER

Figure 9-4

Revision: 0 Drawn: NK Checked: MB Approved: LF Date: 2023-09-12

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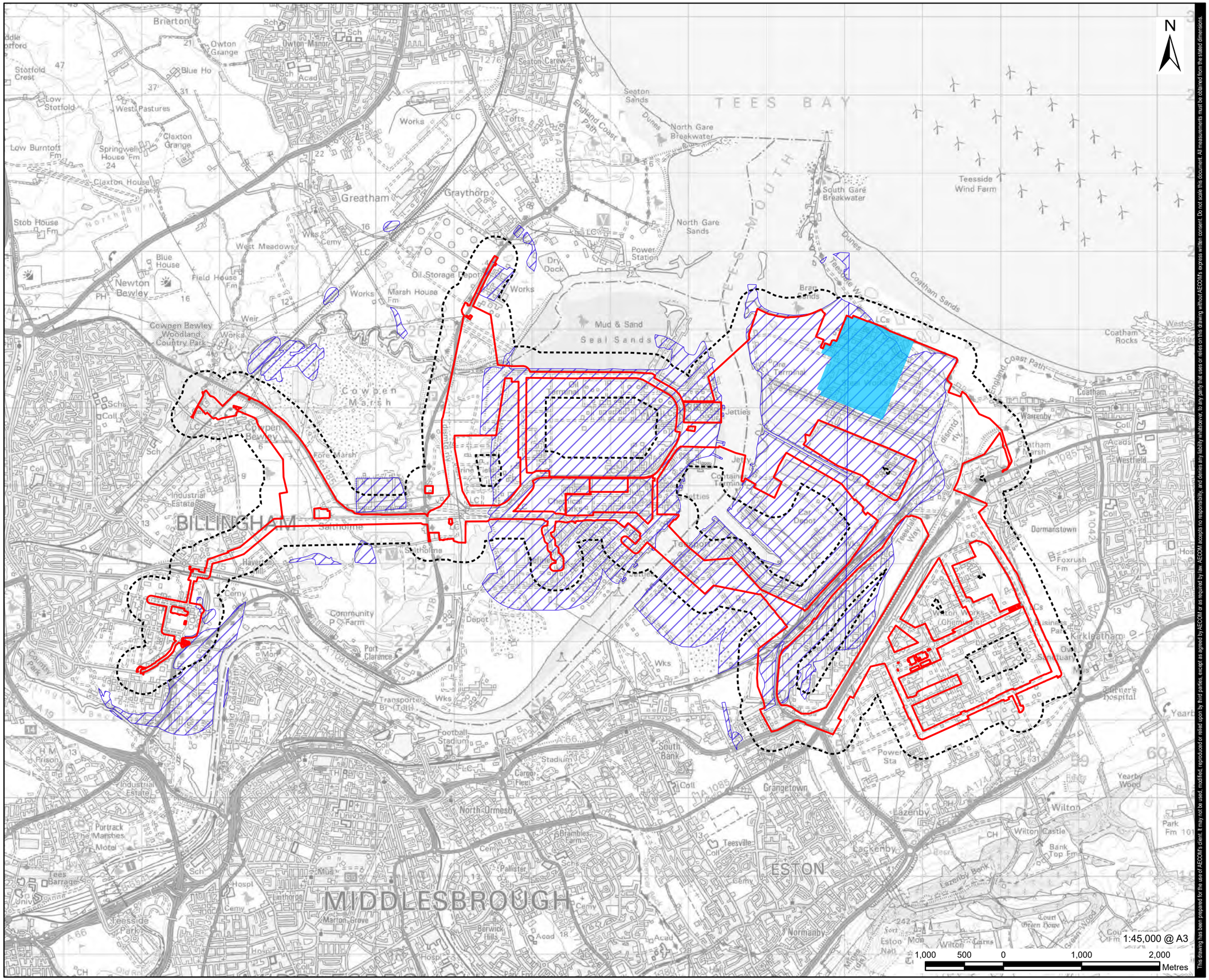

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APPLICANT

H2 Teesside Limited

CONSULTANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Artificial Geology (BGS 50k)

- Made Ground (Undivided)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Artificial Geology

FIGURE NUMBER

Figure 10-1

Revision: 0 Drawn: NK Checked: MB Approved: LF Date: 2023-09-12

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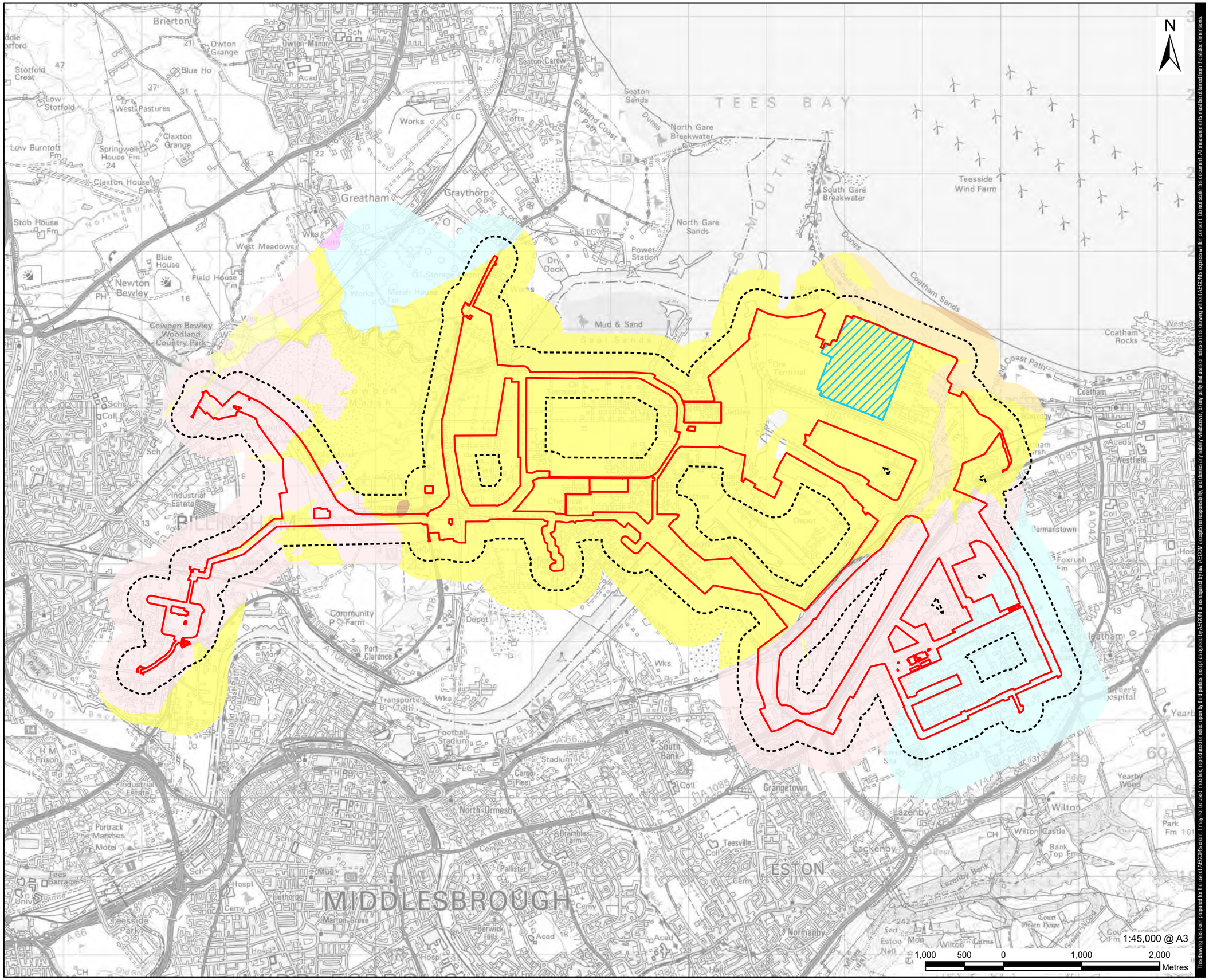

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1,000 500 0 1,000 2,000 Metres

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APPLICANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Superficial Geology (BGS 50k)

- Alluvium
- Beach And Tidal Flat Deposits (Undifferentiated)
- Blown Sand
- Glaciofluvial Deposits, Devensian
- Glaciolacustrine Deposits, Devensian
- Peat
- Tidal Flat Deposits
- Till, Devensian

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PEI Report

PROJECT NUMBER

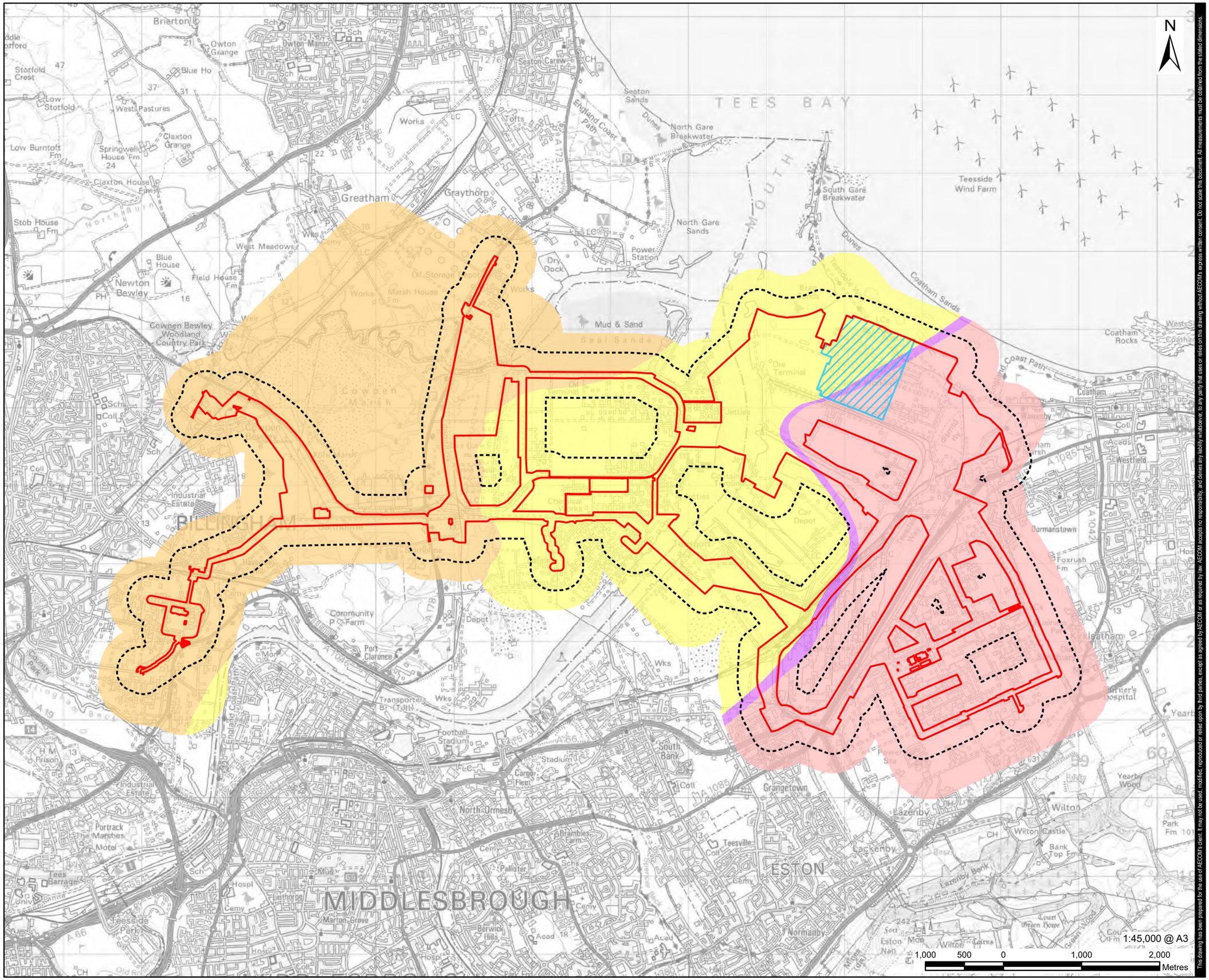
60689030

FIGURE TITLE

Superficial Geology

FIGURE NUMBER

Figure 10-2



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APPLICANT

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CONSULTANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Bedrock Geology (BGS 50k)

- Mercia Mudstone Group – Mudstone
- Penarth Group – Mudstone
- Redcar Mudstone Formation – Mudstone
- Sherwood Sandstone Group - Sandstone

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Bedrock Geology

FIGURE NUMBER

Figure 10-3

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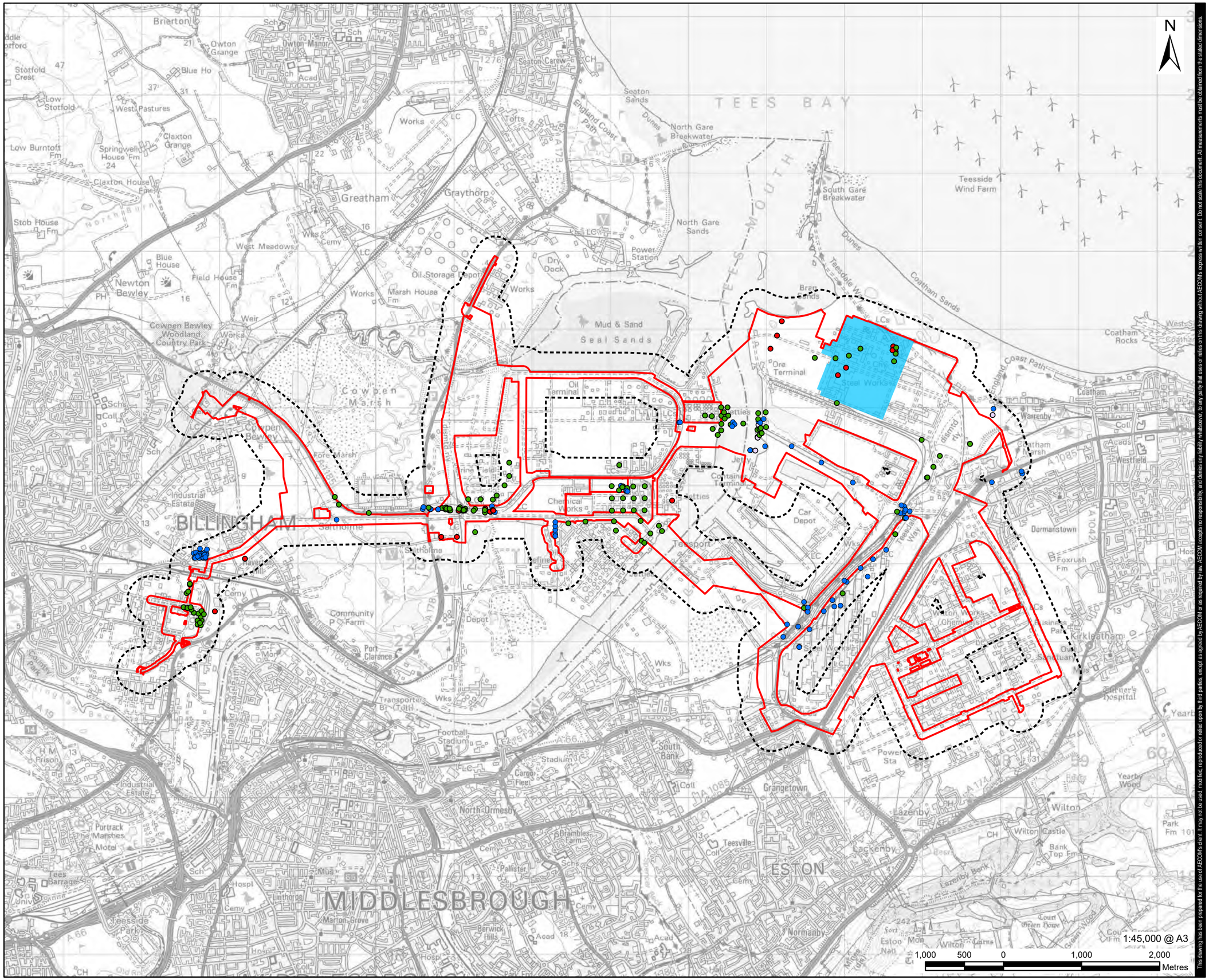

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APPLICANT

H2 Teesside Limited

CONSULTANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

BGS Borehole (Depth m)

- 0 - 10m
- 10 - 30m
- 30m +
- Other

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PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

BGS Boreholes

FIGURE NUMBER

Figure 10-4

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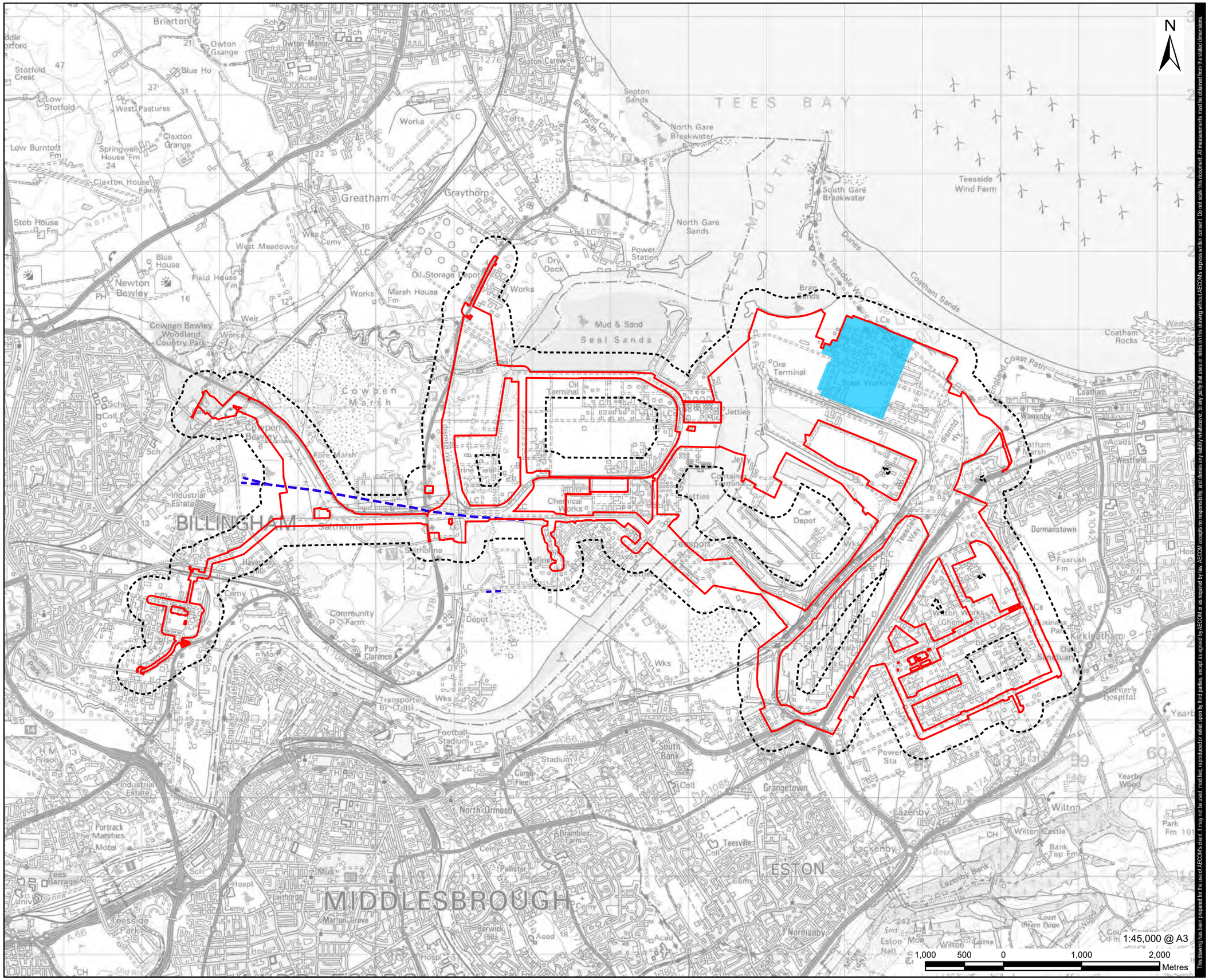

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APPLICANT

H2 Teesside Limited

CONSULTANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Bedrock Faults and Linear Features

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Faults and Linear Features

FIGURE NUMBER

Figure 10-5

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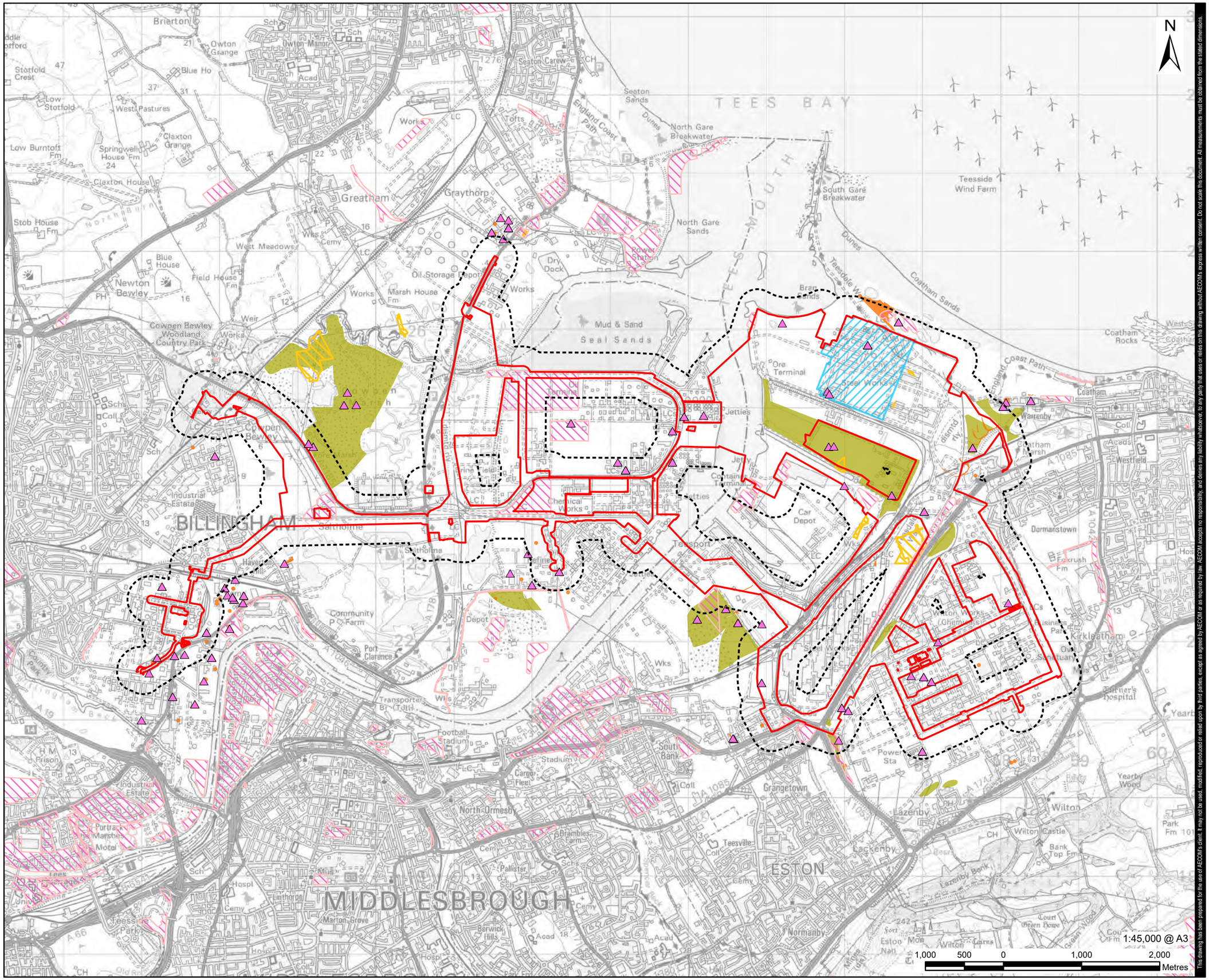

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Licensed Waste Site
- Historic Landfill Site
- Historical Waste Site
- Active or Recent Landfill
- Historical Landfill (Local Authority Mapping)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Waste and Landfills

FIGURE NUMBER

Figure 10-6

Revision: 0 Drawn: NK Checked: MB Approved: LF Date: 2023-09-12

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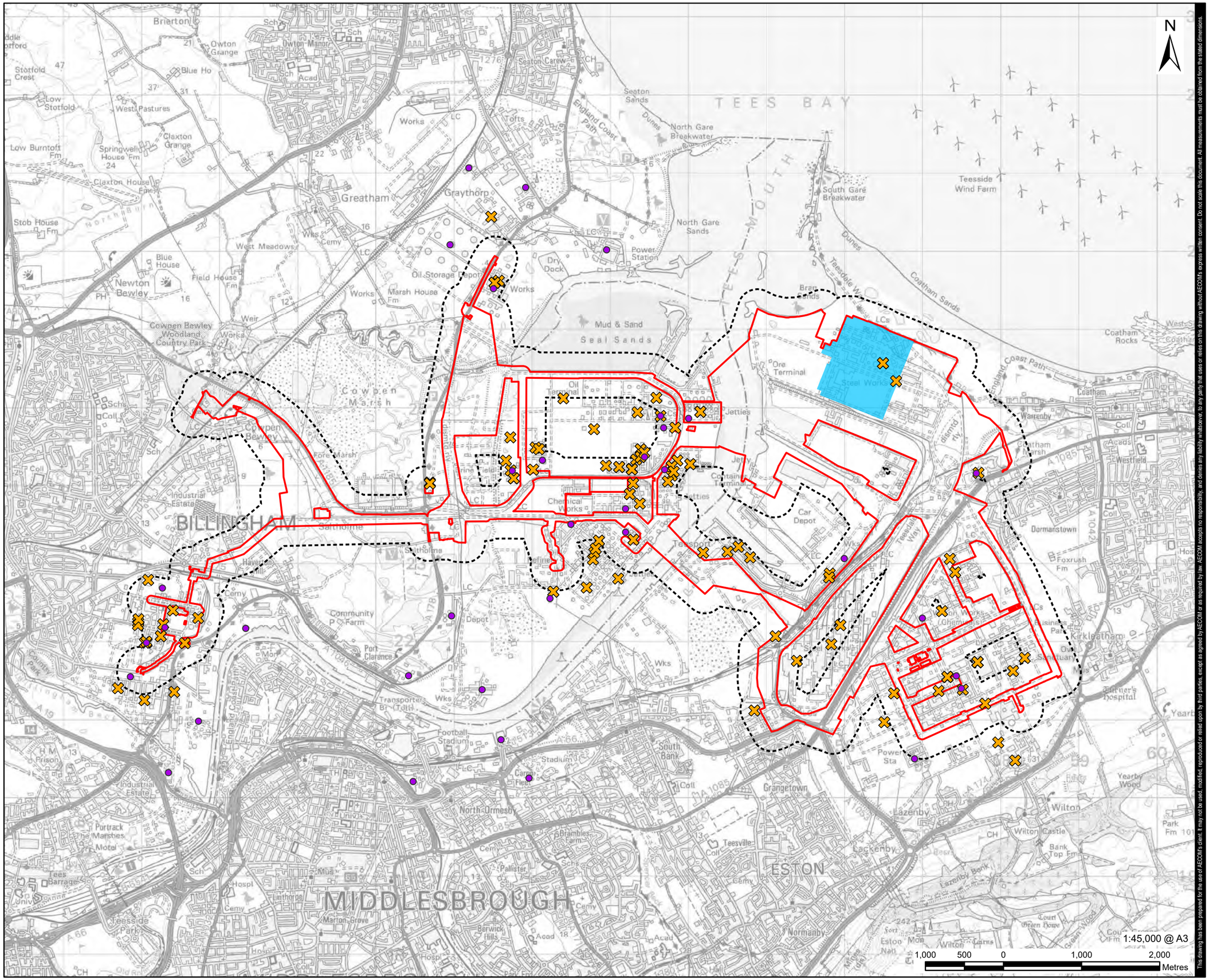

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Hazardous Substance Storage
- COMAH Site

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Hazardous Sites

FIGURE NUMBER

Figure 10-7

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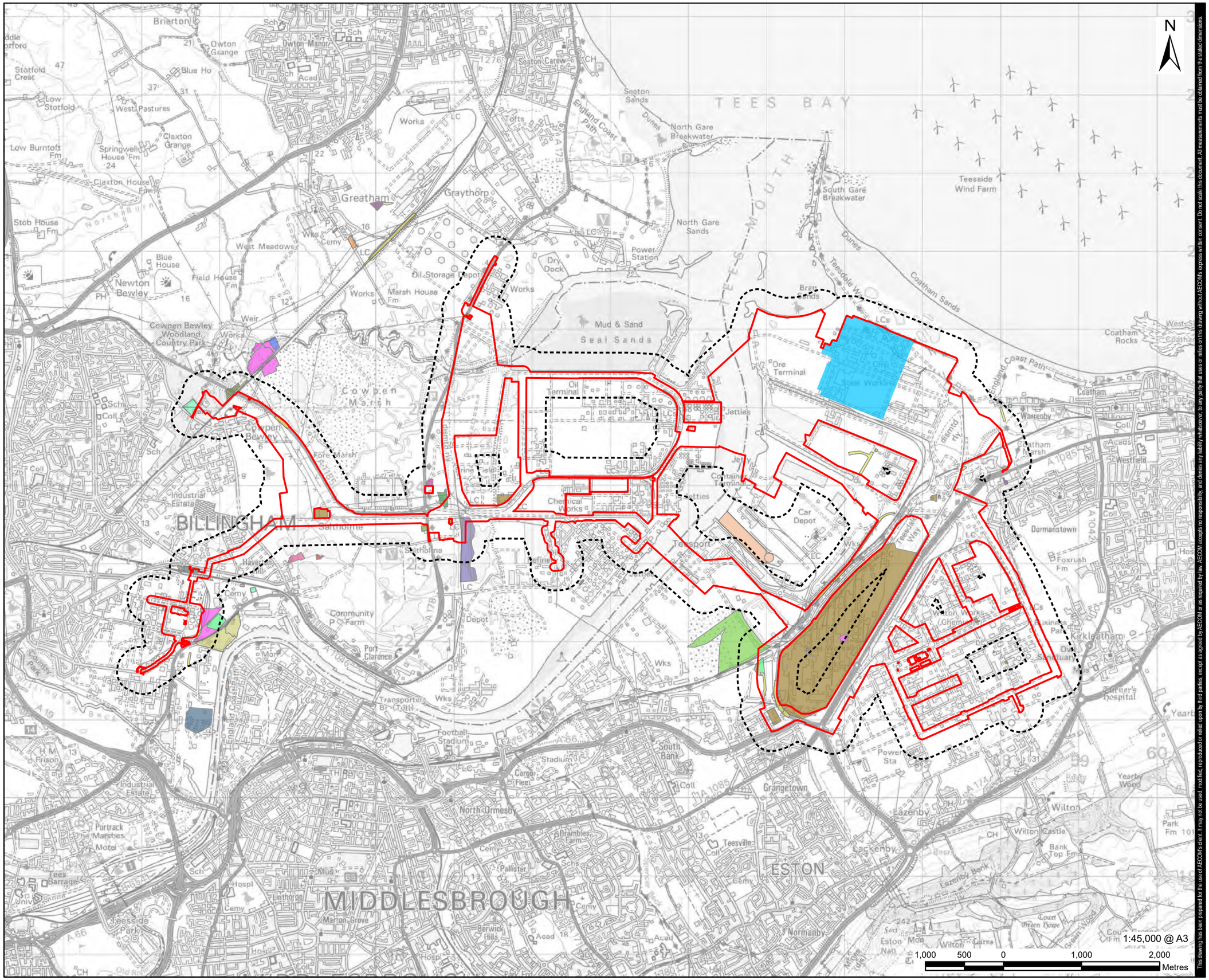

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1,000 500 0 1,000 2,000 Metres

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APPLICANT

H2 Teesside Limited

CONSULTANT

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100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Airport
- Bank Works
- Barracks
- Bedding Works
- Brick Work
- Brick and Tile Works
- Brick and Tile Yard
- Brine Reservoirs
- Brine Well
- Cement Works
- Cemetery
- Chemical Works
- Chimneys
- Clay Pit
- Cooling Pond
- Cooling Tanks
- Corporation Yard
- Cuttings
- Disused Brine Wells
- Disused Rifle Range
- Disused Salt Works
- Dock Yard
- Electric Substation
- Electricity Switch House
- Engine House
- Engine Shed
- Engineering Works
- Filter Beds
- Fire Station
- Gas Handling Station

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Historical Industrial Land Uses (Polygons)

FIGURE NUMBER

Figure 10-8a

Revision: 0 Drawn: NK Checked: MB Approved: LF Date: 2023-09-12

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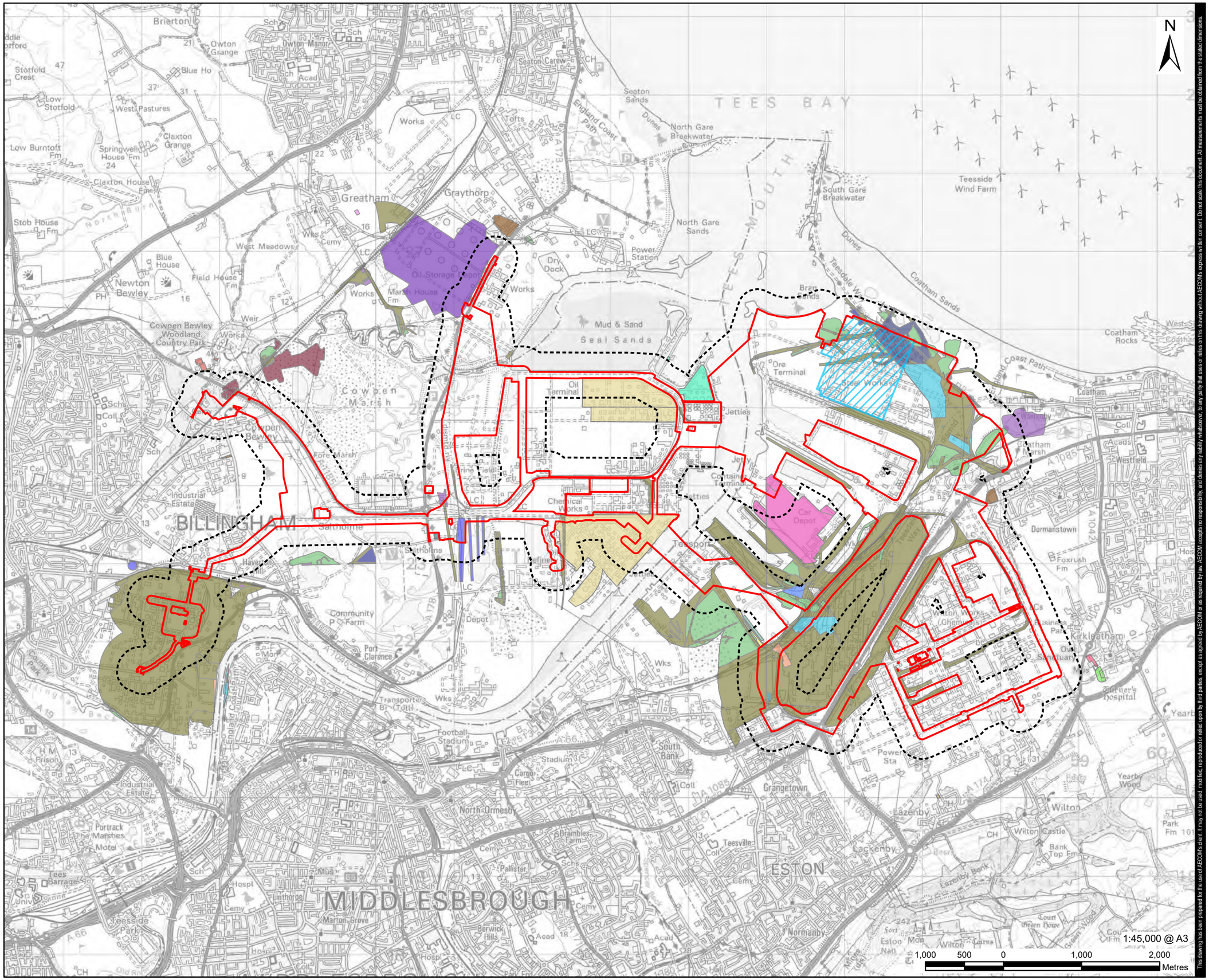

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APPLICANT

H2 Teesside Limited

CONSULTANT

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Cathedral Approach,
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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Gravel Heap
- Hospital
- Industrial Estate
- Iron Workings
- Iron and Steel Works
- Mortuary
- Nursery
- Oil Refinery
- Oil Storage Depot
- Oil Supply Terminal
- Oil Terminal
- Old Clay Pits
- Oxygen Works
- Phosphate Manure Works
- Police Station
- Power Station
- Pump House
- Pumping Station
- Railway Buildings
- Railway Engine Shed
- Railway Sidings
- Railway Station
- Refinery
- Refuse Heaps
- Rifle Ranges
- Salt works
- Sand Pit
- Sawmill
- Settling Beds
- Settling Pond

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Historical Industrial Land Uses (Polygons)

FIGURE NUMBER

Figure 10-8b

Revision: 0 Drawn: NK Checked: MB Approved: LF Date: 2023-09-12

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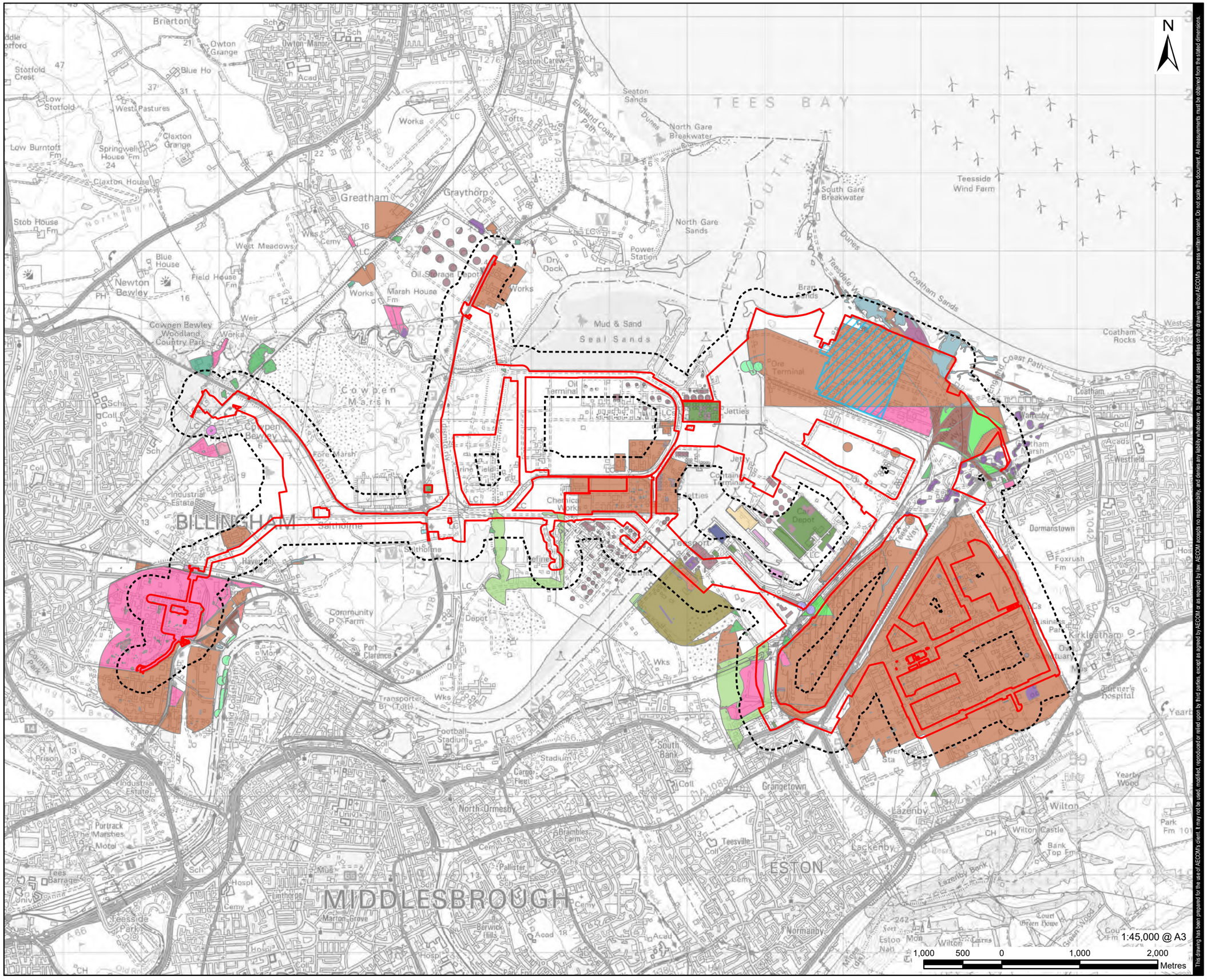

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APPLICANT

H2 Teesside Limited

CONSULTANT

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Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Sewage Works
- Ship Building Works
- Ship Building Yard
- Slag Brick Works
- Slag Reduction Works
- Slag Wool Works
- Slag Works
- Slag and Tar Macadam Works
- Smithy
- Steel Works
- Telephone Exchange
- Terminal
- Tramway Sidings
- Transit Shed
- Tunnel
- Unspecified Commercial/Industrial
- Unspecified Depot
- Unspecified Disused Works
- Unspecified Factory
- Unspecified Foundry
- Unspecified Ground Workings
- Unspecified Heaps
- Unspecified Mill
- Unspecified Pits
- Unspecified Tanks
- Unspecified Warehouses
- Unspecified Wharf
- Uspecified Workings
- Wire Mills

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60689030

FIGURE TITLE

Historical Industrial Land Uses (Polygons)

FIGURE NUMBER

Figure 10-8c

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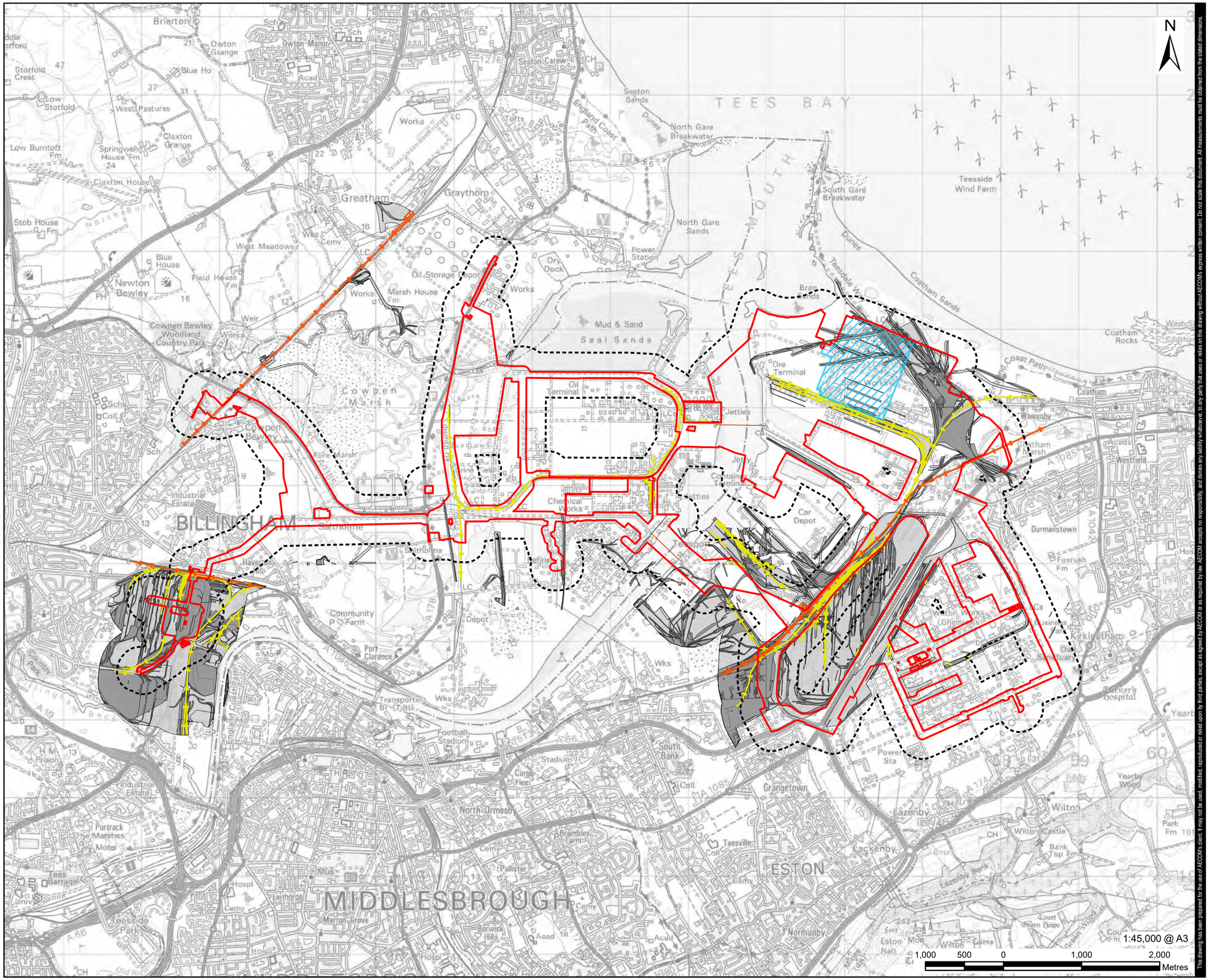
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TEES BAY
BILLINGHAM
MIDDLESBROUGH
ESTON
Greatham
Graythorp
Seaton Carew
Seaton Sands
North Gare Breakwater
South Gare Breakwater
North Gare Sands
Teesside Wind Farm
Power Station
Dry Dock
Oil Storage Depot
Mud & Sand
Seal Sands
Ore Terminal
Oil Terminal
Jetties
Chemical Works
Car Depot
Coatham Sands
Coatham Rocks
Coast Path
England Coast Path
Dunes
Brierton
Owton Manor
Owton Grange
Claxton Grange
Newton Bewley
Cowpen Bewley
Cowpen Marsh
Marsh House
Field House Fm
Blue House
Claxton House Fm
Springwell House Fm
Low Burntoft Fm
Stob House Fm
Low Stotfold
Stotfold Crest
West Pastures
West Meadows
Woodland Country Park
Industrial Estate
Port Clarence
Transporter Br (Toll)
Football Stadium
Cargo Fleet
North Ormesby
Grangetown
South Bank
Lazenby
Wilton
Wilton Castle
Dormanstown
Kirkleatham
Coatham
Redcar
Warrenby
Eston Nab
Normanby
Teesville
Brambles Farm
Pallister
Marton Grove
Berwick Hills
Linthorpe
Teesside Park
Portrack
Tees Barrage
Yearby Wood
Foxrush Fm
Park Fm
Bank Top Fm
Lazenby Bank
Court Green House
Great Wood
Westfield
Community P Farm
Havelock Mill
Sathorne
Wks
Works
Depot
Cemy
Coll
Acad
Sch
Hospl
Mus
Prison
Power Sta
Chemical Works
Car Depot
Jetties
Oil Terminal
Ore Terminal
Dry Dock
Power Station
Oil Storage Depot
Marsh House
Weir
Tofts
Works
Wks
Cemy
Coll
Sch
Acad

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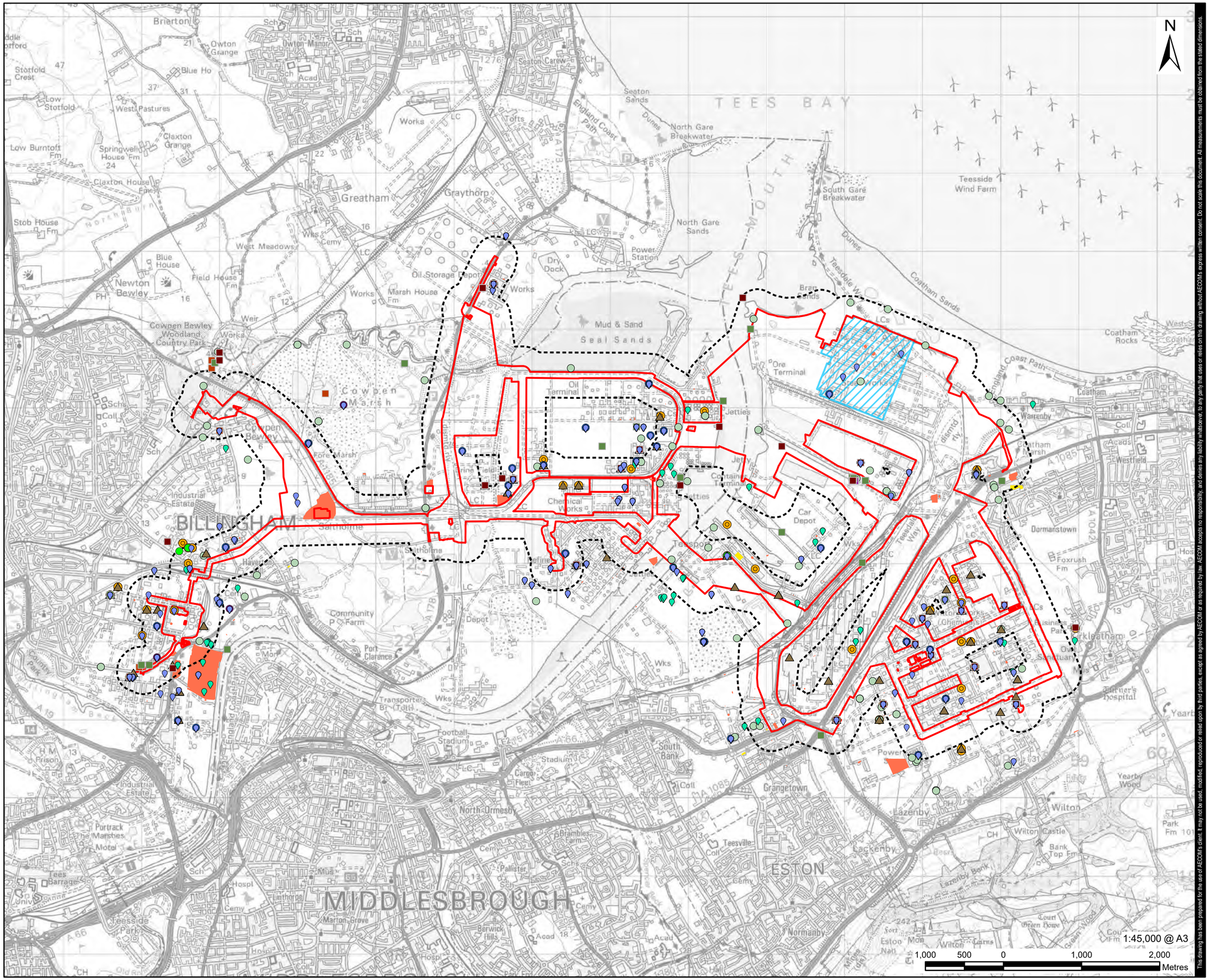

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Licensed Industrial Activities PartA1
- Licensed Pollutant Release PartA2 B
- List 1 Dangerous Substances
- List 2 Dangerous Substances
- Pollutant Release to Public Sewer
- Pollutant Release To Surface Waters Red List
- Pollution Incidents
- Pollution Inventory Radioactive
- Pollution Inventory Substances
- Pollution Inventory Waste Transfer
- Radioactive Substance Authorisations
- Historical Licensed Industrial Activities
- Historical Energy Features
- Historical Garages

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Historical Industrial Land Use - Other Features

FIGURE NUMBER

Figure 10-8e

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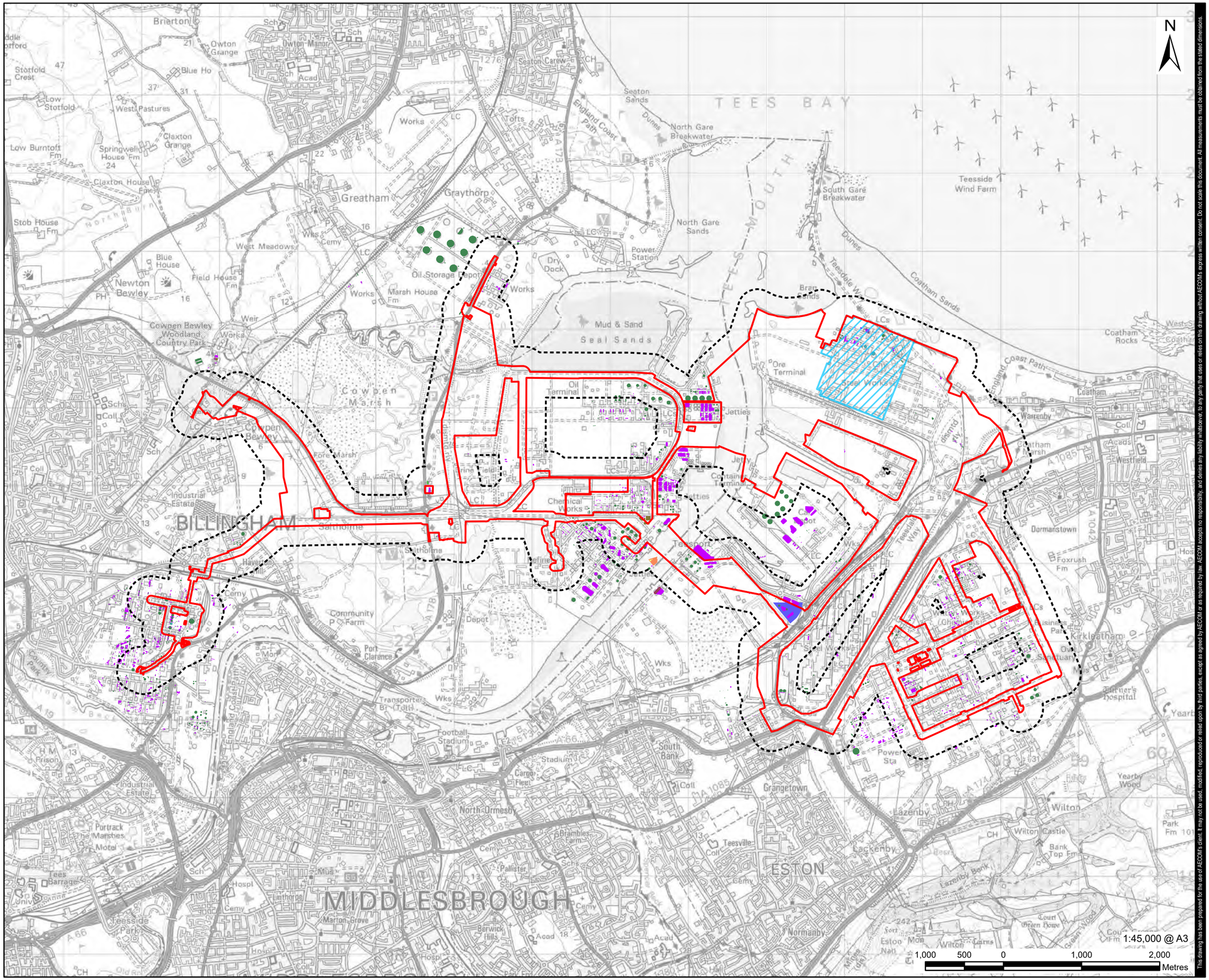

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Historical Tank

- Cooling Tank
- Gas Holder Station
- Gas Works
- Gas Holder
- Gasometer
- Oil Tank
- Oxygen Tank
- Settling Tank
- Tank Farm
- Tanks
- Unspecified Tank

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ISSUE PURPOSE

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PROJECT NUMBER

60689030

FIGURE TITLE

Historical Tanks

FIGURE NUMBER

Figure 10-9

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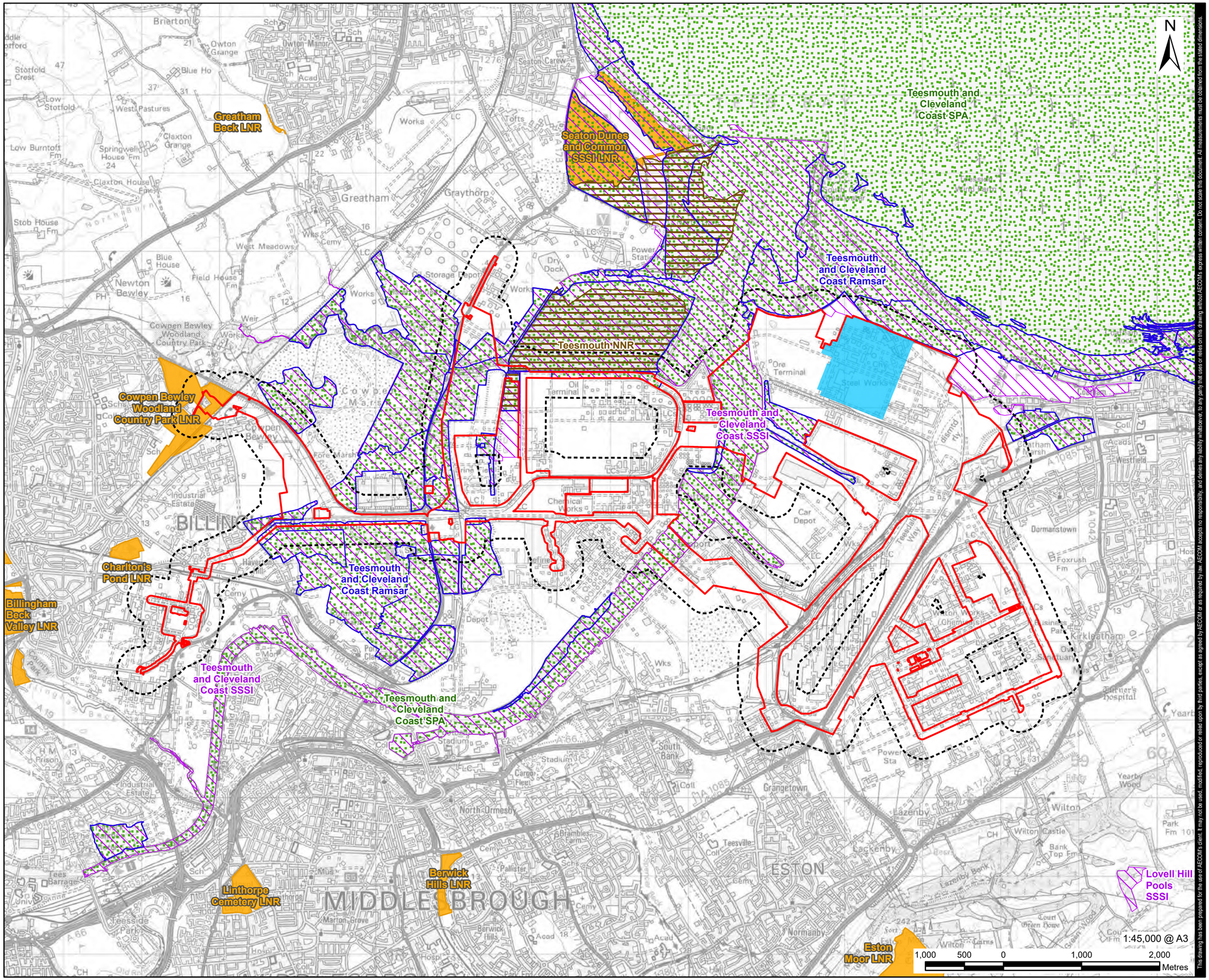

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Ramsar
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Ecological Designations

FIGURE NUMBER

Figure 10-10

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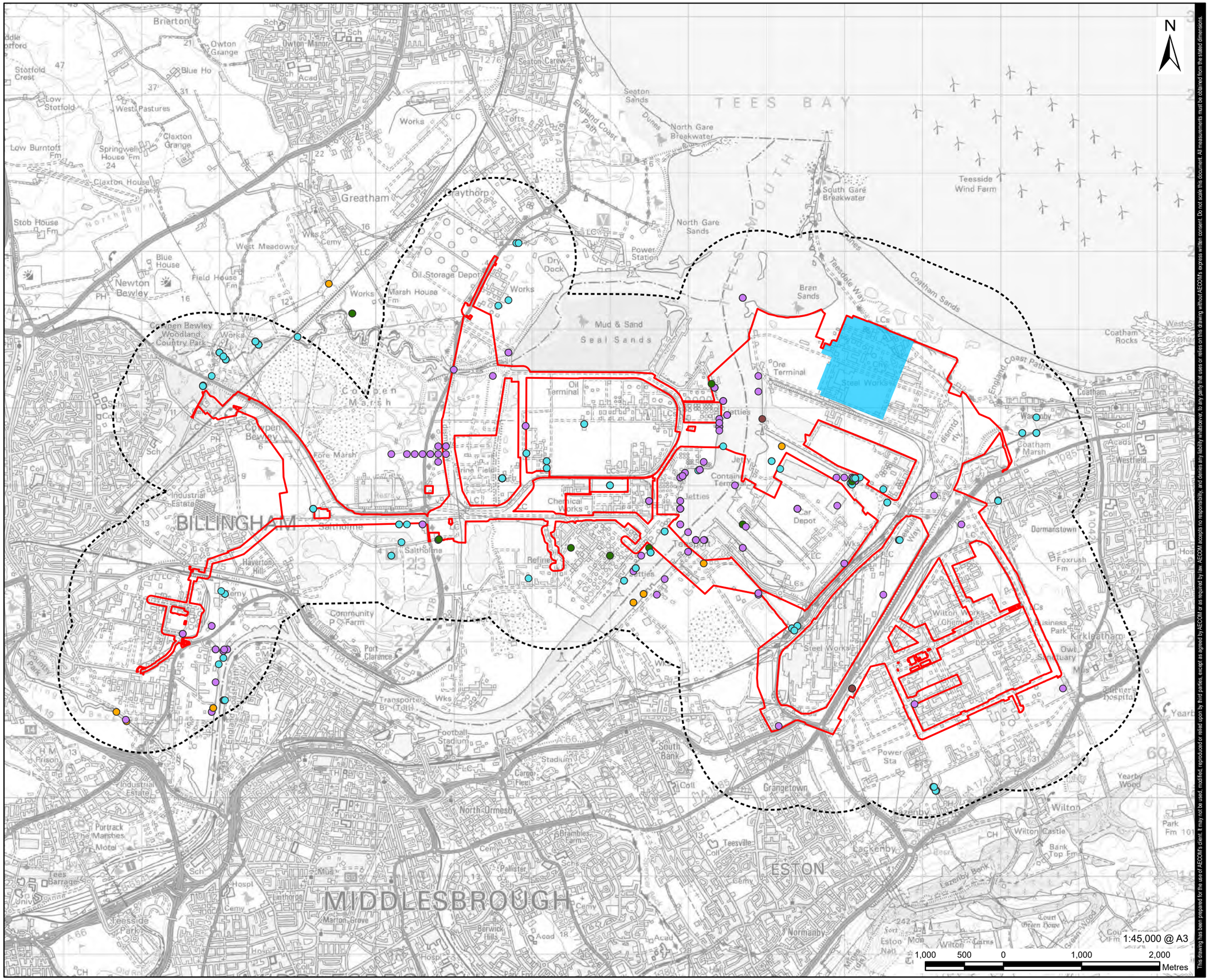

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site

Licensed Discharges To Controlled Waters

- Miscellaneous Discharge
- Sewage and Trade Discharge
- Sewage Discharge
- Trade Discharge
- Unspecified Discharge

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Discharge Consents

FIGURE NUMBER

Figure 10-11

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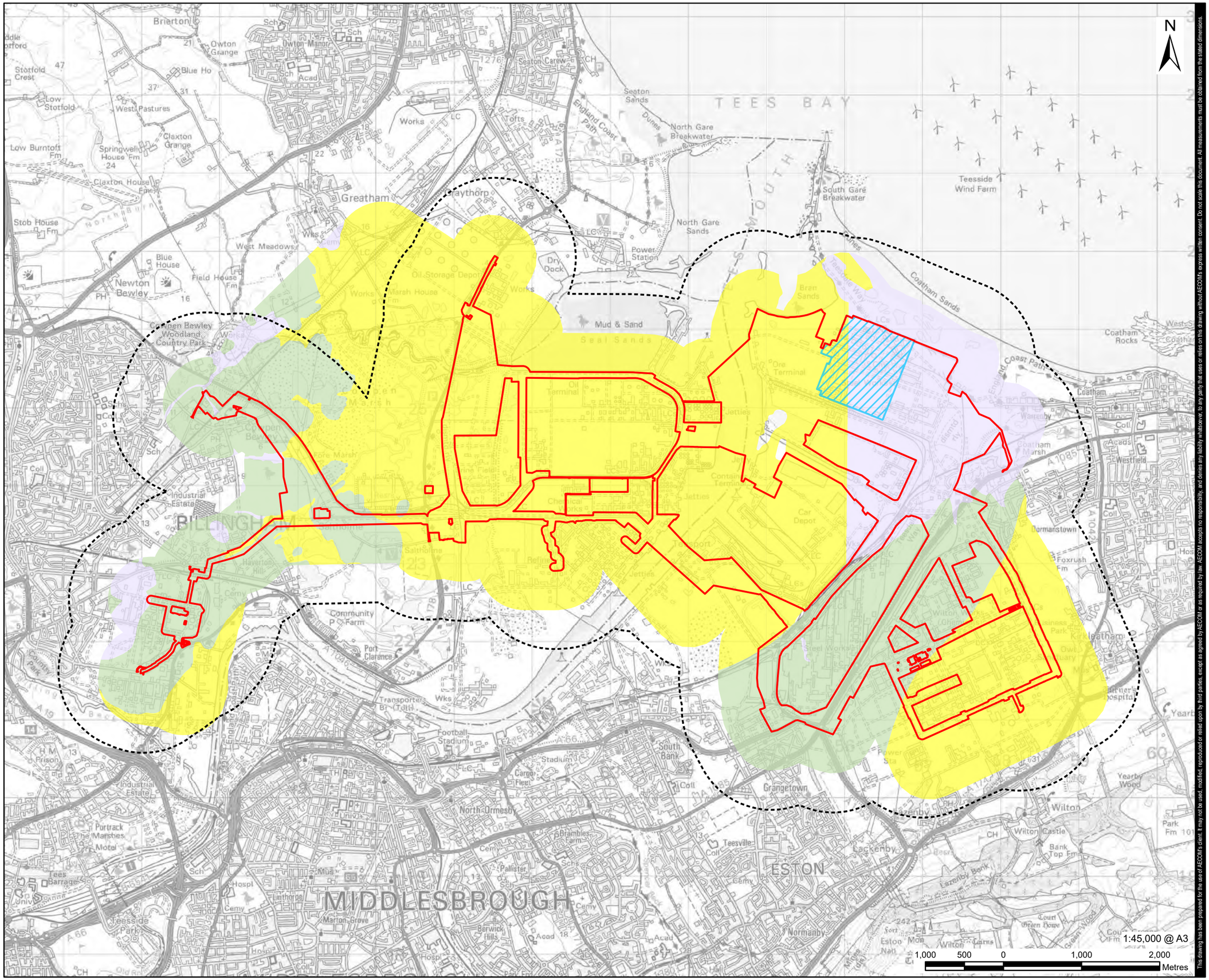

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site

Superficial Aquifer

- Superficial Aquifer - Secondary A
- Superficial Aquifer - Undifferentiated
- Superficial Aquifer - Unproductive

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PEI Report

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FIGURE TITLE

Superficial Aquifers

FIGURE NUMBER

Figure 10-12

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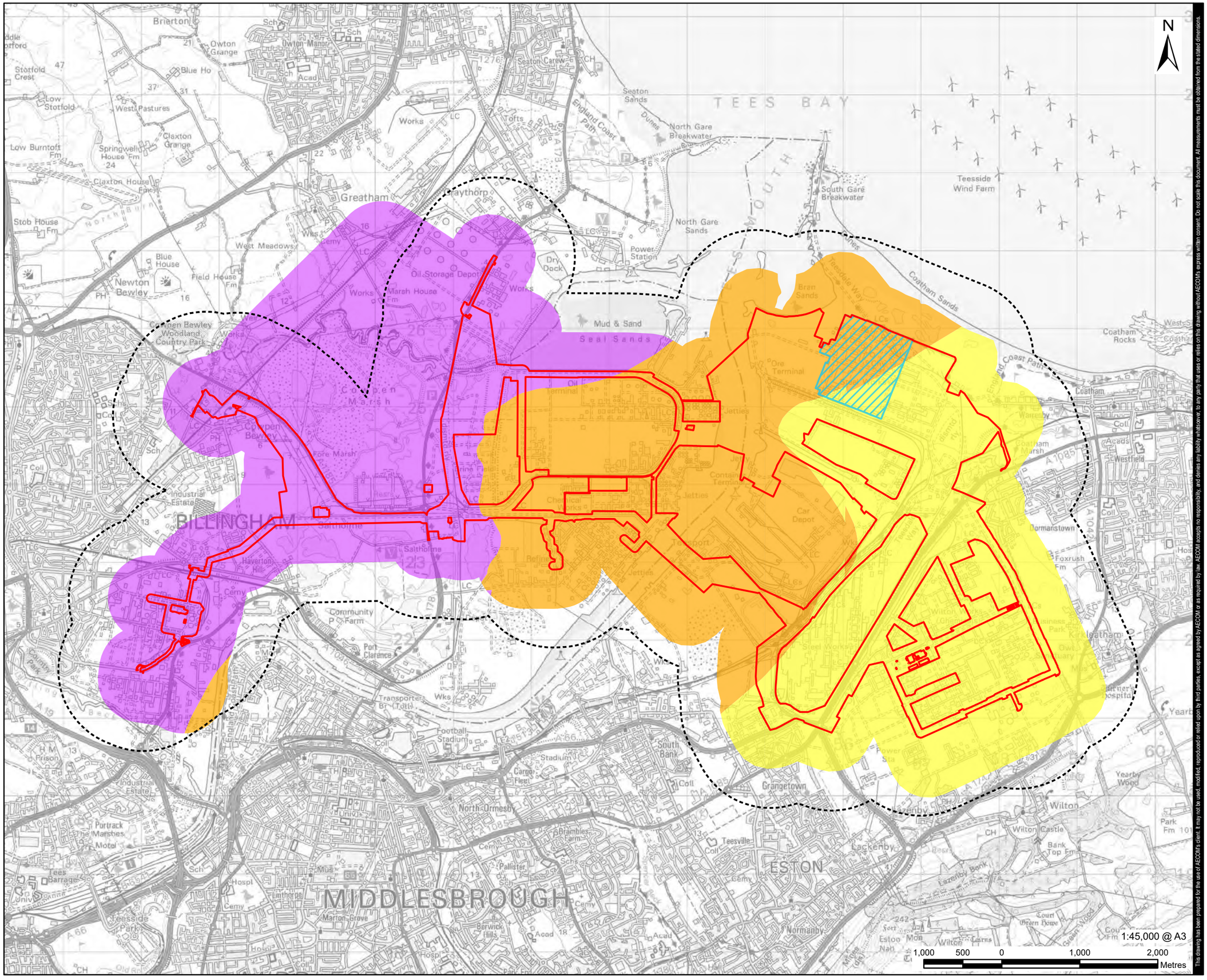

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site

Bedrock Aquifer

- Principal Aquifer
- Secondary Aquifer - Undifferentiated
- Secondary Aquifer - B

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FIGURE TITLE

Bedrock Aquifers

FIGURE NUMBER

Figure 10-13

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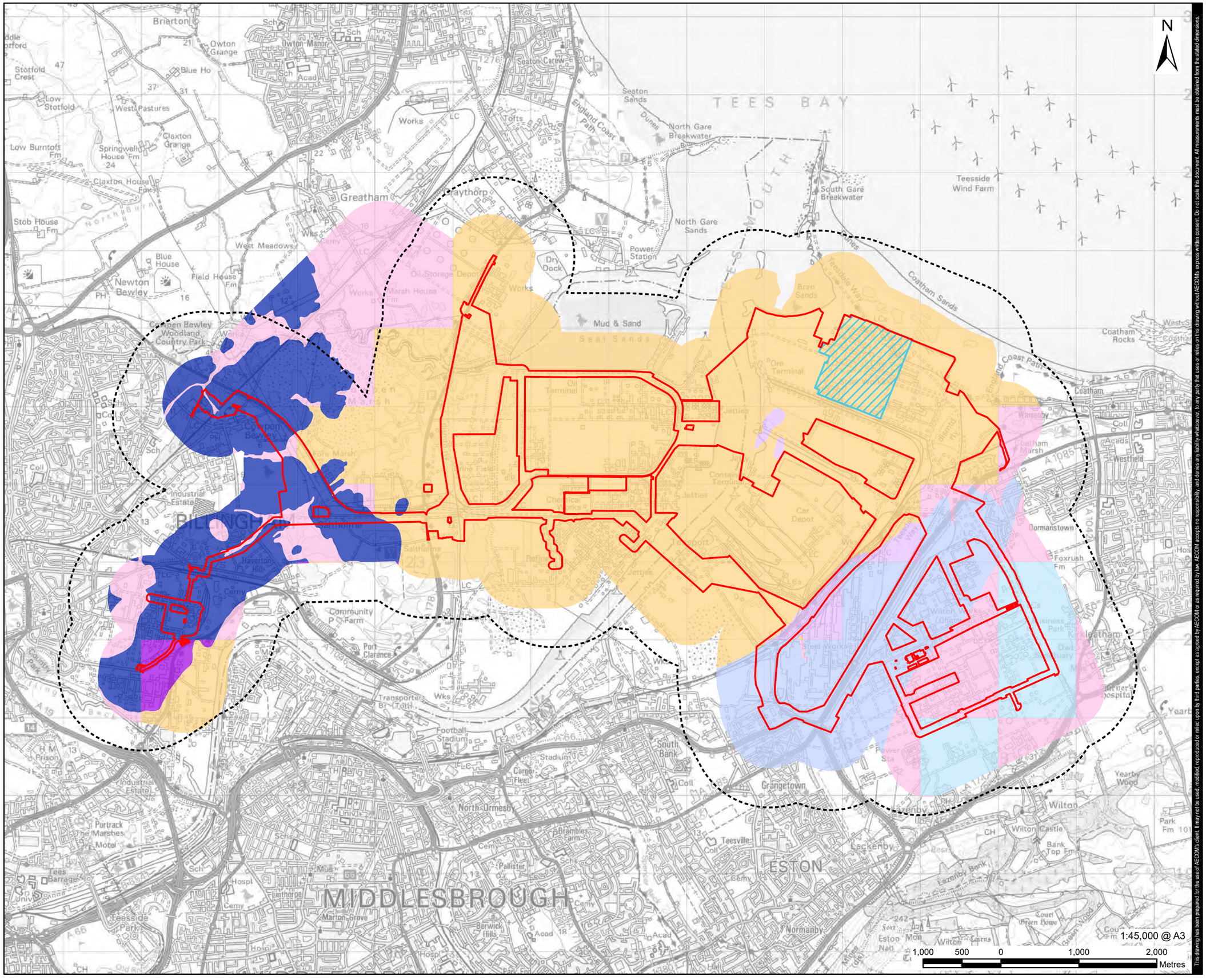

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site

Groundwater Vulnerability

- Principal bedrock aquifer - Low Vulnerability
- Principal bedrock aquifer - Medium Vulnerability
- Secondary superficial aquifer - Low Vulnerability
- Secondary superficial aquifer - Medium Vulnerability
- Secondary superficial aquifer - High Vulnerability
- Secondary bedrock aquifer - Low Vulnerability
- Secondary bedrock aquifer - Medium Vulnerability

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PROJECT NUMBER

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FIGURE TITLE

Groundwater Vulnerability

FIGURE NUMBER

Figure 10-14

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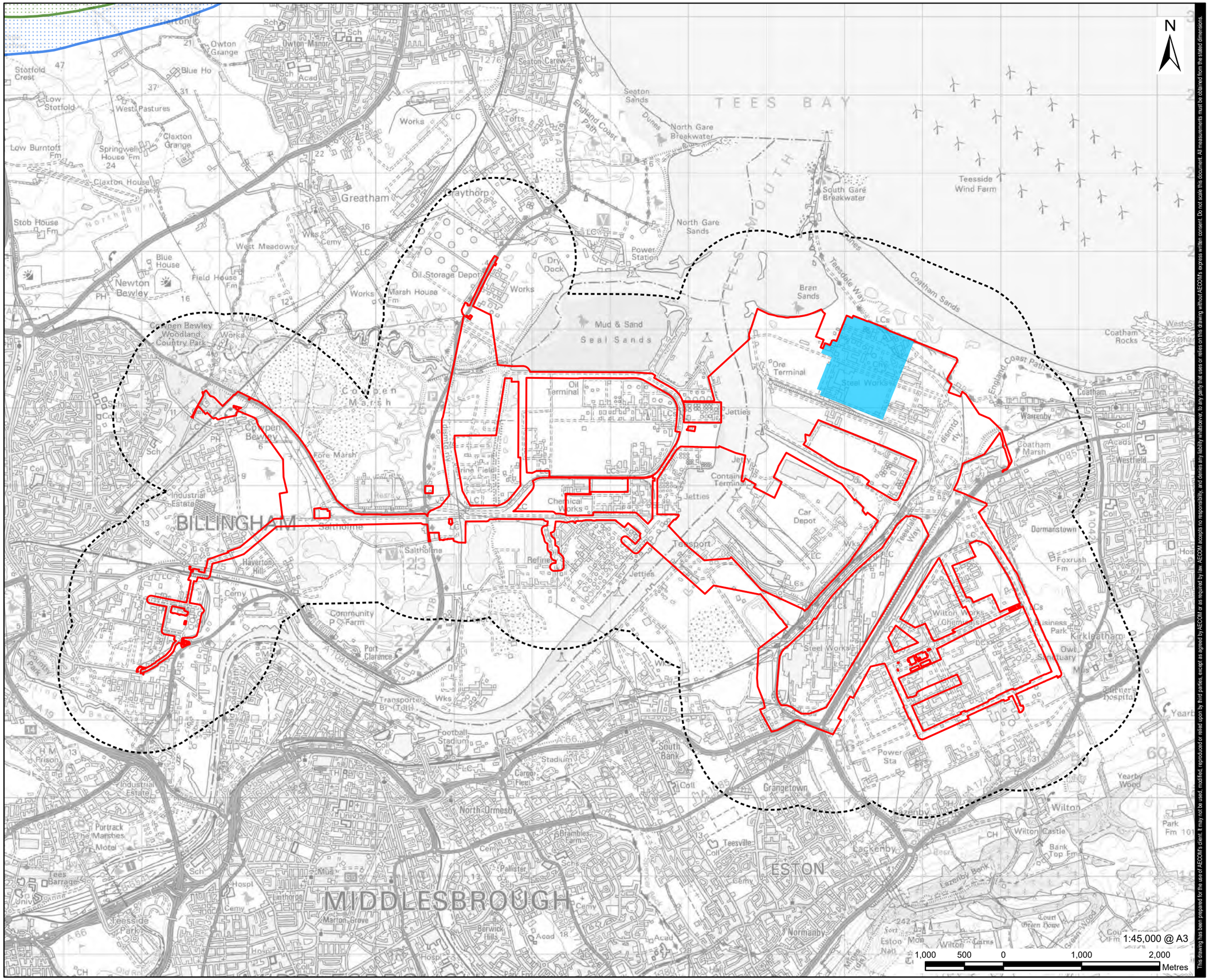

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H2 Teesside Limited

CONSULTANT

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Cathedral Approach,
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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site

Source Protection Zone

- Zone II - Outer Protection Zone
- Zone III - Total Catchment

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PROJECT NUMBER

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FIGURE TITLE

Groundwater Source Protection Zones

FIGURE NUMBER

Figure 10-15

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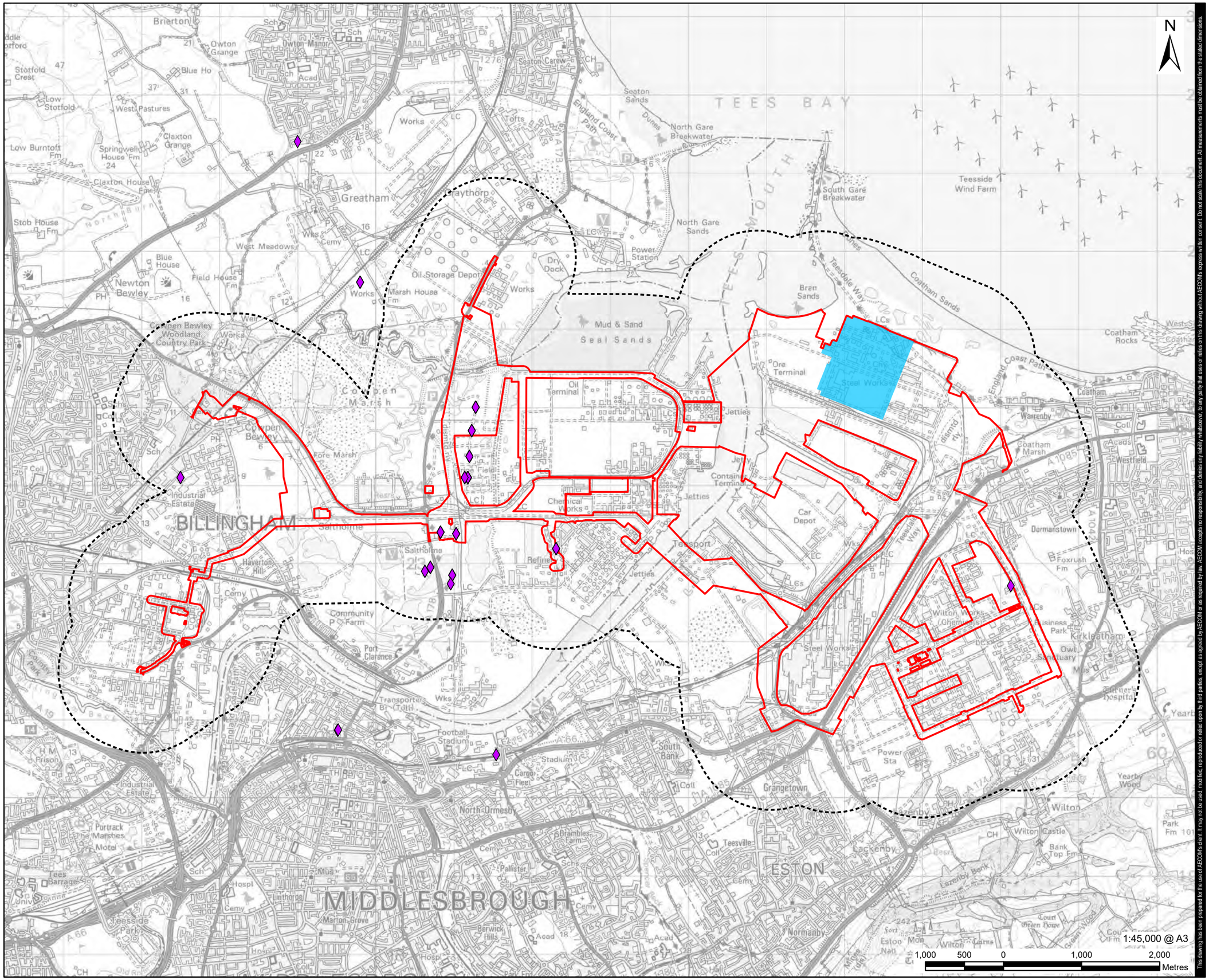

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site
- Groundwater Abstractions

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Groundwater Abstractions

FIGURE NUMBER

Figure 10-16

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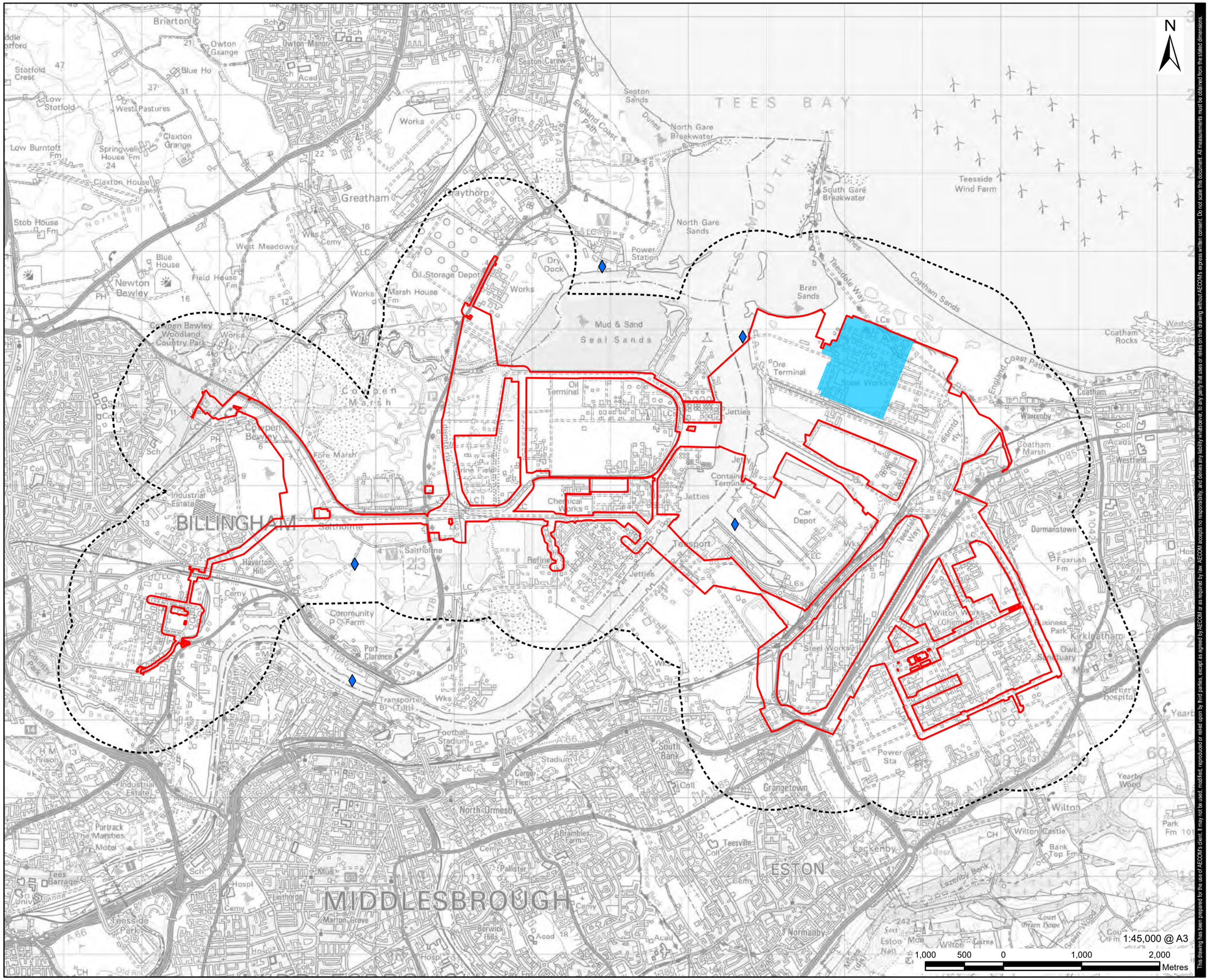

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site
- Surface Water Abstractions

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PEI Report

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60689030

FIGURE TITLE

Surface Water Abstractions

FIGURE NUMBER

Figure 10-17

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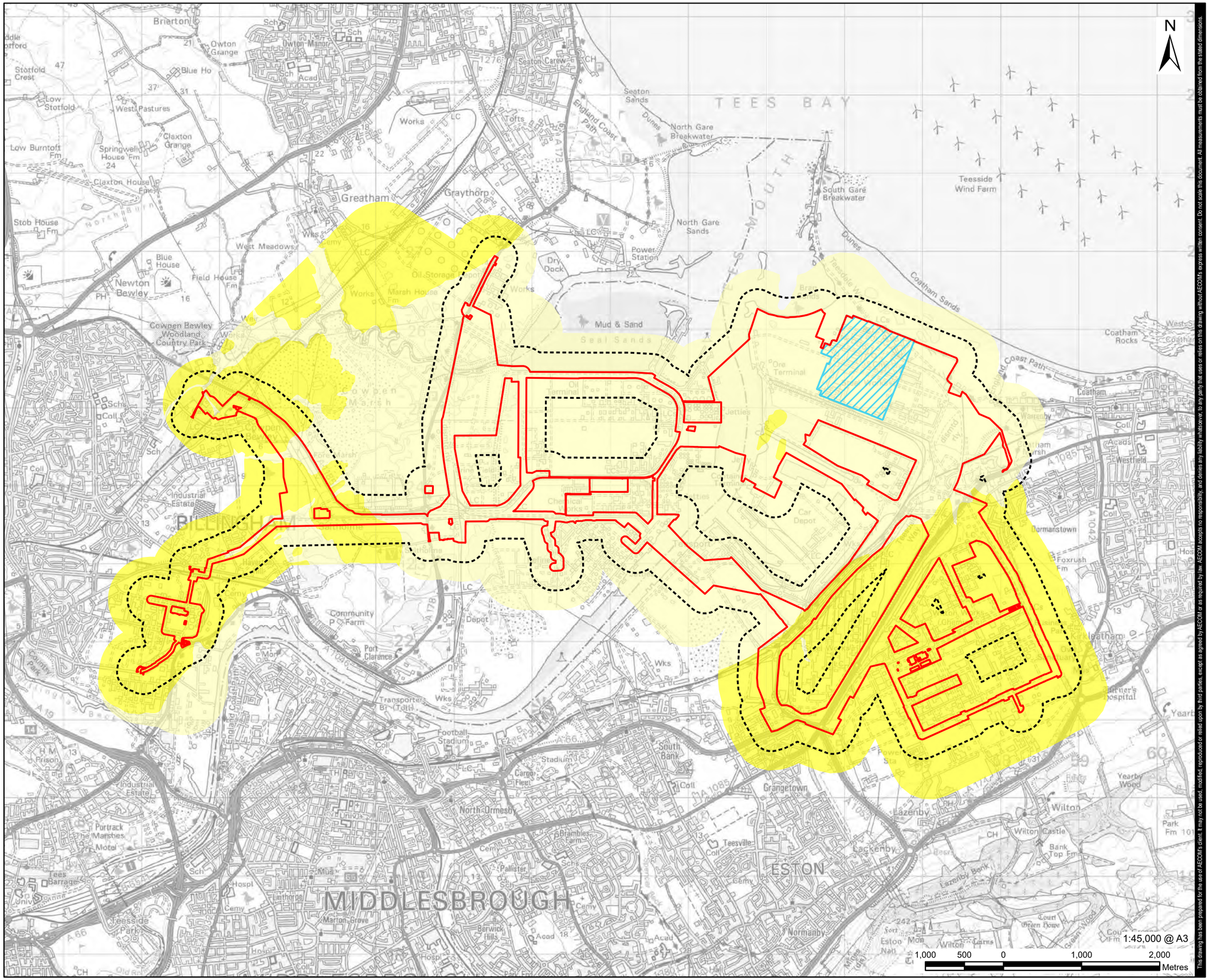

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Natural Ground Subsidence - Collapsible Deposits

- Deposits with potential to collapse when loaded and saturated are believed not to be present.
- Deposits with potential to collapse when loaded and saturated are unlikely to be present.

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PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Natural Ground Subsidence - Collapsible Deposits

FIGURE NUMBER

Figure 10-18a

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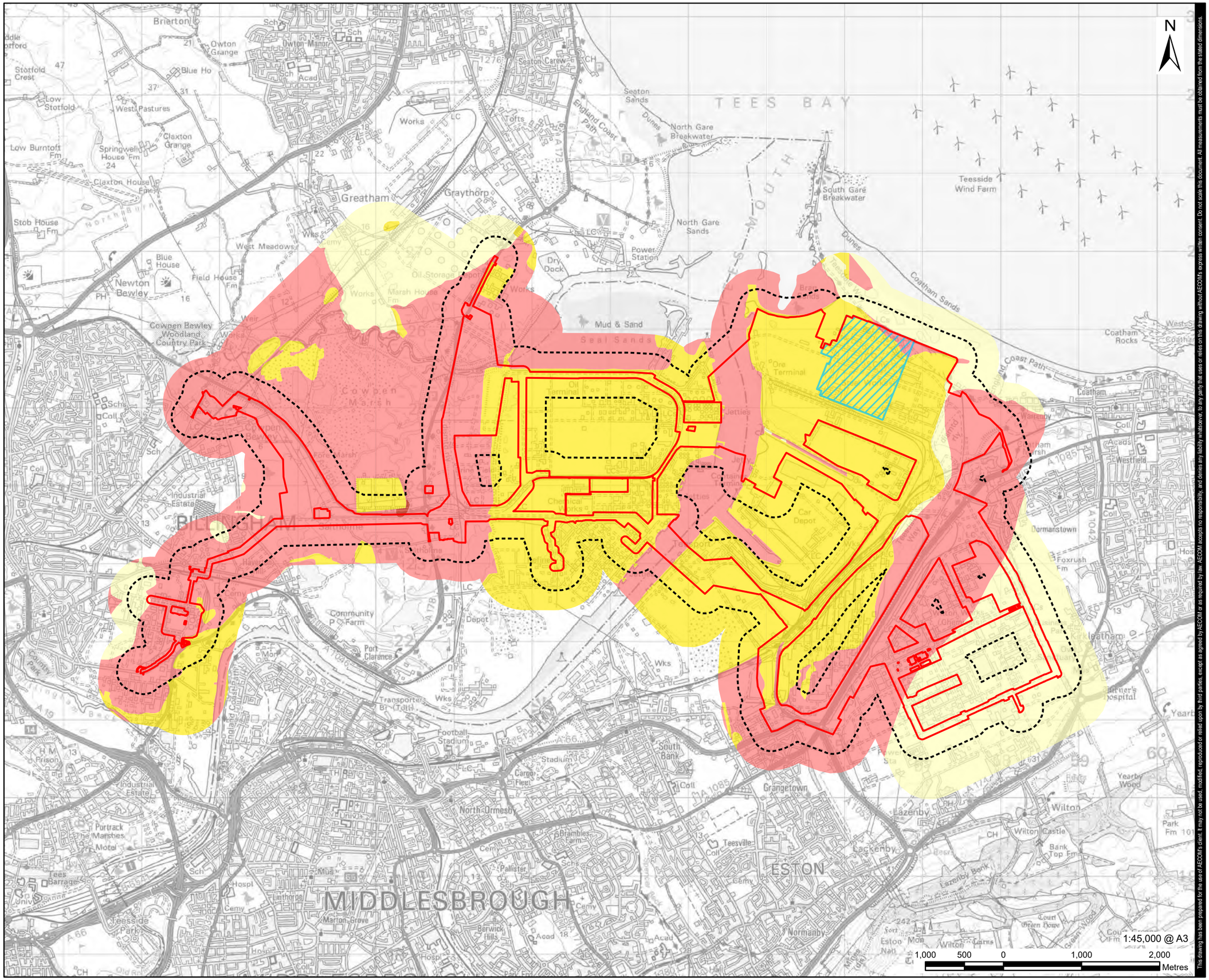

1:45,000 @ A3

1,000 500 0 1,000 2,000 Metres

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Natural Ground Subsidence - Compressible Deposits

- Compressible strata are not thought to occur.
- Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.
- Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.
- Highly compressible strata present. Significant constraint on land use depending on thickness.

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FIGURE TITLE

Natural Ground Subsidence - Compressible Deposits

FIGURE NUMBER

Figure 10-18b

Revision: 0 Drawn: NK Checked: MB Approved: LF Date: 2023-09-13

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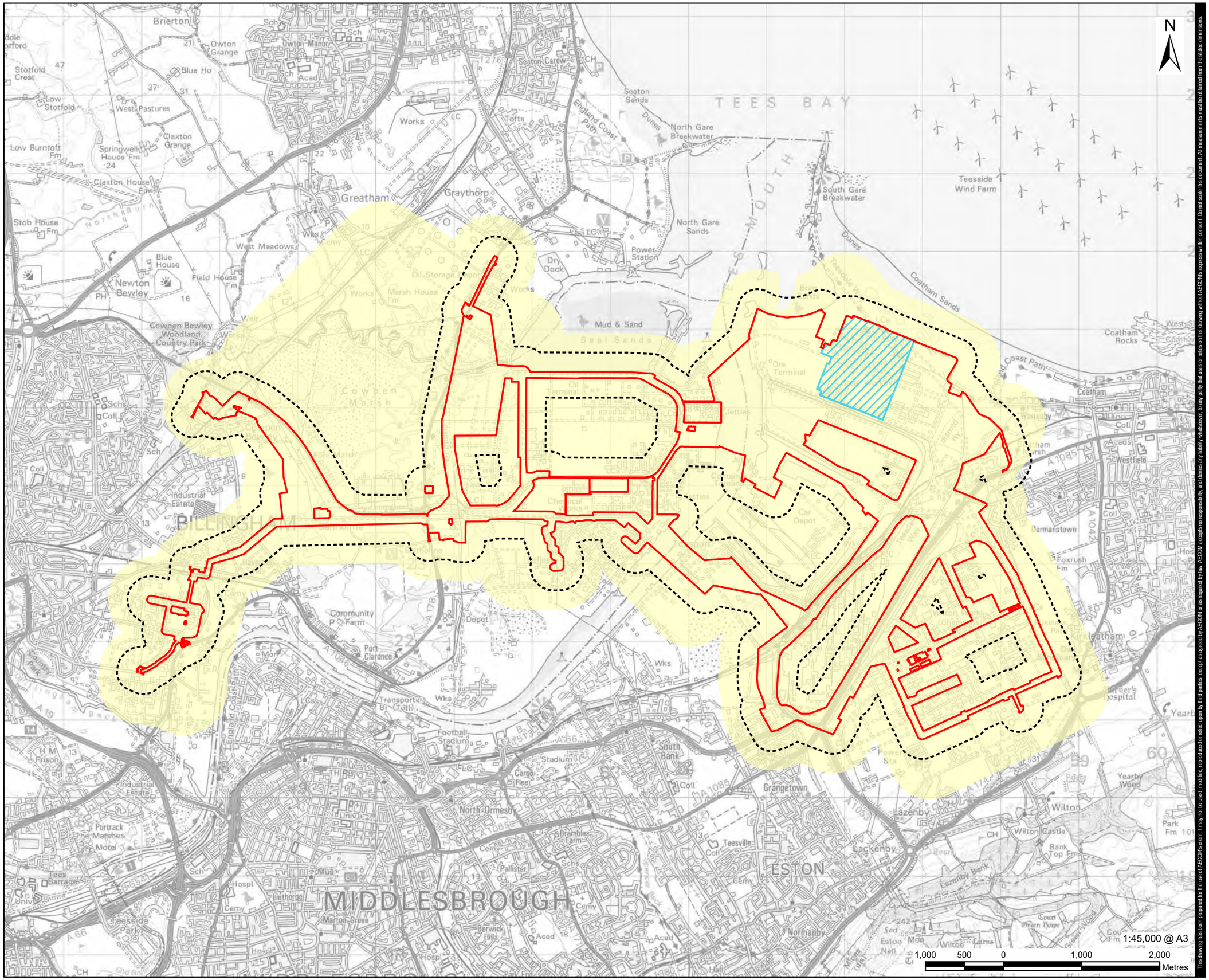

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Natural Ground Subsidence - Ground Dissolution of Soluble Rocks

Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Natural Ground Subsidence - Ground Dissolution of Soluble Rocks

FIGURE NUMBER

Figure 10-18c

Revision: 0 Drawn: NK Checked: MB Approved: LF Date: 2023-09-13

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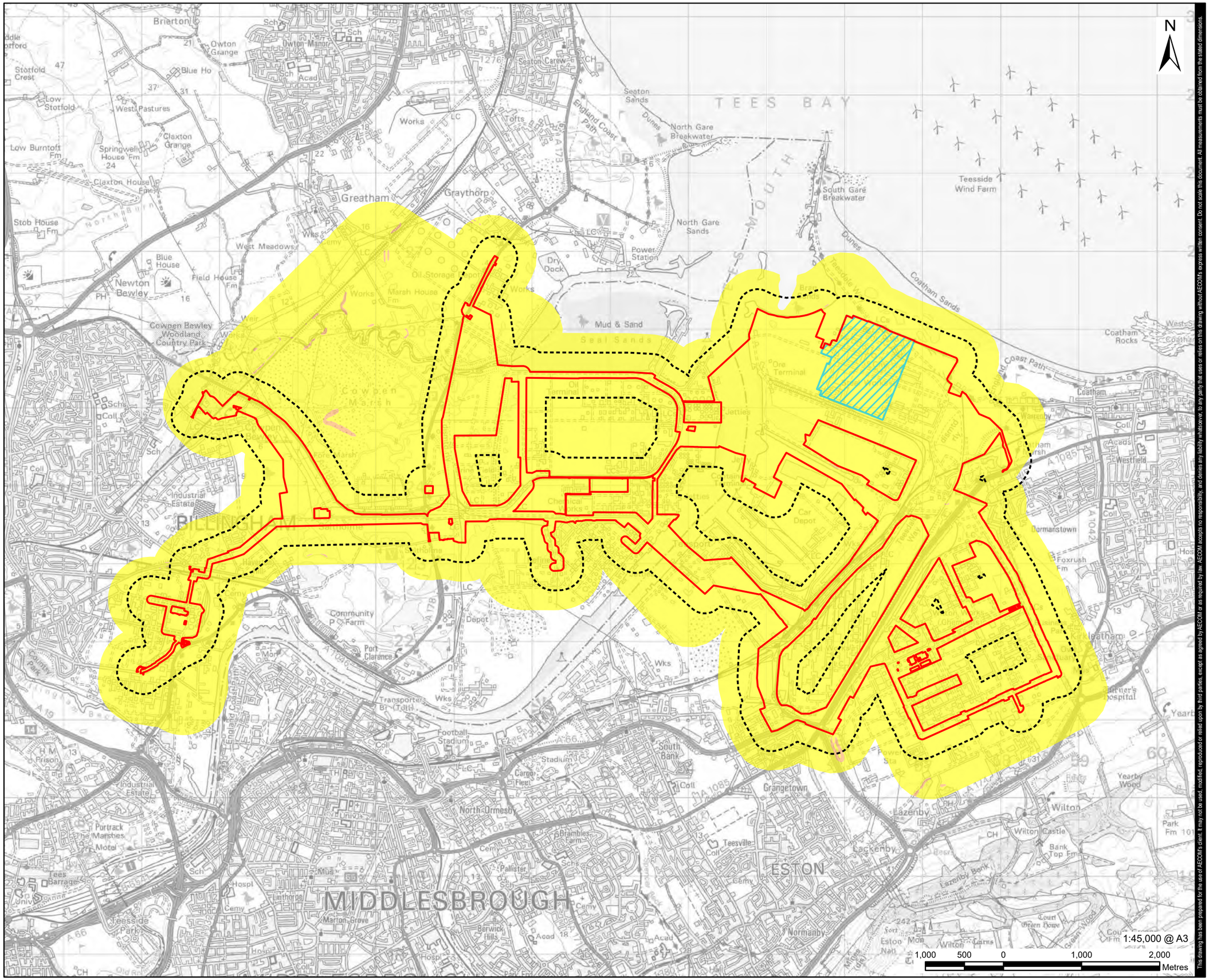

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H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Natural Ground Subsidence - Landslides

- Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.
- Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Natural Ground Subsidence - Landslides

FIGURE NUMBER

Figure 10-18d

Revision: 0 Drawn: NK Checked: MB Approved: LF Date: 2023-09-13

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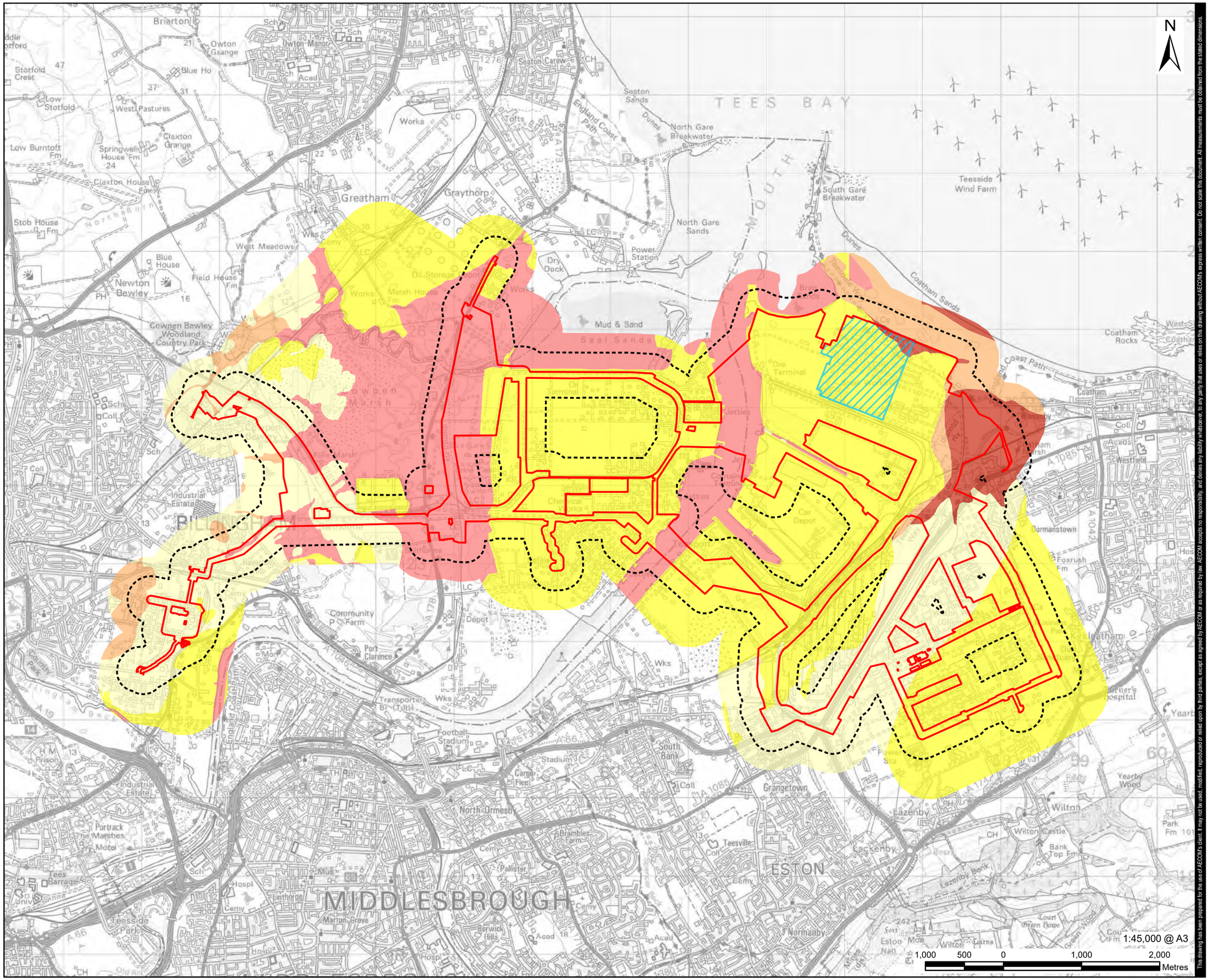

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Natural Ground Subsidence - Running Sand

- Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.
- Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.
- Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.
- Running sand conditions are probably present. Constraints may apply to land uses involving excavation or the addition or removal of water.
- Running sand conditions are almost certainly present. Constraints will apply to land uses involving excavation or the addition or removal of water.

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Natural Ground Subsidence - Running Sand

FIGURE NUMBER

Figure 10-18e

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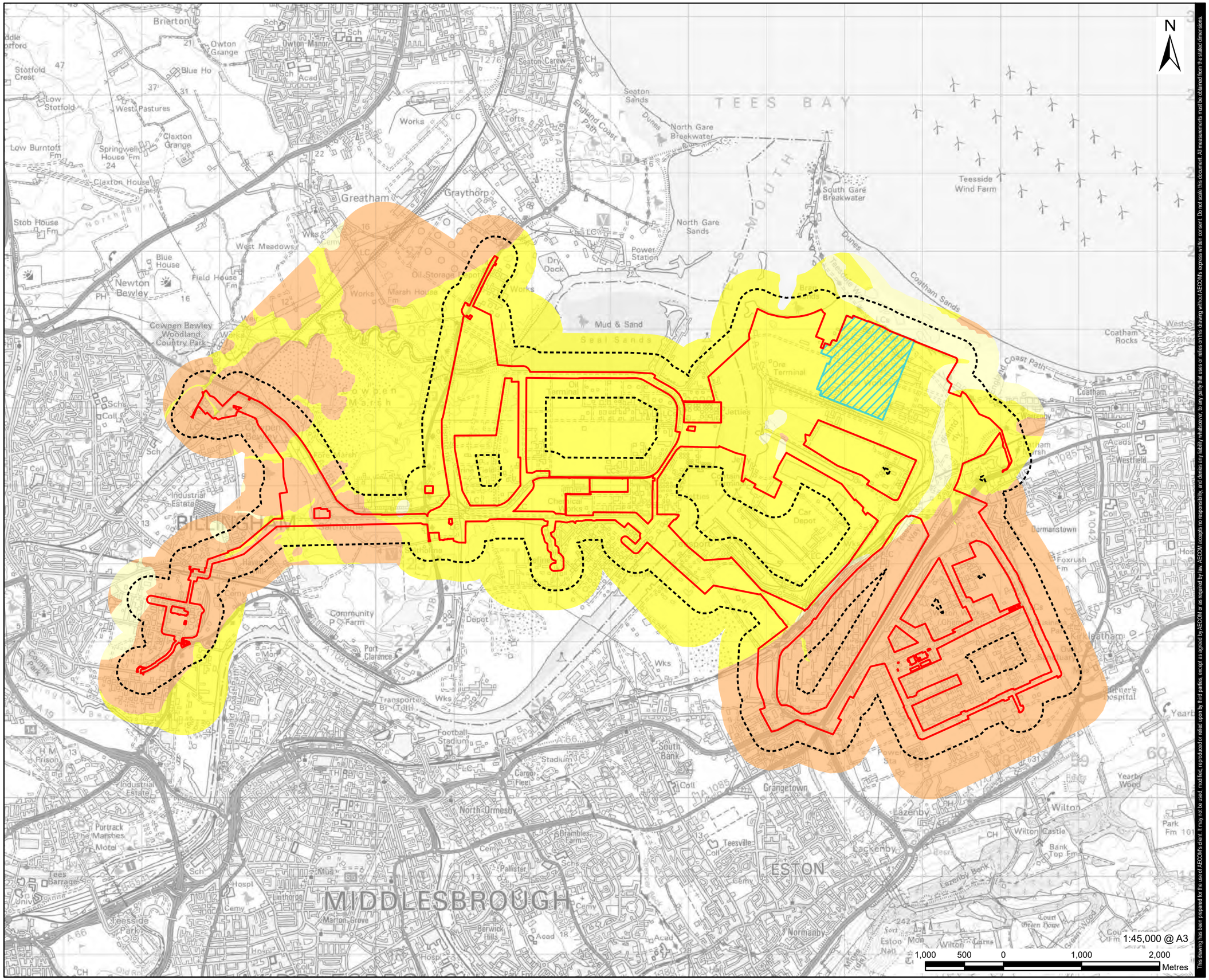

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APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Natural Ground Subsidence - Shrink Swell Clays

- Ground conditions predominantly non-plastic.
- Ground conditions predominantly low plasticity.
- Ground conditions predominantly medium plasticity.

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Natural Ground Subsidence - Shrink Swell Clays

FIGURE NUMBER

Figure 10-18f

Revision: 0 Drawn: NK Checked: MB Approved: LF Date: 2023-09-13

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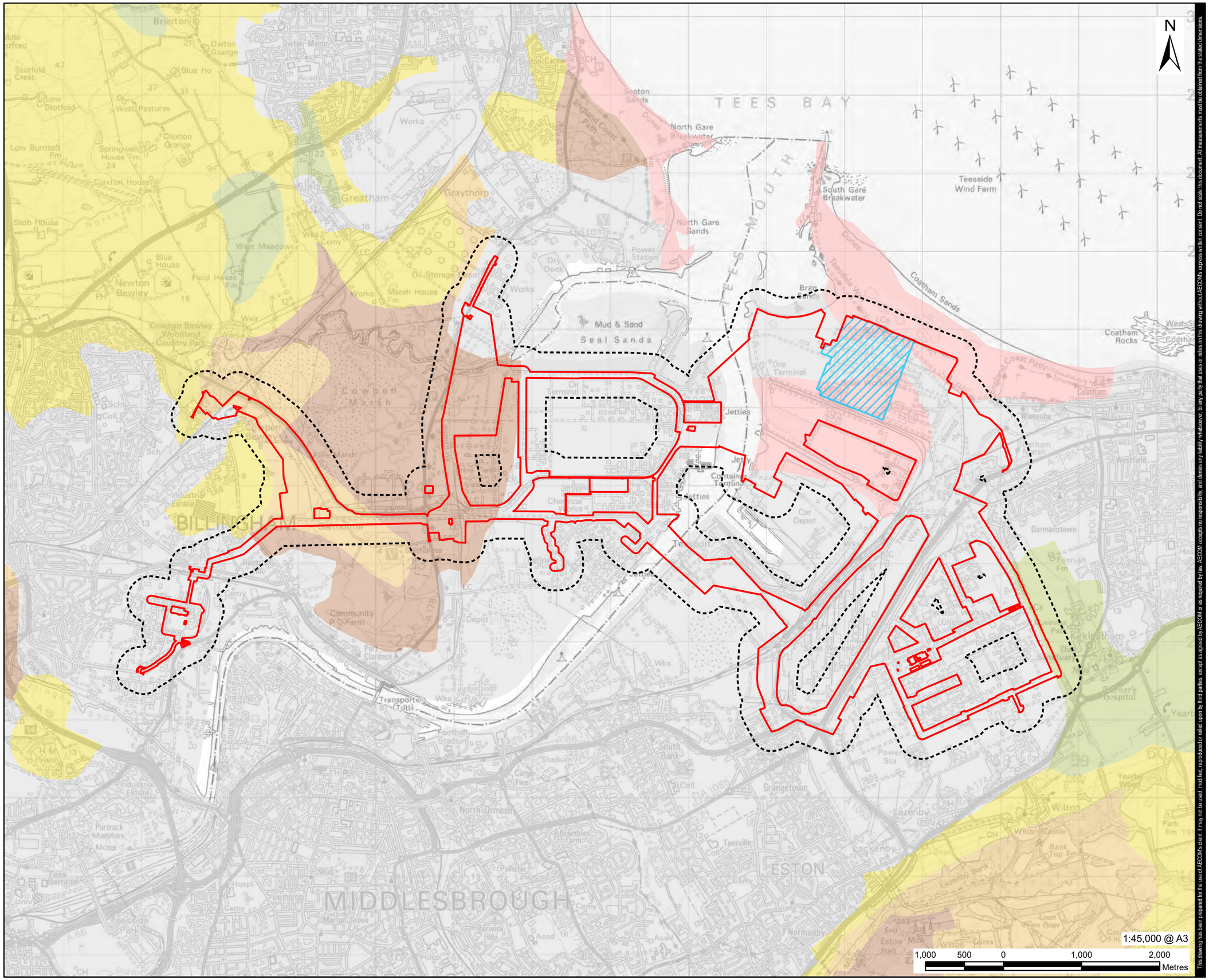

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APPLICANT

H2 Teesside Limited

CONSULTANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Agricultural Land Classification Grade

- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Non Agricultural
- Urban

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FIGURE TITLE

Agricultural Land Classification

FIGURE NUMBER

Figure 10-19

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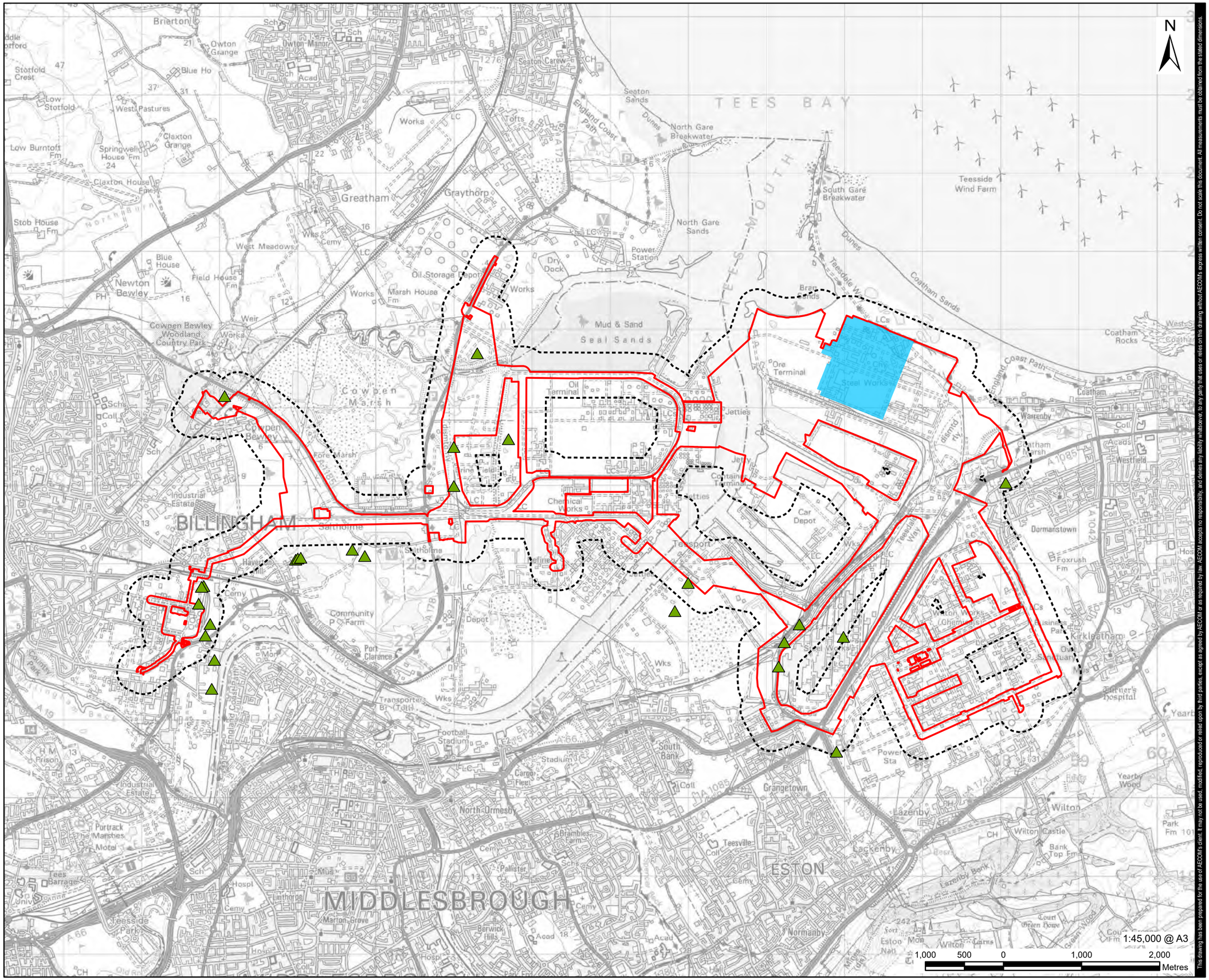

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APPLICANT

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CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Brit Pits

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PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Brit Pits

FIGURE NUMBER

Figure 10-20

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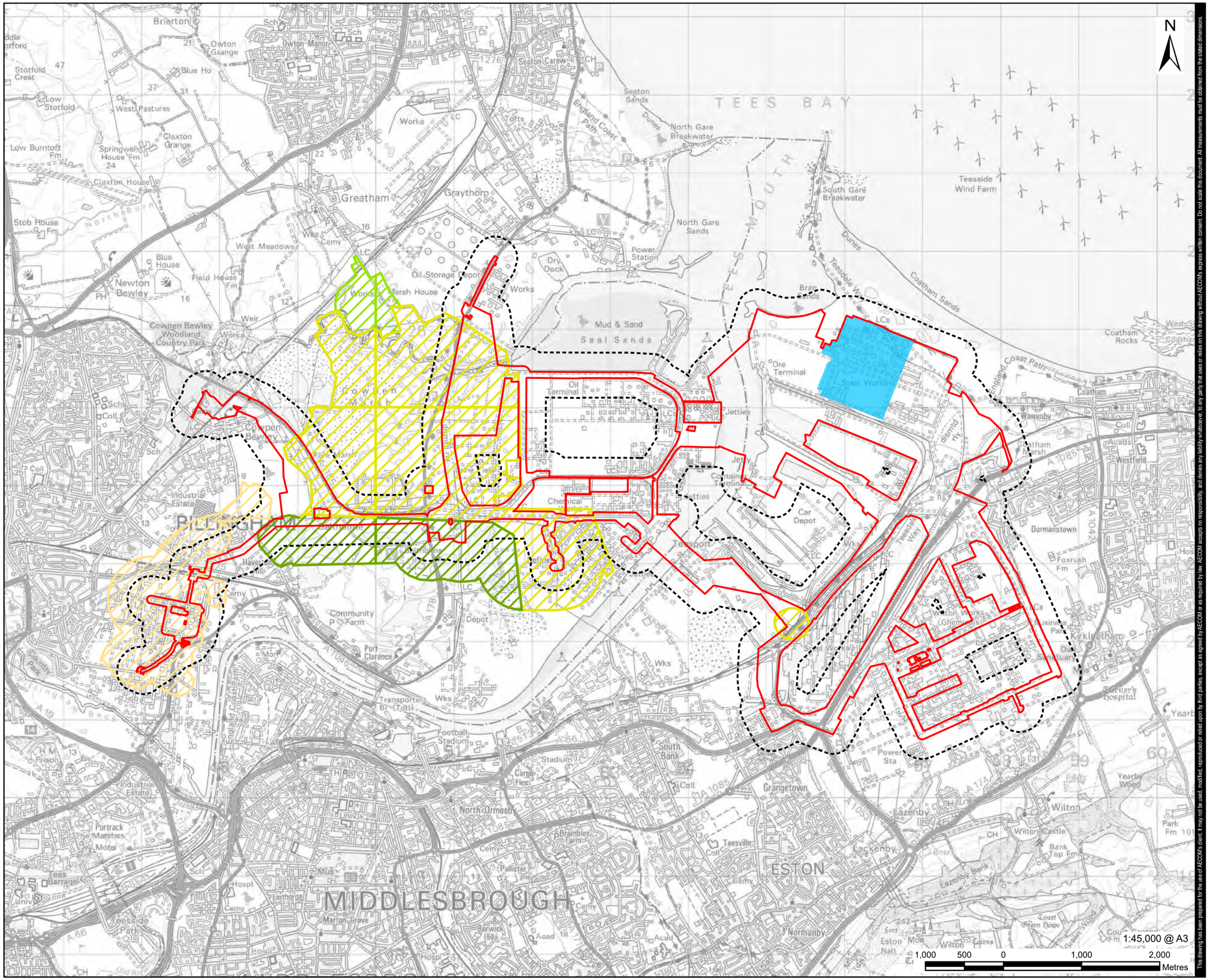

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APPLICANT

H2 Teesside Limited

CONSULTANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site

Non-Coal Mining Class

- A
- B
- C
- D

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Non-Coal Mining

FIGURE NUMBER

Figure 10-21

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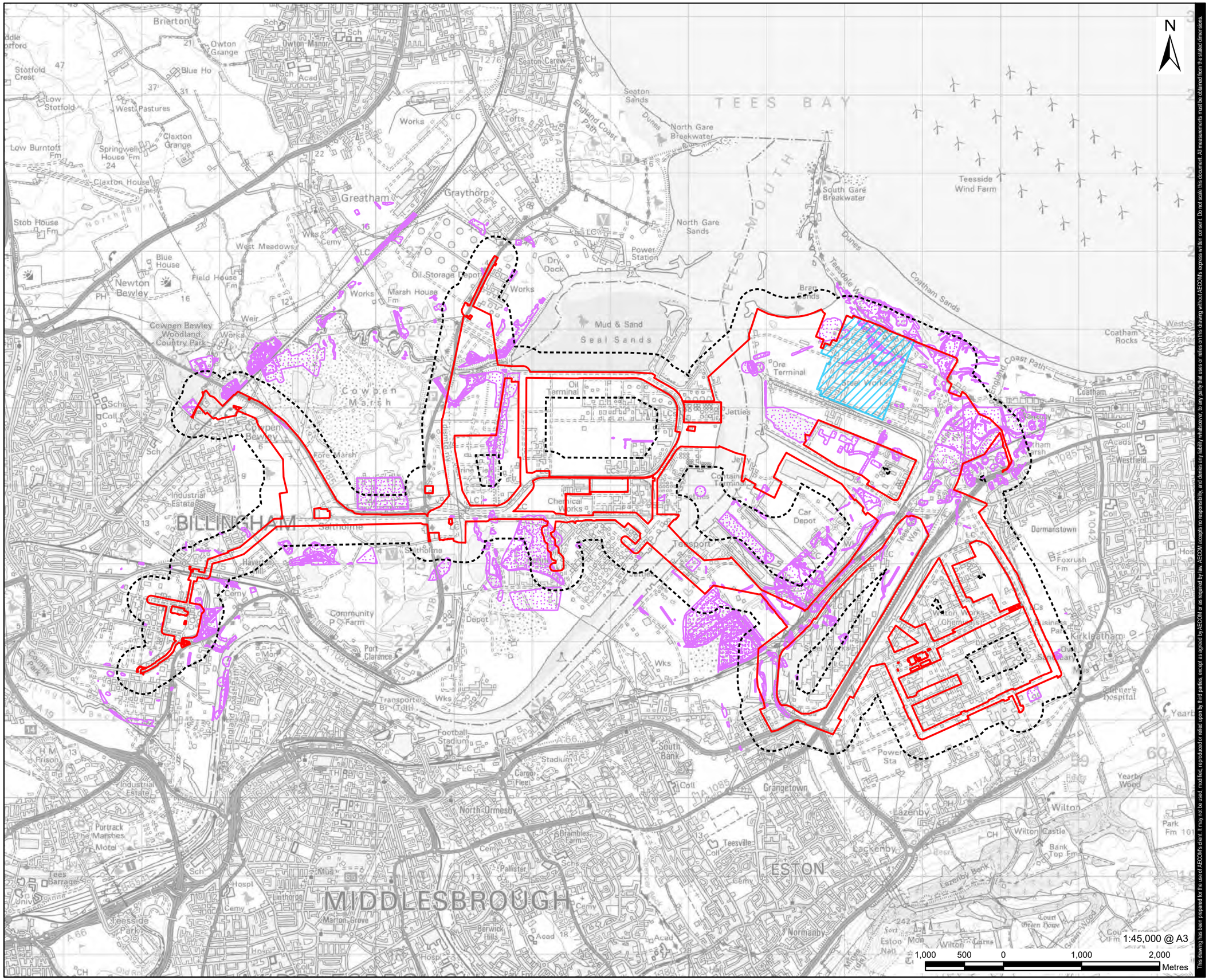

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Surface Ground Workings

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Surface Ground Workings

FIGURE NUMBER

Figure 10-22

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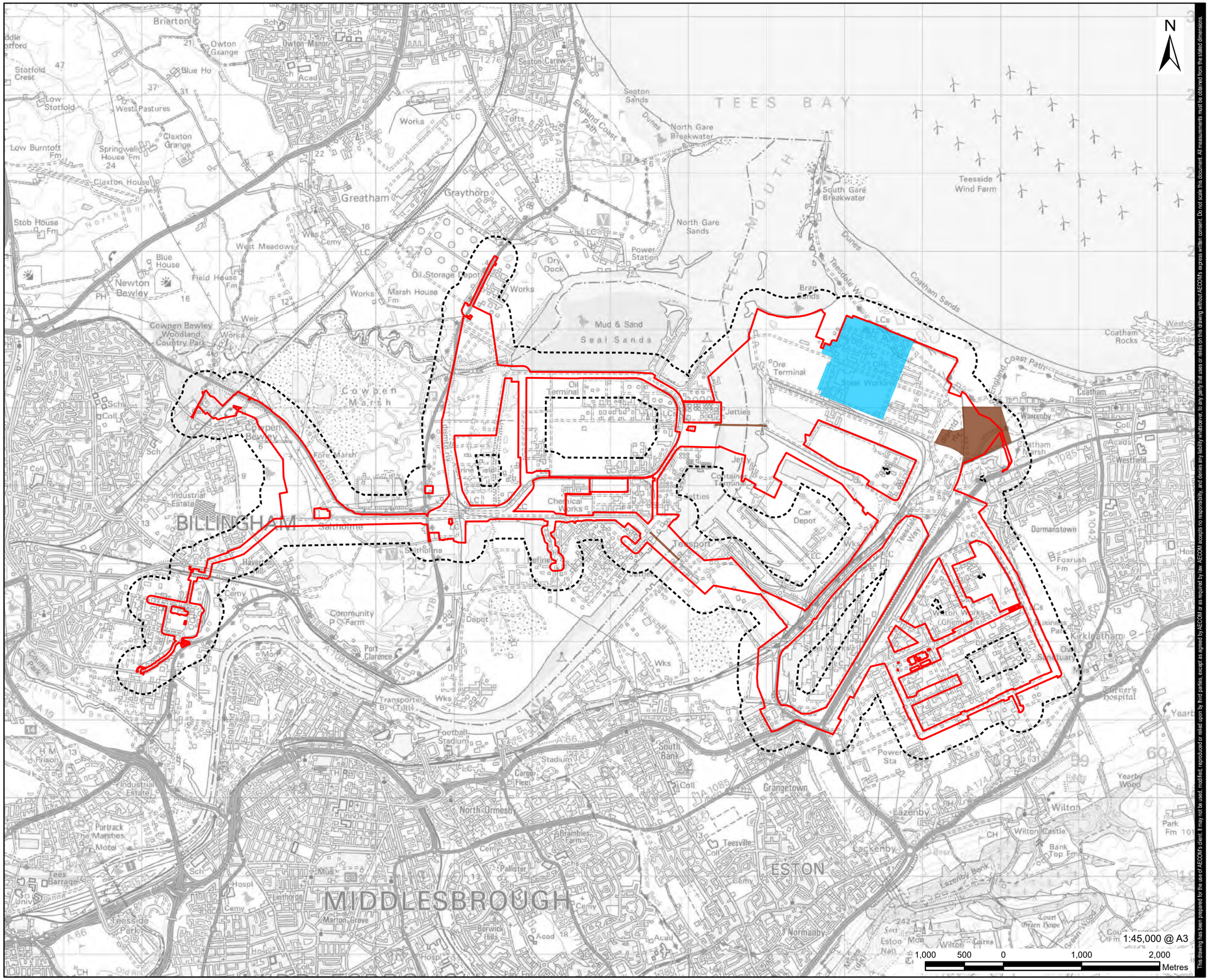
N
TEES BAY
Seaton Sands
North Gare Breakwater
South Gare Breakwater
Teesside Wind Farm
North Gare Sands
Power Station
Dry Dock
Oil Storage Depot
Mud & Sand
Seal Sands
Ore Terminal
Steel Works
Oil Terminal
Jetties
Chemical Works
Car Depot
Teesport
Coatham Sands
Coatham Rocks
Coatham
Warrenby
Dormanstown
Redcar
Kirkleatham
Wilton
Lazenby
Lackenby
ESTON
Normanby
Grangetown
South Bank
North Ormesby
MIDDLESBROUGH
BILLINGHAM
Greatham
Graythorp
Seaton Carew
Brierton
Newton Bewley
Cowpen Bewley
Cowpen Marsh
Claxton
Tofts
Port Clarence
Transporter Br (Toll)
Teesville
Brambles Farm
Pallister
Marton Grove
Teesside Park
Portrack
Tees Barrage
Yearby Wood
Wilton Castle
Bank Top Fm
Foxrush Fm
Marsh House Fm
Field House Fm
Blue House
Stob House Fm
Low Burntoft Fm
Springwell House Fm
Claxton House Fm
Stotfold Crest
Low Stotfold
West Pastures
Owton Grange
Owton Manor
Blue Ho
Cowpen Bewley Woodland Country Park
West Meadows
Fore Marsh
Industrial Estate
Community P Farm
Football Stadium
Stadium
Cargo Fleet
Teesdale Way
England Coast Path
Dunes
Works
Wks
Depot
Sch
Coll
Cemy
Acad
Hospl
Mus
Univ
Prison
Motel
Power Sta
Wilton Works (Chemicals)
Wilton Sewage Works
Court Farm House
Estoo Nan
Mon
Carrs
Hall
Olde
Park Fm
Westfield
Acads
Hosp
Foxrush Fm
Dormanstown
Kirkleatham
Yearby Wood
Park Fm
Lazenby Bank
Teesville
Pallister
Marton Grove
Berwick Hills
Brambles Farm
Cargo Fleet
Transporter Br (Toll)
Football Stadium
Stadium
Community P Farm
Port Clarence
Depot
Wks

Revision: 0 Drawn: MAB Checked: BB Approved: SE Date: 2023-08-29

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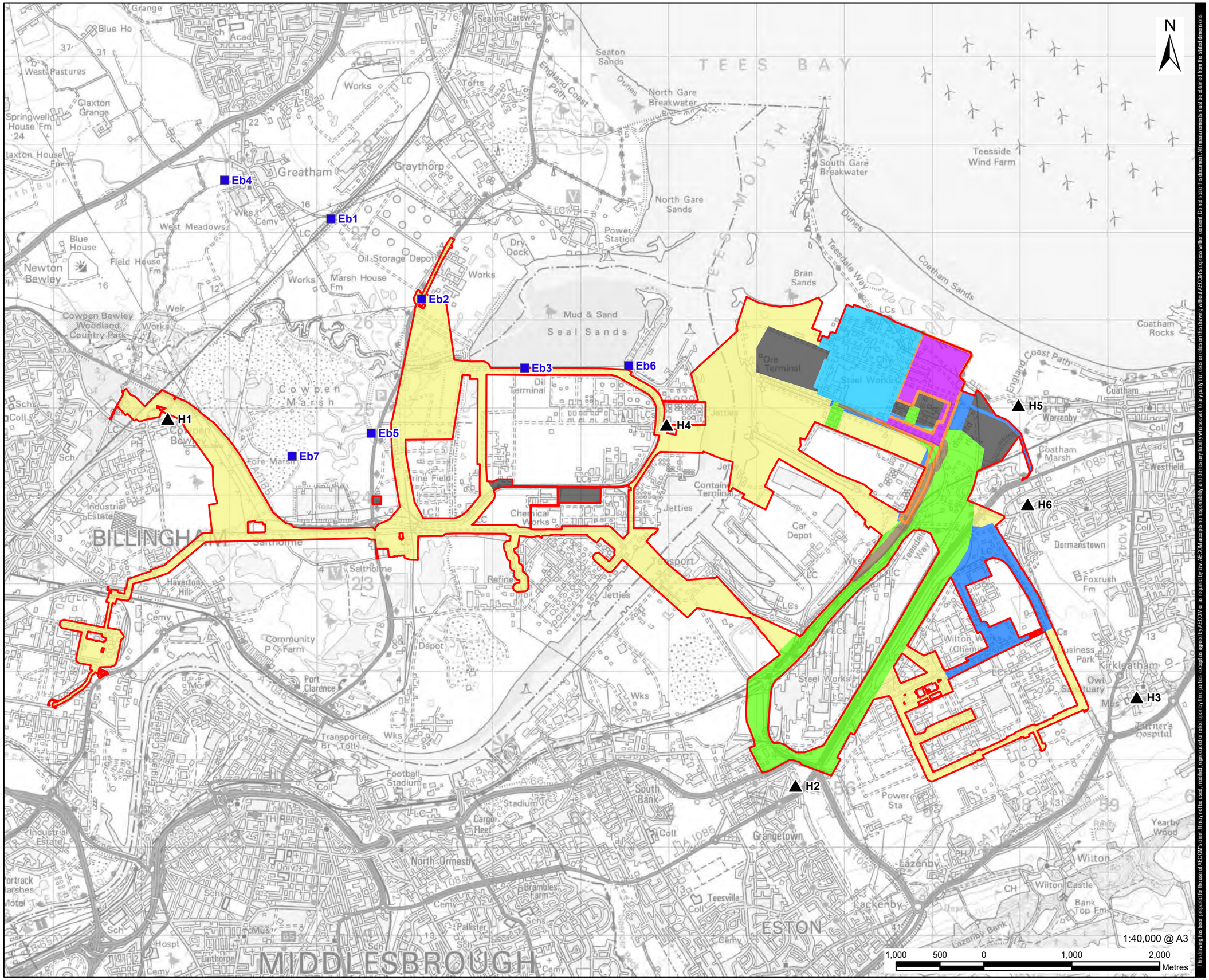

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- CO_2 Export Corridor
- Electrical Connection Corridor
- Hydrogen Pipeline Corridor
- Indicative Temporary Construction Laydown Area
- Natural Gas Connection Corridor
- Other Gases Connection Corridor (O_2 and N_2)
- Water Connection Corridor
- H2Teesside Noise Sensitive Receptor - Ecological
- H2Teesside Noise Sensitive Receptor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Noise Sensitive Receptors

FIGURE NUMBER

Figure 1

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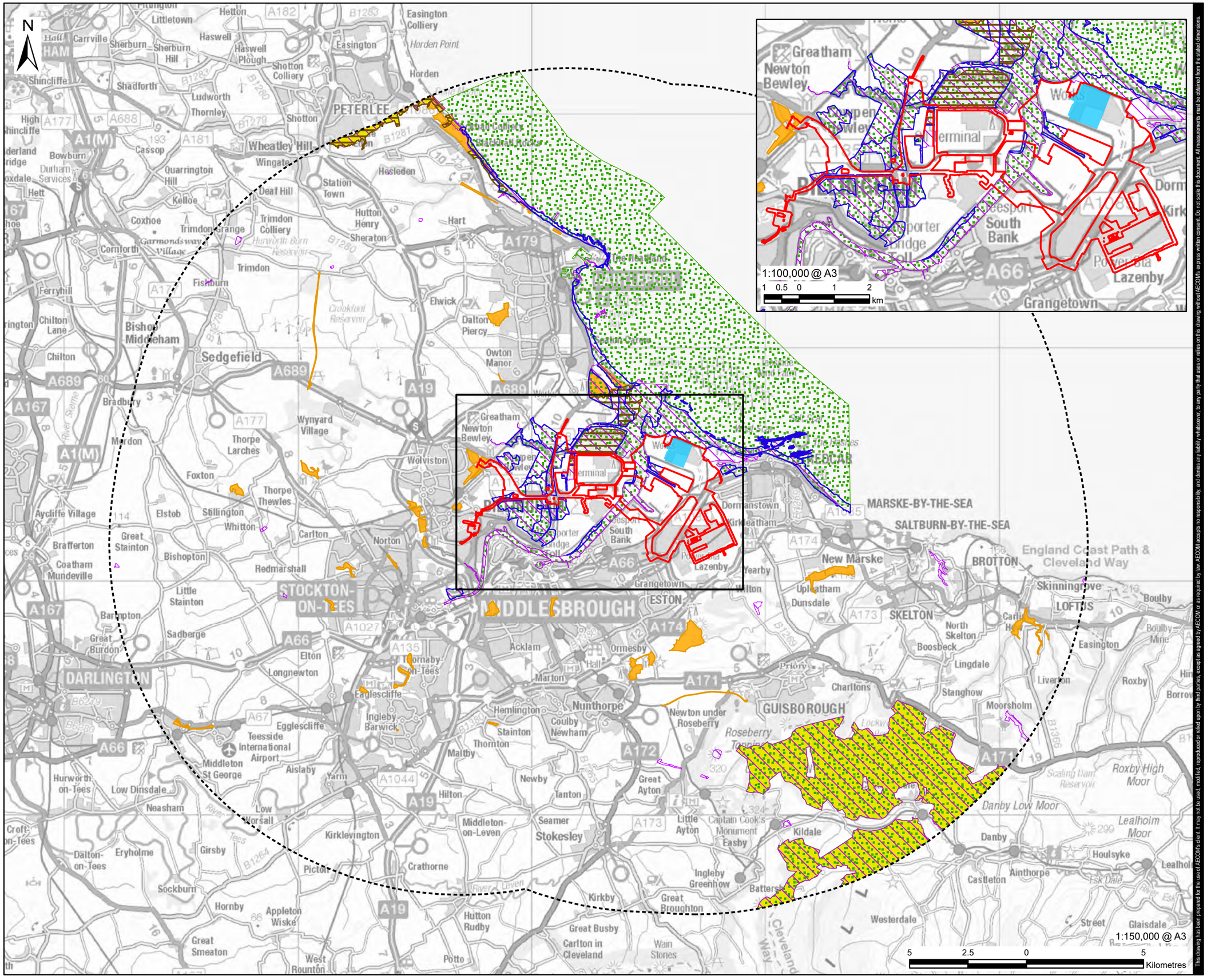

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APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 15 km Buffer
- Main Site
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Ramsar
- Special Areas of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Statutory Designated Ecological Sites within 15 km of the Proposed Development Site Boundary

FIGURE NUMBER

Figure 12-1

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

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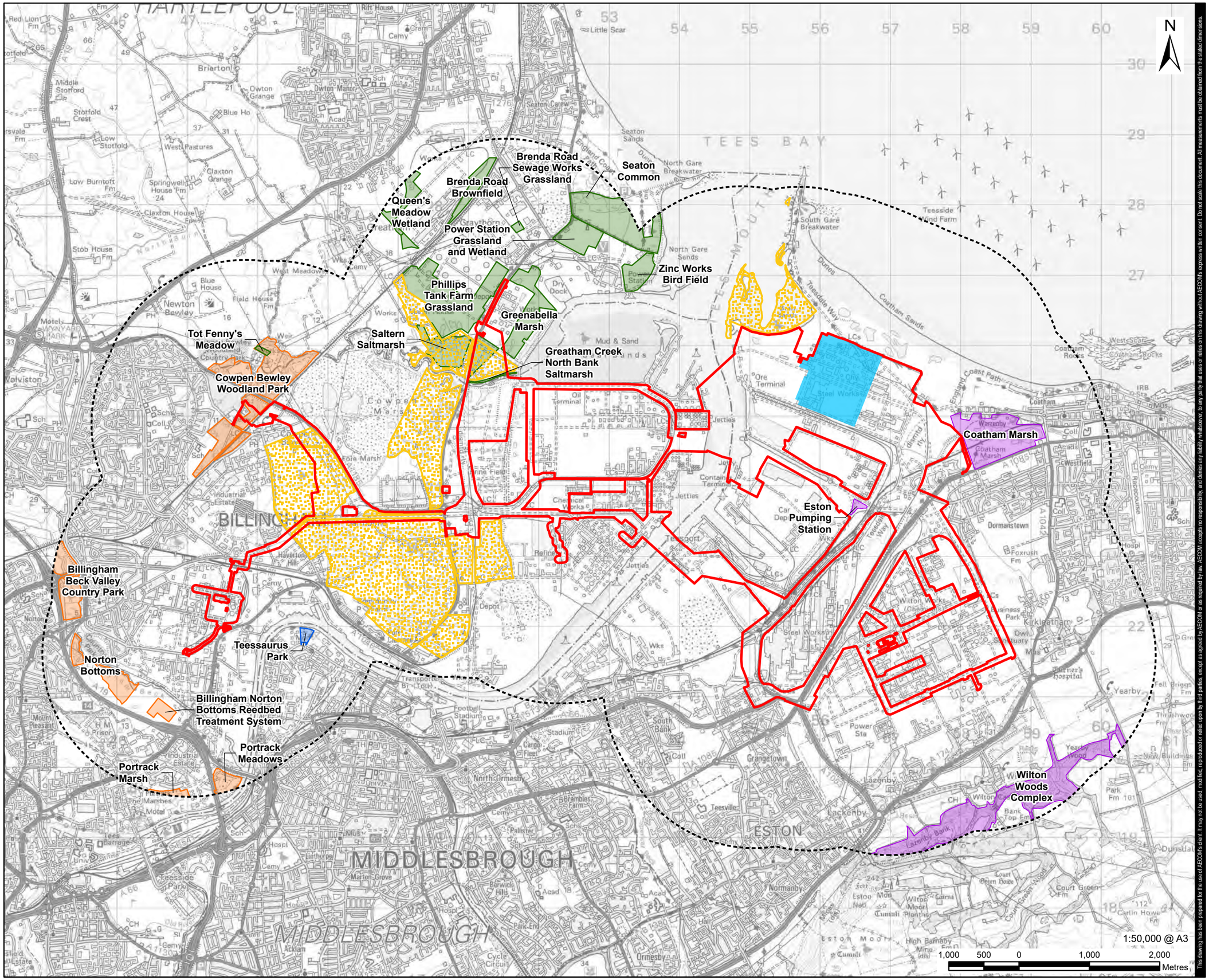

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H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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100 Embankment,
Cathedral Approach,
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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 2 km Buffer
- Main Site
- Saltholme RSPB Reserve

Local Wildlife Site (LWS)

- Hartlepool
- Stockton
- Redcar and Cleveland
- Middlesborough

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ISSUE PURPOSE

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PROJECT NUMBER

60689030

FIGURE TITLE

Non-Statutory Designated Sites

FIGURE NUMBER

Figure 12-2

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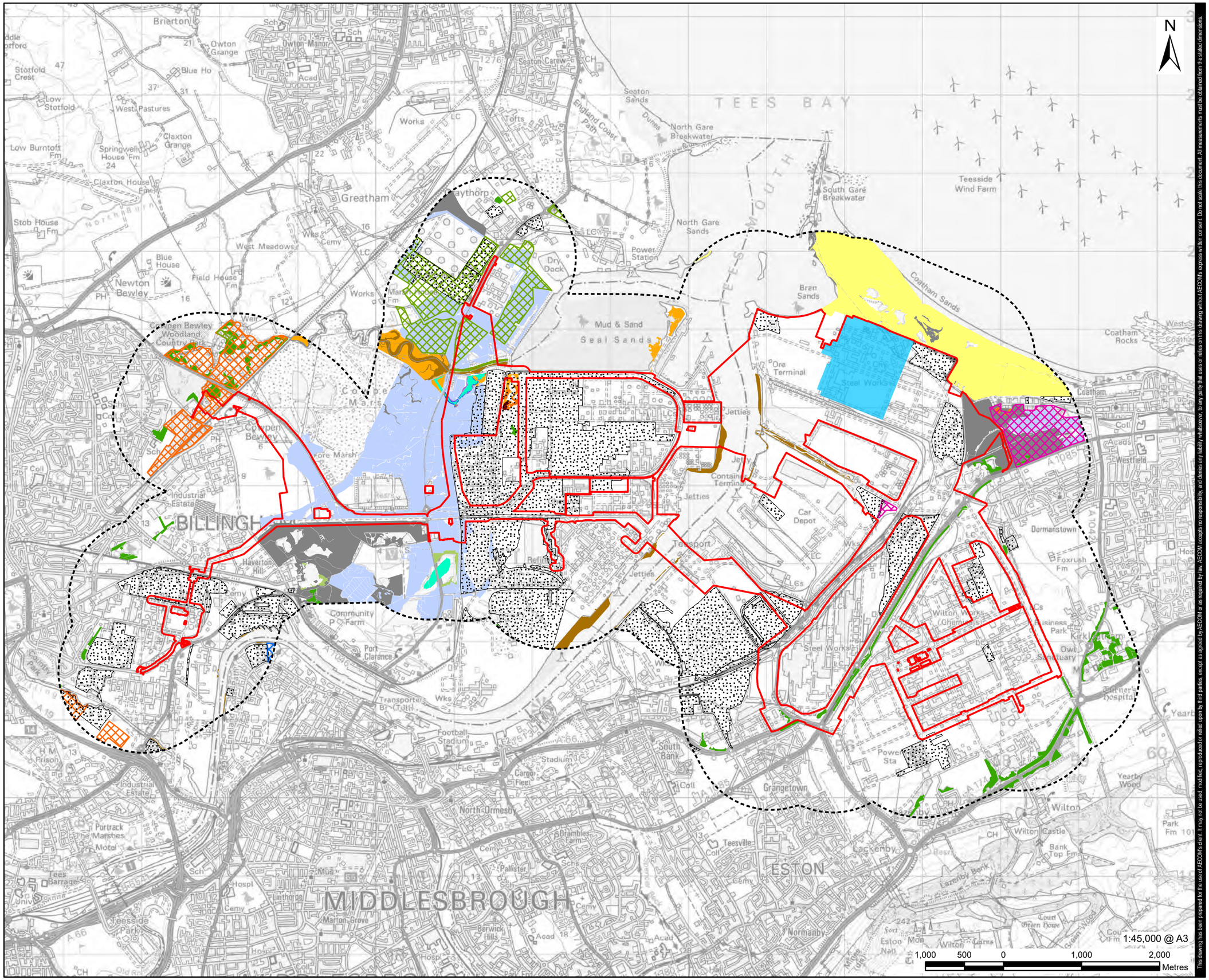

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site

Priority Habitat

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal sand dunes
- Deciduous woodland
- Lowland fens
- Mudflats
- No main habitat but additional habitats present
- Reedbeds
- Saline lagoons
- Coastal and floodplain grazing marsh,Coastal saltmarsh
- Coastal saltmarsh,Saline lagoons
- Reedbeds,Coastal saltmarsh
- Open Mosaic Habitat

Local Wildlife Site (LWS)

- Stockton
- Redcar and Cleveland
- Middlesborough
- Hartlepool

NOTES

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2: Data licensed under the Open Government License v3.0. Contains data created and provided by Cumbria Biodiversity Data Centre on behalf of Cumbria Wildlife Trust. The data has been extracted from Cumbria Wildlife Trust's Grassland Inventory and is used under the CC BY 4.0 International licence terms.
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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Non-Statutory Ecological Constraints within 1 km of the Proposed Development Site Boundary

FIGURE NUMBER

Figure 12-3

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-21

Filename: \\na.aecomnet.com\fls\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_Ecology.aprx

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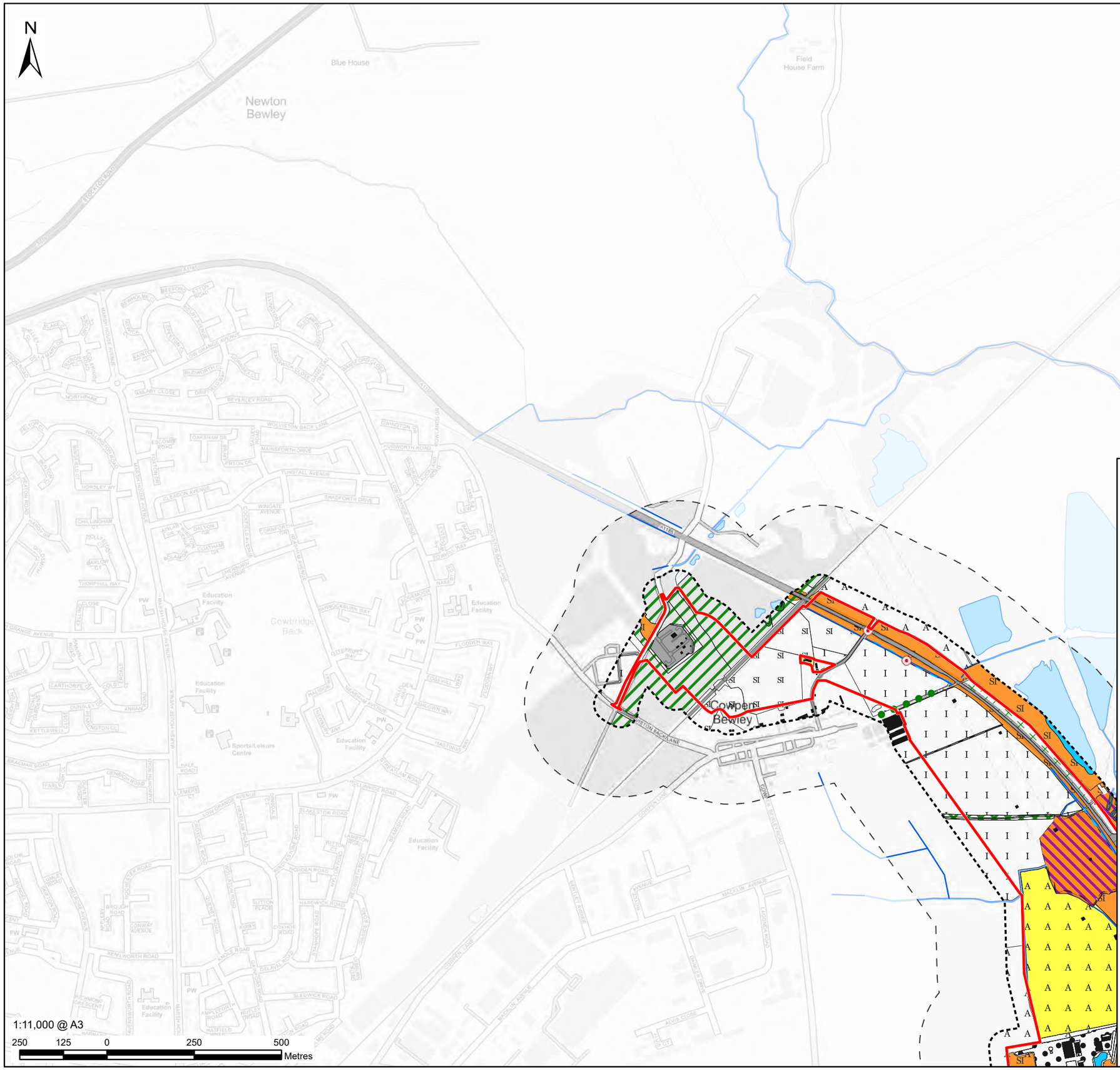

LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- SI B2.2 - Neutral grassland - semi-improved
- I B4 - Improved grassland
- B5 - Marsh/marshy grassland
- SI B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- E G1.1 - Standing water - eutrophic
- M G1.2 - Standing water - mesotrophic
- B G1.6 - Standing water - brackish
- G2 - Running water
- B G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- C H8.4 - Coastal grassland
- Q I2.1 - Quarry
- S I2.2 - Spoil
- A J1.1 - Cultivated/disturbed land - arable
- A J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

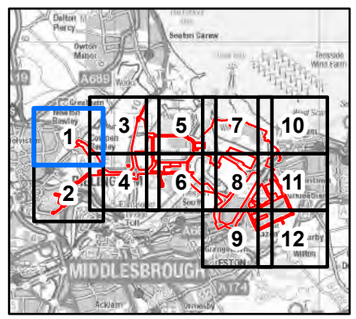
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

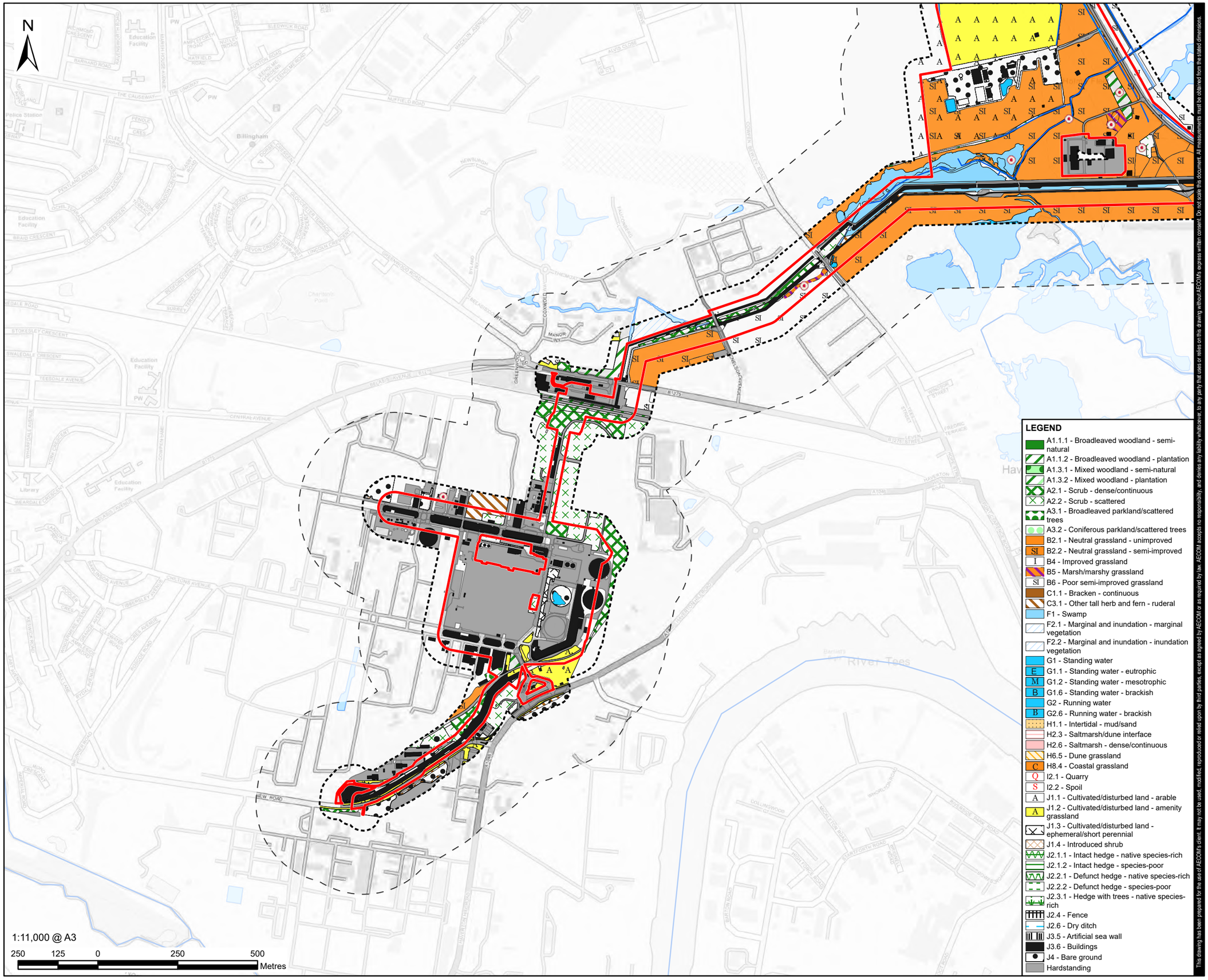
Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 1 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

Filename: \\na.aecomnet.com\ifs\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_Ecology.aprx



LEGEND

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- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G1.1 - Standing water - eutrophic
- G1.2 - Standing water - mesotrophic
- G1.6 - Standing water - brackish
- G2 - Running water
- G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- H8.4 - Coastal grassland
- I2.1 - Quarry
- I2.2 - Spoil
- J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

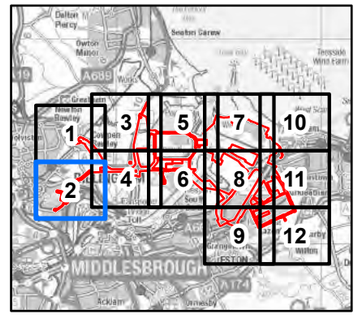
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 2 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

Filename: \\na.aecomnet.com\fls\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_Ecology.aprx

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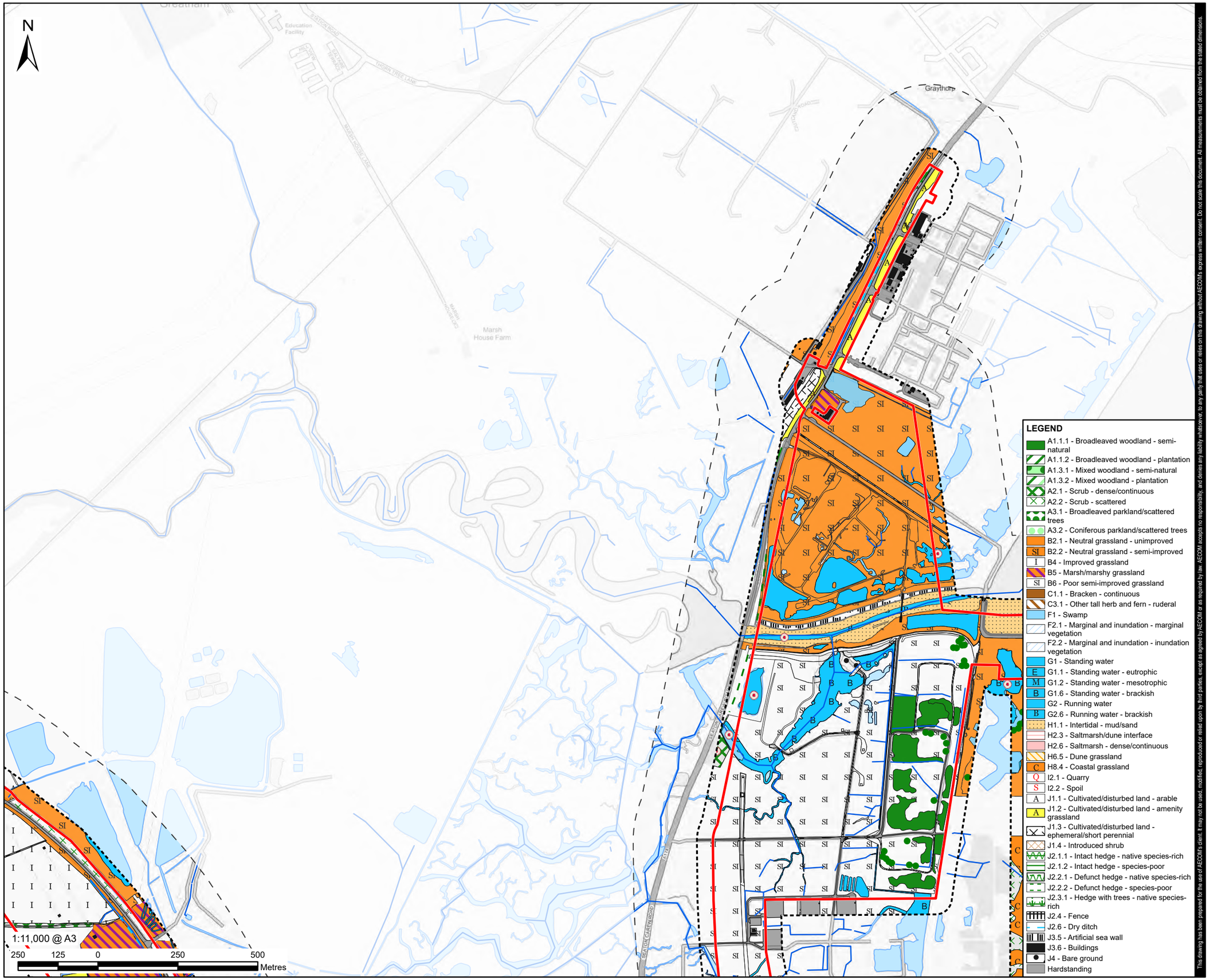

LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- SI B2.2 - Neutral grassland - semi-improved
- I B4 - Improved grassland
- B5 - Marsh/marshy grassland
- SI B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- E G1.1 - Standing water - eutrophic
- M G1.2 - Standing water - mesotrophic
- B G1.6 - Standing water - brackish
- G2 - Running water
- B G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- C H8.4 - Coastal grassland
- Q I2.1 - Quarry
- S I2.2 - Spoil
- A J1.1 - Cultivated/disturbed land - arable
- A J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

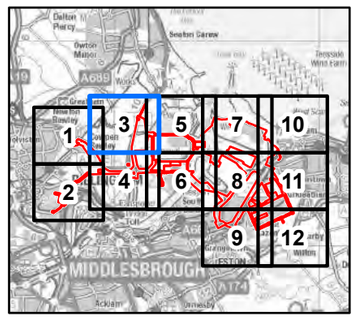
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 3 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

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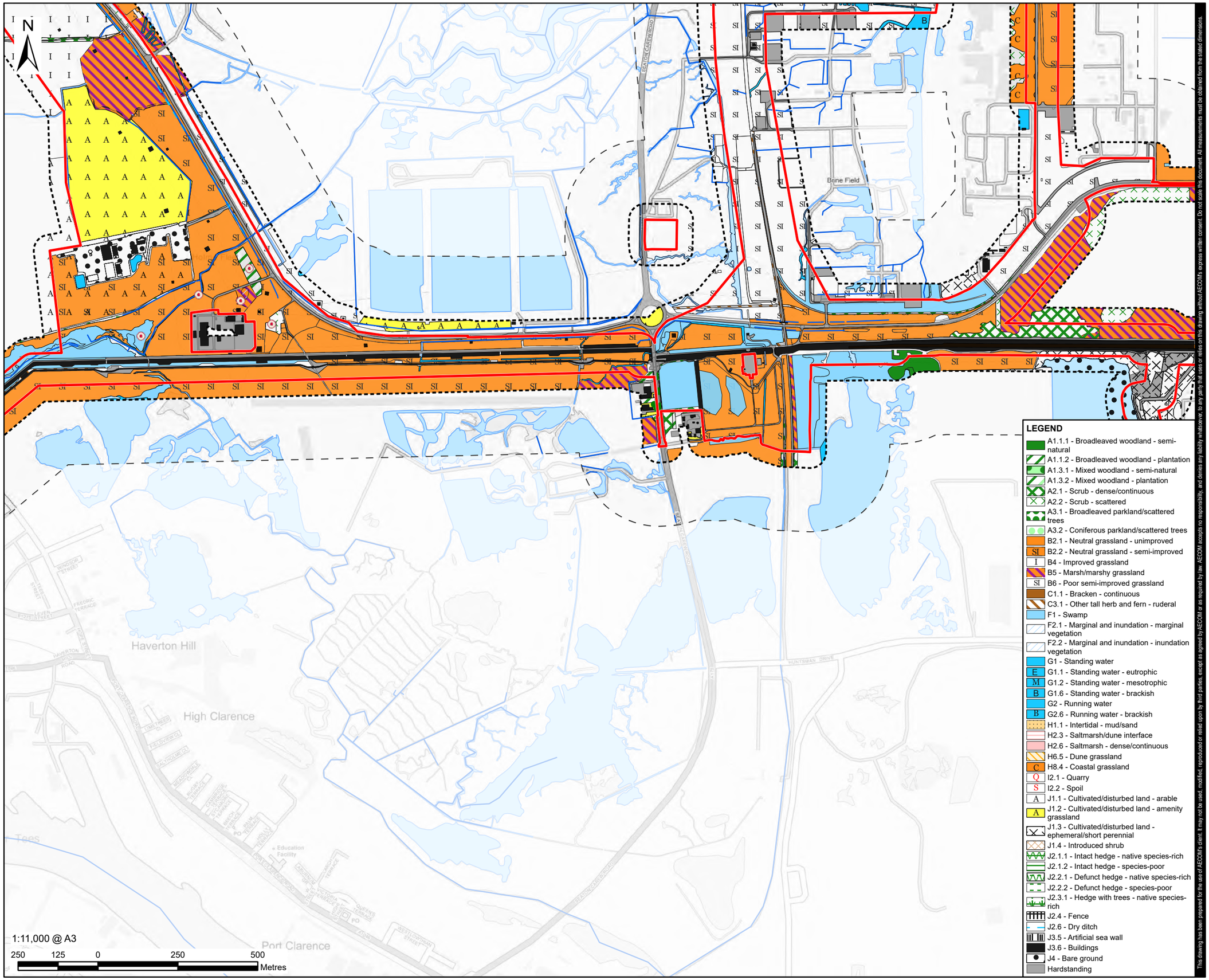

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LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
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- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G1.1 - Standing water - eutrophic
- G1.2 - Standing water - mesotrophic
- G1.6 - Standing water - brackish
- G2 - Running water
- G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- H8.4 - Coastal grassland
- I2.1 - Quarry
- I2.2 - Spoil
- J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

AECOM

PROJECT

H2Teesside DCO

APPLICANT

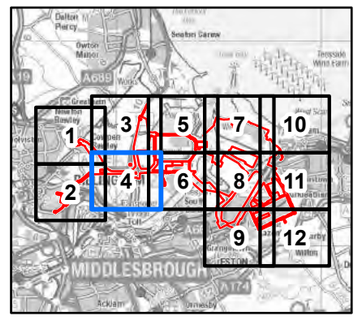
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 4 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

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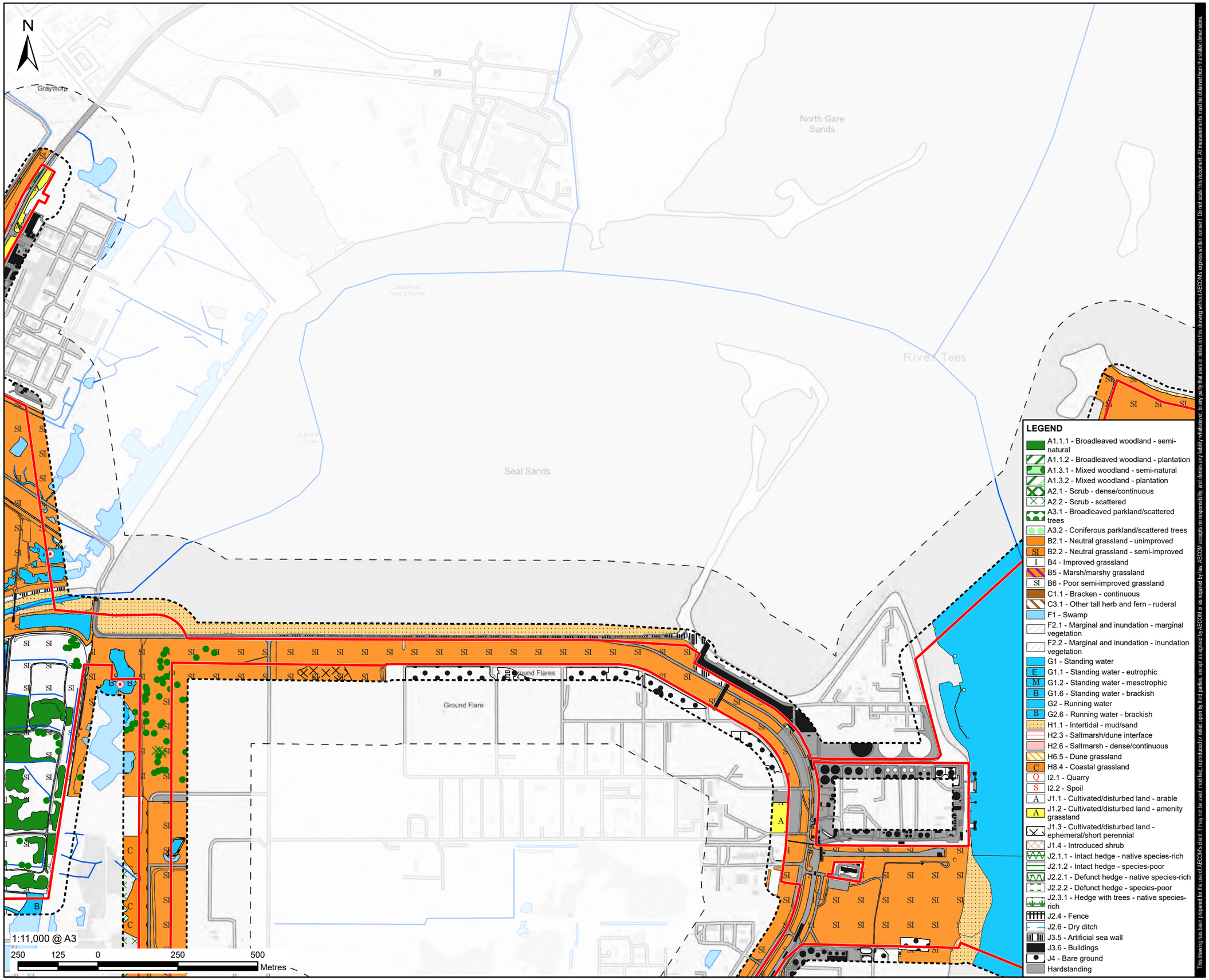

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PROJECT

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CONSULTANT

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100 Embankment,
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Manchester, M3 7FB
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LEGEND

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- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody

LEGEND

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- E G1.1 - Standing water - eutrophic
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- B G1.6 - Standing water - brackish
- G2 - Running water
- B G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- C H8.4 - Coastal grassland
- Q I2.1 - Quarry
- S I2.2 - Spoil
- A J1.1 - Cultivated/disturbed land - arable
- A J1.2 - Cultivated/disturbed land - amenity grassland
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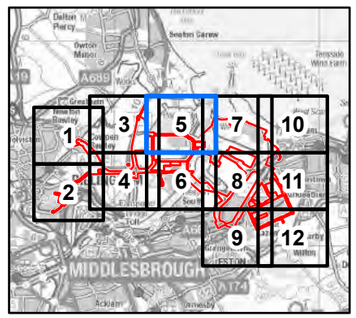
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding



NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

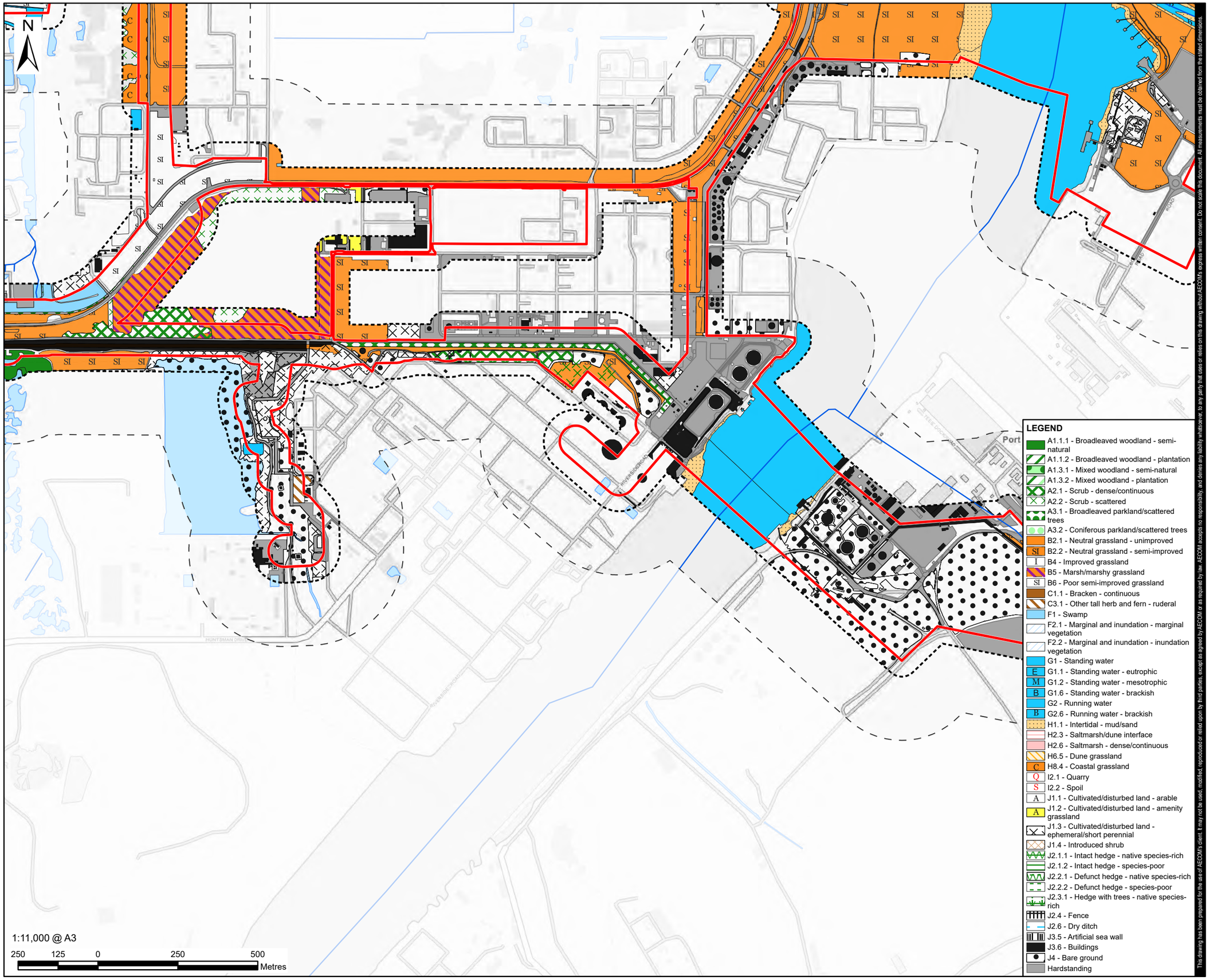
Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 5 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

Filename: \\na.aecomnet.com\lfs\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_Ecology.aprx



LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- SI B2.2 - Neutral grassland - semi-improved
- I B4 - Improved grassland
- B5 - Marsh/marshy grassland
- SI B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- E G1.1 - Standing water - eutrophic
- M G1.2 - Standing water - mesotrophic
- B G1.6 - Standing water - brackish
- G2 - Running water
- B G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- C H8.4 - Coastal grassland
- Q I2.1 - Quarry
- S I2.2 - Spoil
- A J1.1 - Cultivated/disturbed land - arable
- A J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

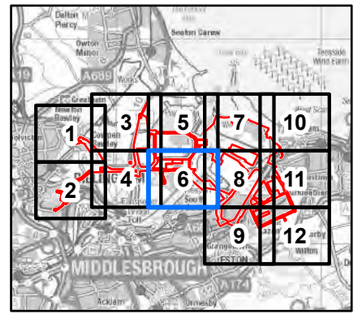
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 6 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

Filename: \\na.aecomnet.com\fs\EMEA\Bristol-UKBR\2\Legacy\UKBR12FP001\VOL1BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_Ecology.aprx

N

River Tees

Bran Sands

Coatham Sands

1:11,000 @ A3

250 125 0 250 500 Metres

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LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- SI B2.2 - Neutral grassland - semi-improved
- I B4 - Improved grassland
- B5 - Marsh/marshy grassland
- SI B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- E G1.1 - Standing water - eutrophic
- M G1.2 - Standing water - mesotrophic
- B G1.6 - Standing water - brackish
- G2 - Running water
- B G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- C H8.4 - Coastal grassland
- Q I2.1 - Quarry
- S I2.2 - Spoil
- A J1.1 - Cultivated/disturbed land - arable
- A J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

AECOM

PROJECT

H2Teesside DCO

APPLICANT

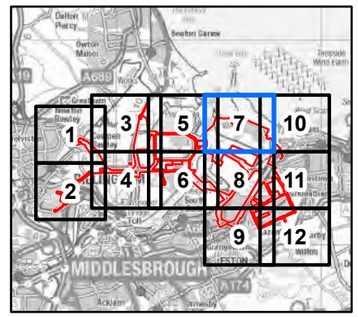
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Main Site
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

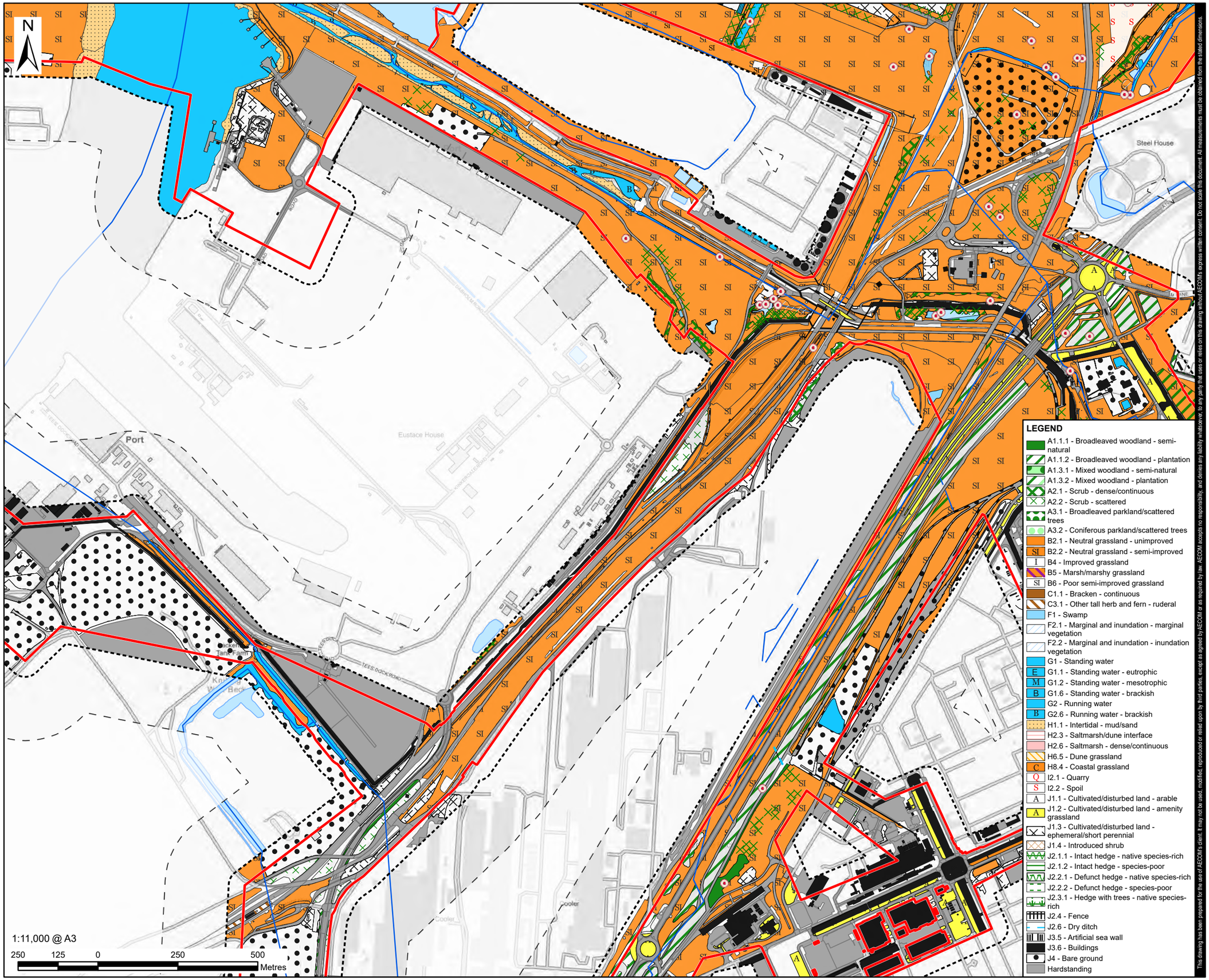
Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 7 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

Filename: \\na.aecomnet.com\fls\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_Ecology.aprx



LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G1.1 - Standing water - eutrophic
- G1.2 - Standing water - mesotrophic
- G1.6 - Standing water - brackish
- G2 - Running water
- G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- H8.4 - Coastal grassland
- I2.1 - Quarry
- I2.2 - Spoil
- J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

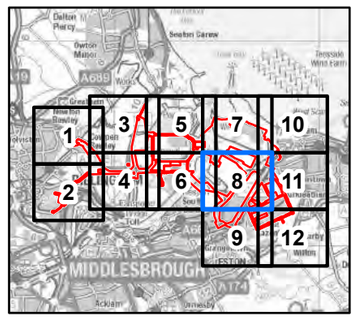
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 8 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

Filename: \\na.aecomnet.com\lfs\EMEA\Bristol\UKBR12\Legacy\UKBR12FP001\VOL I\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_Ecology.aprx

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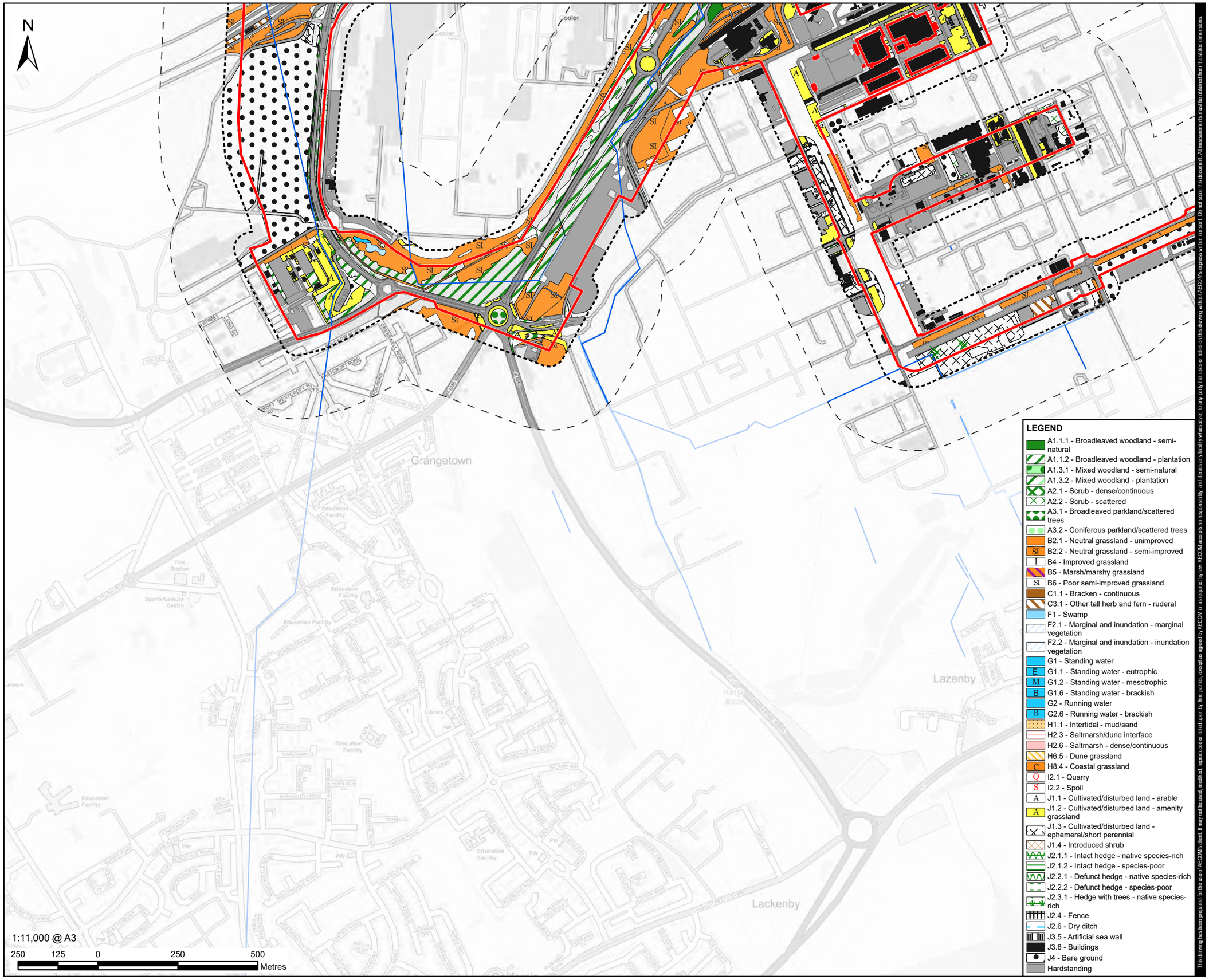

LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G1.1 - Standing water - eutrophic
- G1.2 - Standing water - mesotrophic
- G1.6 - Standing water - brackish
- G2 - Running water
- G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- H8.4 - Coastal grassland
- I2.1 - Quarry
- I2.2 - Spoil
- J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

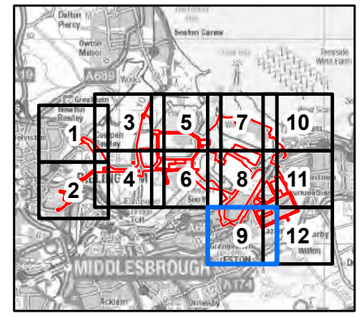
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

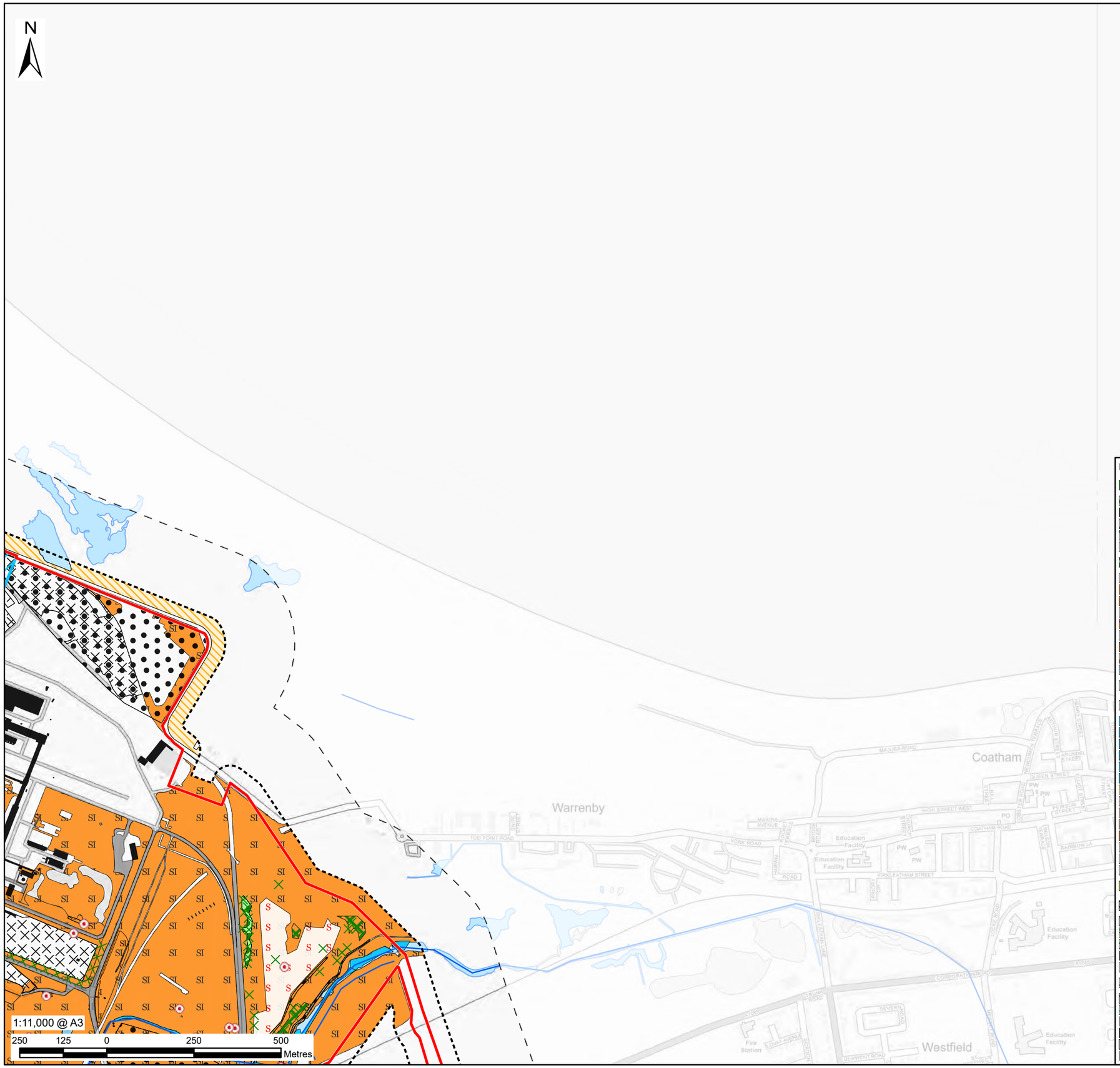
Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 9 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

Filename: \\ra.aecomnet.com\lfs\EMEA\Bristol-UKBR1\Legacy\UKBR2FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEI\RH\H2Teesside_PEIR_Ecology.aprx



LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G1.1 - Standing water - eutrophic
- G1.2 - Standing water - mesotrophic
- G1.6 - Standing water - brackish
- G2 - Running water
- G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- H8.4 - Coastal grassland
- I2.1 - Quarry
- I2.2 - Spoil
- J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

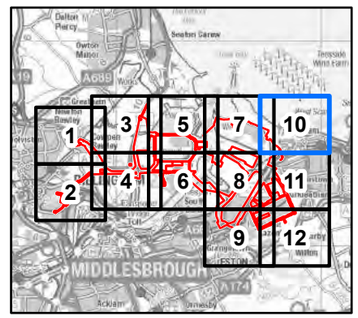
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 10 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

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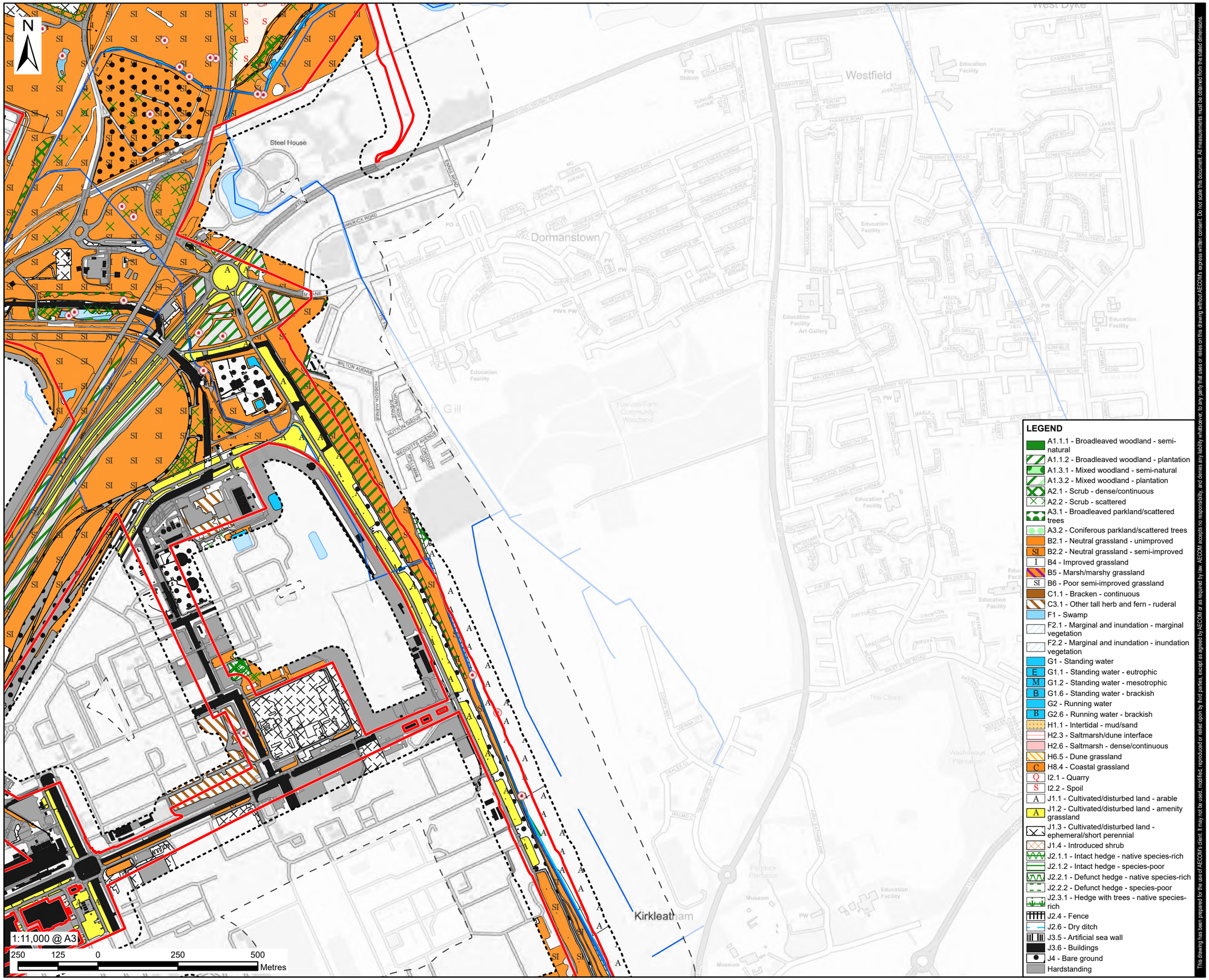

LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G1.1 - Standing water - eutrophic
- G1.2 - Standing water - mesotrophic
- G1.6 - Standing water - brackish
- G2 - Running water
- G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- H8.4 - Coastal grassland
- I2.1 - Quarry
- I2.2 - Spoil
- J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

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AECOM

PROJECT

H2Teesside DCO

APPLICANT

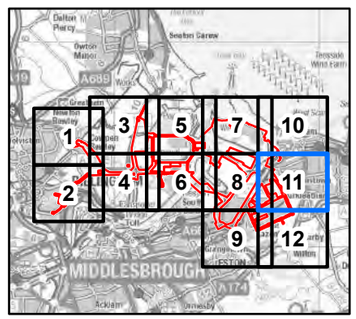
H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

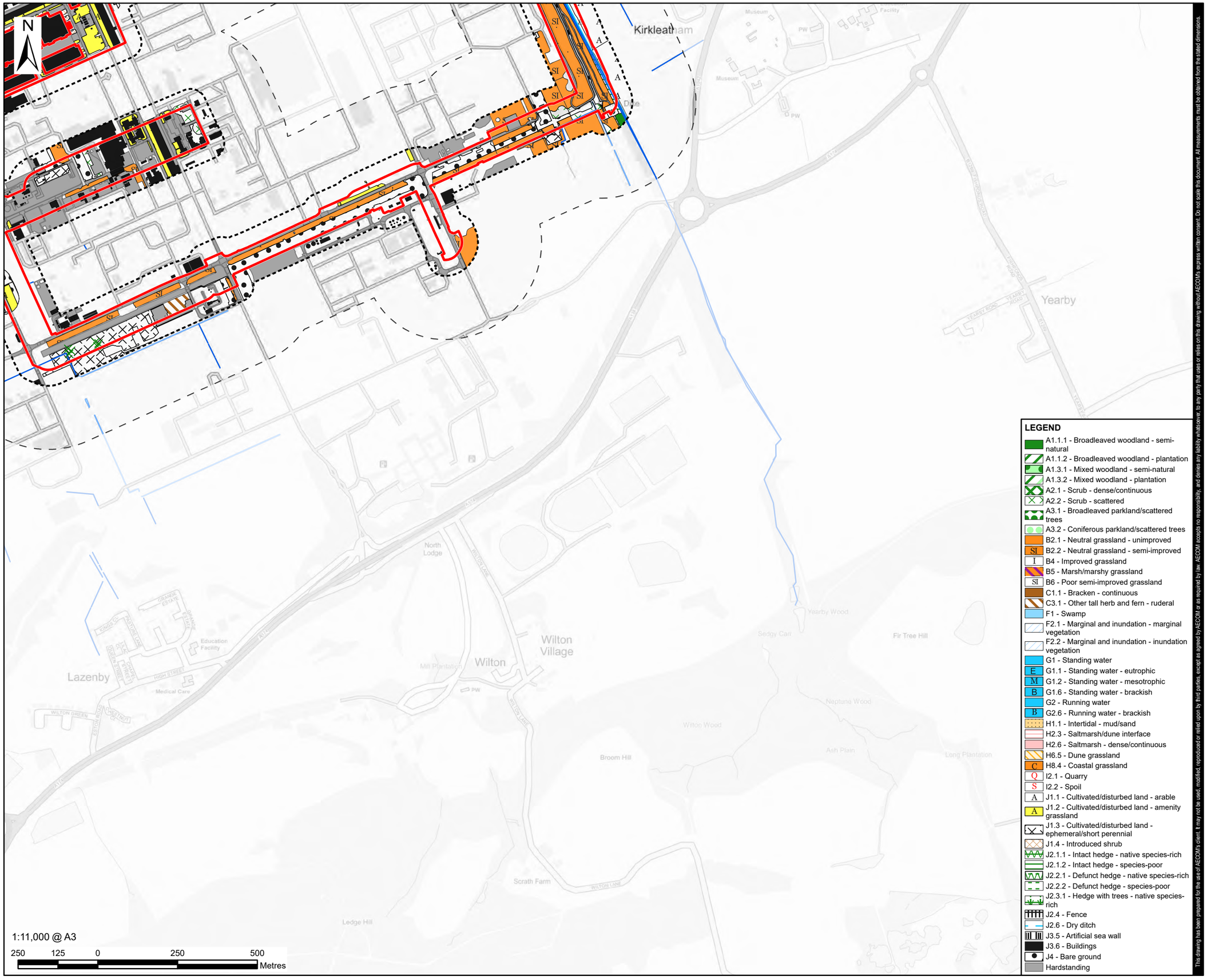
Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 11 of 12)

Revision: 0 Drawn: AC Checked: MAB Approved: KA Date: 2023-08-08

Filename: \\na.aecomnet.com\lfs\EMEA\Bristol\UKBR1\2\Legacy\UKBR12FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_Ecology.aprx



1:11,000 @ A3

250 125 0 250 500 Metres

LEGEND

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- B2.1 - Neutral grassland - unimproved
- SI B2.2 - Neutral grassland - semi-improved
- I B4 - Improved grassland
- B5 - Marsh/marshy grassland
- SI B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- F2.1 - Marginal and inundation - marginal vegetation
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- E G1.1 - Standing water - eutrophic
- M G1.2 - Standing water - mesotrophic
- B G1.6 - Standing water - brackish
- G2 - Running water
- B G2.6 - Running water - brackish
- H1.1 - Intertidal - mud/sand
- H2.3 - Saltmarsh/dune interface
- H2.6 - Saltmarsh - dense/continuous
- H6.5 - Dune grassland
- C H8.4 - Coastal grassland
- Q I2.1 - Quarry
- S I2.2 - Spoil
- A J1.1 - Cultivated/disturbed land - arable
- A J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.4 - Fence
- J2.6 - Dry ditch
- J3.5 - Artificial sea wall
- J3.6 - Buildings
- J4 - Bare ground
- Hardstanding

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
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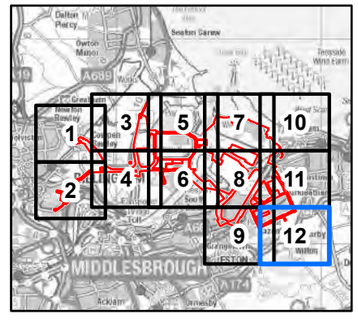
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 50 m Buffer
- Proposed Development Site Boundary - 250 m Buffer
- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J5 - Other habitat
- A2.2 - Scrub - scattered
- J2.6 - Dry ditch
- J2.2.2 - Defunct hedge - species-poor
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- F2.1 - Marginal and inundation - marginal vegetation
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- Watercourse
- Waterbody



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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Phase 1 Habitat Map (Draft)

FIGURE NUMBER

Figure 12-4 (Sheet 12 of 12)

Revision: 0 Drawn: MAB Checked: AD Approved: RW Date: 2023-08-04
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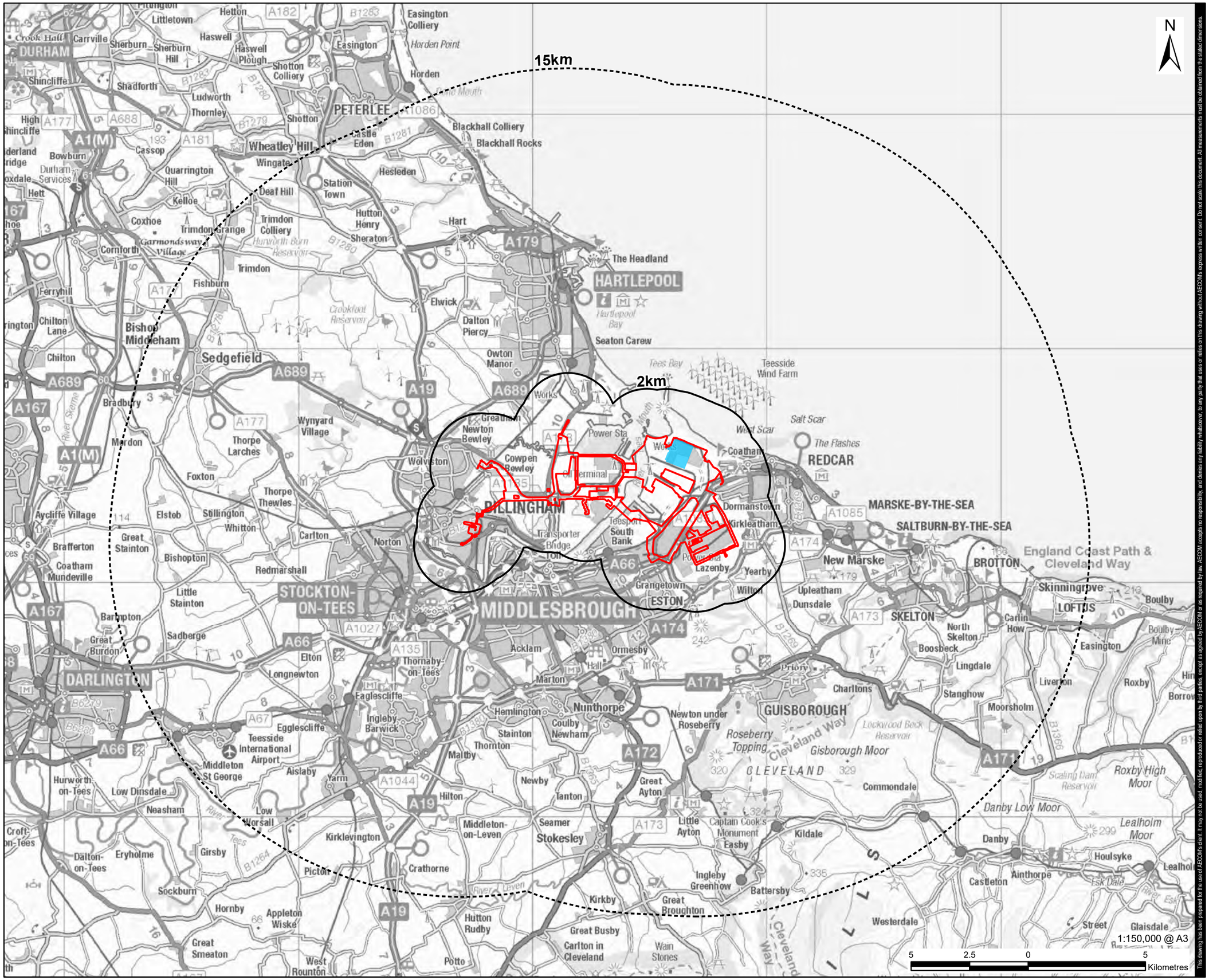

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PROJECT
H2Teesside DCO

APPLICANT
H2 Teesside Limited

CONSULTANT
AECOM Limited
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LEGEND
- Proposed Development Site Boundary
- Proposed Development Site Boundary - 2 km Study Area
- Proposed Development Site Boundary - 15 km Study Area
- Main Site

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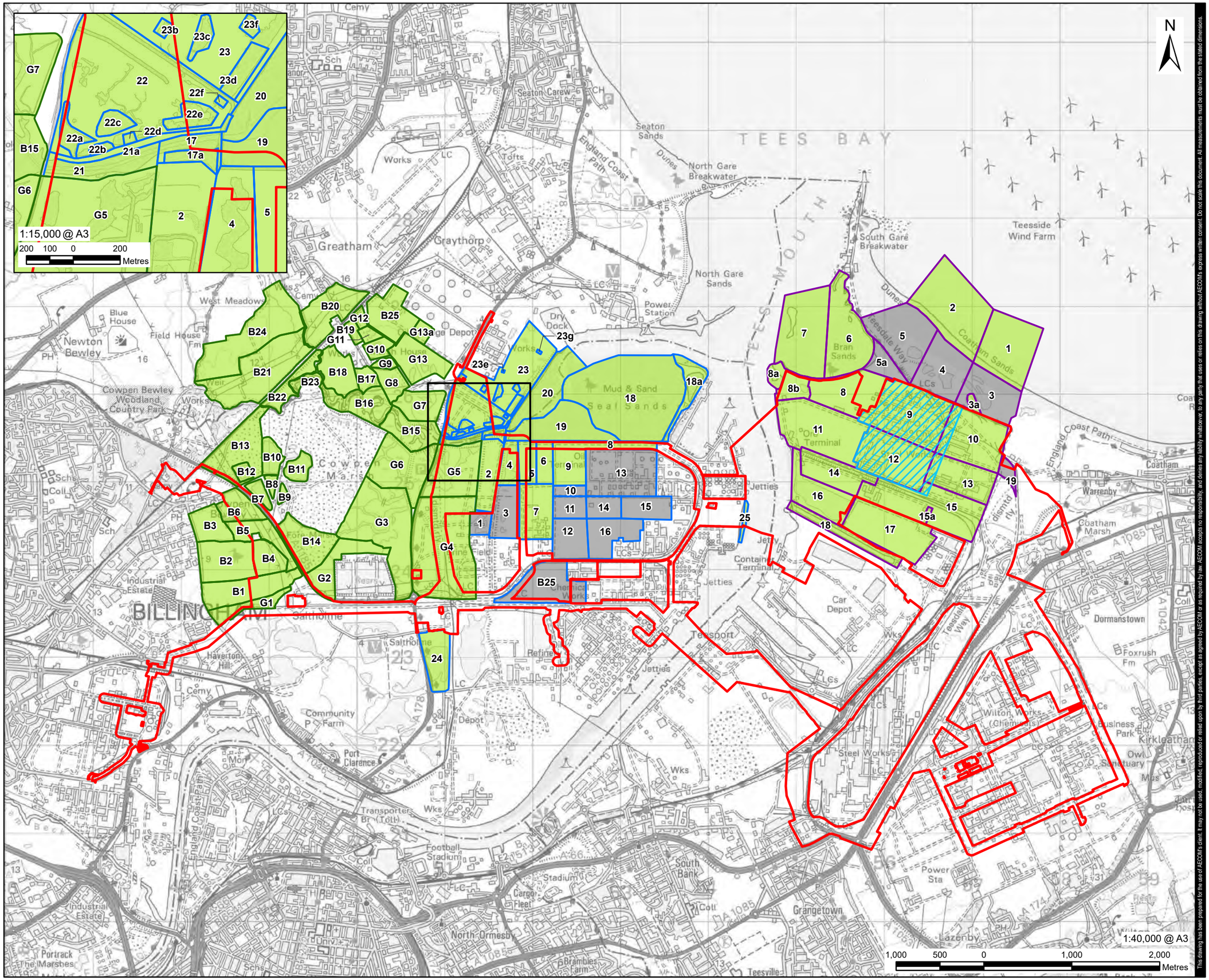
ISSUE PURPOSE
PEI Report

PROJECT NUMBER
60689030

FIGURE TITLE
Study Areas

FIGURE NUMBER
Figure 13-1



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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Main Site

AECOM Bird Count Sector

Status

- Active
- Inactive

Site

- North Tees Marshes
- Seal Sands
- The Foundry

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Survey Areas

FIGURE NUMBER

Figure 13-2

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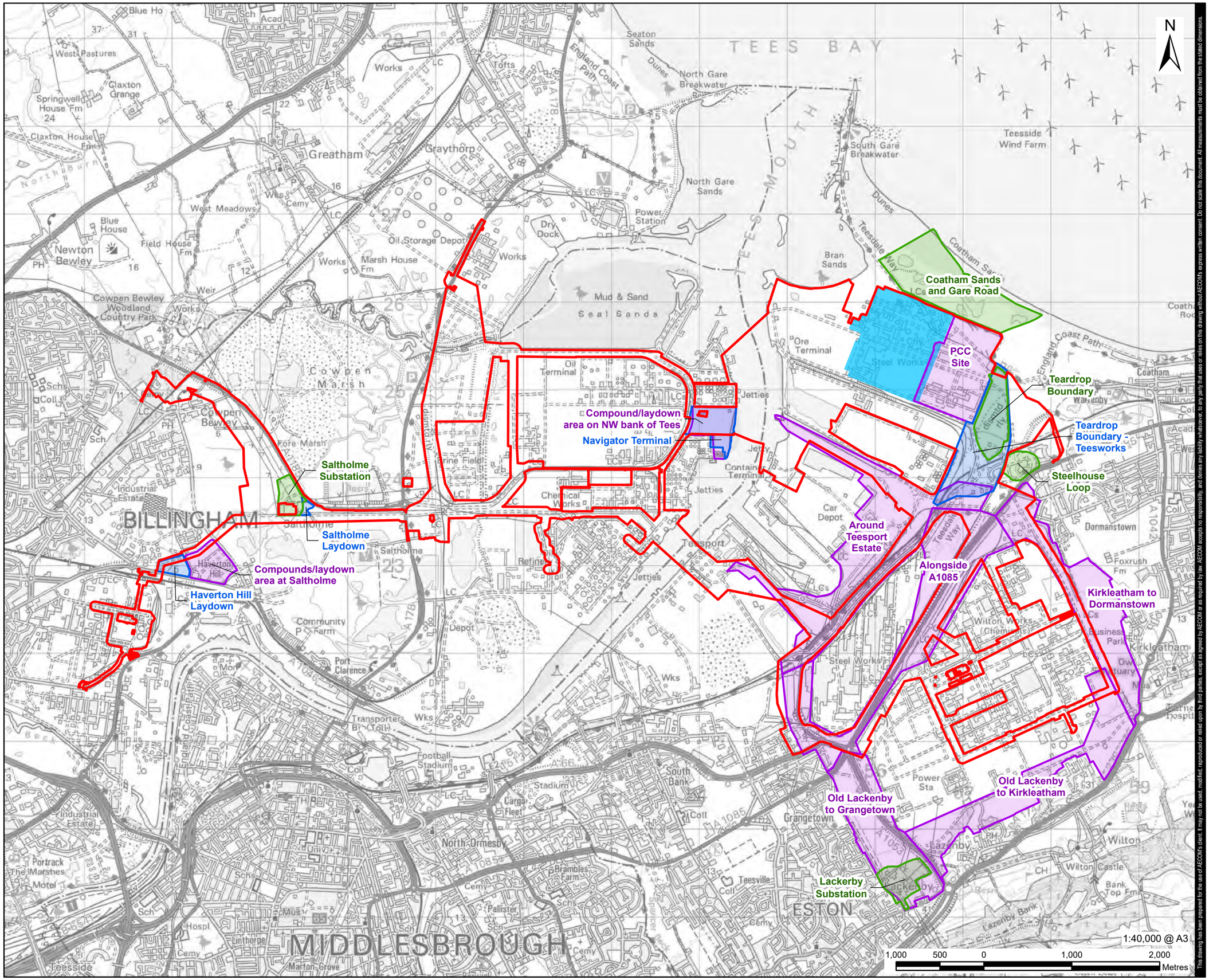

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APPLICANT

H2 Teesside Limited

CONSULTANT

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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site

Breeding Bird Survey Area (NZT)

- 2018
- 2020
- 2022

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Net Zero Teesside Breeding Bird Survey Areas

FIGURE NUMBER

Figure 13-3

Revision: 0 Drawn: MAB Checked: AD Approved: RW Date: 2023-08-04

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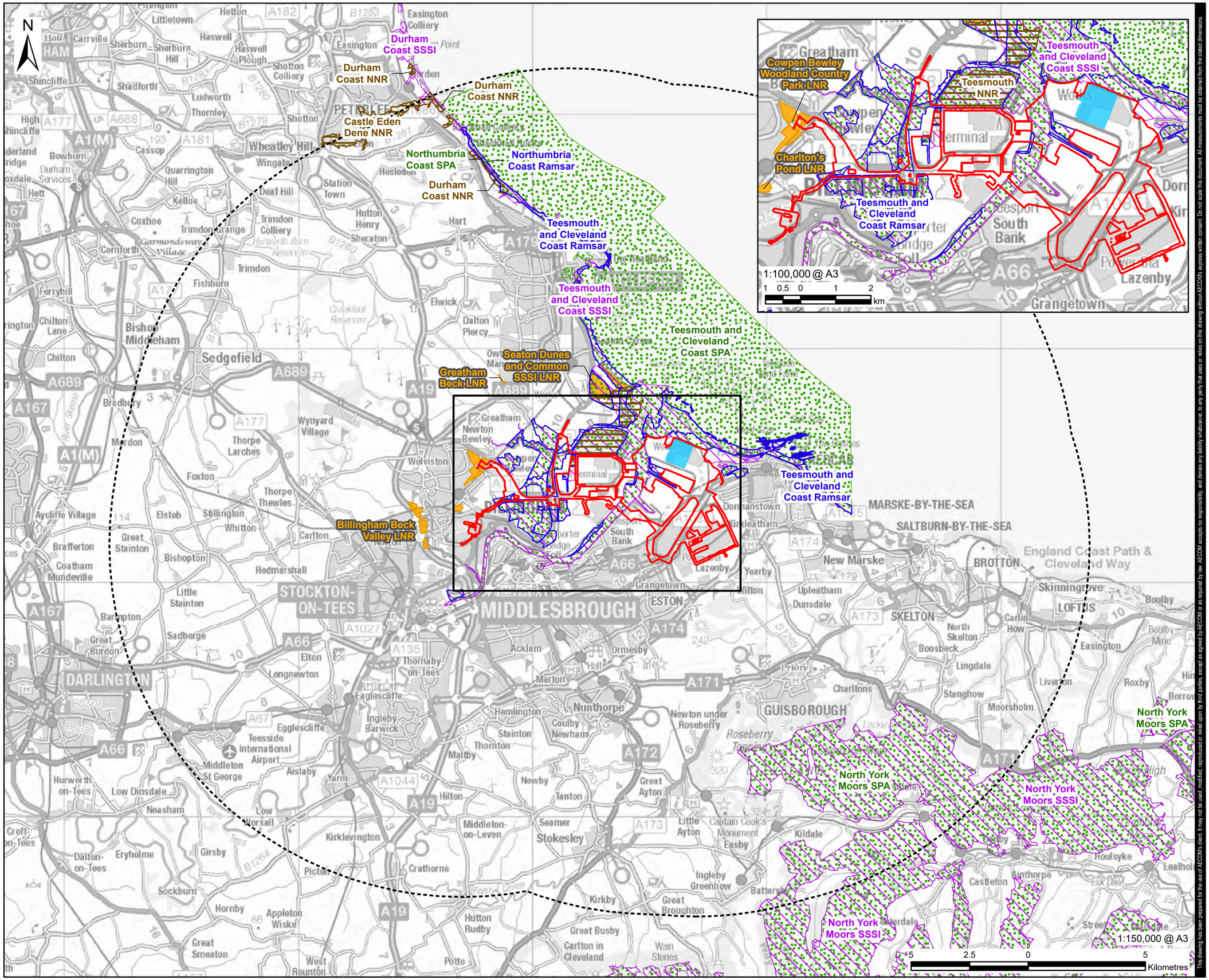

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 15 km Buffer
- Main Site
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Ramsar
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Statutory Designated Sites with Ornithology Features

FIGURE NUMBER

Figure 13-4

Revision: 0 Drawn: MAB Checked: AD Approved: RW Date: 2023-08-04

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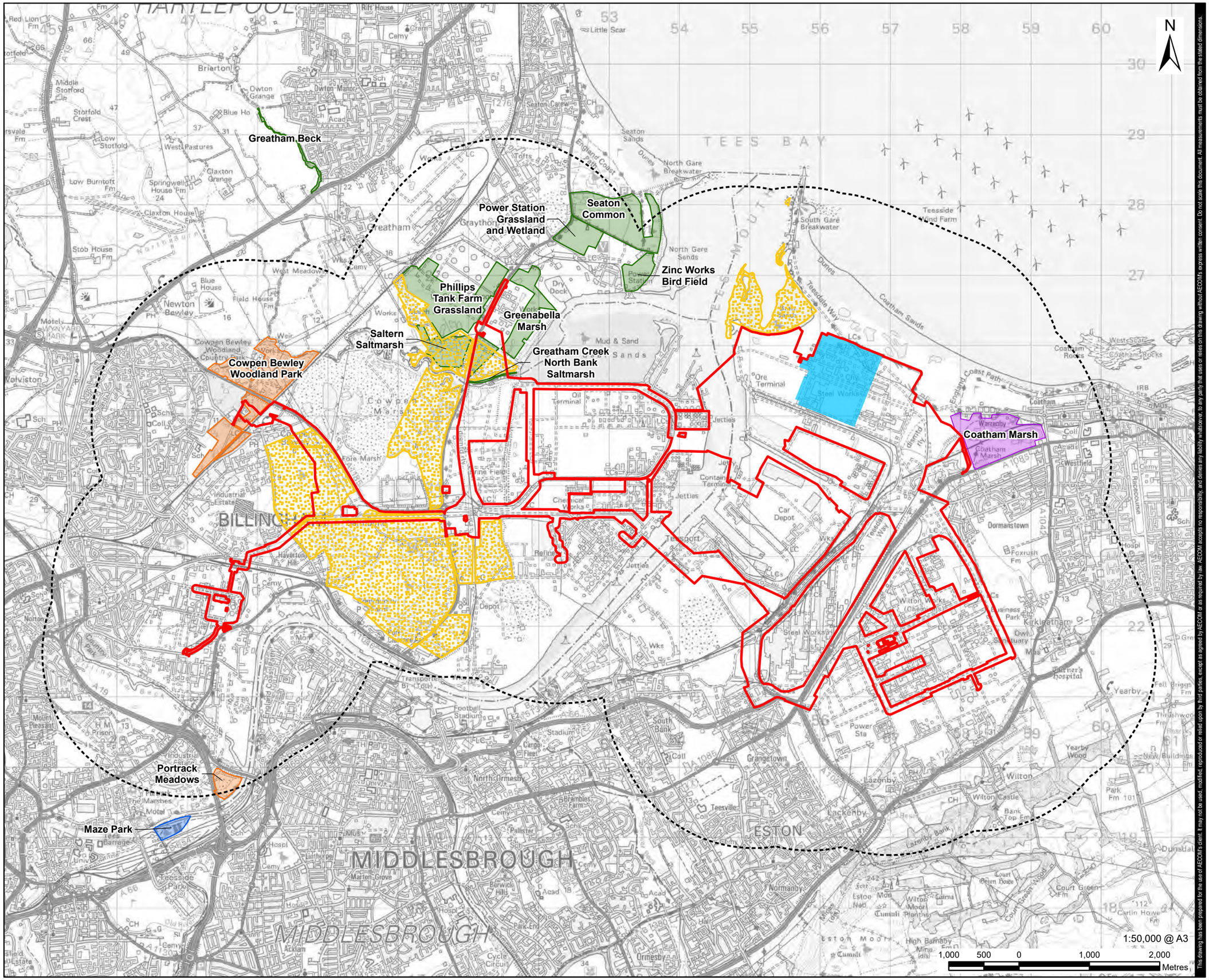

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 2 km Buffer
- Main Site
- Saltholme RSPB Reserve

Local Wildlife Site (LWS)

- Hartlepool
- Stockton
- Redcar and Cleveland
- Middlesborough

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2: Local Wildlife Sites provided by Environmental Records Information Centre North East (ERIC), (2022). Data licensed through Public Sector Mapping Agreement © Crown Copyright.
3: Data reproduced with the permission of RSPB. © Crown Copyright. Ordnance Survey licence number 100021787 (2023)

ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Non-Statutory Designated Sites with Ornithology Features

FIGURE NUMBER

Figure 13-5

Revision: 0 Drawn: AC Checked: LC Approved: JH Date: 2023-08-08
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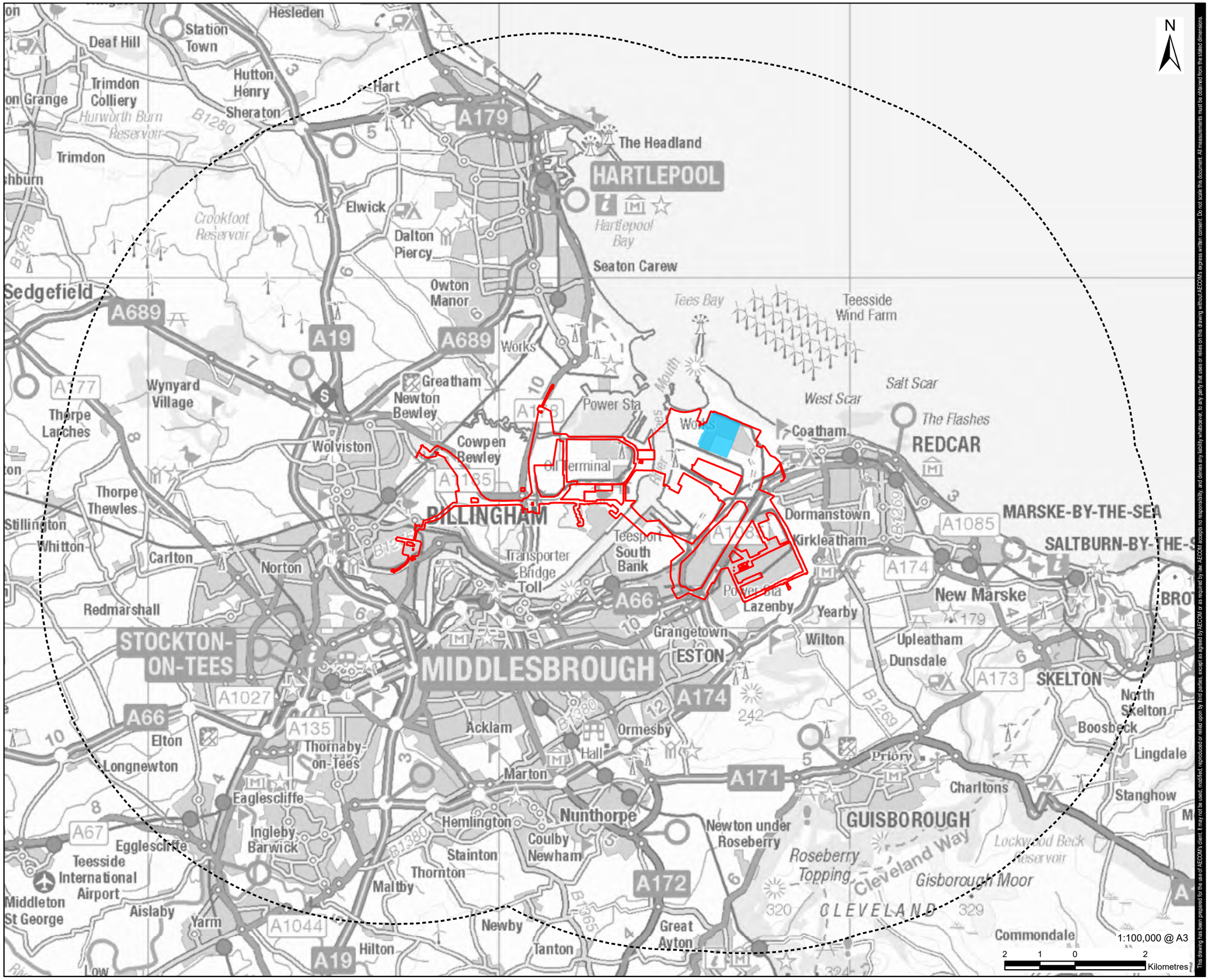

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PROJECT
H2Teesside DCO

APPLICANT
H2 Teesside Limited

CONSULTANT
AECOM Limited
100 Embankment,
Cathedral Approach,
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LEGEND
- Proposed Development Site Boundary
- Proposed Development Site Boundary - 10 km Buffer Study Area
- Main Site

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ISSUE PURPOSE
PEI Report

PROJECT NUMBER
60689030

FIGURE TITLE
Study Area

FIGURE NUMBER
Figure 14-1

Revision: 0 Drawn: AC Checked: LC Approved: JH Date: 2023-08-08

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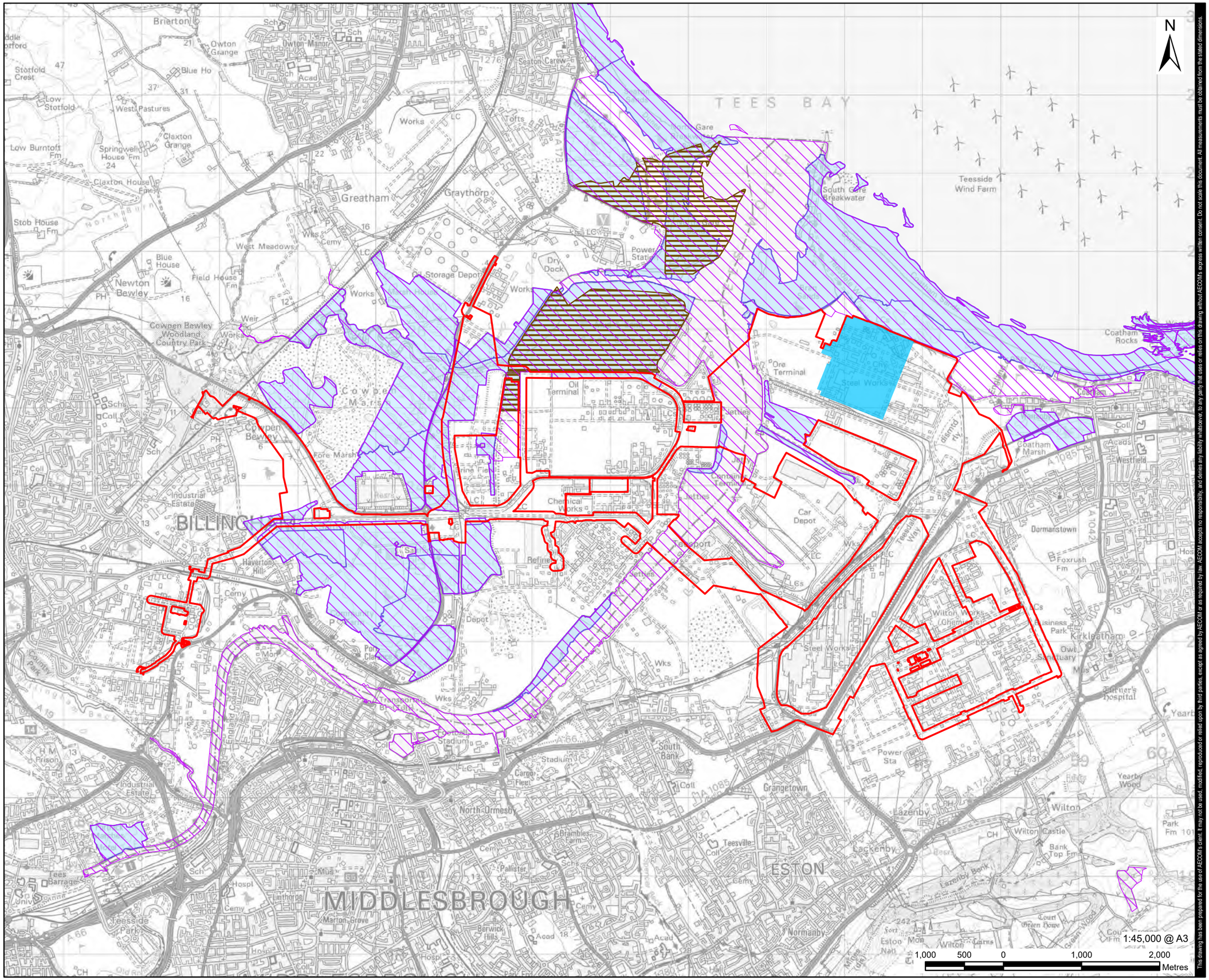

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PROJECT

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APPLICANT

H2 Teesside Limited

CONSULTANT

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Cathedral Approach,
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LEGEND

- Proposed Development Site Boundary
- Main Site
- Ramsar
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Designated Sites with Marine Ecological Features

FIGURE NUMBER

Figure 14-2

Revision: 0 Drawn: AC Checked: LC Approved: JH Date: 2023-08-08

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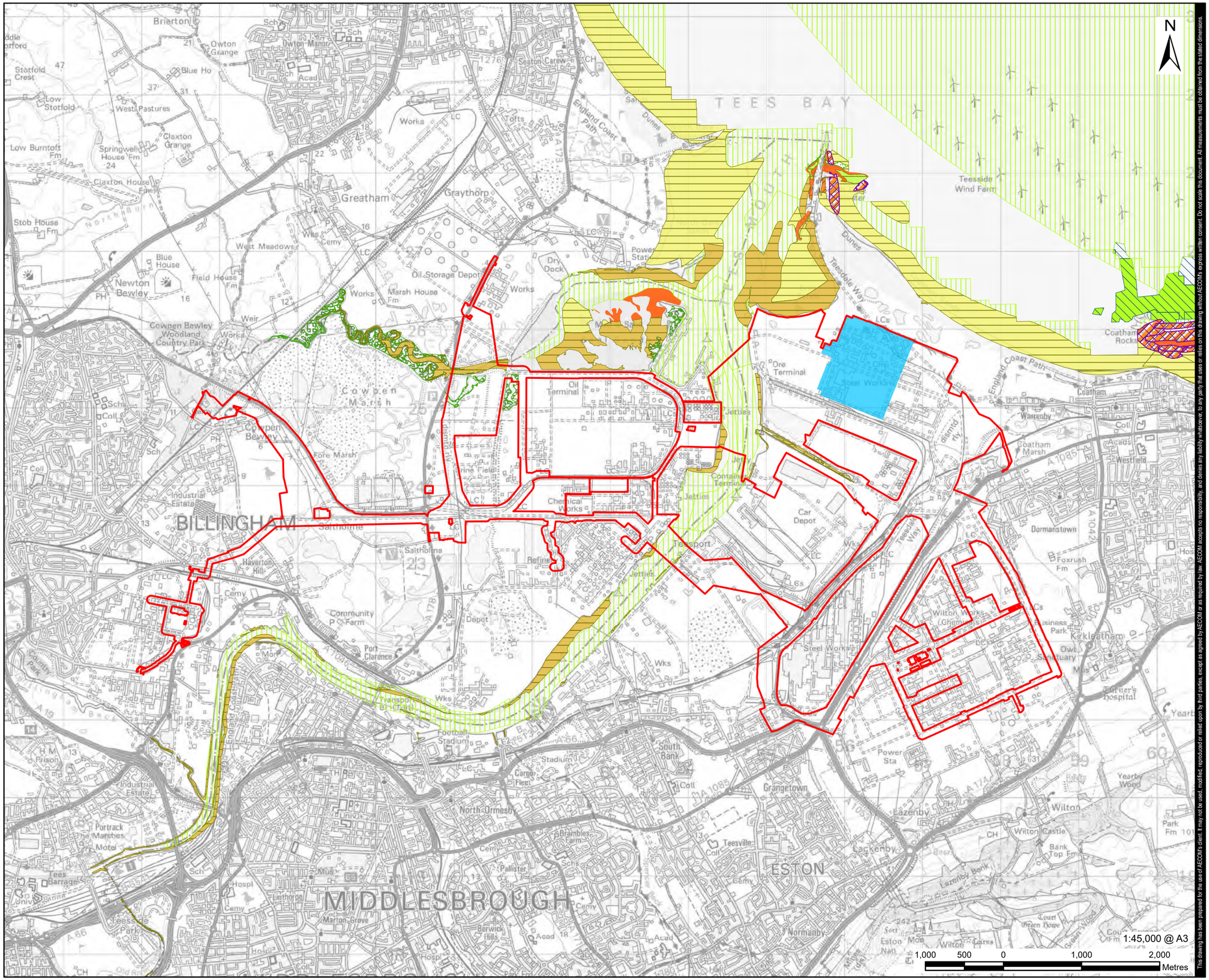

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
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Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site

WFD Habitats - Higher Sensitivity

- Mussel Beds (Modiolus modiolus, Mytilus edulis & others) (A1.22, A2.72, A5.62, A4.24, A3.361)
- Subtidal Kelp Beds (A3.11, A3.21. A3.22, A3.31, A3.32, A5.52)

WFD Habitats - Lower Sensitivity

- Gravel & Cobbles (intertidal & subtidal coarse sediment A2.1, A5.1)
- Intertidal Soft Sediment (Sand, Mud & Mixed A2.2, A2.3, A2.4)
- Subtidal Soft Sediment (Sand, Mud & Mixed A5.2, A5.3, A5.4)
- Subtidal Rocky Reef (Infralittoral and Circalittoral rock A3, A4)

Marine Protected Habitats

SPA/SAC Saltmarsh

- Saltmarsh (A2.5)

SPA/SAC Mudflats and sandflats not covered by seawater at low tide (H1140)

- Intertidal coarse sediment (A2.1)
- Intertidal sand and muddy sand (A2.2)
- Intertidal mud (A2.3)
- Intertidal mixed sediments (A2.4)

SPA/SAC Reefs (H1170)

- Intertidal biogenic reefs: mussel beds (SF_SH_5)
- Intertidal rock (A1)
- Infralittoral rock (A3)

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Important Intertidal and Subtidal Benthic Habitats

FIGURE NUMBER

Figure 14-3

Revision: 0 Drawn: MAB Checked: LC Approved: JH Date: 2023-08-08

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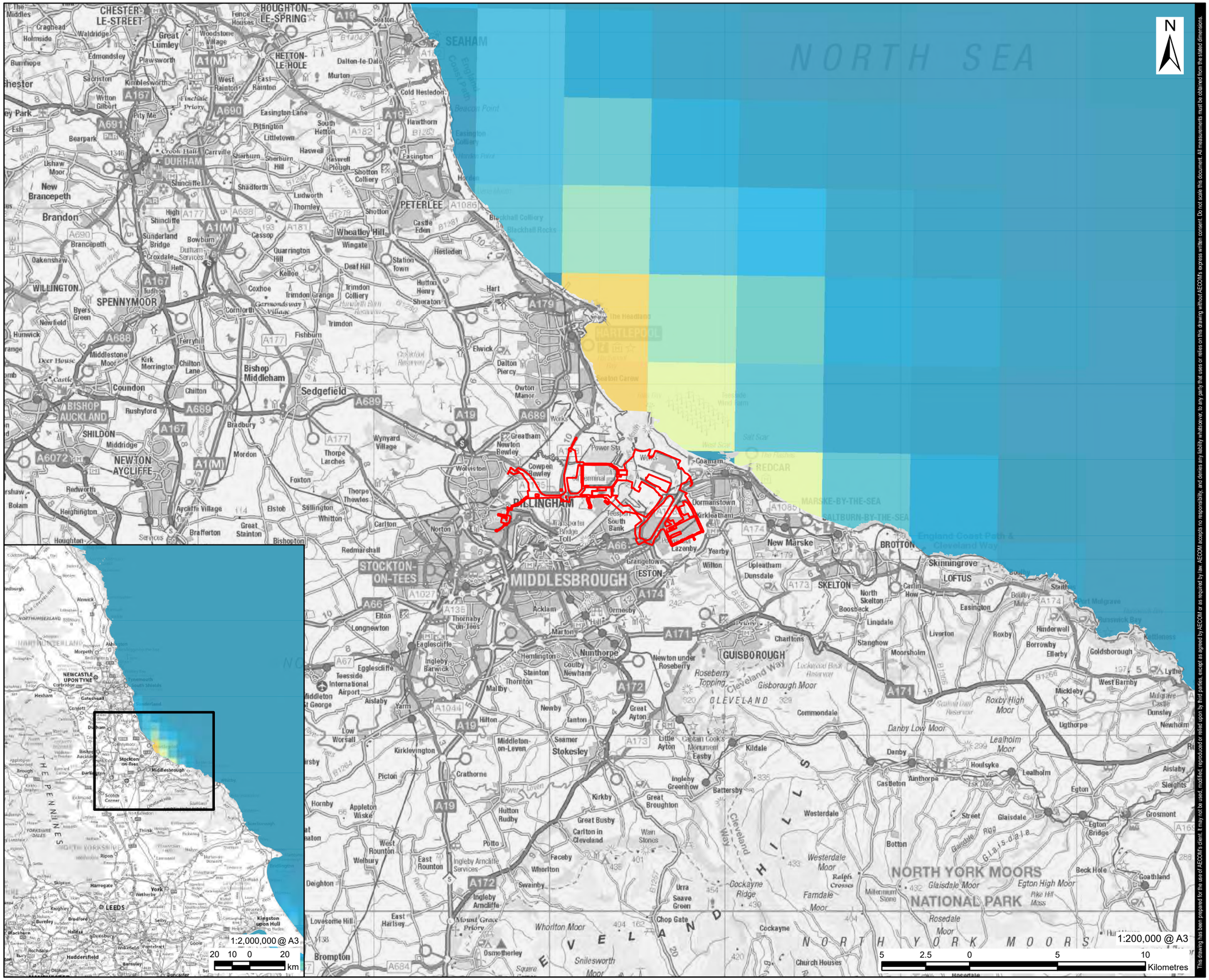

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
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LEGEND

Proposed Development Site Boundary

Harbour Seals

Percentage of at-sea population

High : 0.1

Low : 0

NOTES

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2: Carter et al., 2020.
At-Sea Density Maps for Grey and Harbour Seals in the British Isles (2020)
Attribution 4.0 International (CC BY 4.0). Available online at https://doi.org/10.17630/dcebb865-3177-4498-ac9d-13a0f10b74e1

ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

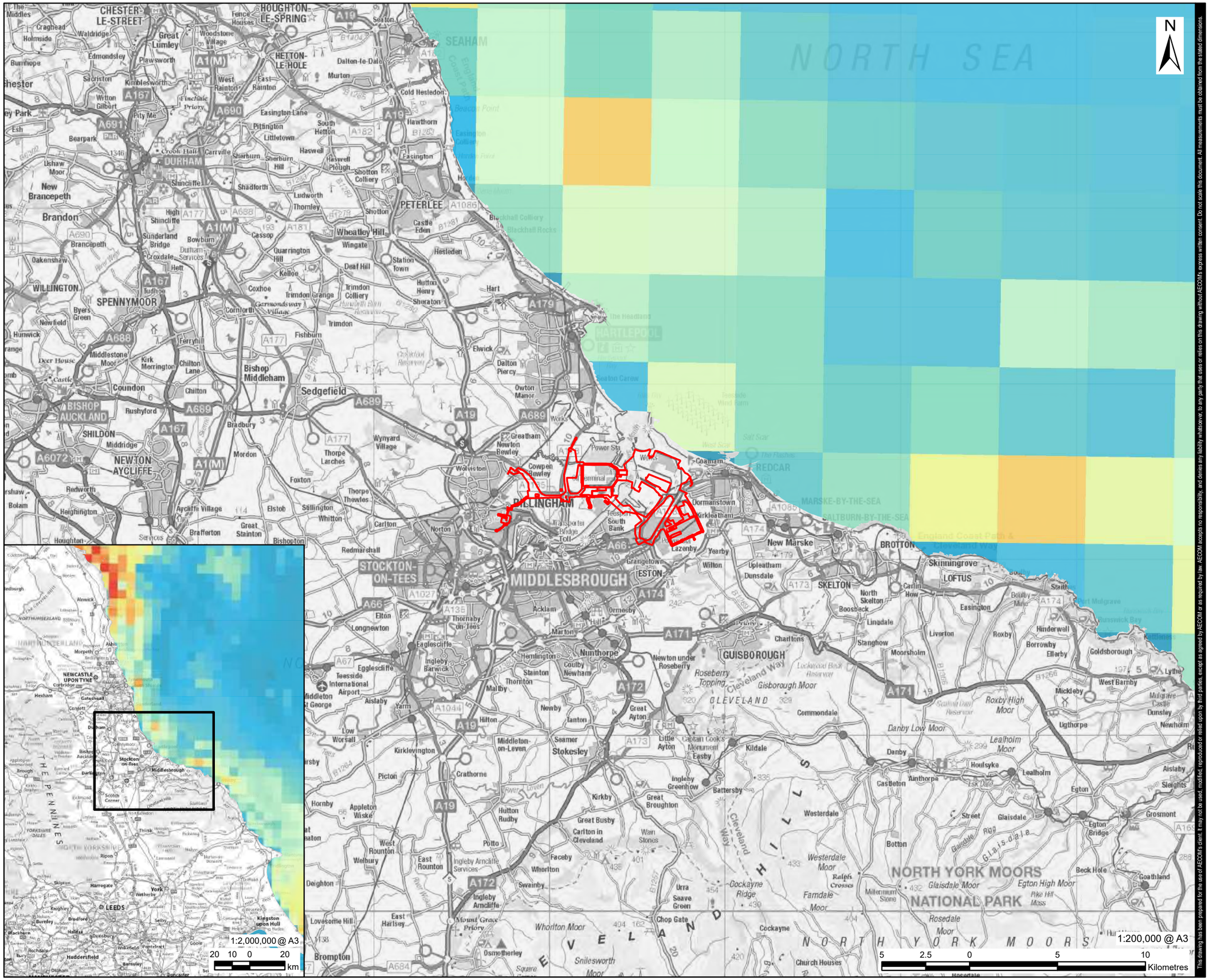
Mean percentage of at-sea population (estimated to be present in each 5 km x 5 km grid cell at any one time) of harbour seals from haulouts in the British Isles (Source: Carter et al., 2020)

FIGURE NUMBER

Figure 14-4

Revision: 0 Drawn: MAB Checked: LC Approved: JH Date: 2023-08-08

Filename: \\na.aecomnet.com\ifs\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_MarineEcology.aprx



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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

Proposed Development Site Boundary

Grey Seals

Percentage of at-sea population

High : 0.1

Low : 0

NOTES

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2: Carter et al., 2020.
At-Sea Density Maps for Grey and Harbour Seals in the British Isles (2020)
Attribution 4.0 International (CC BY 4.0). Available online at https://doi.org/10.17630/dcebb865-3177-4498-ac9d-13a0f10b74e1

ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Mean percentage of at-sea population (estimated to be present in each 5 km x 5 km grid cell at any one time) of grey seals from haulouts in the British Isles (Source: Carter et al., 2020)

FIGURE NUMBER

Figure 14-5

Revision: 0 Drawn: EH Checked: MB Approved: SM Date: 2023-08-08

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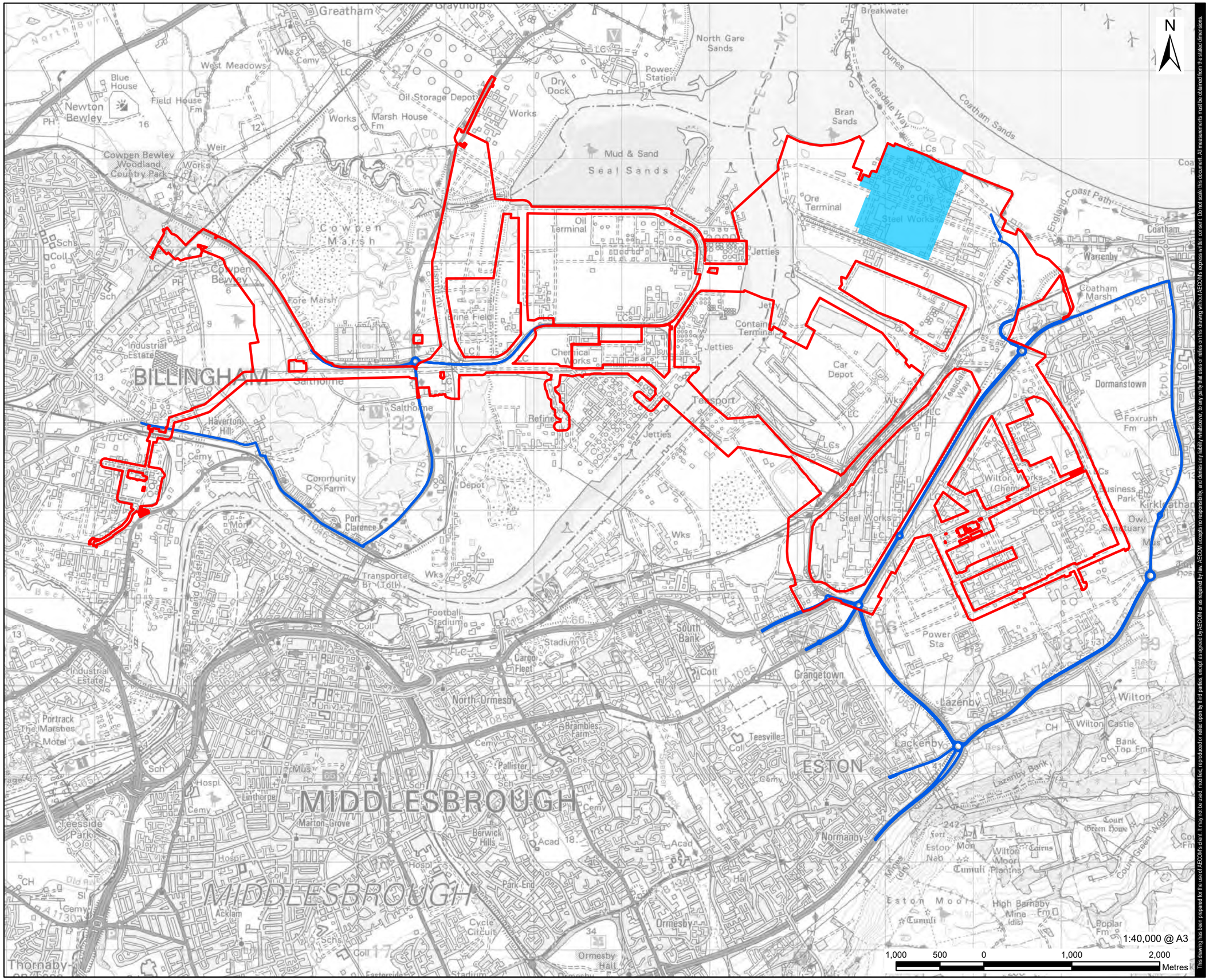

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Traffic Study Area

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Traffic Study Area

FIGURE NUMBER

Figure 15-1

Revision: 0 Drawn: EH Checked: MB Approved: SM Date: 2023-08-08

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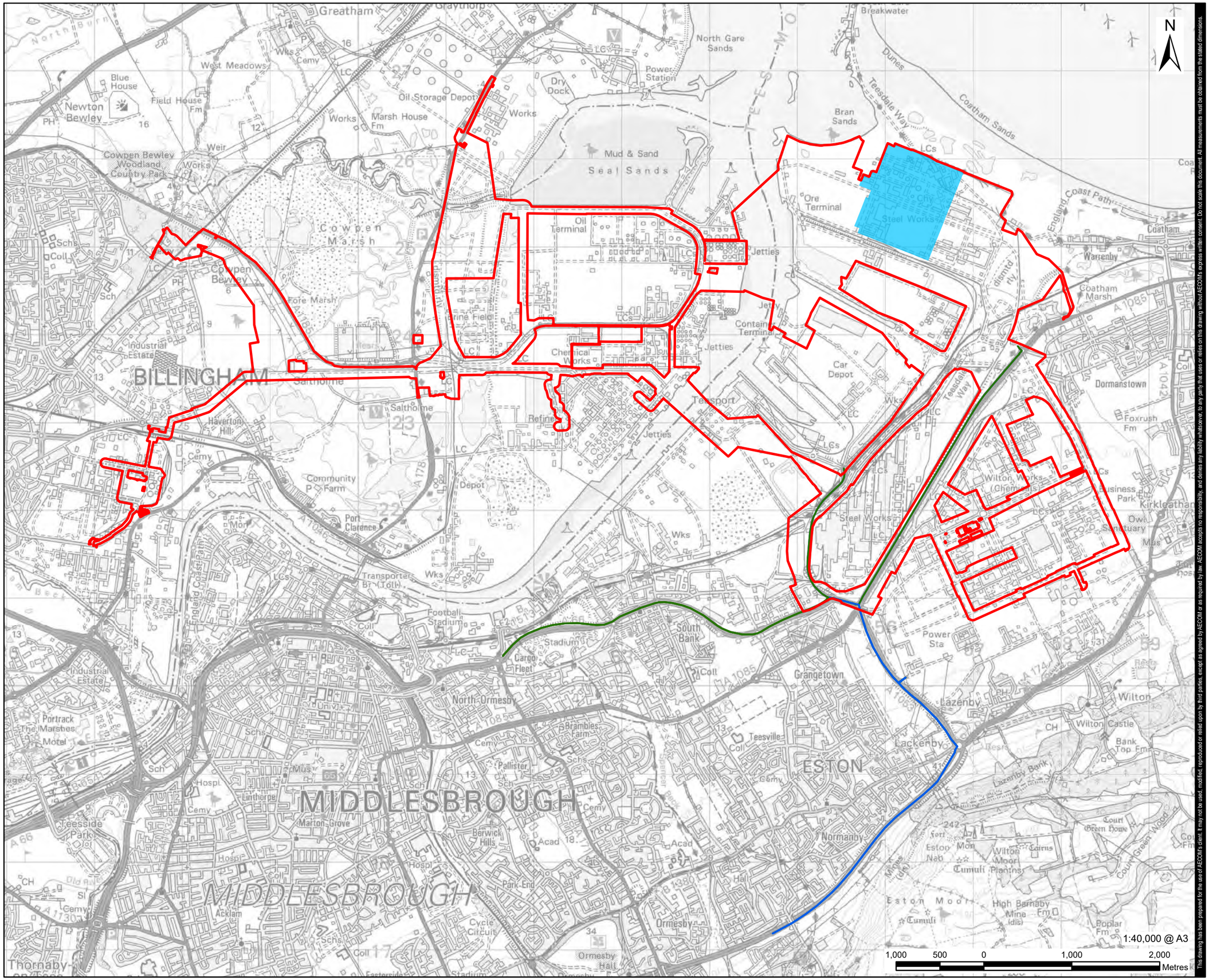

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LEGEND

- Proposed Development Site Boundary
- Main Site

HGV Route

- via A174
- via A66

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

HGV Routes to and from Site

FIGURE NUMBER

Figure 15-2

Revision: 0 Drawn: EH Checked: MB Approved: SM Date: 2023-08-08

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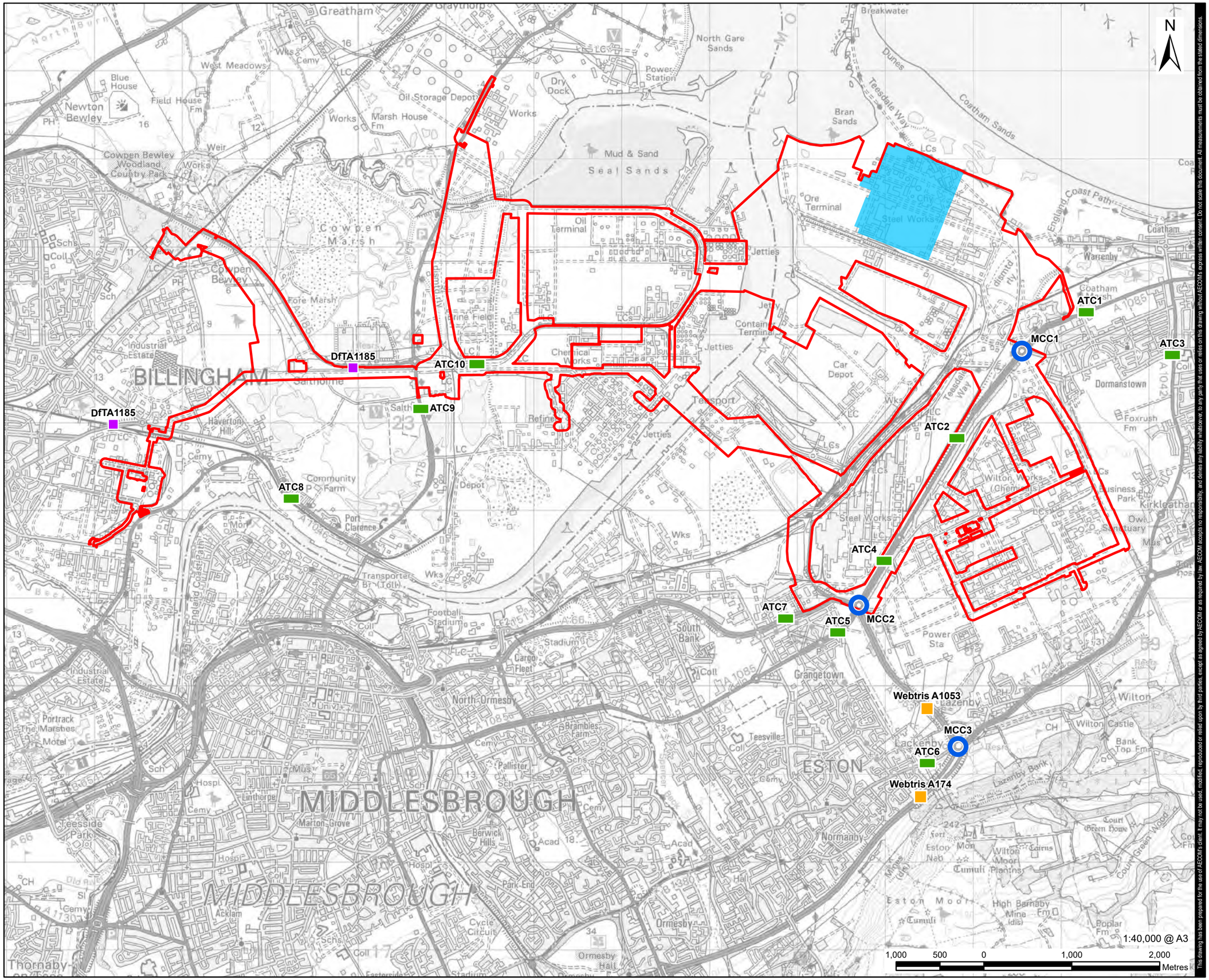

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LEGEND

- Proposed Development Site Boundary
- Main Site

Traffic Count Location

- Automated Traffic Count
- DfT
- Manual Classified Count
- Webtris Data

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

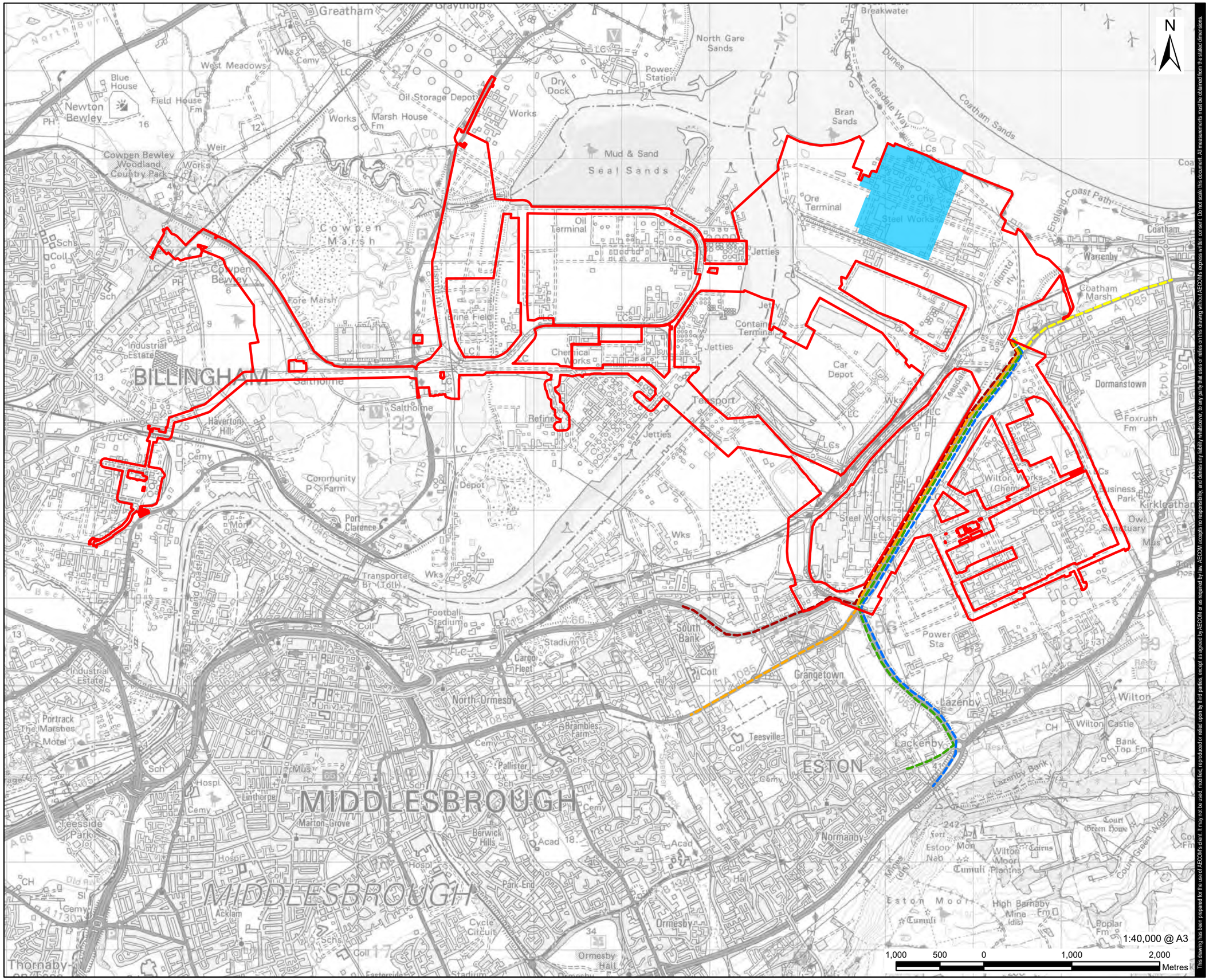
FIGURE TITLE

Traffic Count Locations

FIGURE NUMBER

Figure 15-3

Revision: 0 Drawn: EH Checked: MB Approved: SM Date: 2023-08-08



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LEGEND

- Proposed Development Site Boundary
- Main Site
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Traffic Routes

FIGURE NUMBER

Figure 15-4

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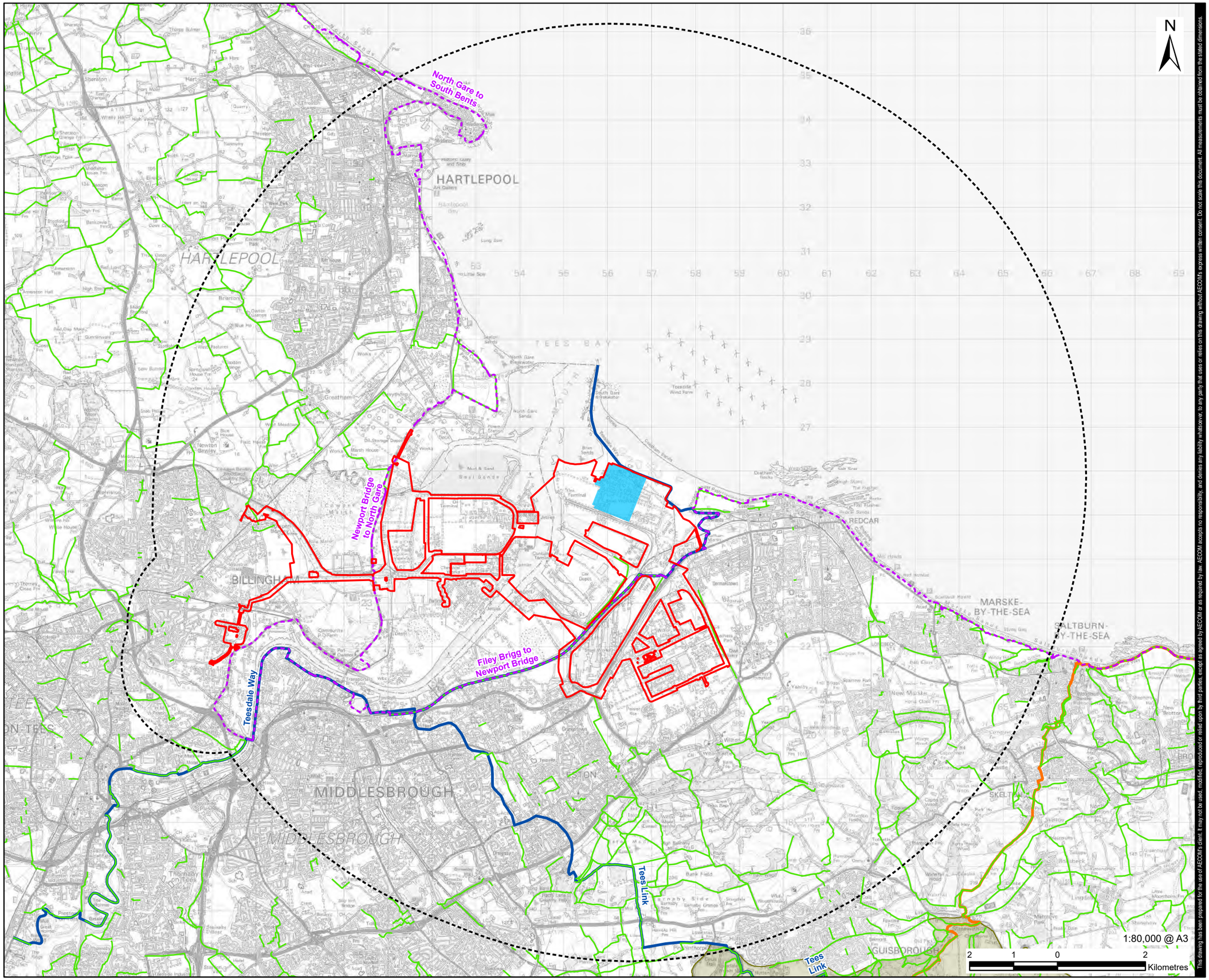

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LEGEND

- Proposed Development Site Boundary
- Landscape Study Area
- Main Site
- Public Rights of Way
- England Coast Path
- Long Distance Route
- National Trail
- North York Moors National Park

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Landscape Context

FIGURE NUMBER

Figure 16-1

Revision: 0 Drawn: MAB Checked: LC Approved: EB Date: 2023-08-08

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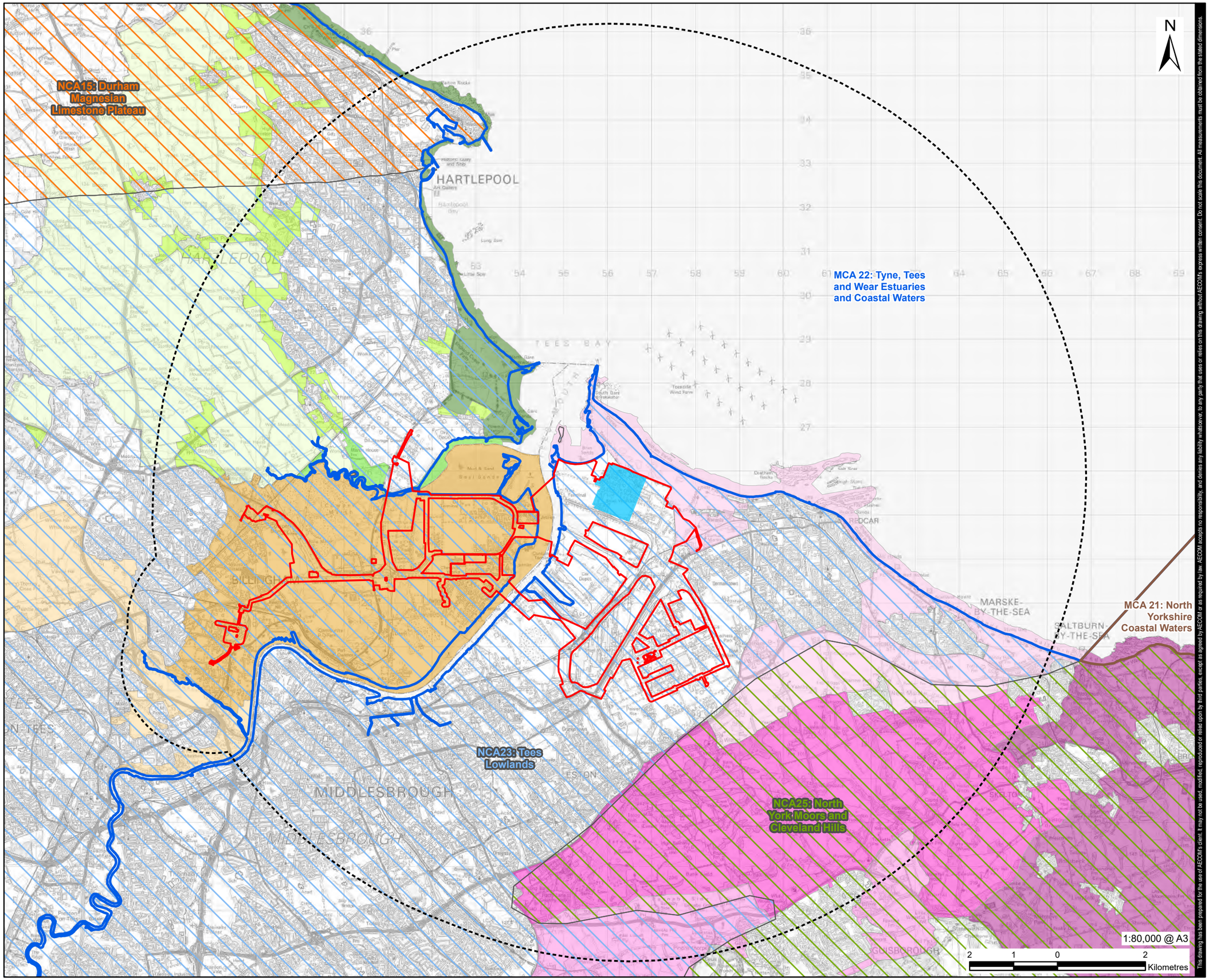

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LEGEND

- Proposed Development Site Boundary
- Landscape Study Area
- Main Site

Marine Character Area

- MCA 21: North Yorkshire Coastal Waters
- MCA 22: Tyne, Tees and Wear Estuaries and Coastal Waters

National Character Area (NCA)

- NCA 15: Durham Magnesian Limestone Plateau
- NCA 23: Tees Lowlands
- NCA 25: North York Moors and Cleveland Hills

Stockton and Tees Landscape Character Assessment (2011)

Landscape Character Area

- East Billingham to Teesmouth
- Thorpe and Billingham Beck Valley

Redcar and Cleveland Landscape Character SPD (2010)

Landscape Character Tract

- East Cleveland Plateau
- Eston Hills
- Guisborough Lowland
- Redcar Flats

Hartlepool Landscape Assessment (2000)

Landscape Character Type

- Coastal
- Estuarine
- Rural Fringe
- Undulating Farmland

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

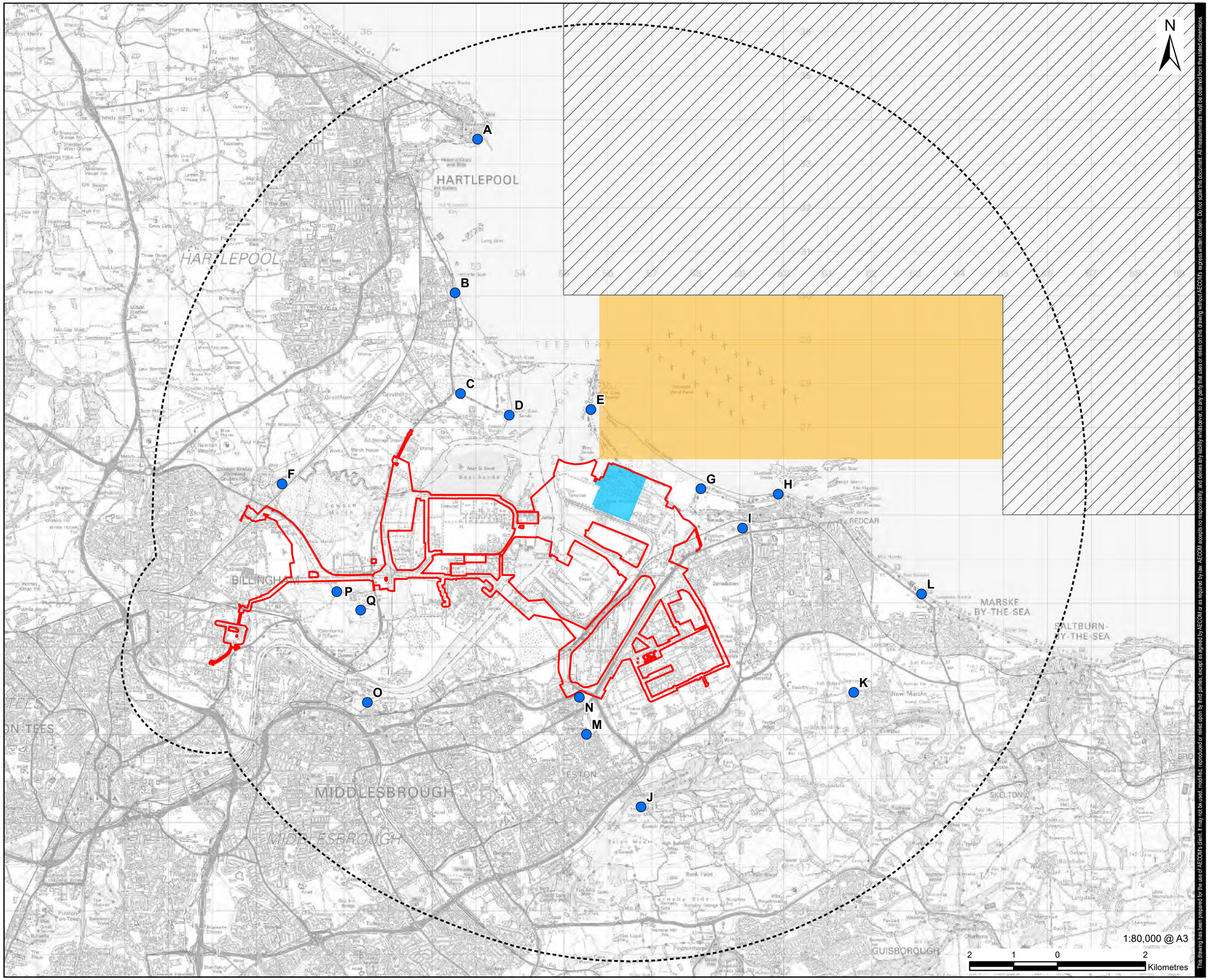
FIGURE TITLE

Landscape Character

FIGURE NUMBER

Figure 16-2

Revision: 0 Drawn: MAB Checked: LC Approved: EB Date: 2023-08-16



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LEGEND

- Proposed Development Site Boundary
- Landscape Study Area
- Main Site
- Potential Viewpoint Location
- Zone of Theoretical Visibility
- No Digital Terrain Model (DTM) Coverage

NOTES

1: Zone of Theoretical Visibility (ZTV) has been generated using Ordnance Survey Terrain 5 Digital Terrain Model (DTM) which does not take into account the screening effects of vegetation, buildings or other structures.
ZTV is based upon a grid of points at 50m apart within the Main Site footprint with an assumed flare height of 100m and an observer eye height of 1.6m.
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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

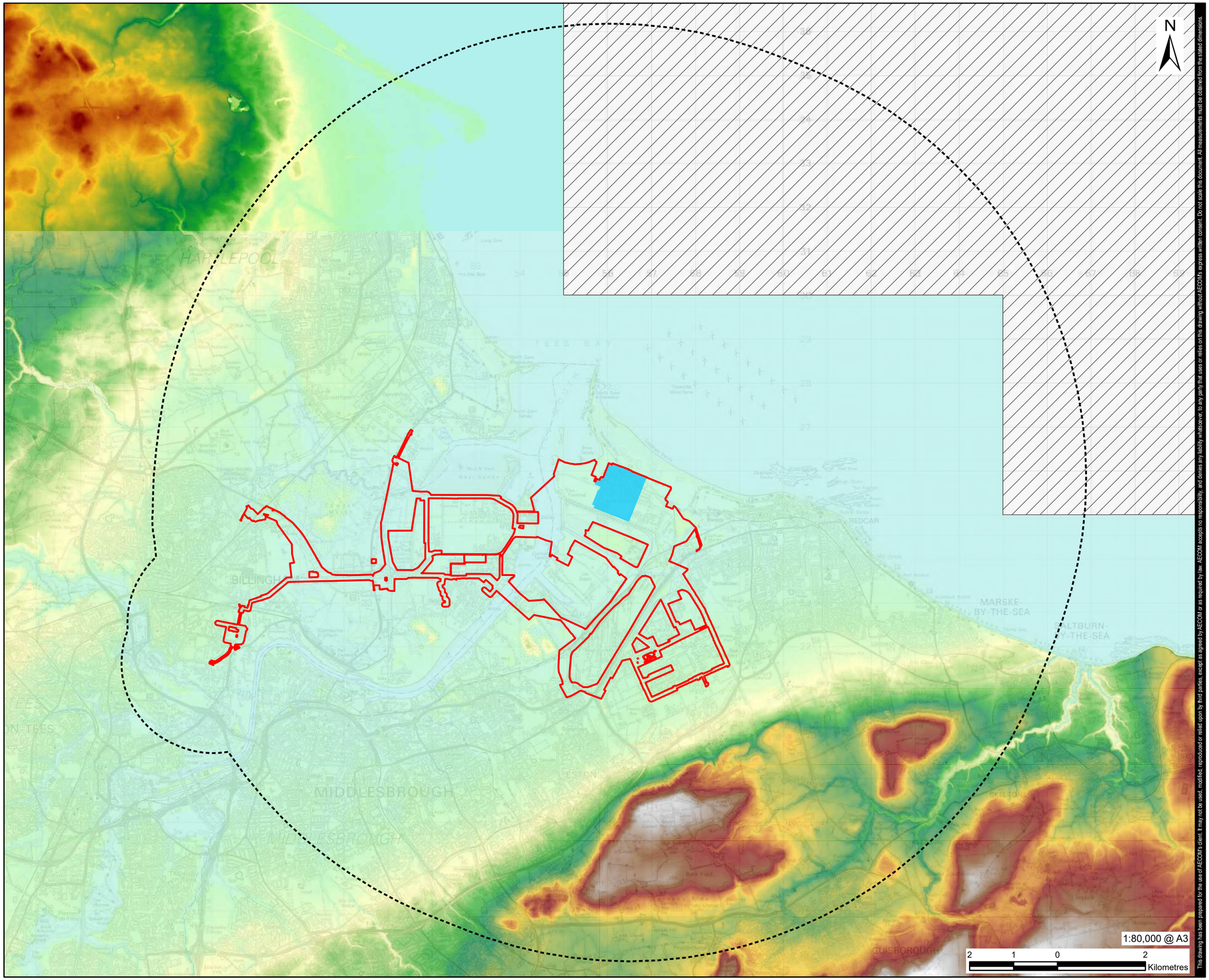
Zone of Theoretical Visibility and Potential Viewpoint Locations

FIGURE NUMBER

Figure 16-3

Filename: K:\02_Maps\PEIR\H2Teesside_PEIR_Landscape.aprx

Revision: 0 Drawn: MAB Checked: LC Approved: EB Date: 2023-08-08



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LEGEND

- Proposed Development Site Boundary
- Landscape Study Area
- Main Site
- No Digital Terrain Model (DTM) Coverage

Topography (OS Terrain 5)

- High: 323.41m
- Low: -5.74m

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Topography

FIGURE NUMBER

Figure 16-4

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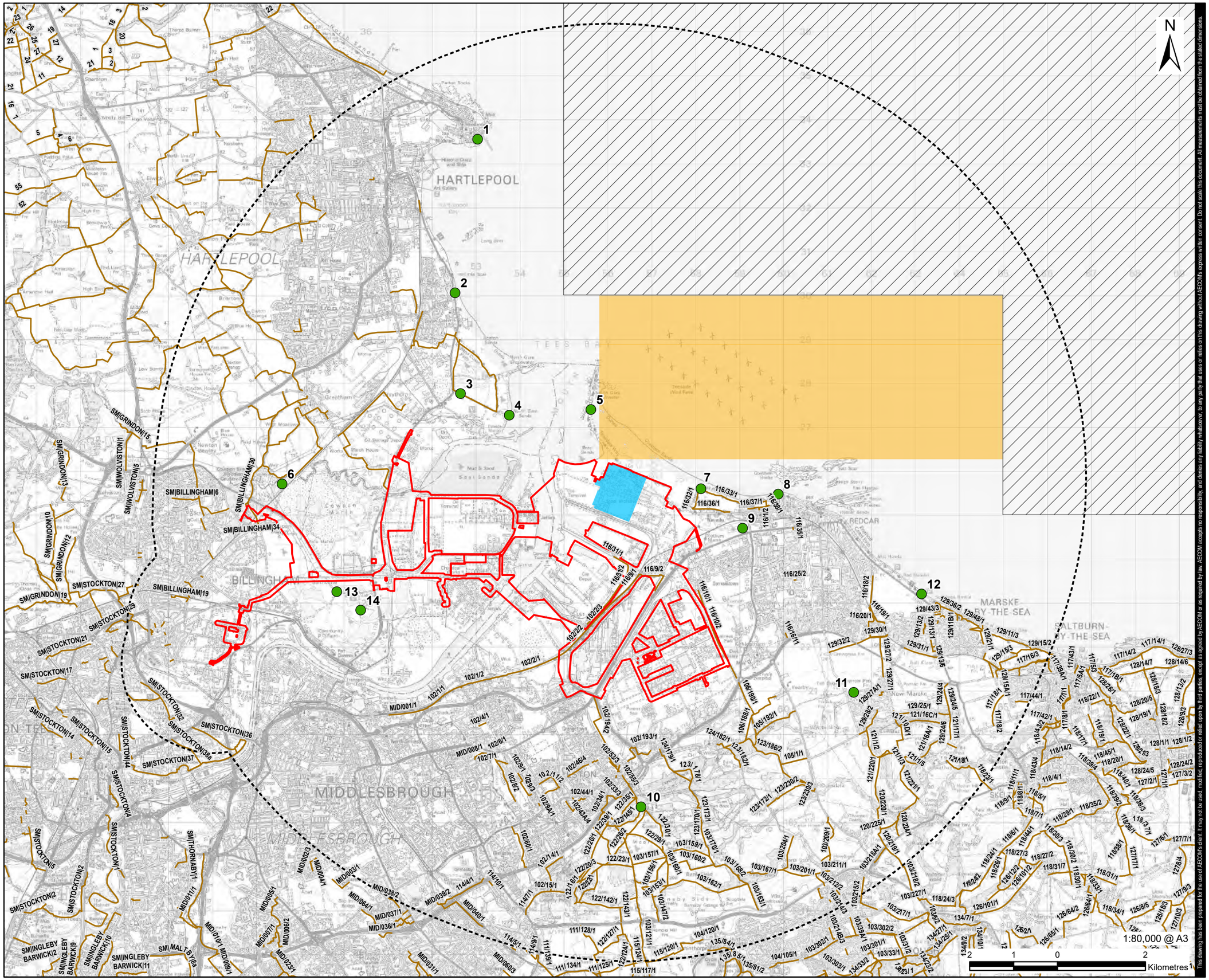

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LEGEND

- Proposed Development Site Boundary
- Landscape Study Area
- Main Site
- Representative Viewpoint Location
- Zone of Theoretical Visibility
- No Digital Terrain Model (DTM) Coverage
- Public Rights of Way

NOTES

1: Zone of Theoretical Visibility (ZTV) has been generated using Ordnance Survey Terrain 5 Digital Terrain Model (DTM) which does not take into account the screening effects of vegetation, buildings or other structures.
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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Zone of Theoretical Visibility and Representative Viewpoint Locations

FIGURE NUMBER

Figure 16-5



200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	South east		
Date / Time:	22/03/2023, 14:15	Location:	453044 , 533546		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.6.1 Winter Viewpoint Photography

Viewpoint 1: Albion Terrace, Hartlepool

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°

EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:		**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	4.7m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°		1.6m		
Paper Size:	A1	Direction of View:	South east				
Date / Time:	22/03/2023, 13:02	Location:	452531 , 530050				

Figure 16.6.2 Winter Viewpoint Photography

Viewpoint 2: The Cliff, Seaton Carew

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	South east		
Date / Time:	22/03/2023, 12:40	Location:	452655 , 527758		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.6.3 Winter Viewpoint Photography

Viewpoint 3: Teesmouth National Nature Reserve, England Coast Path

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	Figure 16.6.4 Winter Viewpoint Photography
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	**Viewpoint 4: North Gare Sands**
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	South east				
Date / Time:	22/03/2023, 12:27	Location:	453764 , 527266				

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	South east				
Date / Time:	22/03/2023, 12:59	Location:	455623 , 527394				

Figure 16.6.5 Winter Viewpoint Photography

Viewpoint 5: South Gare Breakwater

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	East				
Date / Time:	22/03/2023, 15:21	Location:	448593 , 525702				

Figure 16.6.6 Winter Viewpoint Photography

Viewpoint 6: Cowpen Bewley Country Park

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°

EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	West		
Date / Time:	22/03/2023, 11:41	Location:	458128 , 525592		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.6.7 Winter Viewpoint Photography

Viewpoint 7: England Coast Path, Warrenby

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

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EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	West		
Date / Time:	22/03/2023, 12:20	Location:	459887 , 525470		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.6.8 Winter Viewpoint Photography

Viewpoint 8: Redcar seafront

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

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EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	West				
Date / Time:	22/03/2023, 13:24	Location:	459076 , 524695				

Figure 16.6.9 Winter Viewpoint Photography

Viewpoint 9: Coatham Marsh Nature Reserve

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

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EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**: Images to be viewed at a comfortable arm's length.	Figure 16.6.10 Winter Viewpoint Photography
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m		**Viewpoint 10: Eston Nab**
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	North				
Date / Time:	22/03/2023, 15:07	Location:	456765 , 518354				

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

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EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	Figure 16.6.11 Winter Viewpoint Photography
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	**Viewpoint 11: Longbeck Lane**
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	North west				
Date / Time:	22/03/2023, 10:57	Location:	461606 , 520959				

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°

EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	North west		
Date / Time:	22/03/2023, 10:37	Location:	463150 , 523198		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.6.12 Winter Viewpoint Photography

Viewpoint 12: Carpark off A1085 Coast Road, Marske by the Sea

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	North		
Date / Time:	22/03/2023, 11:16	Location:	450533 , 520732		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.6.13 Winter Viewpoint Photography

Viewpoint 13: Saltholme Wildlife Reserve and Discovery Park

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	North east				
Date / Time:	22/03/2023, 11:16	Location:	450479 , 522590				

Figure 16.6.14 Winter Viewpoint Photography

Viewpoint 14: Saltholme Wildlife Reserve and Discovery Park

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	South east				
Date / Time:	06/07/2023, 14:26	Location:	453044 , 533546				

Figure 16.7.1 Summer Viewpoint Photography

Viewpoint 1: Albion Terrace, Hartlepool

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	4.7m
Enlargement Factor:	96%	Horizontal Field of View:	90°		1.6m
Paper Size:	A1	Direction of View:	South east		
Date / Time:	06/07/2023, 13:47	Location:	452531 , 530050		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.7.2 Summer Viewpoint Photography

Viewpoint 2: The Cliff, Seaton Carew

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	South east		
Date / Time:	06/07/2023, 13:14	Location:	452655 , 527758		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.7.3 Summer Viewpoint Photography

Viewpoint 3: Teesmouth National Nature Reserve, England Coast Path

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	South east		
Date / Time:	06/07/2023, 13:22	Location:	453764 , 527266		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.7.4 Summer Viewpoint Photography

Viewpoint 4: North Gare Sands

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	South east				
Date / Time:	06/07/2023, 9:30	Location:	455623 , 527394				

Figure 16.7.5 Summer Viewpoint Photography

Viewpoint 5: South Gare Breakwater

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	East				
Date / Time:	06/07/2023, 12:48	Location:	448593 , 525702				

Figure 16.7.6 Summer Viewpoint Photography

Viewpoint 6: Cowpen Bewley Country Park

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	West		
Date / Time:	06/07/2023, 10:10	Location:	458128 , 525592		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.7.7 Summer Viewpoint Photography

Viewpoint 7: England Coast Path, Warrenby

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	West		
Date / Time:	06/07/2023, 10:32	Location:	459887 , 525470		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.7.8 Summer Viewpoint Photography

Viewpoint 8: Redcar seafront

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°

EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**: Images to be viewed at a comfortable arm's length.	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m		
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	West				
Date / Time:	06/07/2023, 09:10	Location:	459076 , 524695				

Figure 16.7.9 Summer Viewpoint Photography

Viewpoint 9: Coatham Marsh Nature Reserve

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	North				
Date / Time:	06/07/2023, 07:38	Location:	456765 , 518354				

Figure 16.7.10 Summer Viewpoint Photography

Viewpoint 10: Eston Nab

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	North west		
Date / Time:	06/07/2023, 08:50	Location:	461606 , 520959		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.7.11 Summer Viewpoint Photography

Viewpoint 11: Longbeck Lane

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°		
Paper Size:	A1	Direction of View:	North west		
Date / Time:	06/07/2023, 08:37	Location:	463150 , 523198		

Note:
Images to be viewed at a comfortable arm's length.

Figure 16.7.12 Summer Viewpoint Photography

Viewpoint 12: Carpark off A1085 Coast Road, Marske by the Sea

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°



EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	North				
Date / Time:	06/07/2023, 11:54	Location:	450533 , 520732				

Figure 16.7.13 Summer Viewpoint Photography

Viewpoint 13: Saltholme Wildlife Reserve and Discovery Park

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200% enlargement

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30°

EXISTING (WINTER)

Extent of 50mm single frame image (27° field of view in portrait)

FOR CONTEXT ONLY

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	1	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note**:	
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	
Enlargement Factor:	96%	Horizontal Field of View:	90°				
Paper Size:	A1	Direction of View:	North east				
Date / Time:	06/07/2023, 11:38	Location:	450479 , 522590				

Figure 16.7.14 Summer Viewpoint Photography

Viewpoint 14: Saltholme Wildlife Reserve and Discovery Park

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Extent of 50mm single frame image

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	4	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note:**	H2 Teesside
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	Viewpoint 2: The Cliff, Seaton Carew
Enlargement Factor:	96%	Horizontal Field of View:	90°				Figure 16-8-1
Paper Size:	A1	Direction of View:	South east				
Date / Time:	22/03/2023, 13:02	Location:	E452531, N530050				

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Extent of 50mm single frame image

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	4	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note:**	H2 Teesside
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	Viewpoint 2: The Cliff, Seaton Carew
Enlargement Factor:	96%	Horizontal Field of View:	90°				Figure 16-8-2
Paper Size:	A1	Direction of View:	South east				
Date / Time:	22/03/2023, 13:02	Location:	E4452531, N530050				

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Extent of 50mm single frame image

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	4	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note:**	H2 Teesside
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	Viewpoint 5: South Gare Breakwater
Enlargement Factor:	96%	Horizontal Field of View:	90°				Figure 16-8-3
Paper Size:	A1	Direction of View:	South east				
Date / Time:	23/02/2023, 12:59	Location:	E455639, N527643				

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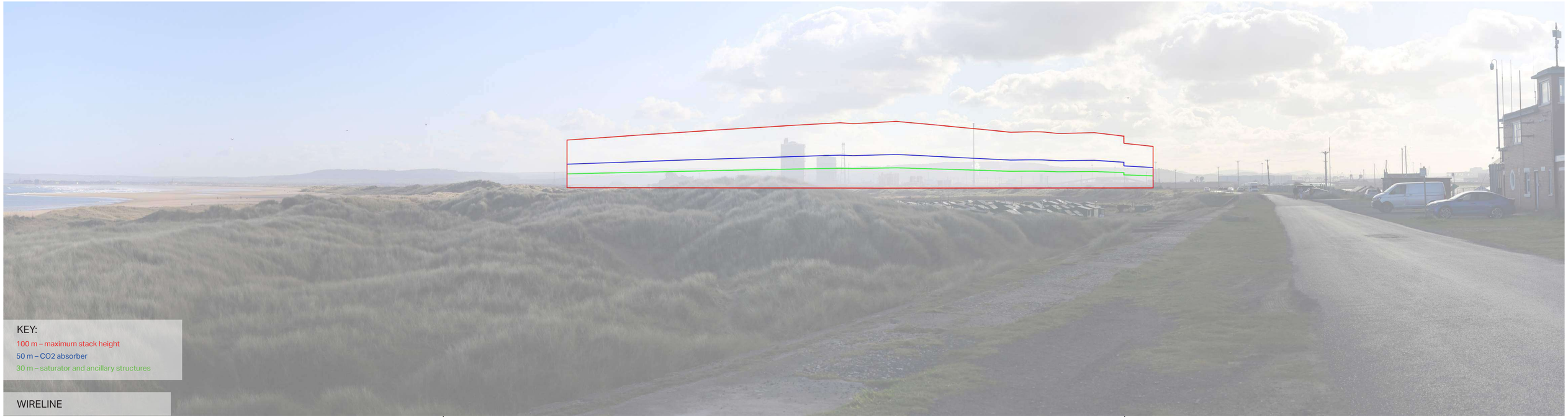

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Visualisation Type:	4	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note:** Images to be viewed at a comfortable arm's length.	H2 Teesside
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m		Viewpoint 5: South Gare Breakwater
Enlargement Factor:	96%	Horizontal Field of View:	90°				Figure 16-8-4
Paper Size:	A1	Direction of View:	South east				
Date / Time:	23/02/2023, 12:59	Location:	E455639, N527643				

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Visualisation Type:	4	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note:**	H2 Teesside
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	Viewpoint 7: England Coast Path, Warrenby
Enlargement Factor:	96%	Horizontal Field of View:	90°				Figure 16-8-5
Paper Size:	A1	Direction of View:	West				
Date / Time:	23/02/2023, 11:41	Location:	E458531, N525499				

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Extent of 50mm single frame image

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

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Visualisation Type:	4	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note:** Images to be viewed at a comfortable arm's length.	H2 Teesside
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m		Viewpoint 7: England Coast Path, Warrenby
Enlargement Factor:	96%	Horizontal Field of View:	90°				Figure 16-8-6
Paper Size:	A1	Direction of View:	West				
Date / Time:	23/02/2023, 11:41	Location:	E458531, N525499				

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Extent of 50mm single frame image

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	4	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note:**	H2 Teesside
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m	Images to be viewed at a comfortable arm's length.	Viewpoint 8: Redcar Seafront
Enlargement Factor:	96%	Horizontal Field of View:	90°				Figure 16-8-7
Paper Size:	A1	Direction of View:	West				
Date / Time:	23/02/2023, 12:20	Location:	E459887, N525470				

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Visualisation Type:	4	Camera:	Canon EOS 6D	Eye level:	4.7m	**Note:** Images to be viewed at a comfortable arm's length.	H2 Teesside
Projection:	Cylindrical	Lens:	Canon EF50mm f/1.8 STM	Height of Camera:	1.6m		Viewpoint 8: Redcar Seafront
Enlargement Factor:	96%	Horizontal Field of View:	90°				Figure 16-8-8
Paper Size:	A1	Direction of View:	West				
Date / Time:	23/02/2023, 12:20	Location:	E459887, N525470				

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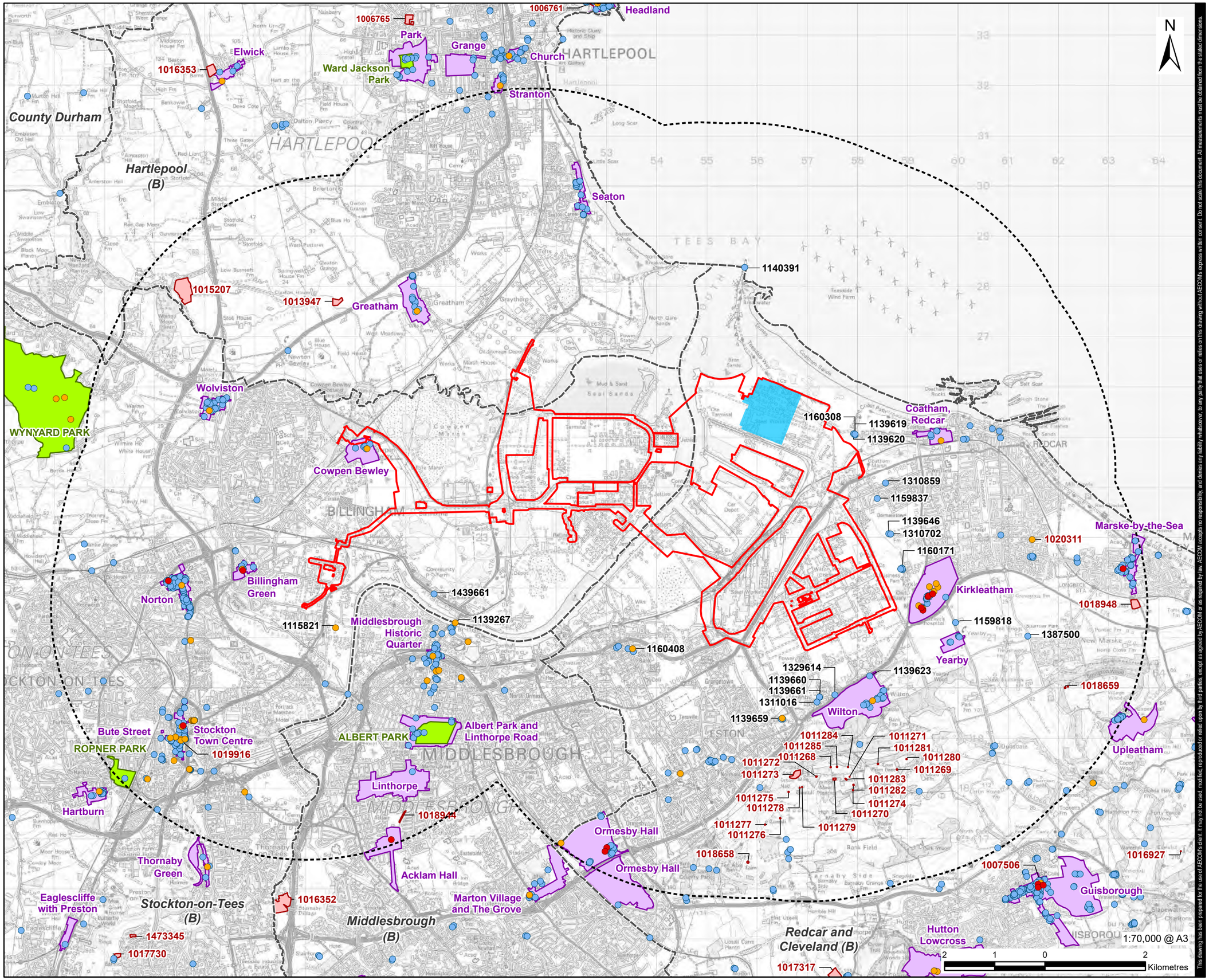

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 5 km Buffer
- Main Site
- Local Authority Boundary
- Conservation Area
- Scheduled Monument
- Registered Parks & Garden

Listed Building

- Grade I
- Grade II*
- Grade II

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

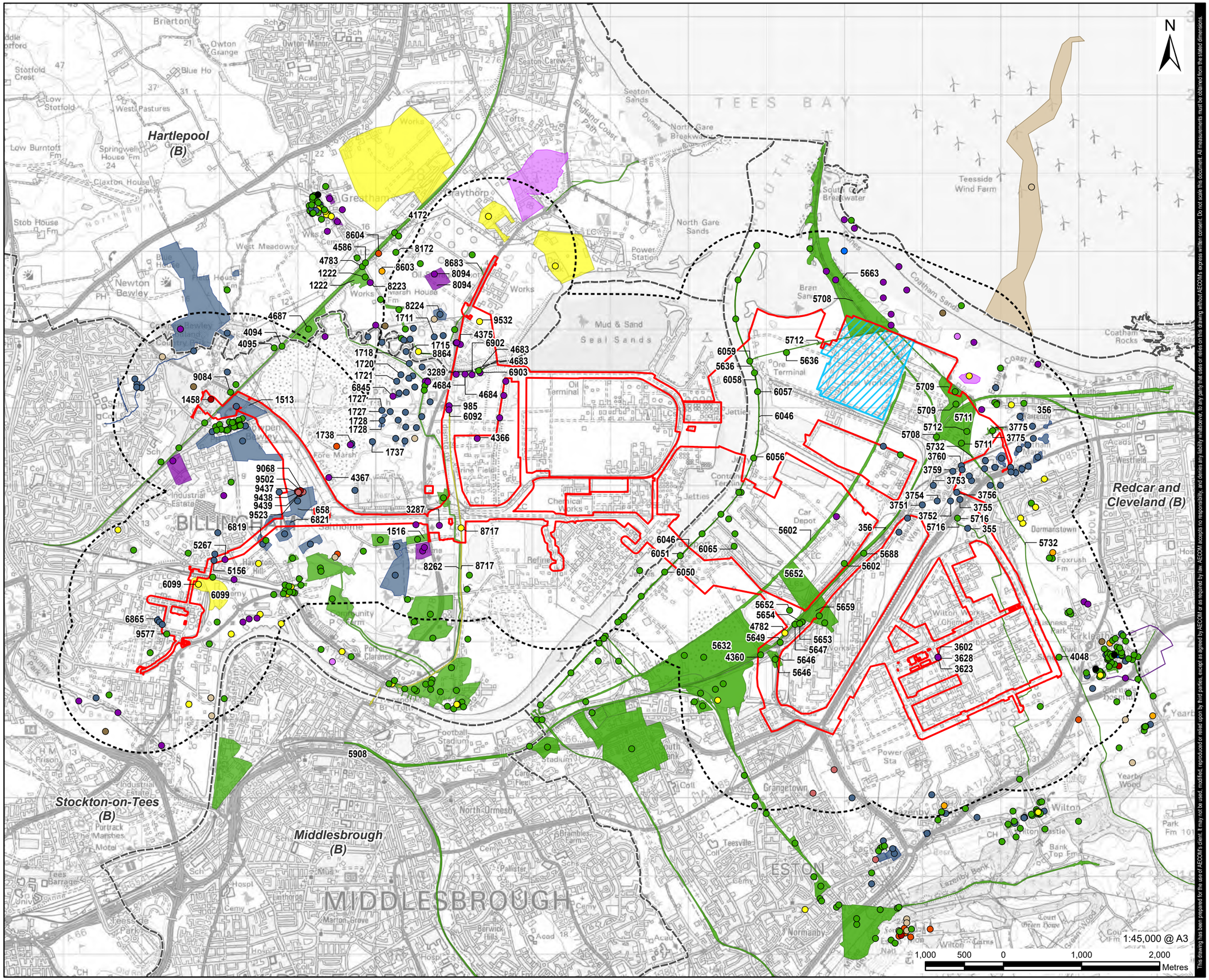
Location of Designated Heritage Assets

FIGURE NUMBER

Figure 17-1

Revision: 0 Drawn: MAB Checked: BB Approved: AC Date: 2023-08-07

Filename: \\na.aecomnet.com\lfs\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1\BEProjects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_CulturalHeritage.aprx



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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site
- Local Authority Boundary

HER Heritage Asset (Point)

- Palaeolithic
- Neolithic
- Bronze Age
- Iron Age
- Prehistoric
- Roman
- Romano-British
- Anglo-Saxon
- Early Medieval
- Medieval
- Post Medieval
- World War I
- World War II
- Modern
- Unknown

HER Heritage Asset (Polygon)

- Prehistoric
- Medieval
- Post Medieval
- World War I
- World War II
- Modern

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Location of Non-Designated Heritage Assets

FIGURE NUMBER

Figure 17-2

Revision: 0 Drawn: MAB Checked: BB Approved: AC Date: 2023-08-07

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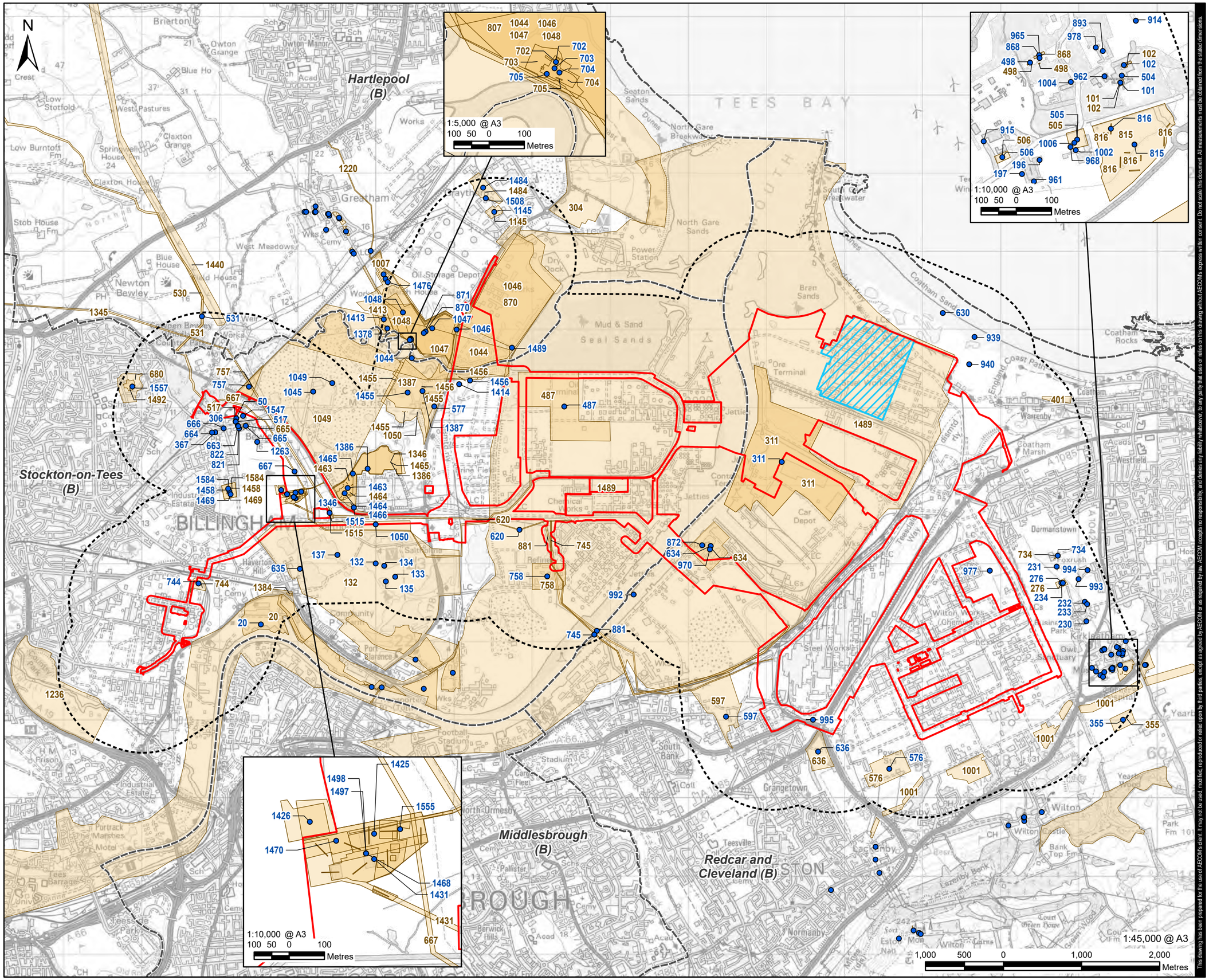

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site
- Local Authority Boundary
- HER Event (Polygon)*
- HER Event (Point)

*Darker 'HER Event (Polygon)' indicate that multiple events are overlapping.

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Location of Cultural Heritage Events

FIGURE NUMBER

Figure 17-3

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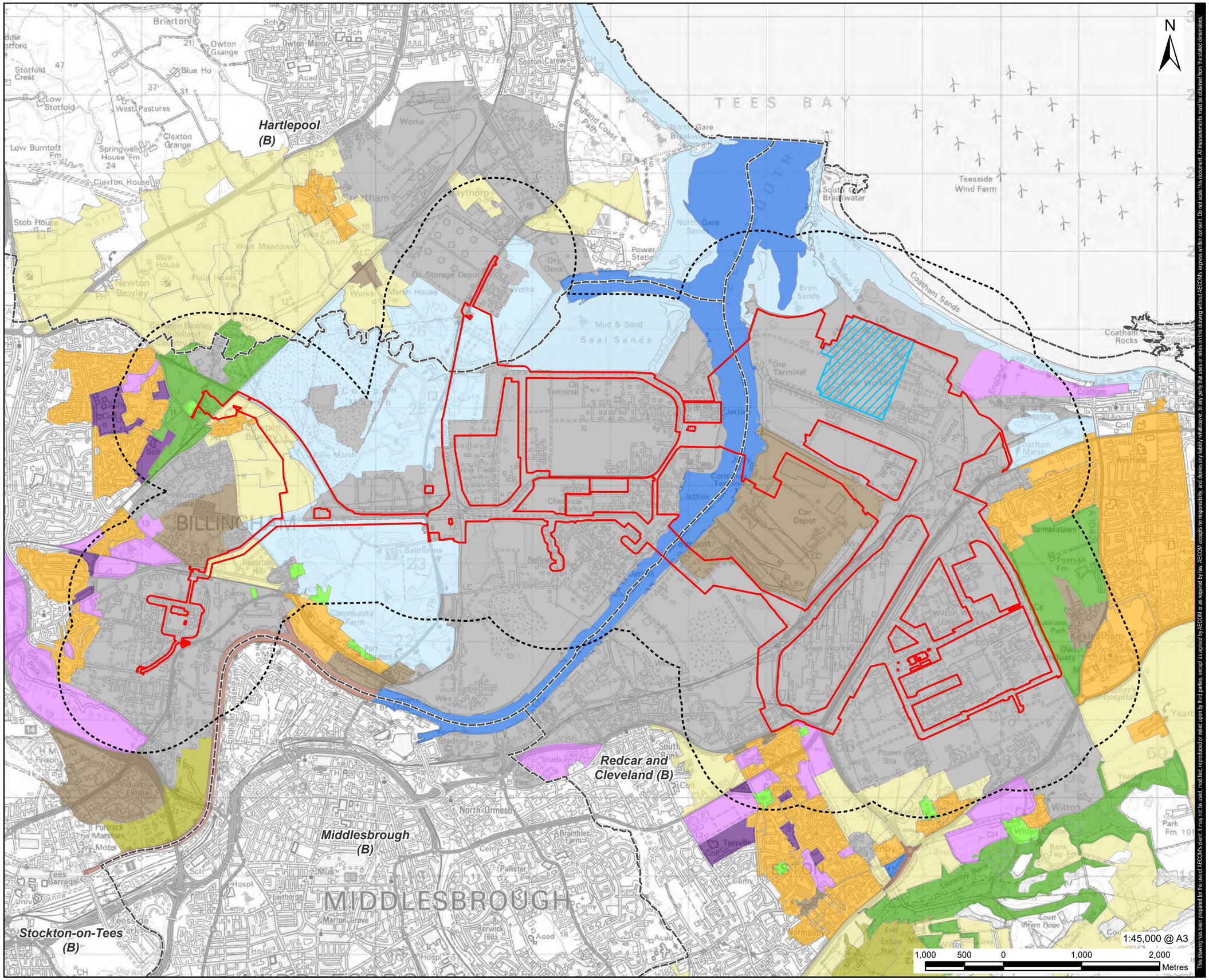
Revision: 0 Drawn: MAB Checked: BB Approved: AC Date: 2023-08-07



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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 1 km Buffer
- Main Site
- Local Authority Boundary

Historic Landscape Character

- Coastal
- Commercial
- Communications
- Designed landscape
- Enclosed land
- Industrial
- Institutional
- Recreational
- Settlement
- Unenclosed land
- Water
- Woodland

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

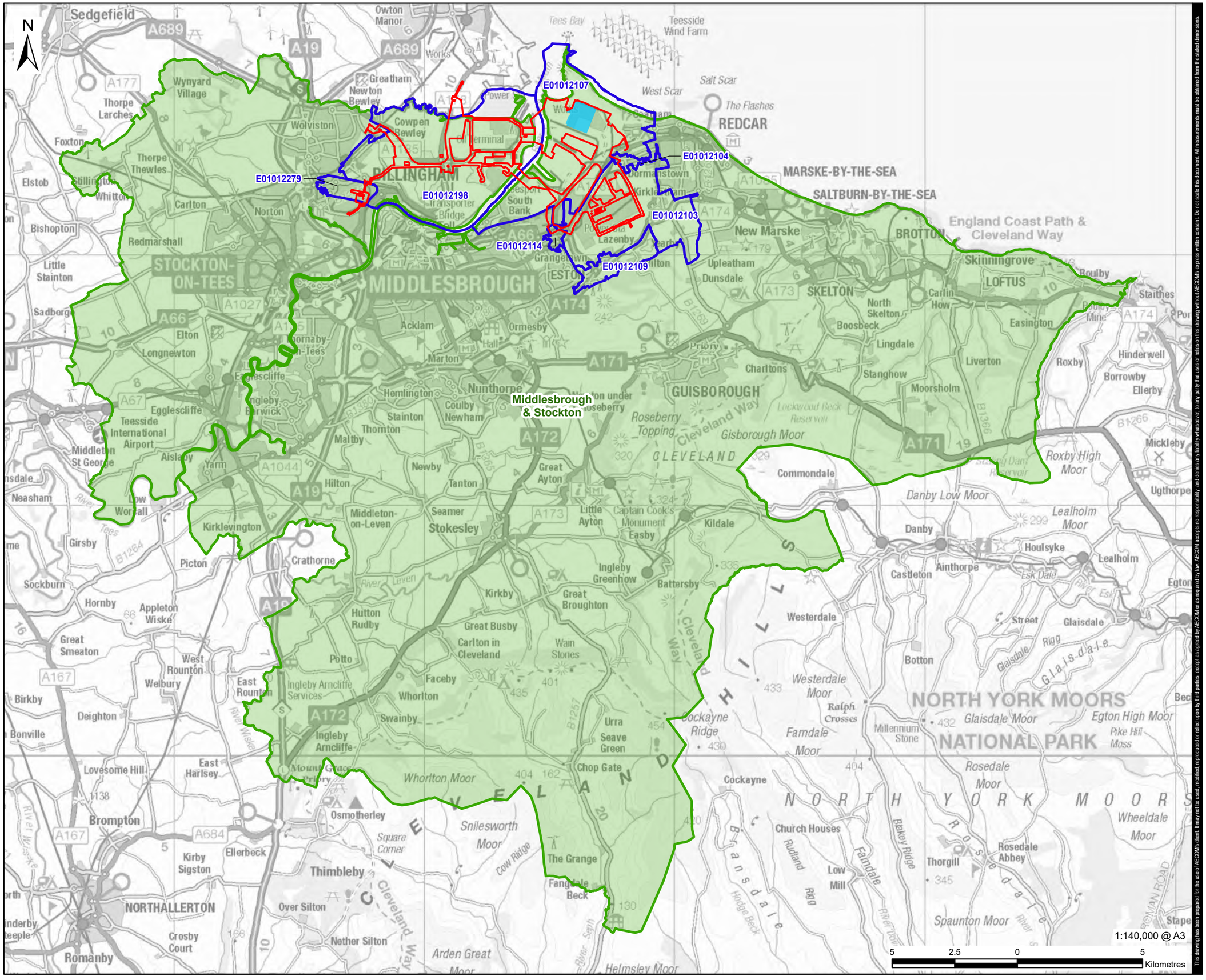
FIGURE TITLE

Historic Landscape Character

FIGURE NUMBER

Figure 17-4

Revision: 0 Drawn: MAB Checked: AD Approved: ML Date: 2023-08-04



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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- Direct Impact Area: Lower Layer Super Output Area (LSOA)
- Wider Impact Area: Middlesbrough and Stockton Travel To Work Area (TTWA)

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Direct and Wider Impact Areas

FIGURE NUMBER

Figure 18-1

Revision: 0 Drawn: MAB Checked: AD Approved: NE Date: 2023-08-07

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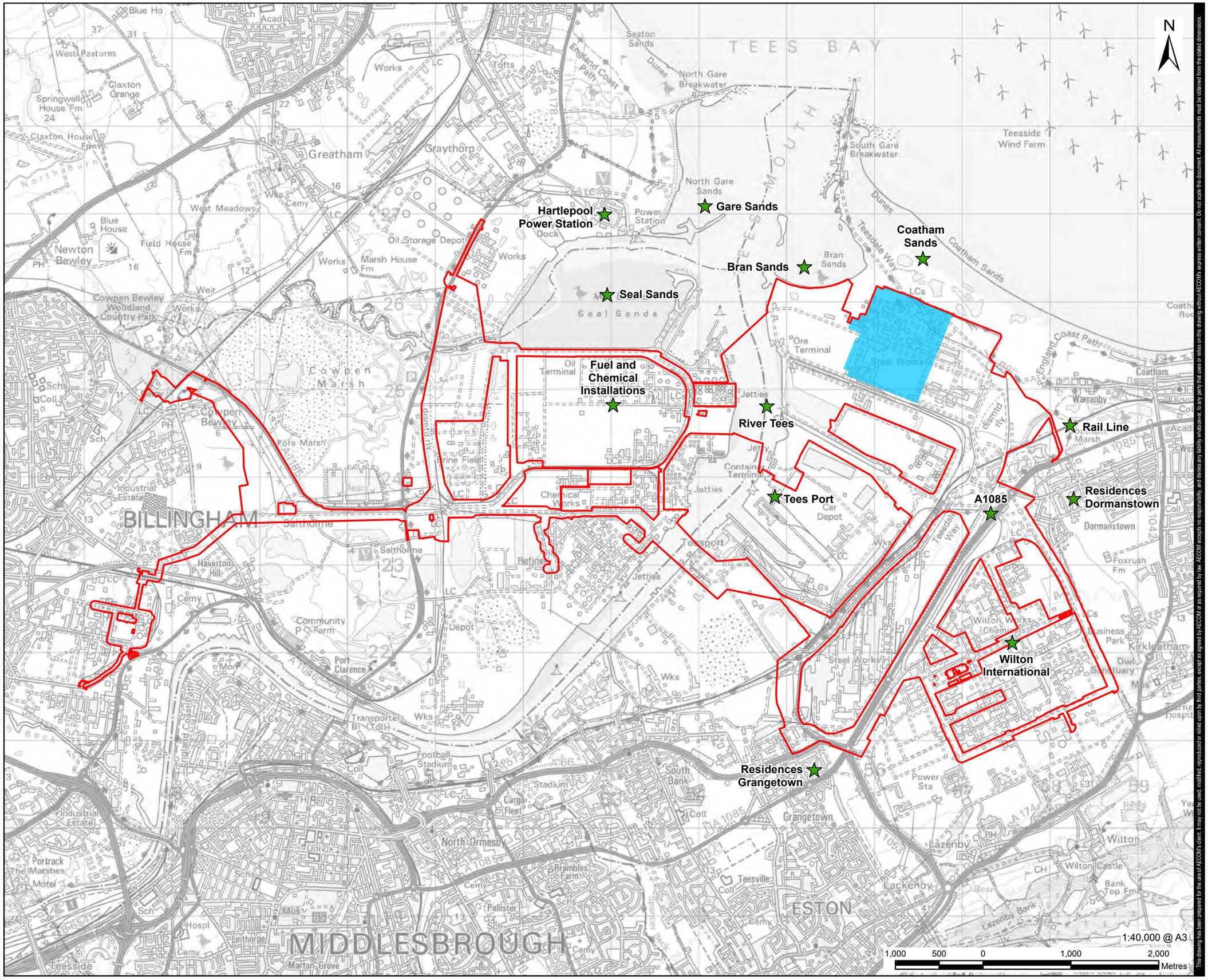

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APPLICANT

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Receptor

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Major Accidents and Disasters Receptors within 5 km of the Proposed Development Site Boundary (Indicative)

FIGURE NUMBER

Figure 20-1

Revision: 0 Drawn: MAB Checked: LC Approved: LH Date: 2023-08-07

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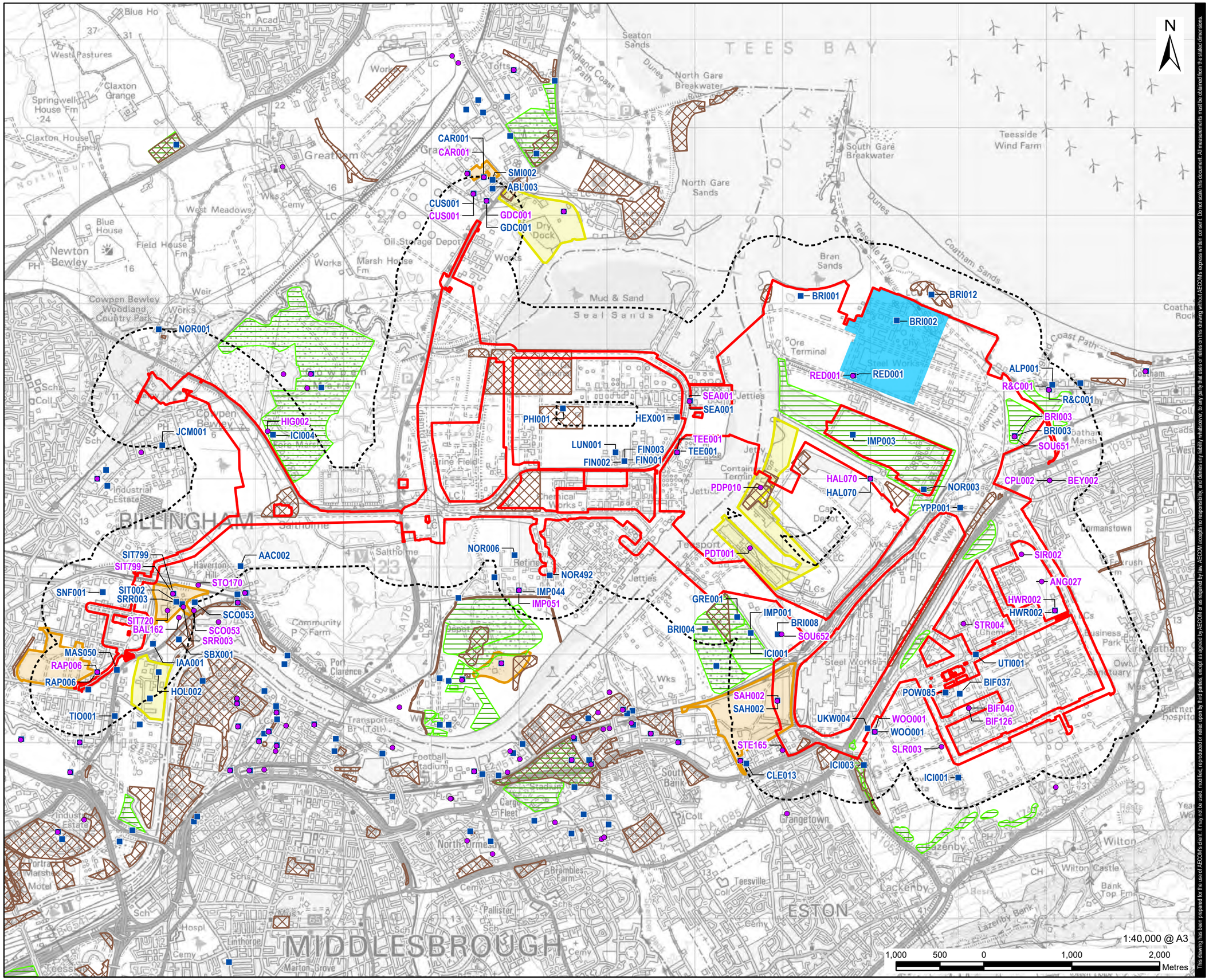

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 500 m Buffer
- Main Site
- Permitted Waste Site
- Waste Site Application
- Safeguarded Mineral Site - Wharf
- Safeguarded Waste Site
- Historic Landfill
- Authorised Landfill

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5: Indicative safeguarded mineral and waste site boundaries have been digitised from 'Tees Valley, 2011. Tees Valley Joint Minerals and Waste Development Plan Documents, Core Strategy and Policies and sites'.

ISSUE PURPOSE

PEI Report

PROJECT NUMBER

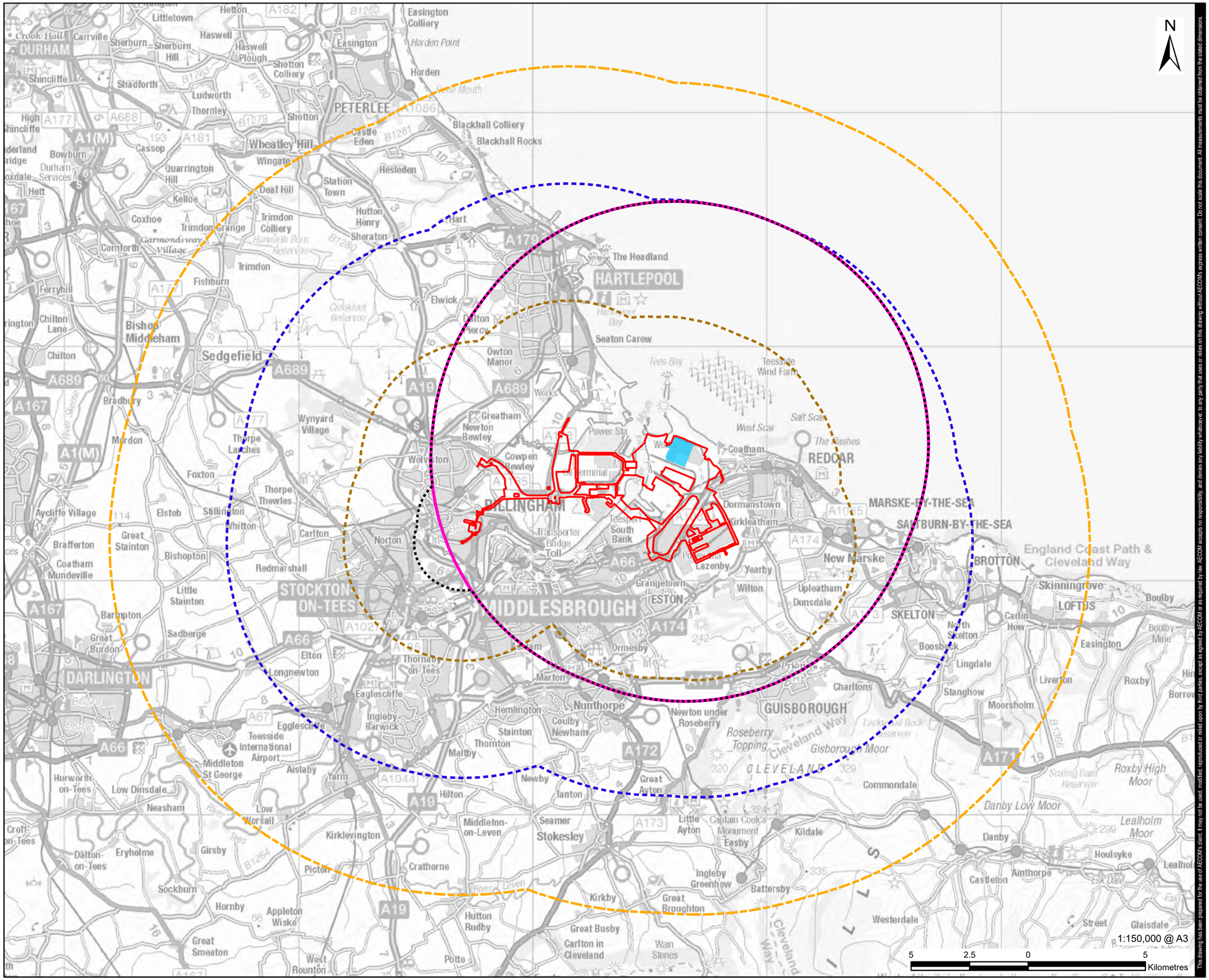
60689030

FIGURE TITLE

Historic and Authorised Landfills and Waste and Mineral Sites

FIGURE NUMBER

Figure 21-1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Wheatley Hill
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Ludworth
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Wingate
Hesleden
Castle Eden
Station Town
Deaf Hill
Quarrington Hill
Kelloe
Cassop
Bowburn
Durham Services
Hett
Coxhoe
Trimdon Grange
Trimdon Colliery
Hutton Henry
Sheraton
Hart
Cornforth
Garmondsway Village
Trimdon
Fishburn
Ferryhill
Chilton
Chilton Lane
Bishop Middleham
Sedgefield
Bradbury
Mordon
Wynyard Village
Thorpe Larches
Foxton
Thorpe Thewles
Aycliffe Village
Elstob
Stillington
Whitton
Carlton
Norton
Great Stainton
Brafferton
Coatham Mundeville
Bishopton
Redmarshall
Little Stainton
Barmpton
Great Burdon
Sadberge
Elton
Longnewton
Eaglescliffe
Ingleby Barwick
Teesside International Airport
Middleton St George
Aislaby
Yarm
Hurworth-on-Tees
Low Dinsdale
Neasham
Low Worsall
Croft-on-Tees
Dalton-on-Tees
Eryholme
Girsby
Kirklevington
Picton
Sockburn
Hornby
Appleton Wiske
Great Smeaton
West Rounton
Potto
Crathorne
Middleton-on-Leven
Seamer
Stokesley
Hilton
Thornton
Maltby
Stainton
Hemlington
Coulby Newham
Nunthorpe
Marton
Ormesby
Thornaby-on-Tees
Newton under Roseberry
Great Ayton
Newby
Tanton
Little Ayton
Captain Cook's Monument
Easby
Kildale
Commondale
Danby Low Moor
Danby
Houlsyke
Castleton
Ainthorpe
Esk Dale
Lealholm Moor
Roxby High Moor
Roxby
Easington
Boulby
Loftus
Skinningrove
Carlin How
Liverton
Moorsholm
Staithes
Lingdale
Boosbeck
North Skelton
SKELTON
Upleatham
Dunsdale
Wilton
Yearby
Lazenby
New Marske
MARSKE-BY-THE-SEA
SALTBURN-BY-THE-SEA
BROTTON
England Coast Path & Cleveland Way
Dormanstown
Kirkleatham
Teesport
South Bank
Transporter Bridge
Power Sta
Works
Greatham
Newton Bewley
Cowpen Bewley
Wolviston
REDCAR
Coatham
Teesside Wind Farm
Tees Bay
Salt Scar
West Scar
The Flashes
The Headland
HARTLEPOOL
Seaton Carew
Owton Manor
Elwick
Hartlepool Bay
Crookfoot Reservoir
Hurworth Burn Reservoir
Scaling Dam Reservoir
Lockwood Beck Reservoir
Roseberry Topping
Cleveland Way
Gisborough Moor
GUISBOROUGH
Charltons
Stanghow
Skelton
Ingleby Greenhow
Battersby
Kirkby
Great Broughton
Hutton Rudby
Great Busby
Carlton in Cleveland
Wain Stones
Westerdale
Glaisdale
Street
Lealholm
Castleton
Ainthorpe
Houlsyke
Danby
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Billingham
Norton
Stockton-on-Tees
Middlesbrough
Eston
Grangetown
Darlington
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Sedgefield
Bishop Middleham
Durham
Peterlee
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Shotton
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Hesleden
Hutton Henry
Sheraton
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New Marske
Marske-by-the-Sea
Saltburn-by-the-Sea
Brotton
England Coast Path & Cleveland Way
Dormanstown
Kirkleatham
Teesport
South Bank

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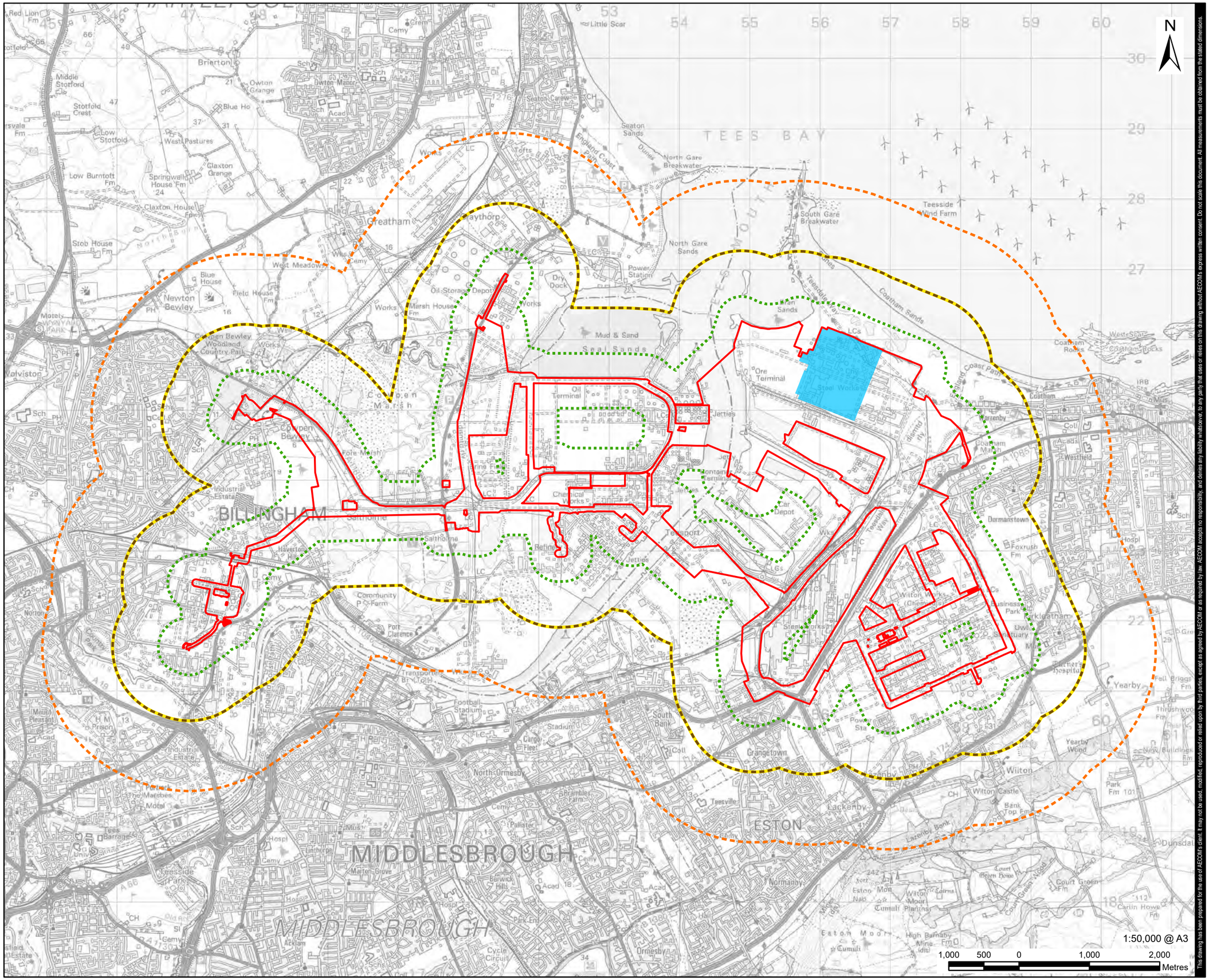

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- Air Quality (Construction) - 350 m from Proposed Development Site Boundary, 500 m for Site Entrances
- Geology, Hydrogeology and Contaminated Land - 1 km from Proposed Development Site Boundary
- Surface Water, Flood Risk and Water Resources and Cultural Heritage (Non-Designated Assets) - 1 km from Proposed Development Site Boundary
- Ecology (including Aquatic Ecology) and Ornithology (all other Ecological and Ornithological Effects) - 2 km from Proposed Development Site Boundary

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Zones of Influence for Cumulative Effects Assessment

FIGURE NUMBER

Figure 23-1 (Sheet 2 of 4)

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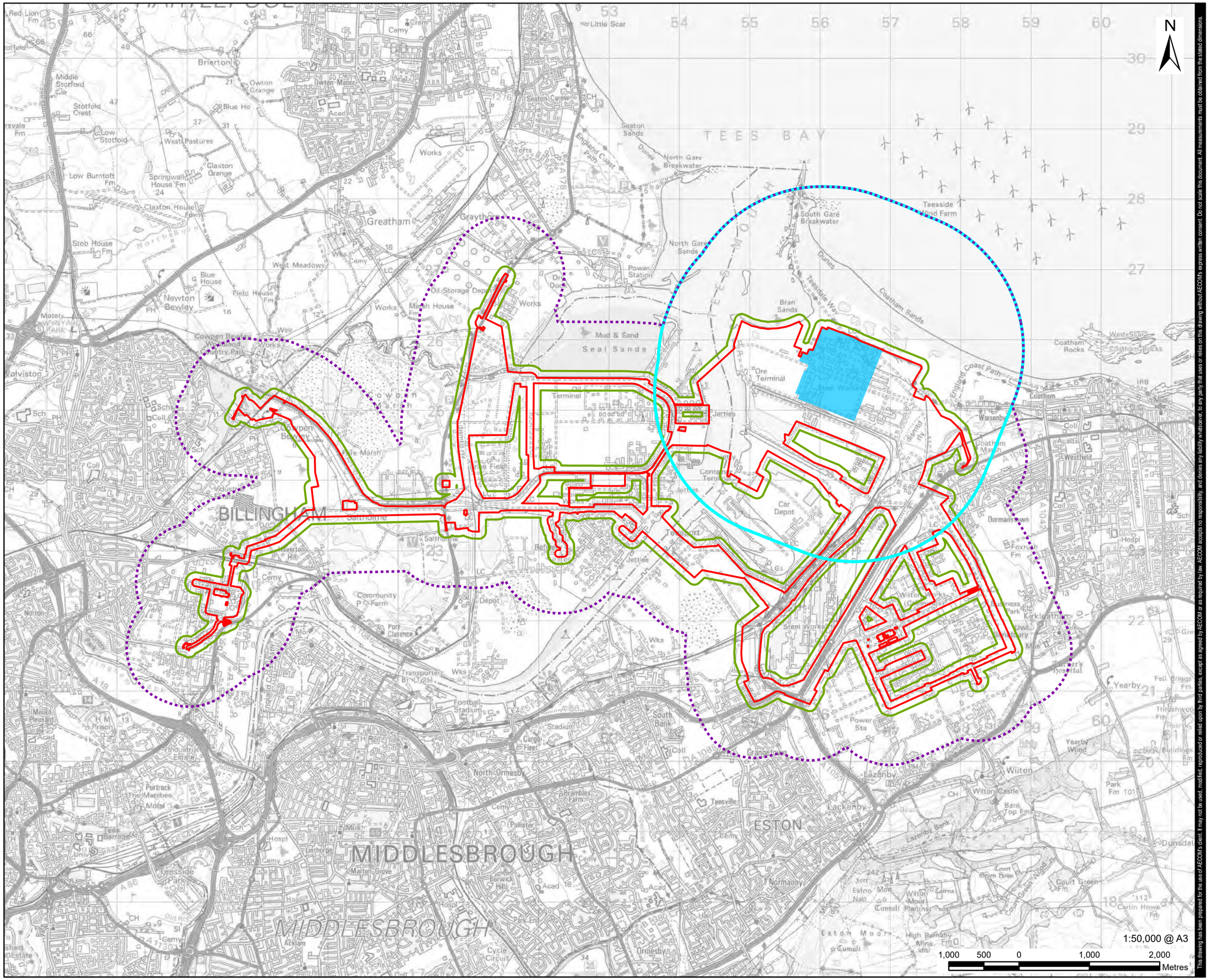
N
TEES BAY
BILLINGHAM
MIDDLESBROUGH
ESTON
Greatham
Seaton Sands
North Gare Breakwater
South Gare Breakwater
Teesside Wind Farm
Coatham Sands
Bran Sands
Mud & Seal Sands
Ore Terminal
Jetties
Steel Works
Car Depot
Dormanstown
Coatham
Redcar
Saltholme
Port Clarence
Transporter Br. (Toll)
Football Stadium
Cargo Fleet
North Ormesby
South Bank
Grangetown
Lazenby
Wilton
Wilton Castle
Yearby
Dunsdale
Normanby
Ormesby
Eston Moor
Eston Nab
Wilton Moor Cumuli
Cumuli
Newton Bewley
Cowpen Bewley
Claxton
Greatham
Stotfold
Brierton
Owton Manor
Seaton Carew
Tofts
Power Station
Oil Storage Depot
Marsh House
Works
Teesside Way
England Coast Path
Dunes
Coatham Rocks
Warrenby
Boosbeck
Kirkleatham
Yearby Wood
Lackenby
Teesville
Portrack
Tees Barrage
Teesside Park
Stainsby Hall
Hemlington
Nunthorpe
Marton
Acklam
Cycle Circuit
Football Stadium
Community Farm
Depot
Industrial Estate
H M Prison
Mount Pleasant
Norton
Stockton
Thornaby
Eaglescliffe
Yarm
Egglescliffe
Preston
Middleton St George
Darlington
Low Burntott Fm
Springwell House Fm
Claxton House Fm
Stob House Fm
Blue House
Field House Fm
West Meadows
West Pastures
Low Stotfold
Stotfold Crest
Middle Stotford
Owton Grange
Blue Ho
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Retail Pk
Recreation Ground
Park End
Berwick Hills
Marton Grove
Pallister
Teesville
Bramble Farm
Grange
Power Sta
Bank Top Fm
Court Green Fm
Carlin Howe Fm
Fell Briggs Fm
Thrushwood Fm
New Buildings Fm
Foxrush Fm
Dormanstown
Hospl
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Acad
Westfield
Rescourse
Boathorn Manor
Boathorn
Coatham
Warrenby
Kirkleatham
Owl Valley
Wilton Castle
Bank Top Fm
Lazenby Bank
Court Green House
Court Green Wood
Eston Nab
Wilton Moor Cumuli
Plantns
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Fm
Cumuli
Eston Moor
Dunsdale
Yearby
Wilton
Lackenby
Normanby
Ormesby
Grangetown
Power Sta
Steel Works
Car Depot
Jetties
Terminal
Oil Terminal
Container Terminal
Refinery
Tofts
Seaton Carew
Seaton Sands
Dunes
England Coast Path
Teesside Way
Coatham Sands
Bran Sands
Mud & Seal Sands
Ore Terminal
Steel Works
Jetties

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1,000 500 0 1,000 2,000 Metres

AECOM

PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
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www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- Air Quality (Traffic-related Air Quality) - 200 m from affected roads
- Noise (Traffic-related Noise) – 600 m from affected roads

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Zones of Influence for Cumulative Effects Assessment

FIGURE NUMBER

Figure 23-1 (Sheet 4 of 4)

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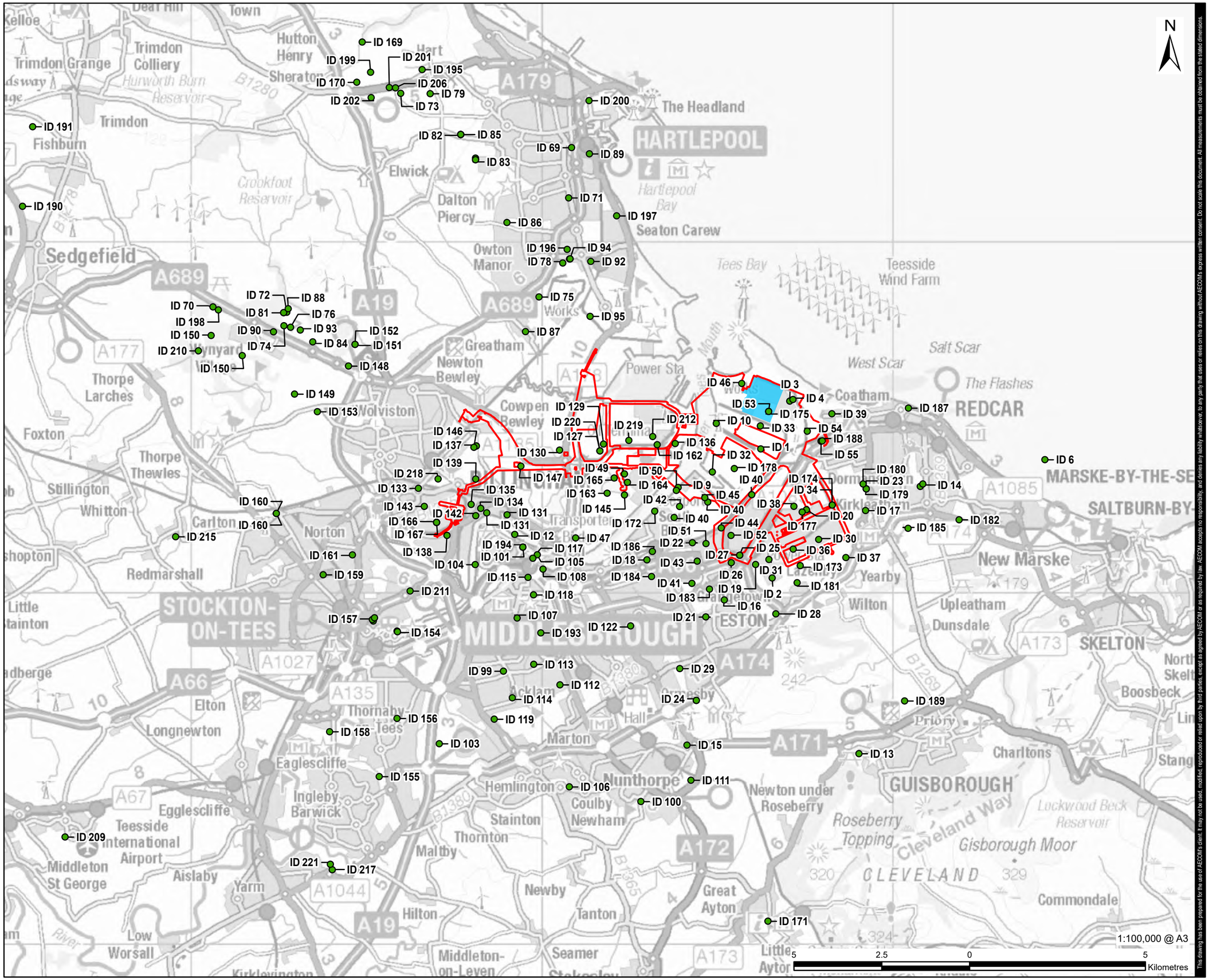

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Other Developments on the Long List

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Long List of Other Developments

FIGURE NUMBER

Figure 23-2 (Sheet 1 of 2)

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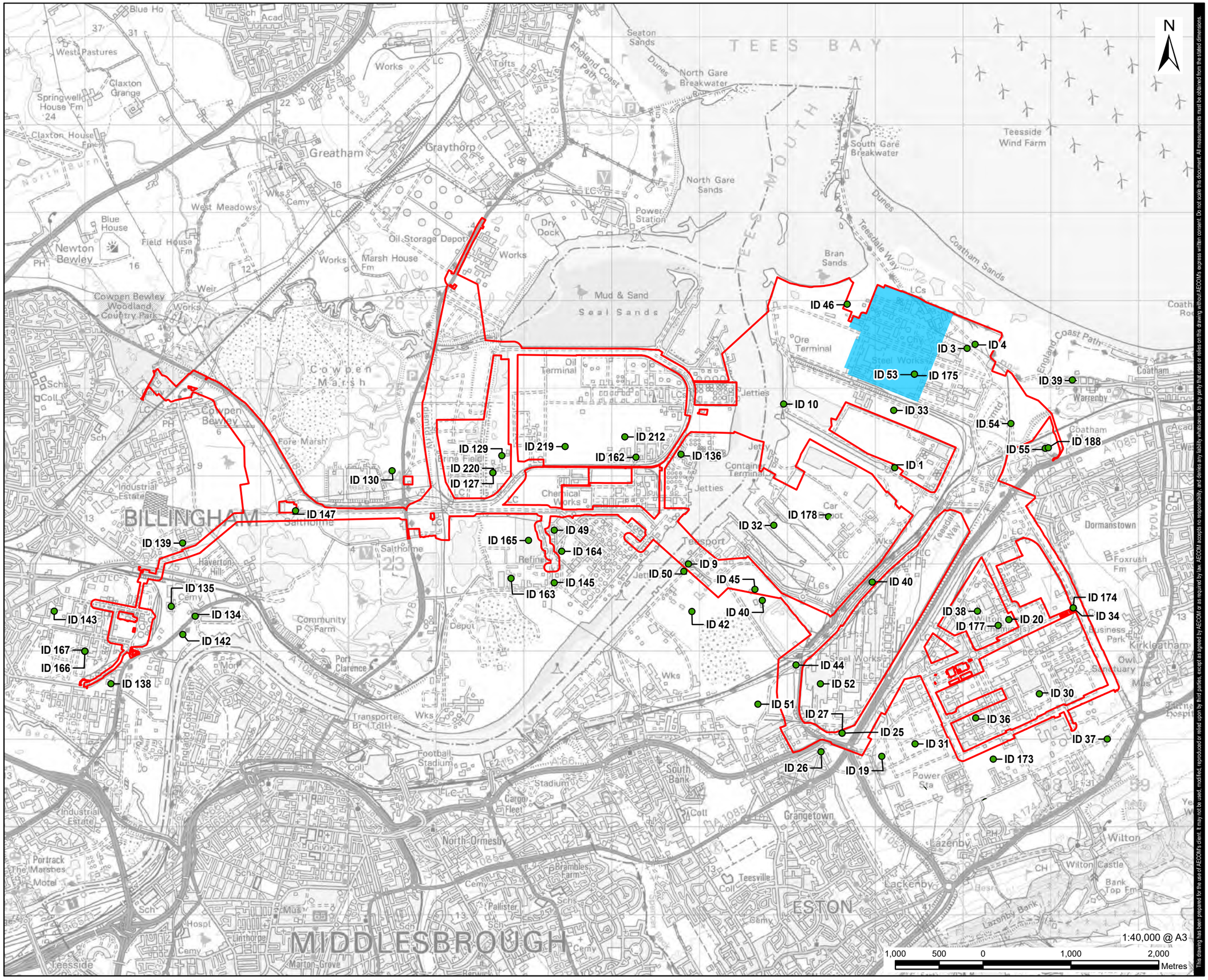

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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Main Site
- Other Developments on the Long List within 500 m of the Proposed Development Site

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Long List of Other Developments

FIGURE NUMBER

Figure 23-2 (Sheet 2 of 2)

H2Teesside Project

Land at and in the vicinity of the former Redcar Steel Works site, Redcar and in Stockton-on-Tees, Teesside

Environmental Impact Assessment: Scoping Report

Document Reference: EIA Scoping

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



Applicant: H2 Teesside Ltd

Date: April 2023

DOCUMENT HISTORY

Document Ref	H2Teesside EIA Scoping		
Revision	1.0 Final 06.04.2023		
Author	Various		
Signed		**Date**	
Approved By	I. Campbell		
Signed		**Date**	06.04.2023
Document Owner	AECOM		

GLOSSARY

Abbreviation	Term
AEP	Annual Exceedance Probability
AGI	Above Ground Installation
AIL	Abnormal Indivisible Load
ALARP	As Low As Reasonably Practicable
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
APFP Regulations	Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)
Applicant	H2 Teesside Limited
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
ASU	Air Separation Unit
ATR	Auto Thermal Reforming
BAP	Biodiversity Action Plan
BEIS	Former Department for Business, Energy and Industrial Strategy
BESS	British Energy Security Strategy
bgl	Below ground level
BGS	British Geological Survey
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
BOC	British Oxygen Company
BRE	Building Research Establishment
BRES	Business Register and Employment Survey
BS	British Standard
BSI	British Standards Institute
BTO	British Trust for Ornithology
CAA	Civil Aviation Authority
CCPP	Combined Cycle Power Plant (see also CCGT)
CCR	Carbon Capture Readiness
CCR	Climate Change Resilience
CCS	Carbon Capture and Storage
CCG	Clinical Commissioning Group

Abbreviation	Term
CCGT	Combined Cycle Gas Turbine
CCUS	Carbon Capture, Usage and Storage
CDM	Construction (Design and Management) Regulations 2007
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CEMP	Construction Environmental Management Plan
CH_4	Methane
CHP	Combined Heat and Power
CIBSE	Chartered Institution of Building Services Engineers
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research and Information Association
CLP	Classification, Labelling and Packaging Regulations
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
COMAH	Control of Major Accident Hazards
COPA	Control of Pollution Act 1974
COPD	Chronic Obstructive Pulmonary Disease
CRoW	Countryside and Rights of Way
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual Site Model
COVID-19	Coronavirus
CTMP	Construction Traffic Management Plan
CWS	Cooling Water System
CWTP	Construction Worker Travel Plan
DAF	Dissolved Air Flotation
DAS	Discretionary Advice Service
DBA	Desk-Based Assessment
DCLG	Former Department for Communities and Local Government (now DLUHC)
DCO	Development Consent Order
DECC	Former Department of Energy and Climate Change (later part of BEIS, now DESNZ)
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DLL	District Level Licencing
DLUHC	Department for Levelling-up, Housing and Communities
DML	Deemed Marine Licence
DMRB	Design Manual for Roads and Bridges
DMW	Demineralised Water
DNA	Deoxyribonucleic Acid
DTM	Digital Terrain Model
EcIA	Ecological Impact Assessment
eDNA	Environmental DNA
EEA	European Economic Area
EHO	Environmental Health Officer

Abbreviation	Term
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EMODnet	European Marine Observation Data Network
EMS	Environmental Management System
EPC	Engineering, Procurement and Construction
EPSM	European Protected Species Mitigation (Licence)
ERIC	Environmental Records Information Centre North-East
ES	Environmental Statement
ETP	Effluent Treatment Plant
EU	European Union
EUNIS	European Union Nature Information System
EWP	Energy White Paper
FEED	Front End Engineering Design
FRA	Flood Risk Assessment
FRfSW	Flood Risk from Surface Water
GAC	Generic Assessment Criteria
GCN	Great Crested Newt
GHG	Greenhouse Gas
GI	Ground Investigation
GLVIA3	Guidelines for Landscape & Visual Impact Assessment (third edition)
GWth	Gigawatt Thermal
H_2	Hydrogen (gaseous)
Ha	Hectare
HCA	Former Homes and Communities Agency
HDD	Horizontal Directional Drill
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HPI	Habitat of Principal Importance
HRA	Habitats Regulations Assessment
HSE	Health and Safety Executive
HSI	Habitat Suitability Index
HV	High Voltage
IAMMWG	Inter-Agency Marine Mammal Working Group
IAQM	Institute of Air Quality Management
ICCI	In-combination Climate Change Impacts
ICES	International Council for the Exploration of the Sea
IEA	Institute of Environmental Assessment
IEMA	Institute of Environmental Management and Assessment
IHBC	Institute of Historic Building Conservation
INCA	The Industry Nature Conservation Association
INNS	Invasive and Non-Native Species
ISO	International Organization for Standardization
JNCC	Joint Nature Conservation Committee
kV	Kilovolt
LHV	Lower Heating Value

Abbreviation	Term
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LP	Low Pressure
LPA	Local Planning Authority
LSOA	Lower Layer Super Output Area
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographical Information for the Countryside
MA&Ds	Major Accidents and (Natural) Disasters
MBT	Micro-bored Tunnel
MCAA	Marine and Coastal Access Act (2009)
MCZ	Marine Conservation Zones
MHCLG	Ministry of Housing, Communities and Local Government
MHWS	Mean High Water Springs
ML	Marine Licence
MMO	Marine Management Organisation
MNCR	Marine Nature Conservation Review
MAOP	Maximum Allowable Operating Pressure
MoU	Memorandum of Understanding
MP	Medium Pressure
MPA	Mineral Planning Authority
MPS	Marine Policy Statement
MSA	Mineral Safeguarding Area
Mt	Megatonne
MW	Megawatt
NBN	National Biodiversity Network
NCA	National Character Area
NEP	Northern Endurance Partnership
NERC Act	Natural Environment and Rural Communities Act (2006)
NGG	National Gas Grid
NGR	National Grid Reference
NH_3	Ammonia
NNR	National Nature Reserve
NO_x	Oxides of Nitrogen
NPG	Northern Power Grid
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NPSE	Noise Policy Statement for England
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary
NZT	Net Zero Teesside
O_2	Oxygen
ONS	Office for National Statistics
PA 2008	Planning Act 2008

Abbreviation	Term
PAH	Polycyclic Aromatic Hydrocarbon
PCC	Power, Capture and Compressor
PEI	Preliminary Environmental Information
PINS	Planning Inspectorate
PHE	Public Health England, the former name of the UK Health Security Agency
PHOF	Public Health Outcomes Framework
PM	Particulate Matter
$PM_{2.5}$	Particulate matter of 2.5 micrometres (µm) diameter or less
PM_{10}	Particulate matter of 10 micrometres (µm) diameter or less.
PPG	Planning Practice Guidance
PRoW	Public Right of Way
PSA	Pressure Swing Adsorber
PSR	Pipelines Safety Regulations
PSYM	Predictive System for Multimetrics
PWS	Private Water Supply (abstractions)
RBT	Redcar Bulk Terminal
RCBC	Redcar and Cleveland Borough Council
REC	Redcar Energy Centre
REP	Renewable Energy Plant
RO	Reverse Osmosis
RMP	Regeneration Master Plan
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SCANS	Small Cetacean Abundance in the European Atlantic and North Sea
SCOS	Special Committee on Seals
SCR	Selective Catalytic Reduction
SMRU	Sea Mammal Research Unit
SMU	Seal Management Unit
SNS	Southern North Sea
SoCC	Statement of Community Consultation
SoS	Secretary of State
SO_x	Sulphur Oxides
SPA	Special Protection Area
SPZ	Source Protection Zone
SSI	Sahaviriya Steel Industries (UK Limited)
SSSI	Site of Special Scientific Interest
STBC	Stockton-on-Tees Borough Council
STDC	South Tees Development Corporation
STG	Steam Turbo Generator
SuDS	Sustainable (urban) Drainage System
SPD	Supplementary Planning Document
Syngas	Mixture comprising H_2, CO, and CO_2 produced at an intermediary stage of Blue Hydrogen production
TA	Transport Assessment
TraC	Transitional and Coastal

Abbreviation	Term
TTWA	Travel to Work Area
TVCA	Tees Valley Combined Authority
UF	Ultrafiltration
UK	United Kingdom
UKCP18	UK Climate Projections 2018
UPS	Uninterruptable Power Supply
UXO	Unexploded Ordnance
WBCSD	World Business Council for Sustainable Development
WeBS	Wetland Bird Survey
WFD	Water Framework Directive
WHO	World Health Organisation
Withdrawal Act	European Union Withdrawal Agreement Act (2020)
WPA	Waste Planning Authority
WRI	World Resources Institute
WwTW	Wastewater Treatment Works
ZTV	Zone of Theoretical Visibility

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1.0 INTRODUCTION

1.1 Background

1.1.1 AECOM Ltd ('AECOM') has been commissioned by H2 Teesside Ltd (hereafter referred to as 'the Applicant') to prepare an Environmental Impact Assessment (EIA) Scoping Report to inform the scope and content of an EIA for the construction, operation (including maintenance where relevant) and decommissioning of a 1.2 Gigawatt Thermal (GWth) Hydrogen Production Facility with associated Carbon Capture and hydrogen transport pipeline network on land in Redcar and Cleveland, Stockton-on-Tees, and Hartlepool on Teesside (hereafter referred to as the 'Proposed Development Site') (see Figure 1, Appendix A).

1.1.2 The Hydrogen Production Facility (hereafter referred to as the 'Production Facility') together with the hydrogen gas (H_2) pipeline network to deliver low carbon H_2 to offtakers who may potentially use the H_2 in the future, and the CO_2 export, natural gas, electricity, water, oxygen (O_2) and nitrogen (N_2) connections required for the facility to operate are herein referred to as the 'Proposed Development'. The proposed Production Facility will produce low carbon hydrogen which is compliant with the UK Government's Low Carbon Hydrogen Standard (Department for Business, Energy and Industrial Strategy (BEIS), 2022) which defines what constitutes 'low carbon hydrogen' up to the point of production. The intent of the standard is to ensure new low carbon hydrogen production supported by government makes a direct contribution to the UK's greenhouse gas (GHG) emissions reduction targets.

1.1.3 The Proposed Development is subject to ongoing technical studies; however, it is expected to comprise the Production Facility with a design capacity of up to 1.2 GWth Lower Heating Value (LHV), across two phases of development (up to 600 Megawatt thermal (MWth) per phase).

1.1.4 The Production Facility and associated infrastructure which form part of the Proposed Development will be located on the 'Main Site'. There are currently two Main Site options – the Foundry ('Main Site A') on land formerly part of the Redcar Steelworks and adjacent land at Redcar Bulk Terminal (RBT) ('Main Site B'), as indicated on Figures 3 and 3a (Appendix A) respectively.

1.1.5 The proposed hydrogen transport pipelines and other connections (the 'Connection Corridors') will also cross other third-party land where required. Together, the Main Site and Connection Corridors are referred to as the Proposed Development Site.

1.1.6 The Proposed Development Site boundary and the location of the two Main Site options, Hydrogen Pipeline Corridor and indicative other Connection Corridors are shown in Figures 3-9 in Appendix A.

1.1.7 This EIA Scoping Report considers the environmental context of the Proposed Development Site and the potential environmental impacts of the Proposed Development. Where impacts are considered to have the potential to cause significant environmental effects, these are identified and the proposed approach to be used to characterise the impacts and understand the significance of their effects

is outlined. This report also outlines issues perceived to be non-significant, which do not require formal assessment as part of the EIA.

1.1.8 EIA is an iterative process that feeds into the engineering design process to identify potential significant environmental effects which require mitigation. The final design iteration, along with the findings of the EIA will be reported in an Environmental Statement (ES), in accordance with the Infrastructure Planning (EIA) Regulations 2017 ('EIA Regulations') and will be submitted with the Development Consent Order (DCO) application ('the Application') in accordance with Regulation 5 (2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) ('APFP Regulations').

1.2 Consenting Regime

Development Consent Orders

1.2.1 Under the Planning Act 2008 (PA 2008), development consent can be granted in the form of a DCO for certain types of 'Nationally Significant Infrastructure Projects' (NSIPs) by the relevant Secretary of State (SoS) – in the case of energy infrastructure projects this is the SoS for the Department of Energy Security and Net Zero (DESNZ).

1.2.2 Section 14 'Nationally significant infrastructure projects: general' of the PA 2008 confirms the types of projects that are NSIPs and which require development consent. Section 14 does not include the construction and operation of H_2 production facilities but does include the "*construction of a pipe-line other than by a gas transporter"* that would require *"authorisation under … the Pipe-lines Act 1962"*. According to the Pipe-Lines Act, a cross-country pipeline means a pipeline whose length exceeds, or is intended to exceed 16.093 km (i.e. 10 miles), and a pipeline is defined as a pipe or system of pipes for the conveyance of anything other than air, water, water vapour or steam. Therefore, the hydrogen pipeline as currently proposed would require development consent.

1.2.3 Although works to construct and operate the Production Facility itself do not fall under the definition of a NSIP, the Applicant has sought a direction under Section 35 of the PA 2008 from the SoS to give a direction that the Hydrogen Production Facility should be treated as development for which development consent is required under Section 35 of the 2008 Act alongside the hydrogen pipelines. On the 22nd December 2022 the SoS took the decision within the conditions as required by sections 35A of the PA 2008, and issued a Direction under sections 35(1) and 35ZA that the Hydrogen Production Facility and any aspect of the hydrogen pipelines that are not automatically NSIP are to be treated as development for which development consent is required. The other aspects of the Proposed Development are being brought forward as 'Associated Development' to that development.

1.2.4 As a result of the above, the Applicant is required to seek a DCO to construct and operate the Proposed Development, under the PA 2008. Section 37 governs the form, content and accompanying documents that are required as part of a DCO application. The requirements are implemented through the APFP Regulations which

state that an application must be accompanied by an ES, where a development is 'EIA development' under the EIA Regulations.

1.2.5 The Application will be submitted to the Planning Inspectorate ('PINS') who will examine the application and make recommendations to the SoS for DESNZ pursuant to the PA 2008, who will subsequently determine whether a DCO should be granted for the Proposed Development.

Environmental Impact Assessment

1.2.6 Regulation 3(1) of the EIA Regulations defines the meaning of 'EIA development' (with reference to Schedules 1 and 2 to the EIA Regulations).

1.2.7 Schedule 1 of the EIA Regulations describes developments for which an EIA is necessary in all cases. The Proposed Development as a whole does not meet any of the definitions of Schedule 1. However, certain parts of the Proposed Development meet the definition of Schedule 1 Section 23 "*Installations for the capture of carbon dioxide streams for the purposes of geological storage pursuant to Directive 2009/31/EC from installations referred to in this Schedule, or where the total yearly capture of carbon dioxide is 1.5 megatonnes or more*".

1.2.8 Based on current projections (including Phase 1 and Phase 2 of the Proposed Development), H2Teesside will have the capacity to continuously export approximately 2.84 Megatonnes (Mt)/year (at 100% utilisation) of dehydrated and compressed carbon dioxide (CO_2), with no on-site temporary CO_2 storage required, resulting in the capture of more than 1.5 Mt of CO_2 per year for onward geological storage to the off-shore Endurance store via Northern Endurance Partnership (NEP) infrastructure on the nearby Net Zero Teesside (NZT) site. The NEP infrastructure and Endurance store will both be separately consented.

1.2.9 Although part of the Proposed Development meets the description of development in Schedule 1 and therefore EIA would be required, a review of Schedule 2 has also been completed for thoroughness.

1.2.10 When considering the Proposed Development in relation to the descriptions of development for the purposes of definition of 'Schedule 2 Development' it is considered that the Proposed Development does meet the following descriptions:

- *3(a) industrial installations for the production of electricity, steam and hot water (projects not included in Schedule 1 to these Regulations);*
- *3(b) industrial installations for carrying gas, steam and hot water; transmission of electrical energy by overhead cables (projects not included in Schedule 1 to these Regulations); and*
- *10(k) oil and gas pipeline installations (unless included in Schedule 1 to these Regulations).*

1.2.11 Given the above the Proposed Development is considered 'EIA development' and consequently a formal EIA screening opinion is not being sought from the SoS. Furthermore, having regard to the nature and scale of the proposed activities

comprised in the overall Proposed Development, such that some form of environmental assessment would likely be required in any event (even if not EIA) for the aspects that are not 'EIA development', the Applicant intends to provide all environmental assessments for the Proposed Development in a single ES.

1.2.12 This report constitutes the Applicant's notification under Regulation 8(1b) of the EIA Regulations. Having determined that an ES will be included as part of the Application, which will present the details of the EIA of the Proposed Development, in accordance with Regulation 10(1) of the EIA Regulations the Applicant is applying to the SoS for their opinion as to the scope and level of detail of the information to be provided in the ES in respect of the full Proposed Development.

1.2.13 The indicative Proposed Site Boundary (referred to as the 'Proposed Development Site') is shown on Figure 2: Proposed Development Site Boundary (including location of Main Site A) and Figure 2a: Proposed Development Site Boundary (including location of Main Site B), in Appendix A. At this stage, the Proposed Development Site Boundary has been refined as much as possible based on current design information and reflects a worst-case scenario of those areas that may be required for the construction and operation of the Proposed Development, including the Production Facility, hydrogen pipeline and connections, as well as indicative laydown areas for construction. The Proposed Development Site will be further refined as the design and further studies progress.

Deemed Marine Licence

1.2.14 In England, the Marine and Coastal Access Act 2009 (MCAA) provides that a Marine Licence (ML) is required for certain 'licensable activities' within the UK Marine Area (Section 42, MCAA). For the purposes of the EIA, the marine environment is defined as any area seaward of the mean high-water springs (MHWS) mark of any tidally influenced water body (anything below MHWS). This includes intertidal zones, which are periodically exposed by the tide and subtidal zones which are always submerged.

1.2.15 It is acknowledged that for the purposes of marine consenting, the UK Marine Area (Section 42, Marine and Coastal Access Act 2009) also includes areas which are temporarily or permanently separated from the natural course of the tide (i.e.by a lock gate or other similar means).

1.2.16 MLs can be issued via a 'standalone' Marine Licence Application (MLA) or a licence 'deemed' within the body of the DCO (i.e. a Deemed Marine Licence (DML)). The Marine Management Organisation (MMO) is the body responsible for issuing, revoking and enforcing a ML, other than where a licence is in the form of a DML, in which case the SoS has the power to grant it.

1.2.17 Some aspects of the Proposed Development are likely to require a ML, namely the construction and operation of the crossing of the River Tees for the proposed hydrogen pipeline, and the potential for crossings of Greatham Creek where below MHWS, north of the Tees and to the west of the Main Sites. The design work for all crossings is ongoing, however, currently it is proposed that the crossing under the Tees will be constructed using either Horizontal Directional Drilling (HDD) or Micro

Bored Tunnelling (MBT) techniques, thereby minimising disturbance during construction. For other areas including the areas around Greatham Creek and Seal Sands various construction methodologies are being considered. Further detail is provided in Section 3.5.

1.2.18 The Application will therefore include a request to secure the ML for activities below MHWS via a DML. The scope of the DML will be discussed and agreed in consultation with the MMO throughout the DCO process.

1.3 The Applicant

1.3.1 The Applicant is H2 Teesside Limited, a bp company, who will be the lead developer and operator for the Production Facility and new hydrogen pipelines. The Proposed Development will support the decarbonisation of UK-produced natural gas landed in Teesside for use in industrial applications and is also a key contributor to restoring manufacturing jobs in the Tees Valley as well as towards achieving national targets in relation to net zero.

1.3.2 H2Teesside will export CO_2 to the NEP offshore storage facility via NEP infrastructure on the adjacent NZT site including the high pressure compression facility and the CO_2 export pipeline. The DCO application for NZT is due to be determined by the SoS by 10th May 2023.

1.4 Purpose of Scoping

1.4.1 The scoping phase of the EIA process provides a framework for identifying potential significant environmental effects which may arise as a result of the Proposed Development, and distinguishing the priority issues to be addressed at the assessment stage (i.e. within the ES). It also identifies those matters, where possible, which do not need to be assessed in detail and can be 'scoped out'.

1.4.2 The Scoping Report facilitates early pre-application engagement with key statutory consultees and stakeholders on the Proposed Development, as well as the proposed structure, methodology and content of the EIA.

1.4.3 This Scoping Report has been prepared in accordance with the relevant legislative provisions and associated Advice Notes (published by PINS).

1.4.4 Table 1-1, presents a list of information that should be included in a request for an EIA scoping opinion, as prescribed by Regulation 10(3) of the EIA Regulations and as set out in Paragraph 4.2 (and the associated Insert 2) of Advice Note Seven 'Environmental Impact Assessment: Preliminary Environmental Information and Environmental Statements' (PINS, 2020). Table 1-1 signposts to where that information is provided within this Scoping Report.

Table 1-1: Information Required for a Request for a Scoping Opinion

DESCRIPTION OF INFORMATION REQUIRED (REGULATION 10(3))	SUPPLEMENTARY DESCRIPTIONS (REGULATION 8(3))	SECTION IN SCOPING REPORT WHERE INFORMATION PRESENTED
A plan sufficient to identify the land	-	EIA Scoping Figures 1-8 (Appendix A)
A description of the proposed development, including its location and technical capacity	A description of the physical characteristics of the whole development; and a description of the location of the development, with particular regard to the environmental sensitivity of geographical areas likely to be affected.	Section 1-4 Section 2, 3 and 6
An explanation of the likely significant effects of the development on the environment	…resulting from: the expected residues and emissions and the production of waste, where relevant; and the use of natural resources, in particular soil, land, water and biodiversity.	Section 6 Section 3 and 6
Such other information or representations as the person making the request may wish to provide or make	-	See Table 1-2

1.4.5 PINS Advice Note Seven (PINS, 2020) recommends the information is presented in the form of a Scoping Report that includes the information required by the EIA Regulations (as presented in Table 1-1) together with more detailed/additional information as presented in Table 1-2.

Table 1-2: Information to be Provided in the Scoping Report

DESCRIPTION OF INFORMATION REQUIRED	SECTION IN SCOPING REPORT WHERE THE INFORMATION IS PRESENTED
The Proposed Development	

DESCRIPTION OF INFORMATION REQUIRED	SECTION IN SCOPING REPORT WHERE THE INFORMATION IS PRESENTED
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g. design parameters.	Section 1-4
Referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the Proposed Development.	EIA Scoping Figures (Appendix A)
EIA Approach and Topic Areas	
An outline of the reasonable alternatives considered and the reasons for selecting a preferred option.	Section 4 (Alternatives)
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues.	Section 8 (Summary)
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided.	Section 6 (Scope of the Assessment for each environmental topic) Section 8 (Summary)
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters.	Section 2 (Description of the existing environment) Section 6 (Baseline Conditions and Scope of the Assessment for each environmental topic)
Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect (e.g. criteria for determining sensitivity and magnitude).	Section 6 (Baseline Conditions and Scope of the Assessment for each environmental topic) and Section 7 (EIA Process)
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects.	Section 6 (Baseline Conditions and Scope of the Assessment for each environmental topic) and Section 7(EIA Process)
Information Sources	
References to any guidance and best practice to be relied upon.	Section 6 (Scope of the Assessment for each environmental topic)
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities).	Section 7 (EIA Process-See Table 7-1)
An outline of the structure of the proposed ES.	Section 7 (EIA Process)

Source: Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information and Environmental Statements, June 2020 (version 7).

1.5 Structure of this Report

1.5.1 The remainder of this report is structured as follows:

- Section 2 – Description of the Existing Environment: provides a description of the site and the surrounding area, together with any particular potentially significant environmental sensitivities/receptors within the vicinity of the Proposed Development Site;
- Section 3 – Proposed Development: outlines the key elements (including those likely to have a significant environmental effect) of the Proposed Development, the infrastructure to be developed and the function of the operational plant;
- Section 4 – Consideration of Alternatives: details the alternatives that have been considered during development of the Proposed Development design;
- Section 5 – Planning Policy and Need: identifies the key documents relating to national and local planning policy in the area, together with a summary of some of the principal planning policies or provisions as relevant to the Proposed Development;
- Section 6 – Potentially Significant Environmental Effects: provides a discussion of how the Proposed Development may interact with the different aspects of the receiving environment, together with a description of the proposed assessment methodologies, guidance and best practice to be adopted for the EIA of the Proposed Development (or, as appropriate, its design) and initial consideration of potential features of the Proposed Development or any measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment;
- Section 7 – Environmental Impact Assessment Process: provides an overview of the approach to be taken in the EIA and outline structure for the proposed ES; and
- Section 8– Summary and Matters to be Scoped Out: provides a summary of the EIA Scoping Report, the issues proposed to be scoped out of the EIA and the reasoning.

1.5.2 The following figures are included at Appendix A:

- Figure 1: Site Location Plan;
- Figure 2: Proposed Development Site Boundary (including location of Main Site A - Foundry);
- Figure 2a: Proposed Development Site Boundary (including location of Main Site B - RBT);
- Figure 3: Parts of the Proposed Development Site (Main Site A - Foundry);
- Figure 3a: Parts of the Proposed Development Site (Main Site B – RBT);
- Figure 4: CO_2 Export Corridor (Main Site A - Foundry);

- Figure 4a: CO_2 Export Corridor (extension required for Main Site B - RBT);
- Figure 5: Hydrogen Pipeline Corridor (Main Sites A - Foundry);
- Figure 5a: Hydrogen Pipeline Corridor (extension required for Main Site B - RBT)
- Figure 6: Natural Gas Connection Corridor (Main Site A – Foundry);
- Figure 6a: Natural Gas Connection Corridor (extension required for Main Site B – RBT);
- Figure 7: Electrical Connection Corridor (Main Site A – Foundry);
- Figure 7a: Electrical Connection Corridor (extension required for Main Site B – RBT);
- Figure 8: Water Connections Corridor (Main Site A – Foundry);
- Figure 8a: Water Connections Corridor (extension required for Main Site B – RBT);
- Figure 9: Other Gases Connection Corridor (O_2 and N_2) (Main Site A- Foundry);
- Figure 9a: Other Gases Connection Corridor (O_2 and N_2) (Main Site B- RBT);
- Figure 10: Environmental Constraints within 1 km of the Proposed Development Site Boundary;
- Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary;
- Figure 12: Ecological Constraints within 1 km of the Proposed Development Site Boundary;
- Figure 13: Statutory Designated Ecological Sites within 15 km of the Proposed Development Site Boundary;
- Figure 14: Major Accidents and Disasters Receptors within 5 km of the Proposed Development Site Boundary; and
- Figure 15: Other Developments to be Considered in the Cumulative Impact Assessment.

1.5.3 Any baseline data from other sources presented on Figures 1-15 in Appendix A is based on the information currently available from various data sources (see notes section on the individual Figures) and will be updated where required to inform the assessments as the EIA progresses.

2.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

2.1 The Proposed Development Site

2.1.1 The Main Site will be located either at 'The Foundry' site, within the Teesworks development site, or at RBT, to the immediate west of the Foundry.

2.1.2 The Proposed Development Site is located primarily within the administrative boundaries of Redcar and Cleveland Borough Council (RCBC) and Stockton-on-Tees Borough Council (STBC). The Hydrogen Pipeline Corridor extends further north-west to include land within the administrative boundary of Hartlepool Borough Council (HBC). For the purposes of this report, the Proposed Development Site is split into distinct areas. These are summarised below and illustrated on Figures 3-9 in Appendix A.

- The Main Site (whether Main Site A or B) which will be the location of the Production Facility together with the associated carbon capture and compression facilities and ancillary infrastructure.
- CO_2 Export Corridor: CO_2 captured from the process will be compressed to medium pressure at the Main Site and transported at a Maximum Allowable Operating Pressure (MAOP) of up to 28 barg[1] in a pipeline of up to 22" diameter to feed into the NEP CO_2 gathering system. CO_2 in dense-phase will then be exported off shore for geological storage offsite at the Endurance Store in the Southern North Sea using NEP infrastructure.
- Hydrogen Pipeline Corridor: Gaseous phase hydrogen pipeline network for the purpose of connecting to potential offtakers at various industrial installations across the Tees Valley. This pipeline system will be at up to 24" diameter and with a MAOP of up to 49 barg.
- Natural Gas Connection Corridor: Pipeline to connect the Production Facility to gas supply infrastructure.
- Other Gases Connection Corridor: Pipelines required for the transportation of compressed O_2 and N_2 from local sources for use in the H_2 production process.
- Electrical Connection Corridor: To provide electrical power for the Production Facility via a connection to the National Grid Network, either via private connection to Teesworks or to Northern Power Grid (NPG).
- Water Connections Corridor: Connections are required for water supply and discharge from/to the Production Facility.

[1] barg is the unit for the measurement of gauge pressure given by absolute pressure minus atmospheric pressure.

2.1.3 Further information regarding the above is provided in Section 3: The Proposed Development.

2.1.4 The Proposed Development Site encompasses an area of approximately 1,746 hectares (ha) and is indicative at this stage. The land required for the Proposed Development will be subject to appraisal, refinement, and final site selection as the preparation of the Application progresses. The final layout that will be incorporated within the Proposed DCO Boundary will be determined through ongoing studies of potential constraints and discussions with relevant stakeholders.

2.1.5 Any existing structures currently located within the Main Site A are expected to be demolished (by others under a separate consent) prior to commencement of works associated with the Proposed Development. As such, if Main Site A were to be selected, demolition works would not form part of the Proposed Development, and would not be assessed as part of the EIA.

2.1.6 There are structures present on Main Site B which would require demolition works. It is expected that these structures would be demolished (by others under a separate consent) prior to commencement of works associated with the Proposed Development, however, the Applicant may have to undertake these works. As such, if Main Site B were to be selected, demolition works would form part of the Proposed Development, and would be assessed as part of the EIA.

2.2 Site History

Main Site A – The Foundry

2.2.1 The history of Main Site A is summarised in Table 2-1.

Table 2-1: Main Site A History

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE A	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1856-1857 (1:10,560)	The majority of Main Site A is underlain by Bran Sands in the West, associated with the River Tees and Tees Estuary.	Adjacent to Main Site A, the Darlington and Saltburn Branch railway line runs in a broadly north to south direction. The trainline then runs easterly to a village which in later maps is called Warrenby. The south Gare Breakwater runs in a spur north from Main Site A. Adjacent to the east is marshland and agricultural fields.
1859 -1861 (1:10,560)	No significant change.	No significant change, no data available for eastern extent.
1893 (1:10,560) (1:2,250)	Two tramways cross the northern portion of Main Site A. One originates at Redcar Jetty, travels in a north-western direction, and	Redcar Jetty tramway leads into the adjacent Main Site B to the west and runs through its centre.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE A	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
	exits the Site to the south-east. Another tramway crosses Redcar Jetty tramway and travels in a south-easterly direction. Both are understood to lead to an ironworks located adjacent to the eastern boundary of Main Site A.	
1895 & 1898 (1:10,560)	No significant change.	Numerous sidings adjacent east and north of Main Site A have been constructed associated with the Saltburn Branch railway line. A Coastguard Station and South Pier Lighthouse have been constructed on the South Gare Breakwater.
1915 (1:10,560) (1:2,250)	No significant change.	Mapping shows Coatham ironworks, located adjacent to the eastern boundary of Main Site A. Beyond that, to the east, is wider industrial development including a slag works, ironworks and tarmacadam works.
1920 & 1923 (1:10,560)	No significant change.	No significant change. Large portions of the mapping are missing.
1924 Ariel Photography	Photography shows industrial infrastructure in the north of the site, associated with the Redcar Iron and Steel works.	Coatham Ironworks extends beyond the eastern boundary of Main Site A. There is surface water and marshland either side of the jetty in Main Site B site, to the immediate west of Main Site A.
1929 OS Mapping	No significant change.	Coatham Ironworks is renamed Redcar Iron and Steel Works. The Slag and Tarmacadam expanded, along with the associated railway sidings to the north-east of Main Site A.
1930 (1:10,560)	No significant change.	A portion of the Redcar iron and steel works is shown to have been constructed. This can only be distinguished by moving forward in mapping time (1938).
1938 (1:10,560)	No significant change.	The sidings associated with the Saltburn Branch railway line now serve the constructed Redcar iron and steel works. To the east Dormanstown has been constructed, including a residential

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE A	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
		housing area with a sports ground and allotments.
1946 Ariel Photography	Photography shows the industrial infrastructure associated with the steel works to still be present.	No significant change.
1951-1955 (1:10,000)	No significant change.	Dormanstown continues to expand, with further residential and industrial buildings built to the far east.
1970-1978 (1:10,000)	Railway infrastructure and road networks appear to have been constructed.	The Teesport refinery has been constructed approximately 1 km to the south of Main Site A.
1981 British Steel Corporation Site Layout Plan	Industrial infrastructure is present on-site including a blast furnace, two pumphouses, four oil tanks and butane and nitrogen storage compounds.	Area not shown by mapping.
1982 British Steel Corporation Site Layout Plan	In the north-east of Main Site A is a power station, blast furnace gasholder, coke screenhouse, settling pond and slag pits.	Area not shown by mapping.
1981-1985 (1:10,000)	The Redcar Steelworks has been constructed on site. Numerous buildings including tanks/ cooling towers and conveyors have been constructed.	The Saltburn Branch railway line has been realigned.
1986 (1:10,000)	No significant change.	A large reservoir/lake is located approximately 300 m south of Main Site A.
1991-1995 (1:10,000)	No significant change.	A series of square ponds have been constructed to the south of Main Site A.
1995 British Steel Corporation Site Layout Plan	The plan shows a blast furnace, water tanks, a thickener tank, a boiler house, slag pits and a cooling tower on Main Site A.	Area not shown by mapping.
1997 British Steel Corporation Site Layout Plan	Numerous tanks present.	Area not shown by mapping.
1999 Ariel Photography	No significant change.	The large reservoir/lake is still present, located approximately 300 m south of Main Site A.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE A	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
2000 (Google Earth, 2023)	No significant change.	Within Main Site B, large stockpiles are present, as well as various buildings and a lorry park.
2000-2021 (1:10,000)	No significant change.	Teesport refinery, located approximately 1 km to the south of Main Site A, appears to have been dismantled.
2015 Ariel Photography	Conveyors, tanks and other industrial infrastructure are in the north of Main Site A. There is surface water across Main Site A, and a pond in the north-east. Most of the infrastructure in the southern half of Main Site A is no longer present.	Two ponds are located approximately 30 m and 115 m north of Main Site A respectively.
2022 (Google Earth, 2023)	The majority of the southern half of Main Site A is vacant, with various small buildings present in the south western corner and conveyor structures remaining along the southern, eastern and western boundaries. Above-ground conveyors are still present in the northern and central parts of Main Site A. In the north, industrial infrastructure and tanks are still present, associated with the Redcar Steel works.	Large stockpiles are present on Main Site B, to the immediate west of Main Site A.
2023 (1:10,000)	Demolition of the buildings and infrastructure on Main Site A is ongoing.	Demolition of the buildings and infrastructure on Main Site B is ongoing.

Source: Envirocheck Report (284970768_1_1) (2021), Groundsure Report GS-9167761 (2022), Groundsure Report GS-9366847 (2023), National Library of Scotland (2023), Britain from Above (2023), Historic England (2015), Google Earth (2023).

Main Site B – RBT

2.2.2 The history of Main Site B is summarised in Table 2-2, below.

Table 2-2: Main Site B History

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1857 (1:10,560)	Main Site B is located within the Bran Sands area.	The Tees estuary is located approximately 225 m west of Main Site B.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1893 (1:10,560) (1:2,250)	Redcar jetty tramway runs through the centre of Main Site B.	Redcar Wharf is located approximately 160 m southwest of Main Site B, where the Redcar Jetty tramway terminates. Several beacons and buoys are located in the Tees estuary, to the west of Main Site B. Coatham Sands is located approximately 0.5 km to the north-east of Main Site B. Two tramways cross the northern portion of the Foundry site. One originates at Redcar Jetty, travels in a north-western direction, and exits the Site to the south-east. Another tramway crosses Redcar Jetty tramway and travels in a south-easterly direction. Both are understood to lead to an ironworks located approximately 1 km south-east of Main Site B.
1897 (1:10,560) (1:2,250)	No significant change.	Fifth Buoy Lighthouse is located approximately 500 m to the west of Main Site B.
1915 (1:10,560) (1:2,250)	No significant change.	A travelling crane is located at Redcar Wharf, approximately 160 m south-west of Main Site B. An ironworks (renamed Coatham ironworks) is located approximately 1.5 km east of Main Site B. Beyond that, approximately 1.7 km to the east, is wider industrial development including a slag works, ironworks and tarmacadam works.
1924 Aerial Photography	A jetty is located in the centre of Main Site B, with surface water and marshland on either side.	Various other railways/ tramways split off from the original tramway and appear to lead into a large building adjacent to the eastern boundary of Main Site B. A slag and tarmacadam works, and Warrenby slag works, are located to the north-east of Main Site B alongside a reservoir and a pumping station.
1927 – 1929 OS Mapping	No significant change.	Coatham Ironworks located approximately 1.5 km to the east (renamed Redcar Iron and Steel works) expanded, along with associated railway sidings to the north-east. Numerous tanks, sidings, railways lines, buildings, water towers and metre house are related to the iron and steel works are present. A sand pit is located approximately 400 m east of Main Site B.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1929 (1:10,560) (1:2,250)	No significant change.	Another travelling crane is located at Redcar Wharf, approximately 160 m south-west of Main Site B.
1938 OS Mapping	No significant change.	No significant change.
1944 Aerial Photography	Main Site B comprised possible sand/ marshland in the north and south, separated by the jetty and tramway.	Various buildings associated with the slag works are present to the east of Main Site B.
1952 OS Mapping	No significant change.	Six tanks are located approximately 1 km to the south-east of Main Site B. There are numerous drains and ponds along the eastern boundary of the adjacent Foundry site (Main Site A), within marshland, and a pumping station is situated from approximately 1 km to the north-east of Main Site B.
1953 OS Mapping	No significant change.	Two slag heaps were identified adjacent to the north-east corner of the Foundry site and a saltmarsh is located along the eastern boundary of the Foundry site.
1954 (1:10,560) (1:2,250)	Two small buildings are located along Redcar jetty, in the centre of Main Site B. Significant development of the steelworks occurred in the northeast of Main Site B, adjacent to Redcar Jetty, and numerous roadways, ramps, buildings, two conveyors, a platform, and a separator were constructed.	Buildings, roadways and ramps lead from the iron and steel works into Main Site B from the east.
1968 (1:10,560) (1:2,250)	No significant change.	A dismantled tramway is located approximately 600 m to the east of Main Site B. A spoil heap is situated approximately 100 m to the north-east of Main Site B.
1972 OS Mapping	Site not shown by mapping.	To the south of Main Site B, the wider area is referred to as South Teesside Works, Redcar. Active workings are shown to the south-east and a railway line runs parallel to the southern boundary of Main Site B.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
1980 (1:10,000) (1:2,250)	Main Site B is now shown as constructed on reclaimed land adjacent to the wider Redcar Steelworks. Numerous lighting towers are located within it. Seven conveyors stretch across the central and southern areas of it.	Redcar Wharf, located approximately 160 m south-west of Main Site B, expanded. Numerous conveyors, lighting towers and travelling cranes were constructed in the immediate vicinity. The main Redcar Steelworks is located to the immediate east of Main Site B, which includes numerous embankments, conveyors, tanks, travelling cranes, chimneys and buildings. An terminal containing numerous tanks, jetties and a laboratory is located approximately 700 m south-west of Main Site B, on the northern bank of the Tees estuary.
1981 British Steel Corporation Site Layout Plan	Site not shown by mapping.	To the east of Main Site B, within the Foundry site, there is a blast furnace, two pumphouses, four oil tanks and butane and nitrogen storage compounds.
1982 British Steel Corporation Site Layout Plan	Site not shown by mapping.	To the north east of the adjacent Foundry site, there is a power station, blast furnace gasholder, coke screenhouse, settling pond and slag pits.
1993 (1:10,000) (1:2,500)	No significant change.	A pipe tunnel runs from Dabholm Gut, located approximately 700 m south of Main Site B, across the Tees estuary, to the oil terminal/ refinery on its northern bank. Minor expansions to Teesworks were undertaken to the east of Main Site B.
1995 British Steel Corporation Site Layout Plan	Site not shown by mapping.	To the east of Main Site B, within the adjacent Foundry site, there is a blast furnace, as well as water tanks, a thickener tank, a boiler house, slag pits and a cooling tower.
1997 British Steel Corporation Site Layout Plan	Site not shown by mapping.	The Foundry North, adjacent to Main Site B, included numerous tanks.
1999 (Aerial photograph)	Development occurred in the north of Main Site B, including possible stockpiling.	A large reservoir/ lake is located approximately 300 m south of Main Site B.
2000 (Google Earth, 2023)	Main Site B comprised large stockpiles in the north, with various buildings still present,	No significant change.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
	and a possible lorry park. Stockpiles are present in the southern half of Main Site B.	
2001 (1:10,000)	A small pond/ lake is present in north-western corner of Main Site B.	A tip is located approximately 650 m north-east of Main Site B, near a group of small ponds. Various tanks and buildings are located approximately 700 m south of Main Site B, associated with an oil refinery.
2007 (Aerial Photography)	No significant change.	No significant change.
2010 (1:10,000)	Three small buildings were constructed in the centre of Main Site B.	Small expansions were undertaken to Teesworks, east of Main Site B, including the construction of roadways. The oil refinery located approximately 700 m south-east of Main Site B also expanded, including the construction of new tanks and two new pipelines. A tip is located approximately 500 m to the north of Main Site B, within Coatham Dunes, close to eight small ponds.
2015 (Aerial Photography)	No significant changes shown on Groundsure Arial photography, which covers the south of Main Site B. Aerial photography shows that large coal and ore stockpiles and above-ground conveyor structures that extend across the whole of Main Site B are still present. There is a small pond in the north-western corner of Main Site B, within a large, roughly vegetated area. The majority of Main Site B is covered with large puddles and surface water. The railway line through the centre of Main Site B appears to be abandoned. The buildings on-site are still present.	Redcar Steelworks appears to no longer be in use. Various industrial developments are present adjacent to the River Tees, to the west of Main Site B, with nearby cars suggesting that they are in-use.

MAP EDITION(S)	SIGNIFICANT FEATURES ON MAIN SITE B	SIGNIFICANT FEATURES IN THE SURROUNDING AREA
2019 (Aerial photograph)	No significant change.	No significant change.
2021 (Aerial photograph)	No significant change.	No significant change.
2022 (Google Earth, 2023)	Main Site B comprised various large stockpiles, conveyors and associated structures. The small pond is still present in the north-west of Main Site B. This is understood to be representative of the current site layout.	The pond adjacent to the north-east corner of Main Site B is no longer present.
2023 (1:10,000)	Demolition of conveyors and buildings on Main Site B is ongoing.	Demolition works are ongoing in the area surrounding Main Site B.

Sources: Groundsure Report GS-9167761 (2022), Groundsure Report GS-9366847 (2023), National Library of Scotland (2023), Britain from Above (2023), Historic England (2015), Google Earth (2023).

2.3 Environmental Receptors

2.3.1 Several environmental receptors have been identified within the vicinity of the Proposed Development Site (pursuant to study areas discussed in section 6). Each of these are detailed below under each environmental discipline (note this is not intended to be an exhaustive list at this stage) and further detail where required is presented in the topic sections included within Section 6: Potentially Significant Environmental Effects. All distances are given as the shortest distance between the receptor and the closest point of the relevant part of the Proposed Development Site (see Figures 3-13, Appendix A).

Main Site A – Foundry

2.3.2 Main Site A comprises approximately 91 ha of land. It is not anticipated that all of this land will be required but it is presented as a worst-case scenario area until the layout of the Proposed Development is confirmed within this area.

2.3.3 Main Site A comprises former industrial land that was used for steel making production, including a mix of industrial buildings. As of February 2023, much of the site infrastructure including industrial buildings and overhead pipes are either demolished or in the process of being dismantled. A combination of hardstanding and road networks remain on Main Site A, surrounded by informal vegetation (primarily grass), with occasional shrubs and small trees.

2.3.4 The topography of Main Site A is relatively flat, with typical ground levels of between 6-8 m above ordnance datum (AOD).

2.3.5 The following environmental receptors have been identified in the vicinity of Main Site A.

Residential

2.3.6 Main Site A is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 1.3 km east of Main Site A, in Warrenby.

2.3.7 Dormanstown is located approximately 1.3 km to the south-east of Main Site A, and Redcar is located approximately 2.6 km to the east of Main Site A.

Traffic and Transport

2.3.8 Access to Main Site A during the construction phase for Heavy Goods Vehicle (HGV) construction traffic is likely to be via the existing Teesworks access road from the A1085, via the former Redcar Steelworks entrance. This route will also be used during operation for staff and other site traffic.

2.3.9 The Tees Valley Line, a passenger railway, runs approximately 0.9 km south-east of Main Site A. The mothballed Redcar British Steel railway station is located approximately 1.2 km south-west of Main Site A.

2.3.10 There are no Public Rights of Way (PRoWs) within Main Site A. The England Coast Path, a National Trail, runs approximately 1.3 km east of Main Site A. The Teesdale Way Long Distance Route runs adjacent to Main Site A along its northern boundary. There are no other National Trails within 5 km of Main Site A.

2.3.11 Whilst Main Site A is located within access land in the England Coastal Margin defined by the Countryside and Rights of Way (CRoW) Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.12 Within 15 km of Main Site A there are:

- Three Special Protection Areas (SPAs):
  - Teesmouth and Cleveland Coast SPA, immediately north of Main Site A;
  - North York Moors SPA, located approximately 12.2 km south-east of Main Site A; and
  - Northumbria Coast SPA, located approximately 13.5 km north-west of Main Site A.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, immediately north of Main Site A; and

  - Northumbria Coast Ramsar Site, located approximately 13.5 km north-west of Main Site A.

- Two Special Areas of Conservation (SACs):
  - North York Moors SAC, located approximately 12.2 km south-east of Main Site A; and
  - Durham Coast SAC, located approximately 13.5 km north-west of Main Site A.
- Two National Nature Reserves (NNRs):
  - Teesmouth NNR, located approximately 1.6 km west of Main Site A; and
  - Durham Coast NNR, located approximately 12.5 km north-west of Main Site A.

2.3.13 There are no proposed Ramsar Sites or potential SPAs within 15 km of Main Site A.

2.3.14 There is one Site of Special Scientific Interest (SSSI) within 5 km of Main Site A, that being Teesmouth and Cleveland Coast SSSI, adjacent to Main Site A.

2.3.15 There is one Local Nature Reserve (LNR) within 5 km of Main Site A, that being Seaton Dunes and Common LNR, located approximately 3.1 km north-west of Main Site A.

Hydrology/Flood Risk

2.3.16 The River Tees (a Main River) discharges to the North Sea via the Tees Estuary at Tees Mouth and is located approximately 0.9 km west of Main Site A. Other watercourses within 1km of Main Site A include:

- Dabholm Gut[2], a man-made tidal inlet, located approximately 0.7km south of Main Site A;
- The Fleet, located approximately 0.8 km east of Main Site A; and
- The Mill Race, located approximately 0.9 km south-east of Main Site A.

2.3.17 The Environment Agency 'Flood map for planning' indicates that the whole of Main Site A is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% annual exceedance probability (AEP) of river or sea flooding*".

Geology and Hydrogeology

2.3.18 Main Site A is underlain by a sequence of Made Ground, Tidal Flat Deposits and Glacial Till (Boulder Clay)/Glacio-lacustrine deposits, underlain by Triassic Mercia

[2] Also referenced on early mapping sources as Dabholm Cut. For the purposes of this report, this watercourse/ feature will be referred to consistently as Dabholm Gut. It is fed by a combined discharge from number of watercourses and the permitted discharge from Bran Sands WwTW.

Mudstone bedrock in the north-west, Triassic Penarth Formation in the centre and Jurassic Redcar Mudstone Formation in the south-east.

2.3.19 Main Site A is located over 5 km south-east of the nearest aquifer Source Protection Zone (SPZ). There are no Nitrate Vulnerable Zones (NVZs), Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences located within 1 km of Main Site A.

Cultural Heritage

2.3.20 There are no designated heritage assets within Main Site A.

2.3.21 There are 59 listed buildings within 5 km of Main Site A. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 1.3 km east of Main Site A, at Warrenby.

2.3.22 There are four Conservation Areas within 5 km of Main Site A:

- Coatham Conservation Area, Redcar, located approximately 2.5 km east of Main Site A;
- Kirkleatham Conservation Area, located approximately 3.8 km south-east of Main Site A;
- Seaton Conservation Area, located approximately 4.6 km north-west of Main Site A; and
- Wilton Conservation Area, located approximately 5 km south-east of Main Site A.

2.3.23 There are no scheduled monuments, world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of Main Site A.

Landscape

2.3.24 Main Site A is located within the Tees Lowlands National Character Area (NCA).

2.3.25 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including Main Site A and the surrounding area.

Main Site B – RBT

2.3.26 Main Site B comprises approximately 60 ha of land. It is not anticipated that all of this land will be required but it is presented as a worst-case scenario area until the layout of the Proposed Development is confirmed within this area.

2.3.27 Main Site B comprises former industrial land, including a mix of industrial buildings and some small areas of grassland. Much of the site infrastructure is still in place, including hardstanding and road networks.

2.3.28 The topography of Main Site B is relatively flat, with typical ground levels of approximately 2-7 m AOD. Ground levels for the majority of Main Site B are

approximately 5-7 m AOD; the north-western corner of Main Site B is lower at approximately 2 m AOD.

2.3.29 The following environmental receptors have been identified in the vicinity of Main Site B.

Residential

2.3.30 Main Site B is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 2.2 km east of Main Site B in Warrenby.

2.3.31 Dormanstown is located approximately 3 km to the south-east of Main Site B, and Redcar is located approximately 4.2 km to the east of Main Site B.

Traffic and Transport

2.3.32 Access to Main Site B during the construction phase for HGV construction traffic is likely to be the same as that for Main Site A, i.e. via the existing access road from the A1085, via the former Redcar Steelworks entrance. This route will also be used during operation for staff and other site traffic.

2.3.33 The Tees Valley Line railway runs approximately 1.8 km south-east of Main Site B. The mothballed Redcar British Steel railway station is located approximately 2.1 km south-west of Main Site B.

2.3.34 There are no PRoWs within Main Site B. The Teesdale Way long distance route runs approximately 0.4 km north-east of Main Site B. The England Coast Path National Trail runs approximately 2.2 km east of Main Site B. There are no other National Trails within 5 km of Main Site B.

2.3.35 Whilst Main Site B is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.36 Within 15 km of Main Site B there are:

- Three Special Protection Areas (SPAs):
  - Teesmouth and Cleveland Coast SPA, adjacent to Main Site B;
  - North York Moors SPA, located approximately 12.7 km south-east of Main Site B; and
  - Northumbria Coast SPA, located approximately 13.1 km north-west of Main Site B.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site adjacent to Main Site B; and

  - Northumbria Coast Ramsar Site, located approximately 13.1 km north-west of Main Site B.

- Two Special Areas of Conservation (SACs):
  - North York Moors SAC, located approximately 12.7 km south-east of Main Site B; and
  - Durham Coast SAC, located approximately 13.1 km north-west of Main Site B.
- Two National Nature Reserves (NNRs):
  - Teesmouth NNR, located approximately 0.8 km west of Main Site B; and
  - Durham Coast NNR, located approximately 12 km north-west of Main Site B.

2.3.37 There are no proposed Ramsar Sites or potential SPAs within 15 km of Main Site B.

2.3.38 There is one SSSI within 5 km of Main Site B, that being Teesmouth and Cleveland Coast SSSI, adjacent to Main Site B.

2.3.39 There is one LNR within 5 km of Main Site B, that being Seaton Dunes and Common LNR, located approximately 2.3 km north-west of Main Site B.

Hydrology/ Flood Risk

2.3.40 The River Tees (Tees Estuary) at Tees Mouth is located approximately 75 m west of Main Site B at its closest point. Other watercourses within 1 km of Main Site B include:

- Dabholm Gut, located approximately 0.88 km south of Main Site B;
- The Fleet, located approximately 1.7 km east of Main Site B; and
- The Mill Race, located approximately 2.0 km south-east of Main Site B.

2.3.41 The Environment Agency 'Flood map for planning' indicates that the whole of Main Site B is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% annual exceedance probability (AEP) of river or sea flooding*".

Geology and Hydrogeology

2.3.42 Main Site B is underlain by a sequence of Made Ground, Tidal Flat Deposits, Glacial Till (Boulder Clay)/Glacio-lacustrine Deposits underlain by the Triassic Mercia Mudstone Group bedrock.

2.3.43 Main Site B is located over 5 km south-east of the nearest SPZ. There are no NVZs, Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences located within 1 km of Main Site B.

Cultural Heritage

2.3.44 There are no designated heritage assets within Main Site B.

2.3.45 There are 40 listed buildings within 5 km of Main Site B. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 2.2 km east of Main Site B in Warrenby.

2.3.46 There are three Conservation Areas within 5 km of Main Site B:

- Coatham Conservation Area, Redcar, located approximately 3.3 km east of Main Site B;
- Seaton Conservation Area, located approximately 3.9 km north-west of Main Site B; and
- Kirkleatham Conservation Area, located approximately 4.7 km south-east of Main Site B.

2.3.47 There are no scheduled monuments, world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of Main Site B.

Landscape

2.3.48 Main Site B is located within the Tees Lowlands NCA.

2.3.49 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including Main Site B and the surrounding area.

CO_2 Export Corridor – Main Site A

2.3.50 There are two CO_2 Export Corridor options for Main Site A; only one will be required.

2.3.51 The first CO_2 Export Corridor is adjacent to Main Site A and links to NEP infrastructure on the adjacent NZT site. It comprises approximately 4 ha at present, but this will be refined in due course.

2.3.52 An alternative CO_2 Export Corridor option would connect into Main Site A at a location along its southern boundary and then route to the south of the NZT site. Part of this corridor is also being considered as an option for Main Site B. It comprises approximately 11 ha at present, but this will also be subject to refinement if carried forward as the preferred option. The following environmental receptors have been identified in the vicinity of the CO_2 Export Corridors for Main Site A.

Residential

2.3.53 The CO_2 Export Corridors are generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.8 km east of the CO_2 Export Corridors in Warrenby.

2.3.54 Dormanstown is located approximately 1.1 km to the south-east of the CO_2 Export Corridors, and Redcar is located approximately 2.4 km to the-east of the CO_2 Export Corridors.

Traffic and Transport

2.3.55 The Tees Valley railway line runs approximately 0.5 km south-east of the CO_2 Export Corridors.

2.3.56 There are no PRoWs within or adjacent to the CO_2 Export Corridors. The Teesdale Way runs approximately 0.5 km north-east of the CO_2 Export Corridors. The England Coast Path runs approximately 0.8 km north-east of the CO_2 Export Corridors. There are no other National Trails within 5 km of the CO_2 Export Corridors.

2.3.57 Whilst the CO_2 Export Corridors are located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.58 Within 15 km of the CO_2 Export Corridors there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, approximately 0.5 km north of the CO_2 Export Corridors;
  - North York Moors SPA, located approximately 11.7 km south-east of the CO_2 Export Corridors; and
  - Northumbria Coast SPA, located approximately 14.6 km north-west of the CO_2 Export Corridors.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 0.5 km north of the CO_2 Export Corridors; and
  - Northumbria Coast Ramsar Site, located approximately 14.6 km north-west of the CO_2 Export Corridors.
- Two SACs:
  - North York Moors SAC, located approximately 11.6 km south-east of the CO_2 Export Corridors; and
  - Durham Coast SAC, located approximately 14.6 km north-west of the CO_2 Export Corridors.
- Two NNRs:
  - Teesmouth NNR, located approximately 2.7 km west of the CO_2 Export Corridors; and
  - Durham Coast NNR, located approximately 13.6 km north-west of the CO_2 Export Corridors.

2.3.59 There are no proposed Ramsar Sites or potential SPAs within 15 km of the CO_2 Export Corridors.

2.3.60 There is one SSSI within 5 km of the CO_2 Export Corridors, Teesmouth and Cleveland Coast SSSI, located approximately 0.5 m north of the CO_2 Export Corridors.

2.3.61 There is one LNR within 5 km of the CO_2 Export Corridors, Seaton Dunes and Common LNR, located approximately 3.8 km north-west of the CO_2 Export Corridors.

Hydrology/ Flood Risk

2.3.62 The Tees Estuary at Tees Mouth is located approximately 1.8 km west of the CO_2 Export Corridors. Other watercourses within 1 km of the CO_2 Export Corridors include:

- The Fleet, located approximately 80 m east of the CO_2 Export Corridors;
- The Mill Race, located approximately 0.4 km south-east of the CO_2 Export Corridors;
- Ash Gill, located approximately 0.5 km south-east of the CO_2 Export Corridors;
- Dabholm Gut, located approximately 0.8 km south of the CO_2 Export Corridors; and
- Dabholm Beck, located approximately 0.9 km south of the CO_2 Export Corridors.

2.3.63 The Environment Agency 'Flood map for planning' indicates that the CO_2 Export Corridors are wholly located within Flood Zone 1 that is defined as, "*land having a less than 0.1% AEP of river or sea flooding*".

Geology and Hydrogeology

2.3.64 A review of the publicly available British Geological Survey (BGS) borehole records and geological maps (BGS, 2022) indicate that the CO_2 Export Corridors are underlain by a sequence of Made Ground, Tidal Flat Deposits and mudstones of the Redcar Mudstone Formation.

2.3.65 There are no SPZs, NVZs, Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences within 1 km of the CO_2 Export Corridors.

Cultural Heritage

2.3.66 There are no designated heritage assets within the CO_2 Export Corridors.

2.3.67 There are 83 listed buildings within 5 km of the CO_2 Export Corridors. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 0.8 km east of the CO_2 Export Corridors in Warrenby.

2.3.68 There are four Conservation Areas within 5 km of the CO_2 Export Corridors:

- Coatham Conservation Area, Redcar, located approximately 1.9 km east of the CO_2 Export Corridors;
- Kirkleatham Conservation Area, located approximately 3.1 km south-east of the CO_2 Export Corridors;

- Wilton Conservation Area, located approximately 4.4 km south-east of the CO_2 Export Corridors; and
- Yearby Conservation Area, located approximately 4.4 km south-east of the CO_2 Export Corridors.

2.3.69 There is one scheduled monument within 5km of the CO_2 Export Corridors, a 'World War I early warning acoustic mirror 650m north west of Bridge Farm', located approximately 4.7 km south-east of the CO_2 Export Corridors in Redcar.

2.3.70 There are no world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of the CO_2 Export Corridors.

Landscape

2.3.71 The CO_2 Export Corridors are located within the Tees Lowlands NCA.

2.3.72 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the CO_2 Export Corridors and the surrounding area.

Hydrogen Pipeline Corridor – Main Site A

2.3.73 The Hydrogen Pipeline Corridor connects Main Site A to potential offtakers at various industrial installations across the Tees Valley. It currently comprises approximately 1,306 ha of predominantly industrial land, from Billingham in the west to Kirkleatham in the east and includes a crossing of the Tees. However, the land required for the construction and operation of the hydrogen pipeline network will be of much smaller area than this and the corridor will be refined during design work prior to submission of the Application. Refer to Section 3.5 for further detail.

2.3.74 The following environmental receptors have been identified in the vicinity of the Hydrogen Pipeline Corridor.

Residential

2.3.75 The Hydrogen Pipeline Corridor is predominantly located within industrial land, and as such, is generally remote from residential receptors. Near to Main Site A, the Hydrogen Pipeline Corridor is close to Dormanstown and Redcar. Dormanstown is located approximately 0.2 km to the east of the Hydrogen Pipeline Corridor, and Redcar is located approximately 2.2 km to the north-east of the Hydrogen Pipeline Corridor.

2.3.76 Where the Hydrogen Pipeline Corridor extends into the Wilton International Estate, it is approximately 0.4 km to the west of Kirkleatham.

2.3.77 At its western extent, the Hydrogen Pipeline Corridor is approximately 1.2 km north-east of Billingham and 0.5 km east of Wolviston. There is a small group of properties located approximately 50 m south of the Hydrogen Pipeline Corridor on Cowpen Lane, near Cowpen Bewley.

Traffic and Transport

2.3.78 The Tees Valley Line and Durham Coast railway lines run through the Hydrogen Pipeline Connection Corridor. The A1085 Trunk Road, Tees Dock Road, Seaton Carew

Road, Tees Road and Haverton Hill Road also pass through the Hydrogen Pipeline Connection Corridor.

2.3.79 15 PRoWs are located within the Hydrogen Pipeline Corridor (12 of which are footpaths and three of which are bridleways). Some of these PRoWs form part of the England Coast Path National Trail and the Teesdale Way long distance route. There are no other National Trails within 5 km of the Hydrogen Pipeline Corridor.

2.3.80 Whilst some of the Hydrogen Pipeline Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.81 Within 15 km of the Hydrogen Pipeline Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, part of which falls within the Hydrogen Pipeline Corridor;
  - North York Moors SPA, located approximately 7.9 km south-east of the Hydrogen Pipeline Corridor; and
  - Northumbria Coast SPA, located approximately 10 km north-west of the Hydrogen Pipeline Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, part of which falls within the Hydrogen Pipeline Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 10.5 km north-west of the Hydrogen Pipeline Corridor.
- Three SACs:
  - North York Moors SAC, located approximately 8 km south-east of the Hydrogen Pipeline Corridor;
  - Durham Coast SAC, located approximately 10.5 km north-west of the Hydrogen Pipeline Corridor; and
  - Castle Eden Dene SAC, located approximately 13.5 km north-west of the Hydrogen Pipeline Corridor.
- Three NNRs:
  - Teesmouth NNR, some of which falls within the Hydrogen Pipeline Corridor;

- Durham Coast NNR, located approximately 9.5 km north-west of the Hydrogen Pipeline Corridor; and
- Castle Dene NNR, located approximately 13.5 km north-west of the Hydrogen Pipeline Corridor.

2.3.82 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Hydrogen Pipeline Corridor.

2.3.83 There are two SSSIs within 5 km of the Hydrogen Pipeline Corridor:

- Teesmouth and Cleveland Coast SSSI, some of which is located within the Hydrogen Pipeline Corridor; and
- Lovell Hill Pools SSSI, located approximately 2.4 km south-east of the Hydrogen Pipeline Corridor.

2.3.84 There are 13 LNRs within 5 km of the Hydrogen Pipeline Corridor:

- Cowpen Bewley Woodland Country Park LNR, part of which is located within the Hydrogen Pipeline Corridor;
- Charlton's Pond LNR, located approximately 0.5 km west of the Hydrogen Pipeline Corridor;
- Seaton Dunes and Common LNR, located approximately 1.3 km north-east of the Hydrogen Pipeline Corridor;
- Billingham Beck Valley LNR, located approximately 1.4 km west of the Hydrogen Pipeline Corridor;
- Greatham Beck LNR, located approximately 1.8 km north-west of the Hydrogen Pipeline Corridor;
- Eston Moor LNR, located approximately 2.4 km south of the Hydrogen Pipeline Corridor;
- Linthorpe Cemetery LNR, located approximately 2.3 km south of the Hydrogen Pipeline Corridor;
- Norton Grange Marsh LNR, located approximately 2.8 km south-west of the Hydrogen Pipeline Corridor;
- Errington Wood LNR, located approximately 3.3 km west of the Hydrogen Pipeline Corridor;
- Berwick Hills LNR, located approximately 3.8 km south of the Hydrogen Pipeline Corridor;
- Flatts Lane Woodland Country Park LNR, located approximately 4.2 km south of the Hydrogen Pipeline Corridor;
- Summerhill LNR, located approximately 4 km north-west of the Hydrogen Pipeline Corridor; and

- Hardwick Dene & Elm Tree Woods LNR, located approximately 4.6 km south-west of the Hydrogen Pipeline Corridor.

Hydrology/ Flood Risk

2.3.85 The Hydrogen Pipeline Corridor crosses the River Tees. There are 20 other named watercourses within 1 km of the Hydrogen Pipeline Corridor:

- Claxton Beck, Seaton on Tees Channel, Knitting Wife Beck, Dabholm Gut, Holme Fleet, Greatham Creek, Mains Dike, Swallow Fleet, Dabholm Beck, Greatham Beck, Belasis Beck, Castle Gill, the Fleet, the Mill Race, all of which are partially or wholly located within the Hydrogen Pipeline Corridor;
- Ash Gill, located approximately 30 m east of the Hydrogen Pipeline Corridor;
- Cowbridge Beck, located approximately 160 m west of the Hydrogen Pipeline Corridor;
- Billingham Beck, located approximately 570 m south-west of the Hydrogen Pipeline Corridor;
- Kinkerdale Beck, located approximately 600 m south-west of the Hydrogen Pipeline Corridor; and
- Kettle Beck, located approximately 860 m south-west of the Hydrogen Pipeline Corridor.

2.3.86 The Environment Agency 'Flood map for planning' indicates that approximately half of the Hydrogen Pipeline Corridor is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% AEP of river or sea flooding*", whilst the remaining land falls within Flood Zones 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding). The areas of Flood Zones 2 and 3 are around the Tees and Dabholm Gut, and to the north of the Tees, as illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A).

Geology and Hydrogeology

2.3.87 The Hydrogen Pipeline Corridor is variably underlain by a sequence of Made Ground, Tidal Flat Deposits, Alluvium (Clay, Silt, Sand and Gravel), Blown Sand, Devensian Glaciolacustrine Deposits (Clay and Silt) and Devensian Glacial Till (Boulder Clay). The superficial deposits are underlain by the Triassic Sherwood Sandstone Group in the western area of the Hydrogen Pipeline Corridor. The eastern area is underlain by mudstones from the Triassic Mercia Mudstone Group and Penarth Formation and the Jurassic Redcar Mudstone Formation.

2.3.88 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Hydrogen Pipeline Corridor. A small part of the Hydrogen Pipeline Corridor, in Billingham, falls within a NVZ.

Cultural Heritage

2.3.89 There are no designated heritage assets within the Hydrogen Pipeline Corridor.

2.3.90 There are 488 listed buildings within 5 km of the Hydrogen Pipeline Corridor. The closest are Grade II Village Farmhouse, Billingham, located approximately 70 m south of the Hydrogen Pipeline Corridor, and Grade II* 'Phosphate rock silo number 15 at ICI works, Billingham', located approximately 260 m south of the Hydrogen Pipeline Corridor.

2.3.91 There are 21 Conservation Areas within 5 km of the Hydrogen Pipeline Corridor, the closest of which are Cowpen Bewley Conservation Area, part of which falls within the Hydrogen Pipeline Corridor, and Kirkleatham Conservation Area, located approximately 150 m east of the Hydrogen Pipeline Corridor.

2.3.92 There are 25 scheduled monuments within 5 km of the Hydrogen Pipeline Corridor, the closest of which are Claxton medieval moated site, 'Bowl barrow 1.1 km north-west of High Court Green' and 'Eston Nab hill fort, palisaded settlement and beacon'. Claxton medieval moated site is located approximately 2 km north-west of the Hydrogen Pipeline Corridor. 'Bowl barrow 1.1 km north-west of High Court Green' and 'Eston Nab hill fort, palisaded settlement and beacon' are located approximately 2.4 km south of the Hydrogen Pipeline Corridor.

2.3.93 There are two registered parks and gardens within 5 km of the Hydrogen Pipeline Corridor: Grade II Albert Park, located approximately 2.7 km south-east of the Hydrogen Pipeline Corridor in Middlesborough, and Grade II* Ropner Park, located approximately 4.7 km south-east of the Hydrogen Pipeline Corridor in Stockton-on-Tees.

2.3.94 There are no world heritage sites, registered battlefields or heritage coasts within 5 km of the Hydrogen Pipeline Corridor.

Landscape

2.3.95 The Hydrogen Pipeline Corridor is located within the Tees Lowlands NCA.

2.3.96 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Hydrogen Pipeline Corridor and the surrounding area.

Natural Gas Connection Corridor – Main Site A

2.3.97 The identified indicative Natural Gas Connection Corridor comprises approximately 11 ha of industrial land connecting the Production Facility to the wider gas supply infrastructure in the area. However, the land required for the Natural Gas Connection Corridor will be refined during design work prior to submission of the Application. Refer to Section 3.4 for further detail.

2.3.98 The following environmental receptors have been identified in the vicinity of the Natural Gas Connection Corridor.

Residential

2.3.99 The Natural Gas Connection Corridor is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.8 km north-east of the Natural Gas Connection Corridor in Warrenby.

2.3.100 Dormanstown is located approximately 1.1 km to the south-east of the Natural Gas Connection Corridor, and Redcar is located approximately 2.5 km to the east of the Natural Gas Connection Corridor.

Traffic and Transport

2.3.101 The Tees Valley Line railway runs approximately 0.5 km south-east of the Natural Gas Connection Corridor.

2.3.102 There are no PRoWs within or adjacent to the Natural Gas Connection Corridor. The Teesdale Way long distance route runs approximately 0.5 km north-east of the Natural Gas Connection Corridor. The England Coast Path National Trail runs approximately 0.8 km north-east of the Natural Gas Connection Corridor. There are no other National Trails within 5 km of the Natural Gas Connection Corridor.

2.3.103 Whilst the Natural Gas Connection Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.104 Within 15 km of the Natural Gas Connection Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, located approximately 0.7 km south and 1 km north of the Natural Gas Connection Corridor;
  - North York Moors SPA, located approximately 11.7 km south-east of the Natural Gas Connection Corridor; and
  - Northumbria Coast SPA, located approximately 14.9 km north-west of the Natural Gas Connection Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 0.7 km north of the Natural Gas Connection Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 14.9 km north-west of the Natural Gas Connection Corridor.
- Two SACs:
  - North York Moors SAC, located approximately 11.7 km south-east of the Natural Gas Connection Corridor; and

  - Durham Coast SAC, located approximately 14.9 km north-west of the Natural Gas Connection Corridor.

- Two NNRs:
  - Teesmouth NNR, located approximately 2.7 km west of the Natural Gas Connection Corridor; and
  - Durham Coast NNR, located approximately 13.8 km north-west of the Natural Gas Connection Corridor.

2.3.105 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Natural Gas Connection Corridor.

2.3.106 There is one SSSI within 5 km of the Natural Gas Connection Corridor, that being Teesmouth and Cleveland Coast SSSI, located approximately 0.5 km north-east of the Natural Gas Connection Corridor.

2.3.107 There is one LNR within 5 km of the Natural Gas Connection Corridor, that being Seaton Dunes and Common LNR, located approximately 4.1 km north-west of the Natural Gas Connection Corridor.

Hydrology/ Flood Risk

2.3.108 The Tees Estuary at Tees Mouth is located approximately 1.8 km west of the Natural Gas Connection Corridor. Other watercourses within 1 km of the Natural Gas Connection Corridor include:

- The Fleet, located approximately 80 m east of the Natural Gas Connection Corridor;
- The Mill Race, located approximately 0.4 km south of the Natural Gas Connection Corridor.
- Ash Gill, located approximately 0.5 km east of the Natural Gas Connection Corridor;
- Dabholm Gut, located approximately 0.8 km south of the Natural Gas Connection Corridor; and
- Dabholm Beck, located approximately 0.9 km south of the Natural Gas Connection Corridor.

2.3.109 The Environment Agency 'Flood map for planning' indicates that the whole of the Natural Gas Connection Corridor is located within Flood Zone 1, that is defined as "*land having a less than 0.1% AEP of river or sea flooding*".

Geology and Hydrogeology

2.3.110 The Natural Gas Connection Corridor is underlain by a sequence of Made Ground, Tidal Flat Deposits and mudstones of the Redcar Mudstone Formation. An area of Blown Sand superficial deposits may be present along the eastern boundary of the Natural Gas Connection Corridor.

2.3.111 There are no SPZs, NVZs, Drinking Water Protected Areas or Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Natural Gas Connection Corridor.

Cultural Heritage

2.3.112 There are no designated heritage assets within the Natural Gas Connection Corridor.

2.3.113 There are 83 listed buildings within 5 km of the Natural Gas Connection Corridor. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 750 m north-east of the Natural Gas Connection Corridor in Warrenby.

2.3.114 There are four Conservation Area within 5 km of the Natural Gas Connection Corridor:

- Coatham, Redcar Conservation Area, located approximately 1.9 km east of the Natural Gas Connection Corridor;
- Kirkleatham Conservation Area, located approximately 3.1 km south-east of the Natural Gas Connection Corridor;
- Wilton Conservation Area, located approximately 4.4 km south-east of the Natural Gas Connection Corridor; and
- Yearby Conservation Area, located approximately 4.4 km south-east of the Natural Gas Connection Corridor.

2.3.115 There is one scheduled monument within 5 km of the Natural Gas Connection Corridor: 'World War I early warning acoustic mirror 650 m north-west of Bridge Farm', located approximately 4.6 km east of the Natural Gas Connection Corridor in Redcar.

2.3.116 There are no world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of the Natural Gas Connection Corridor.

Landscape

2.3.117 The Natural Gas Connection Corridor is located within the Tees Lowlands NCA.

2.3.118 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Natural Gas Connection Corridor and the surrounding area.

<u>Other Gases Connection Corridor – Main Site A</u>

2.3.119 The identified indicative Other Gases Connection Corridor comprises approximately 33 ha of industrial land connecting the Production Facility to wider gas supply infrastructure in the area. However, the land required for the Other Gases Connection Corridor will be refined during design work prior to submission of the Application. Refer to Section 3.8 for further detail.

2.3.120 The following environmental receptors have been identified in the vicinity of the Other Gases Connection Corridor.

Residential

2.3.121 The Other Gases Connection Corridor is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.9 km north-east of the Other Gases Connection Corridor in Warrenby.

2.3.122 Dormanstown is located approximately 1.1 km to the east of the Other Gases Connection Corridor, and Redcar is located approximately 2.5 km to the east of the Other Gases Connection Corridor.

Traffic and Transport

2.3.123 The Tees Valley Line railway runs through approximately 1.1 km of the Other Gases Connection Corridor. Tees Dock Road also passes through the Other Gases Connection Corridor.

2.3.124 Bridleway 116/9/1 and footpath 102/2/3 (which form part of the Teesdale Way long distance route and England Coast Path National Trail) run adjacent to the Other Gases Connection Corridor for approximately 0.8 km. A small section of bridleway 116/9/1 falls within the Other Gases Connection Corridor, close to Dabholm Gut. A small section of footpath 102/2A/2 also falls within the Other Gases Connection Corridor, by Tees Dock Road. There are no other National Trails within 5 km of the Other Gases Connection Corridor.

2.3.125 Whilst the Other Gases Connection Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.126 Within 15 km of the Other Gases Connection Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, located approximately 0.3 km south-west of the Other Gases Connection Corridor;
  - North York Moors SPA, located approximately 10.4 km south-east of the Other Gases Connection Corridor; and
  - Northumbria Coast SPA, located approximately 14.6 km north-west of the Other Gases Connection Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 0.3 km south-west of the Other Gases Connection Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 14.6 km north-west of the Other Gases Connection Corridor.
- Two SACs:

  - North York Moors SAC, located approximately 10.4 km south-east of the Other Gases Connection Corridor; and
  - Durham Coast SAC, located approximately 14.6 km north-west of the Other Gases Connection Corridor.

- Two NNRs:
  - Teesmouth NNR, located approximately 2.2 km west of the Other Gases Connection Corridor; and
  - Durham Coast NNR, located approximately 13.5 km north-west of the Other Gases Connection Corridor.

2.3.127 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Other Gases Connection Corridor.

2.3.128 There is one SSSI within 5 km of the Other Gases Connection Corridor, that being Teesmouth and Cleveland Coast SSSI, located approximately 0.3 km south-west of the Other Gases Connection Corridor.

2.3.129 There are two LNRs within 5 km of the Other Gases Connection Corridor: Seaton Dunes and Common LNR, located approximately 3.7 km north-west of the Other Gases Connection Corridor, and Eston Moor LNR, located approximately 4.7 km south-east of the Other Gases Connection Corridor.

Hydrology/ Flood Risk

2.3.130 The Tees Estuary at Tees Mouth is located approximately 1.6 km north-west of the Other Gases Connection Corridor. Other watercourses within 1 km of the Other Gases Connection Corridor include:

- The Fleet, Dabholm Gut, Dabholm Beck and the Mill Race, which are partially or wholly located within the Other Gases Connection Corridor; and
- Ash Gill located approximately 0.4 km east of the Other Gases Connection Corridor.

2.3.131 The Environment Agency 'Flood map for planning' indicates that the majority of the Other Gases Connection Corridor is located within Flood Zone 1, that is defined as "*land having a less than 0.1% AEP of river or sea flooding*". A small part of the Other Gases Connection Corridor, Dabholm Gut, falls within Flood Zones 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding), as illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A).

Geology and Hydrogeology

2.3.132 The Other Gases Connection Corridor is underlain by a sequence of Made Ground, Tidal Flat Deposits, and mudstones of the Triassic Penarth Formation and Jurassic Redcar Mudstone Formation. An area of Blown Sand superficial deposits may be

present, underlying a small portion of the north-eastern bend of the Other Gases Connection Corridor.

2.3.133 There are no SPZs, NVZs, Drinking Water Protected Areas or Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Other Gases Connection Corridor.

Cultural Heritage

2.3.134 There are no designated heritage assets within the Other Gases Connection Corridor.

2.3.135 There are 105 listed buildings within 5 km of the Other Gases Connection Corridor. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 0.9 km north-east of the Other Gases Connection Corridor in Warrenby.

2.3.136 There are four Conservation Areas within 5 km of the Other Gases Connection Corridor:

- Coatham, Redcar Conservation Area, located approximately 2 km east of the Other Gases Connection Corridor;
- Kirkleatham Conservation Area, located approximately 2.9 km south-east of the Other Gases Connection Corridor;
- Wilton Conservation Area, located approximately 3.5 km south-east of the Other Gases Connection Corridor; and
- Yearby Conservation Area, located approximately 4 km south-east of the Other Gases Connection Corridor.

2.3.137 There are six scheduled monuments within 5 km of the Other Gases Connection Corridor, the closest of which is 'World War I early warning acoustic mirror 650 m north-west of Bridge Farm', located approximately 4.6 km east of the Other Gases Connection Corridor in Redcar.

2.3.138 There are no world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of the Other Gases Connection Corridor.

Landscape

2.3.139 The Other Gases Connection Corridor is located within the Tees Lowlands NCA.

2.3.140 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Other Gases Connection Corridor and the surrounding area.

Electrical Connection Corridor – Main Site A

2.3.141 The Electrical Connection Corridor connects the Production Facility to the electricity transmission network; it extends from Main Site A in the north, to Grangetown in the south. It comprises approximately 287 ha. However, the land required for the Electrical Connection Corridor will be refined during design work prior to submission of the Application. Refer to Section 3.6 for further detail.

2.3.142 The following environmental receptors have been identified in the vicinity of the Electrical Connection Corridor.

Residential

2.3.143 The Electrical Connection Corridor is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.6 km north-east of the Electrical Connection Corridor in Warrenby.

2.3.144 Near to Main Site A, the Electrical Connection Corridor is close to Dormanstown and Redcar. Dormanstown is located approximately 0.7 km to the east of the Electrical Connection Corridor, and Redcar is located approximately 2 km to the north-east of the Electrical Connection Corridor. At its southern end, the Electrical Connection Corridor is adjacent to Grangetown.

Traffic and Transport

2.3.145 The Tees Valley Line railway runs through the Electrical Connection Corridor, as does the A1085 Trunk Road, Greystone Road and Tees Dock Road.

2.3.146 There are nine PRoWs within the Electrical Connection Corridor (two of which are bridleways, and seven of which are footpaths). Some of these PRoWs form part of the England Coast Path National Trail and the Teesdale Way long distance route. There are no other National Trails within 5 km of the Electrical Connection Corridor.

2.3.147 Whilst some of the Electrical Connection Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.148 Within 15 km of the Electrical Connection Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, located approximately 0.1 km west of the Electrical Connection Corridor;
  - North York Moors SPA, located approximately 8.3 km south-east of the Electrical Connection Corridor; and
  - Northumbria Coast SPA, located approximately 14.4 km north-west of the Electrical Connection Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 120 m west of the Electrical Connection Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 14.4 km north-west of the Electrical Connection Corridor.

- Two SACs:
  - North York Moors SAC, located approximately 8.4 km south-east of the Electrical Connection Corridor; and
  - Durham Coast SAC, located approximately 14.4 km north-west of the Electrical Connection Corridor.
- Two NNRs:
  - Teesmouth NNR, located approximately 2.1 km west of the Electrical Connection Corridor; and
  - Durham Coast NNR, located approximately 13.4 km north-west of the Electrical Connection Corridor.

2.3.149 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Electrical Connection Corridor.

2.3.150 There are two SSSIs within 5 km of the Electrical Connection Corridor:

- Teesmouth and Cleveland Coast SSSI, located approximately 120 m west of the Electrical Connection Corridor; and
- Lovell Hill Pools SSSI, located approximately 4 km south-east of the Electrical Connection Corridor.

2.3.151 There are four LNRs within 5 km of the Electrical Connection Corridor:

- Eston Moor LNR, located approximately 2.6 km south-east of the Electrical Connection Corridor;
- Flatts Lane Woodland Country Park LNR, located approximately 3.8 km south of the Electrical Connection Corridor
- Seaton Dunes and Common LNR, located approximately 3.7 km north-west of the Electrical Connection Corridor; and
- Berwick Hills LNR, located approximately 4.2 km south-west of the Electrical Connection Corridor.

Hydrology/ Flood Risk

2.3.152 The Tees Estuary at Tees Mouth is located approximately 1.2 km west of the Electrical Connection Corridor. Other watercourses within 1 km of the Electrical Corridor include:

- The Mill Race, Knitting Wife Beck, The Fleet, Cross Beck, Dabholm Gut and Dabholm Beck, which are partially or wholly located within the Electrical Connection Corridor;
- Ash Gill, adjacent to the Electrical Connection Corridor;
- Kinkerdale Beck, located approximately 80 m east of the Electrical Connection Corridor;

- Kettle Beck, located approximately 80 m south of the Electrical Connection Corridor;
- Castle Gill, located approximately 0.3 km south-east of the Electrical Connection Corridor; and
- Mains Dike, located approximately 0.8 km south-east of the Electrical Connection Corridor.

2.3.153 The Environment Agency 'Flood map for planning' indicates that the majority of the Electrical Connection Corridor is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% AEP of river or sea flooding*". As illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A), a small part of the Electrical Connection Corridor, between the Teesport Estate and the Trunk Road Industrial Estate, falls within Flood Zones 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding).

Geology and Hydrogeology

2.3.154 The Electrical Connection Corridor is underlain by a sequence of Made Ground, Tidal Flat Deposits, Blown Sand, Devensian Glaciolacustrine Deposits (Clay and Silt) and Devensian Glacial Till. The superficial deposits are underlain by mudstones from the Mercia Mudstone Group, Penarth Formation and the Redcar Mudstone Formation.

2.3.155 There are no SPZs, NVZs, Drinking Water Protected Areas or Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Electrical Connection Corridor.

Cultural Heritage

2.3.156 There are no designated heritage assets within the Electrical Connection Corridor.

2.3.157 There are 144 listed buildings within 5 km of the Electrical Connection Corridor. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 610 m north-east of the Electrical Connection Corridor in Warrenby.

2.3.158 There are five Conservation Areas within 5 km of the Electrical Connection Corridor:

- Coatham Conservation Area, Redcar, located approximately 1.6 km north-east of the Electrical Connection Corridor;
- Wilton Conservation Area, located approximately 1.8 km south-east of the Electrical Connection Corridor;
- Kirkleatham Conservation Area, located approximately 2.2 km east of the Electrical Connection Corridor;
- Yearby Conservation Area, located approximately 3.2 km south-east of the Electrical Connection Corridor; and

- Ormesby Hall Conservation Area, located approximately 3.9 km south of the Electrical Connection Corridor.

2.3.159 There are 19 scheduled monuments within 5 km of the Electrical Connection Corridor, the closest of which is Eston Nab hill fort, palisaded settlement and beacon', located approximately 2.6 km south of the Electrical Connection Corridor.

2.3.160 There are no registered parks and gardens, world heritage sites, registered battlefields or heritage coasts within 5 km of the Electrical Connection Corridor.

Landscape

2.3.161 The Electrical Connection Corridor is located within the Tees Lowlands NCA.

2.3.162 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Electrical Connection Corridor and the surrounding area.

Water Connections Corridor – Main Site A

2.3.163 The Water Connections Corridor are described in Section 3.7 and comprises approximately 218 ha of mostly industrial land. The land required for the Water Connections Corridor will be refined during design work prior to submission of the Application.

2.3.164 The following environmental receptors have been identified in the vicinity of the Water Connections Corridor.

Residential

2.3.165 The Water Connections Corridor is generally remote from residential receptors. Marsh Farmhouse is the closest residential receptor, located approximately 0.4 km east of the Water Connections Corridor in Warrenby.

2.3.166 Dormanstown is located approximately 0.4 km to the east of the Water Connections Corridor, and Redcar is located approximately 2 km to the east of the Water Connections Corridor.

Traffic and Transport

2.3.167 The Tees Valley Line railway and the A1085 Trunk Road pass through the Water Connections Corridor.

2.3.168 There are three PRoWs within the Water Connections Corridor: bridleways 116/9/1, 116/9/2 and 116/10/2. Bridleways 116/9/1 and 116/9/2 form part of the England Coast Path National Trail and Teesdale Way long distance route. There are no other National Trails within 5 km of the Water Connections Corridor.

2.3.169 Whilst the Water Connections Corridor is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

Ecology

2.3.170 Within 15 km of the Water Connections Corridor there are:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, located approximately 0.5 km west of the Water Connections Corridor;
  - North York Moors SPA, located approximately 9.1 km south-east of the Water Connections Corridor; and
  - Northumbria Coast SPA, located approximately 14.9 km north-west of the Water Connections Corridor.
- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar Site, located approximately 0.5 km north of the Water Connections Corridor; and
  - Northumbria Coast Ramsar Site, located approximately 14.9 km north-west of the Water Connections Corridor.
- Two SACs:
  - North York Moors SAC, located approximately 9.1 km south-east of the Water Connections Corridor; and
  - Durham Coast SAC, located approximately 14.9 km north-west of the Water Connections Corridor.
- Two NNRs:
  - Teesmouth NNR, located approximately 2.6 km west of the Water Connections Corridor; and
  - Durham Coast NNR, located approximately 13.8 km north-west of the Water Connections Corridor.

2.3.171 There are no proposed Ramsar Sites or potential SPAs within 15 km of the Water Connections Corridor.

2.3.172 There are two SSSIs within 5 km of the Water Connections Corridor:

- Teesmouth and Cleveland Coast SSSI, located approximately 70 m north of the Water Connections Corridor; and
- Lovell Hill Pools SSSI, located approximately 3.6 km south-east of the Water Connections Corridor.

2.3.173 There are three LNRs within 5 km of the Water Connections Corridor:

- Seaton Dunes and Common LNR, located approximately 4.1 km north-west of the Water Connections Corridor;
- Eston Moor LNR, located approximately 3.6 km south of the Water Connections Corridor; and
- Errington Wood LNR, located approximately 4.1 km south-east of the Water Connections Corridor.

Hydrology/ Flood Risk

2.3.174 The Tees Estuary at Tees Mouth is located approximately 1.4 km west of the Water Connections Corridor. Other watercourses within 1 km of the Water Connections Corridor include:

- The Fleet, The Mill Race and Dabholm Beck, Dabholm Gut and Mains Dike, all of which are partially located within the Water Connections Corridor; and
- Ash Gill, adjacent to the Water Connections Corridor.

2.3.175 The Environment Agency 'Flood map for planning' indicates that the majority of the Water Connections Corridor is located within Flood Zone 1 that is defined as, "*land having a less than 0.1% AEP of river or sea flooding*". As illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A), a small part of the Water Connections Corridor, between the Teesport Estate and Trunk Road Industrial Estate, Dormanstown, falls within Flood Zones 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding).

Geology and Hydrogeology

2.3.176 The Water Connections Corridor is underlain by Made Ground, Tidal Flat Deposits, Glaciolacustrine Deposits, Devensian Glacial Till and mudstones of the Redcar Mudstone Formation. An area of Blown Sand (superficial deposits) may be present along the eastern boundary of the Water Connections Corridor.

2.3.177 There are no SPZs, NVZs, Drinking Water Protected Areas or Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Water Connections Corridor.

Cultural Heritage

2.3.178 There are no designated heritage assets within the Water Connections Corridor.

2.3.179 There are 127 listed buildings within 5 km of the Water Connections Corridor. The closest are three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 0.5 km east of the Water Connections Corridor in Warrenby.

2.3.180 There are five Conservation Areas within 5 km of the Water Connections Corridor:

- Kirkleatham Conservation Area, located approximately 0.9 km east of the Water Connections Corridor;
- Coatham Conservation Area, Redcar, located approximately 1.6 km north-east of the Water Connections Corridor;
- Wilton Conservation Area, located approximately 1.9 km south-east of the Water Connections Corridor;
- Yearby Conservation Area, located approximately 2 km south-east of the Water Connections Corridor; and
- Marske-by-the-Sea Conservation Area, located approximately 4.8 km east of the Water Connections Corridor.

2.3.181 There are 19 scheduled monuments within 5 km of the Water Connections Corridor, the closest of which is 'World War I early warning acoustic mirror 650 m north-west of Bridge Farm', located approximately 3.1 km east of the Water Connections Corridor in Redcar.

2.3.182 There are no world heritage sites, registered parks and gardens, registered battlefields or heritage coasts within 5 km of the Water Connections Corridor.

Landscape

2.3.183 The Water Connections Corridor is located within the Tees Lowlands NCA.

2.3.184 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Water Connections Corridor and the surrounding area.

CO_2 Export Corridor – RBT Extension

2.3.185 The CO_2 Export Corridor RBT Extension comprises approximately 10ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the CO_2 Export Corridor as described for Main Site A, and the CO_2 Export Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.186 The following environmental receptors have been identified in the vicinity of CO_2 Export Corridor RBT Extension. Only receptors which are closer to the CO_2 Export Corridor RBT Extension than they are the CO_2 Export Corridors for Main Site A are listed.

- Teesmouth and Cleveland Coast SPA, Teesmouth and Cleveland Coast Ramsar Site and Teesmouth and Cleveland Coast SSSI are located approximately 0.3 km south-west of the CO_2 Export Corridor RBT Extension (for reference, they are located approximately 0.5 km north of the CO_2 Export Corridors);
- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the CO_2 Export Corridor RBT Extension (for reference, they are located approximately 14.6 km north-west of the CO_2 Export Corridors);

- Teesmouth NNR is located approximately 1.9 km west of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 2.7 km west of the CO_2 Export Corridors);
- Durham Coast NNR is located approximately 13.1 km north-west of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 13.6 km west of the CO_2 Export Corridors);
- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 3.8 km north-west of the CO_2 Export Corridors);
- The Tees Estuary at Tees Mouth is located approximately 1 km west of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 1.8 km west of the CO_2 Export Corridors); and
- Dabholm Gut is located approximately 0.7 km south of the CO_2 Export Corridor RBT Extension (for reference, it is located approximately 0.8 km south of the CO_2 Export Corridors).

Hydrogen Pipeline Corridor – RBT Extension

2.3.187 The Hydrogen Pipeline Corridor RBT Extension comprises approximately 12ha of industrial land within Main Site A. If Main Site B were to be progressed, both the Hydrogen Pipeline Corridor as described for Main Site A, and the Hydrogen Pipeline Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.188 The Hydrogen Pipeline Corridor RBT Extension is not closer to any sensitive receptors than the Hydrogen Pipeline Corridor for Main Site A.

Natural Gas Connection Corridor – RBT Extension

2.3.189 The Natural Gas Connection Corridor RBT Extension comprises approximately 10 ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the Natural Gas Connection Corridor as described for Main Site A, and the Natural Gas Connection Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.190 The following environmental receptors have been identified in the vicinity of Natural Gas Connection Corridor RBT Extension. Only receptors which are closer to the Natural Gas Connection Corridor RBT Extension than they are the Natural Gas Connection Corridor for Main Site A are listed.

- Teesmouth and Cleveland Coast SPA, Teesmouth and Cleveland Coast Ramsar Site and Teesmouth and Cleveland Coast SSSI are located approximately 0.3 km south-west of the Natural Gas Connection Corridor RBT Extension (for reference, they are located approximately 0.7 km south-west of the Natural Gas Connection Corridor);

- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the Natural Gas Connection Corridor RBT Extension (for reference, they are located approximately 14.9 km south-west of the Natural Gas Connection Corridor);
- Teesmouth NNR is located approximately 1.9 km west of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 2.7 km west of the Natural Gas Connection Corridor);
- Durham Coast NNR is located approximately 13.1 km north-west of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 13.8 km north-west of the Natural Gas Connection Corridor);
- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 4.1 km north-west of the Natural Gas Connection Corridor);
- The Tees Estuary at Tees Mouth is located approximately 1 km west of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 1.8 km west of the Natural Gas Connection Corridor); and
- Dabholm Gut is located approximately 0.7 km south of the Natural Gas Connection Corridor RBT Extension (for reference, it is located approximately 0.8 km south of the Natural Gas Connection Corridor).

Other Gases Connection Corridor – RBT Extension

2.3.191 The Other Gases Connection Corridor RBT Extension comprises approximately 6 ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the Other Gases Connection Corridor as described for Main Site A, and the Other Gases Connection Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.192 The following environmental receptors have been identified in the vicinity of Other Gases Connection Corridor RBT Extension; only receptors which are closer to the Other Gases Connection Corridor RBT Extension than they are the Other Gases Connection Corridor for Main Site A are listed.

- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the Other Gases Connection Corridor RBT Extension (for reference, they are located approximately 14.6 km north-west of the Other Gases Connection Corridor);
- Teesmouth NNR is located approximately 1.9 km west of the Other Gases Connection Corridor RBT Extension (for reference, it is located approximately 2.2 km west of the Other Gases Connection Corridor);
- Durham Coast NNR is located approximately 13.1 km north-west of the Other Gases Connection Corridor RBT Extension (for reference, it is located approximately 13.5 km north-west of the Other Gases Connection Corridor);

- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the Other Gases Connection Corridor RBT Extension (for reference, it is located approximately 3.7 km north-west of the Other Gases Connection Corridor); and
- The Tees Estuary at Tees Mouth is located approximately 1 km west of the Other Gases Connection Corridor RBT Extension (for reference, it is located approximately 1.6 km west of the Other Gases Connection Corridor).

Electrical Connection Corridor – RBT Extension

2.3.193 The Electrical Connection Corridor RBT Extension comprises approximately 7 ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the Electrical Connection Corridor as described for Main Site A, and the Electrical Connection Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.194 The following environmental receptors have been identified in the vicinity of Electrical Connection Corridor RBT Extension. Only receptors which are closer to the Electrical Connection Corridor RBT Extension than they are the Electrical Connection Corridor for Main Site A are listed.

- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the Electrical Connection Corridor RBT Extension (for reference, they are located approximately 14.4 km north-west of the Electrical Connection Corridor);
- Teesmouth NNR is located approximately 1.9 km west of the Electrical Connection Corridor RBT Extension (for reference, it is located approximately 2.1 km west of the Electrical Connection Corridor);
- Durham Coast NNR is located approximately 13.1 km north-west of the Electrical Connection Corridor RBT Extension (for reference, it is located approximately 13.4 km north-west of the Electrical Connection Corridor);
- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the Electrical Connection Corridor RBT Extension (for reference, it is located approximately 3.7 km north-west of the Electrical Connection Corridor); and
- The Tees Estuary at Tees Mouth is located approximately 0.9 km west of the Electrical Connection Corridor RBT Extension (for reference, it is located approximately 1.2 km west of the Electrical Connection Corridor).

Water Connections Corridor – RBT Extension

2.3.195 The Water Connections Corridor RBT Extension comprises approximately 14 ha of industrial land within and adjacent to Main Site A. If Main Site B were to be progressed, both the Water Connections Corridor as described for Main Site A, and the Water Connections Corridor RBT Extension, would be required, as shown on Figure 3a: Parts of the Proposed Development Site Boundary (Main Site B – RBT).

2.3.196 The following environmental receptors have been identified in the vicinity of Water Connections Corridor RBT Extension; only receptors which are closer to the Water Connections Corridor RBT Extension than they are the Water Connections Corridor for Main Site A are listed.

- Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar Site are located approximately 0.3 km south-west of the Water Connections Corridor RBT Extension (for reference, they are located approximately 0.7 km south-west of the Water Connection Corridor);
- Northumbria Coast SPA, Northumbria Coast Ramsar Site and Durham Coast SAC are located approximately 14.2 km north-west of the Water Connections Corridor RBT Extension (for reference, they are located approximately 14.9 km south-west of the Water Connections Corridor);
- Teesmouth NNR is located approximately 1.9 km west of the Water Connections Corridor RBT Extension (for reference, it is located approximately 2.6 km west of the Water Connections Corridor);
- Durham Coast NNR is located approximately 13.1 km north-west of the Water Connections Corridor RBT Extension (for reference, it is located approximately 13.8 km north-west of the Water Connections Corridor);
- Seaton Dunes and Common LNR is located approximately 3.3 km north-west of the Water Connections Corridor RBT Extension (for reference, it is located approximately 4.1 km north-west of the Water Connections Corridor); and
- The Tees Estuary at Tees Mouth is located approximately 0.9 km west of the Water Connections Corridor RBT Extension (for reference, it is located approximately 1.4 km west of the Water Connections Corridor).

3.0 PROPOSED DEVELOPMENT

3.1 Overview

3.1.1 As outlined in Section 1.0, the Proposed Development comprises the construction, operation, and maintenance of a 1.2 GWth LHV (Phase 1 600 MWth LHV and Phase 2 600 MWth LHV) Carbon, Capture and Storage (CCS) enabled Hydrogen Production Facility located in the Teesside industrial cluster area. In summary, the Proposed Development also comprises the following elements:

- hydrogen distribution pipelines to supply H_2 to various offtakers on Teesside and within the surrounding area, such pipelines to be utilised in association with the H_2 production plant;
- an Air Separation Unit (ASU) to supply O_2 for the H_2 production process;
- O_2 and N_2 supply pipelines (as an alternative to the ASU) to supply O_2 and N_2 for the H_2 production process;
- CO_2 capture and compression facilities and a connection to the NEP;
- a natural gas supply connection for the supply of gas to the H_2 production plant;
- an electricity grid connection to provide power to the Proposed Development;
- water supply and treatment infrastructure;
- wastewater treatment and disposal infrastructure; and
- other utilities connections, telecommunications, and other associated and ancillary infrastructure.

3.1.2 The Production Facility and associated infrastructure which form part of the Proposed Development will be located on the 'Main Site'. There are currently two Main Site options – Main Sites A and B. Main Site A would be located within land owned by Teesworks known as 'The Foundry'. Main Site B would be located to the west of Main Site A within land owned by Redcar Bulk Terminal, known as 'RBT'. Both Main Sites are located within Redcar and Cleveland Borough, with the connection corridors extending further into Stockton-on-Tees and Hartlepool, all within Teesside.

3.1.3 The Production Facility at the Main Site will need a hydrogen pipeline to transport the H_2 produced to potential industrial offtakers around Teesside as well as a CO_2 export connection and other utility connections including natural gas, water, electricity and other gases (O_2 and N_2).

3.1.4 H2Teesside demand will come from multiple end users, including fuel switching within process heat, steam raising and power generation applications.

3.1.5 The proposed capture technology is pre-combustion amine-based absorption-regeneration with an anticipated design carbon capture rate in excess of 95%. The capture rate is anticipated to be secured through the Environmental Permit. H2Teesside will connect via a short CO_2 export connection to NEP infrastructure on

the NZT site to the east of the Main Site A. Based on current projections, H2Teesside will have the capacity to continuously export 1.42 Mt of dehydrated and compressed CO_2 per year per Phase, or 2.84 Mt/year once both phases are operational (100% utilisation) with no temporary CO_2 storage required on Site.

3.1.6 At this stage in the design of the Proposed Development, there are still options being considered for various components. The design of the Proposed Development incorporates a necessary degree of flexibility to allow for the future selection of the preferred layout at the Main Site, as well as routing of the hydrogen pipeline and other connections. This will evolve as the design and commercial agreements progress throughout the preparation of the Application.

3.1.7 The Rochdale Envelope approach has been adopted to ensure that a worst case in terms of design parameters, proposed development extents and options has been considered at the EIA Scoping stage. It is expected that the current optionality would be reduced, and preferred options confirmed prior to submission of the Application, and the Rochdale Envelope used and assessed will be narrowed accordingly.

3.1.8 In addition, some of the design aspects and features of the Proposed Development cannot be confirmed until the Engineering, Procurement and Construction (EPC) Contractor has been appointed. For example, the building sizes and exact location may vary depending on the contactor selected and their specific configuration and selection of plant. Therefore, focused use of the Rochdale Envelope approach will continue to be adopted to define appropriate parameters for use in the EIA.

3.1.9 The following sections describe the Proposed Development in more detail as required for the purposes of this EIA Scoping Report and provide where possible a brief description of any optionality still being considered by the Applicant for each element.

3.2 Components of the Proposed Development

Hydrogen Production Facility – The Main Site

3.2.1 The description of the components of the Proposed Development at the Main Site below applies regardless of whether Main Site A or Main Site B is selected. However, the configuration of the various components within the Main Sites is subject to ongoing studies and dependant on the final technology and site selected.

3.2.2 The Hydrogen Production Facility will be designed taking account of Best Available Techniques as set out in the UK Government's guidance on emerging techniques for hydrogen production with carbon capture (Environment Agency, 2023).

3.2.3 H2Teesside will utilise natural gas, which will first be pre-reformed with steam over a catalyst bed to break down higher hydrocarbons to primarily carbon oxides and hydrogen. This syngas will then be reformed further using pure O_2 and more steam over catalysts in an Auto Thermal Reformer (ATR).

3.2.4 After cooling, the syngas will be reacted in water-gas shift reactors to generate H_2 and CO_2. The CO_2 will be removed from the gas via scrubbing with amine, which will

be regenerated to yield a CO_2 stream that will be compressed, dehydrated, and then exported utilising NEP infrastructure on the NZT site to the east of the Main Site. The captured CO_2 will be further compressed by NEP to be in dense phase for transportation and will be exported using existing infrastructure to the NEP Endurance store beneath the North Sea. The infrastructure required for export and storage (the high-pressure compression plant and CO_2 export pipeline) is subject to separate consent, including through the NZT DCO Project (for which DCO examination has now closed and a decision is anticipated in early May 2023).

3.2.5 The resulting low-carbon H_2 will be purified to >98 mol% H_2 and compressed and conditioned before exporting via the new proposed purpose-built hydrogen pipeline system to transport the H_2 to offtakers located in the Teesside region.

3.2.6 Steam is required at various stages of the process. Steam is raised in the ATR reformed gas boilers. Steam is then sent to the steam turbine generator (STG) where it is consumed for power generation to power the facility. The power generated by the steam turbine generator will not exceed 50 MW for each phase of the Proposed Development. The remaining saturated steam is used to heat several process streams: in the heater, O_2 preheater, process condensate heater and the CO_2 dryer.

Production Capacity

3.2.7 Production is expected to build during the initial 12-18 months of operation in line with offtaker demand. The peak H_2 export rate for each 600 MWth Phase is expected to be 22,175 kg/hr and the peak CO_2 export rate is 161,710 kg/hr. For Phase 1 and 2 combined this would equate to approximately 44,350 kg/hr peak H_2 production and export and 323,420 kg/hr CO_2 export.

3.2.8 Once commissioned and operational, the Production Facility will be designed to operate at all times, twenty-four hours a day, seven days per week until decommissioning, with brief exceptions for planned outages such as for maintenance and repair.

3.2.9 A schematic of the H_2 production process is provided at Plate 3-1 below.

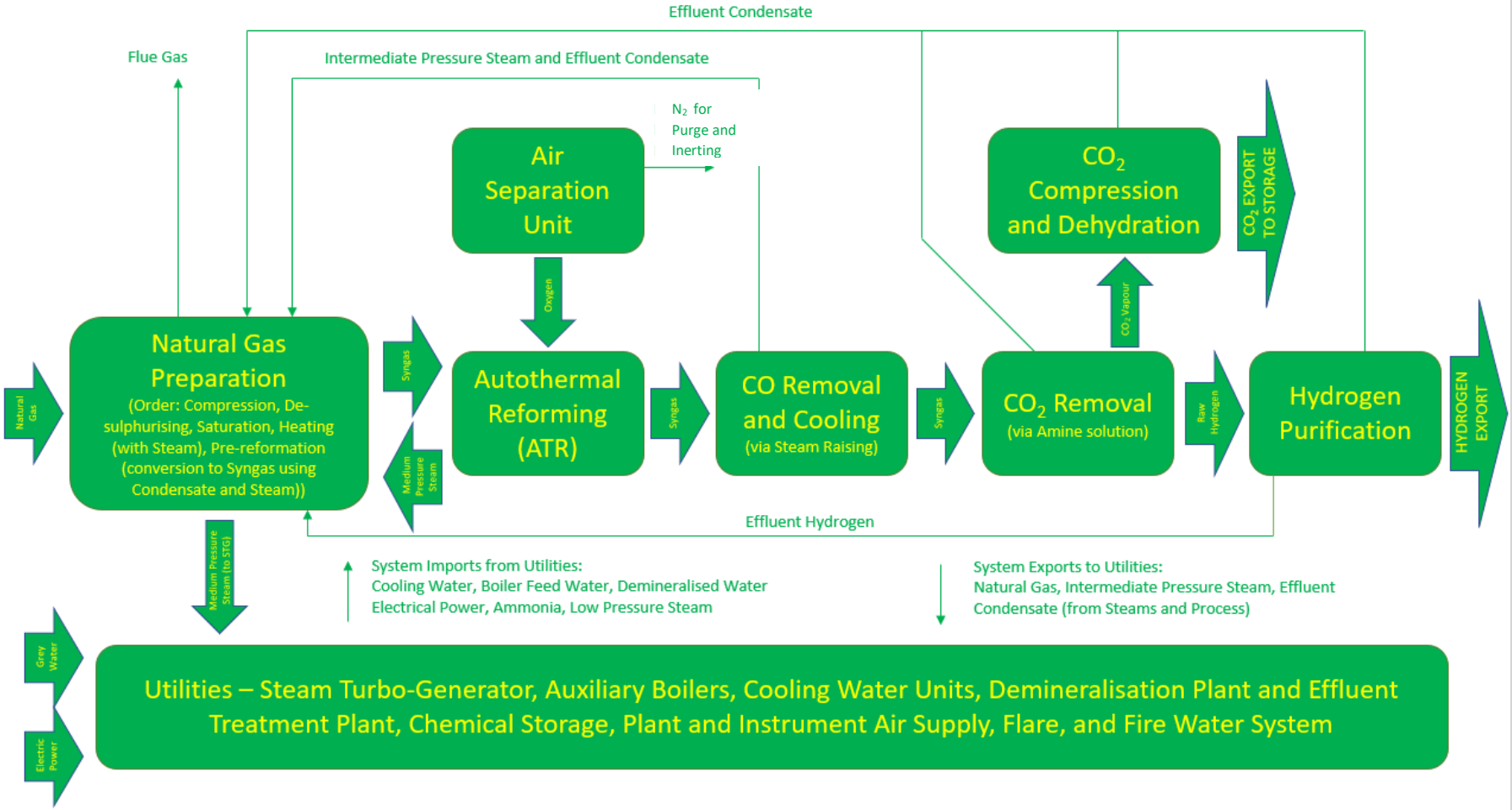

Plate 3-1: H2Teesside Blue Hydrogen Indicative Process Schematic

Note: if O_2 and N_2 are supplied by offsite sources, no ASU will be required.

3.2.10 An outline description of the process infrastructure required for the operation of the Production Facility is presented below. Details on the likely additional infrastructure that would be installed as part of Phase 2 is outlined in Section 3.13.

- A new Above Ground Installation (AGI) on the Main Site to receive natural gas which is compressed and pre-treated for use in the reforming process;
- A Hydrogen Unit (also called an ATR) where the main process of reforming occurs, fitted with Selective Catalytic Reduction (SCR). The Hydrogen Unit also includes the following component units;
  - pre-treatment to remove sulphur species;
  - pre-Reformer to reform longer hydrocarbons to methane, H_2 and CO;
  - shift reactors for conversion of carbon monoxide (CO) to H_2 and CO_2 and heat recovery in the form of steam for reuse in the process;
  - CO_2 absorbers to separate the majority of the CO_2 from the syngas mixture;
  - compressors to increase the pressure of the CO_2 prior to drying (dehydration);
  - compressors where raw H_2 is recycled for input back into the natural gas feed for pre-treatment; and
  - a methanator or Pressure Swing Adsorber (PSA) where raw H_2 is further purified and dehydrated and prepared for export to the pipeline networks, after passing through a compressor to achieve the required pressure of 40 bar and cooled to 30 degrees Celsius for export.

3.2.11 In addition, the following ancillary infrastructure may be required for the Proposed Development:

- **Air Separation Units** for the compression and separation of air, which is passed through a rectification column to produce O_2 for use in the ATR. Also includes provision of liquid oxygen and liquid nitrogen storage for back up. The Applicant is also looking at options to utilise O_2 from BOC, a nearby supplier which would remove the requirement for an onsite ASU and onsite liquid storage. This is subject to further discussions with BOC and detailed design work.
- **Cooling Water Circulation System** including towers, pumps and circuit piping to supply cooling water where it is needed throughout the plant. This will require topping up from time to time due to losses from evaporation and blowdown.
- **Auxiliary Boilers** which will be natural gas fired and used for H_2 plant commissioning (start-up) and are not expected to be required during normal day to day operation of the plant.

- A **Steam Turbine Generator (STG)** which utilises steam produced in the process to produce electricity to power the plant. The power generated by the STG will not satisfy the total demand of the plant, therefore electrical power will be imported from the grid continuously.
- A **Source Water Pre-treatment Plant** (if required subject to the agreement with Northumbrian Water (i.e. Bran Sands WwTW) or 3rd party providers) will be used to pre-treat the source water prior to the demineralisation stage and would include Dissolved Air Flotation (DAF) in case of River Water, Ultrafiltration (UF) (for removal of fine solids), and reverse osmosis (RO) for removal of ions.
- A **Demineralisation Plant** will be used to treat water supplied to the Proposed Development Site (if used), stripped process condensate, flare knockout liquid and steam condensate from power generation and blowdown. The DMW will be pumped to all locations where it is required within the plant.
- An **Effluent Treatment Plant (ETP)**, which if required will consist of an oily water separator, neutralisation sump, and storm water sump. All oily water effluents produced by the plant will be sent to the oil water separator. Post-separation, the liquid effluent will be discharged as final to Bran Sands WwTW and the solids will be sent for disposal offsite.
- A **Flare**. Any fluid released from any high operating pressure parts of the plant during an emergency will be collected in the flare header system and sent to the flare drum where any liquid associated with the gas is separated. Fluids released from low pressure parts of the plant will be sent directly to a dedicated low pressure flare tip in the flare system. The gas from the flare drum is sent to the flare system where it is safely disposed of by combustion. The liquid collected in the drum is pumped by the flare pump to the DMW plant package.
- A **Fire Water System** consisting of a fire water tank (supplied by grey or raw water), pumps and firefighting system.
- **Chemical Storage** for additives and fuel such as aqueous ammonia (NH_3), amines and diesel, which are imported by tanker.

3.2.12 Water management options are summarised in Plate 3-2, below.

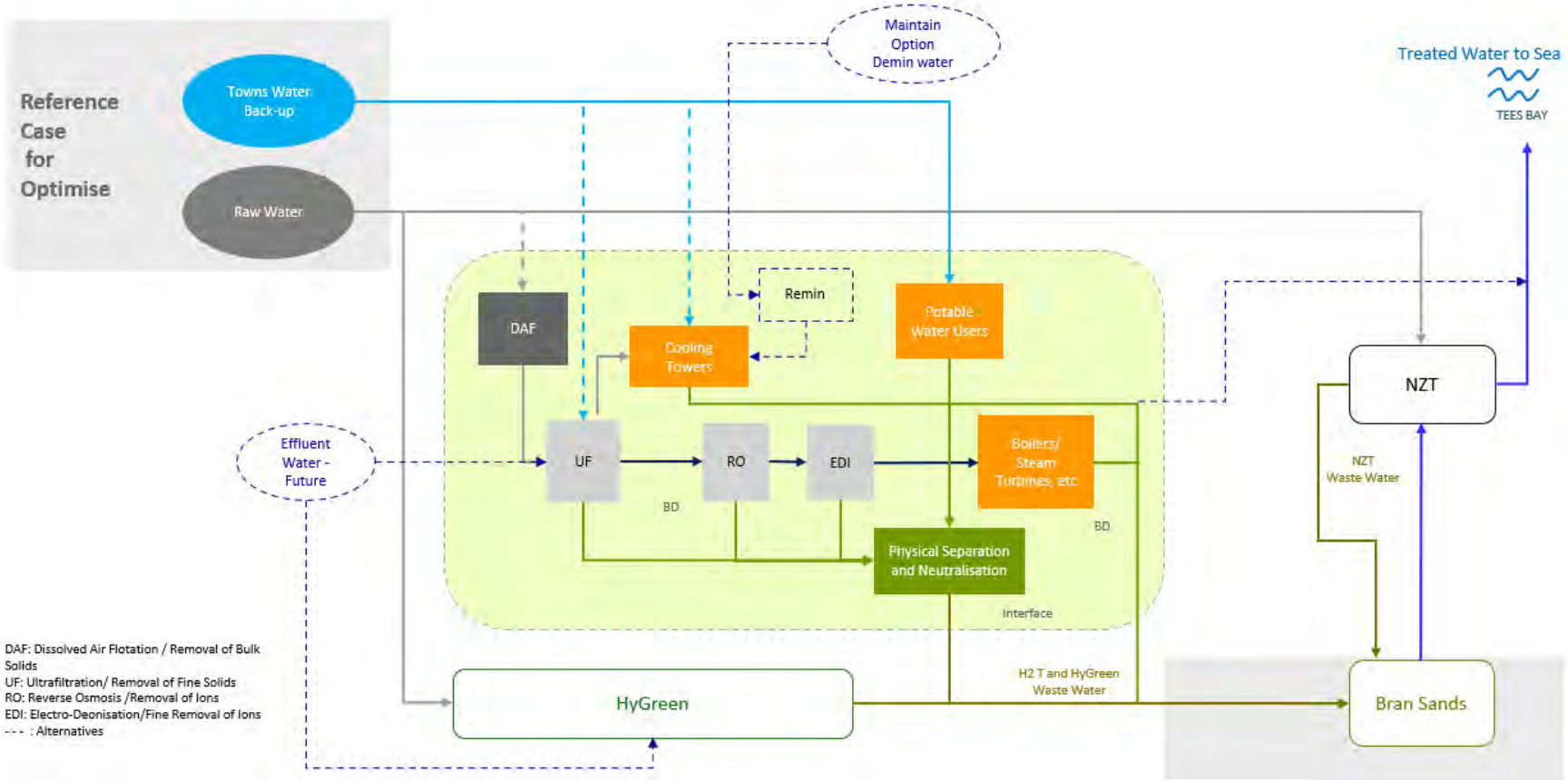

Plate 3-2: Water Management Options (Indicative)

3.2.13 In addition to the above the following components and facilities will be incorporated into the layout as required:

- Main Site entrance (main access with gated entry) as well as a secondary access point(s) and emergency access;
- internal access roads;
- vehicle turning areas;
- internal and external storage areas;
- workshop and maintenance stores;
- a control room and administration buildings;
- carparking; and
- lorry holding and security inspection areas.

3.2.14 The Production Facility will be fenced securely with some internal processes having further internal fencing installed around them as required.

3.3 CO_2 Export Connection

3.3.1 CO_2 captured and compressed at H2Teesside will be exported at an MOP of up to 28 barg and in a pipeline of up to 22" diameter to feed into the NEP CO_2 gathering system via a short CO_2 export connection pipeline between the H2Teesside Production Facility and the NEP development to the east, for high-pressure compression. CO_2 in dense-phase will then be exported off shore for geological storage offsite, at the Endurance Store in the Southern North Sea, via NEP transport infrastructure. Geological storage and CO_2 transportation from H2Teesside will be managed and operated by NEP.

3.3.2 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the CO_2 Export options for Main Sites A and B have been depicted as broad corridors (see Figures 4 and 4a, Appendix A) and it is expected that the extents of these will be refined further as the preparation of the Application progresses. At this stage in the design development, the CO_2 export connection may be entirely above or below ground or a combination of the two.

3.4 Natural Gas Supply Connection

3.4.1 Natural gas will need to be imported to the Production Facility for use in the reforming process. The exact routing of this connection is to be confirmed and subject to ongoing design, however at this stage it is anticipated that a 24" pipeline will be constructed which will connect the proposed Production Facility at the Main Site (A or B) to the wider gas supply network at a tie in point to infrastructure constructed by NZT Power as part of the NZT development.

3.4.2 At this stage in the design development, the natural gas connection may be entirely above or below ground or a combination of the two. At this stage it is assumed that

below ground construction of the Natural Gas Connection will use a combination of open-trench and trenchless technologies dependent upon engineering and environmental constraints.

3.4.3 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the potential areas required for the gas connection options have been depicted as a broad corridor (see Figure 6: Natural Gas Connection Corridor (Main Site A – Foundry) and Figure 6a: Natural Gas Connection Corridor (extension required for Main Site B – RBT), included at Appendix A). It is expected that the extent of this will be refined further, and the routing options may be reduced as the DCO progresses.

3.5 Hydrogen Pipeline Corridor

3.5.1 A gaseous phase hydrogen pipeline network is required to connect various potential industrial offtakers across the Tees Valley to the Production Facility at either Main Site A or B.

3.5.2 Once processed to the required specification and compressed at either of the Main Sites, H_2 will be exported using the proposed hydrogen pipeline, at up to 24" diameter and with a Maximum Operating Pressure (MOP) of up to 49 barg (plus extension for Main Site B). The Hydrogen Pipeline Corridor for both sites will require a crossing of the River Tees via an HDD or MBT to export to customers to the northern side of the river. The hydrogen pipelines will run up to tie-in points with the relevant offtaker (likely to be, but not necessarily having to be) at the offtakers' site boundaries. At this stage, any works beyond tie-in points are assumed to be progressed separately by the relevant offtaker.

3.5.3 At this stage in the design development, the Hydrogen may be either above or below ground.

3.5.4 At this stage several options are being considered for crossing under the River Tees, including the construction of new trenchless crossings (in pipelines or tunnels) or the repurposing of existing pipelines or tunnels (where feasible). Although subject to ongoing studies (engineering and environmental), the construction methodology most likely to be used for the crossing of the River Tees will either be by HDD or using a MBT.

3.5.5 Various route options and construction methodologies are being considered throughout the proposed hydrogen pipeline networks for both Main Site options. These include options such as trenchless crossings (likely HDD), below ground open trench (buried), installation on existing above ground pipe racks, and repurposing and reuse of existing pipelines (where possible). However, this is subject to ongoing design work, discussions with landowners and statutory consultees as well as being informed by environmental surveys.

3.5.6 Ultimately a single route will be selected. Refinement on this optionality continues to be informed by ongoing studies and assessment work. Where possible, the route chosen will seek to avoid environmentally sensitive areas and utilise existing

established pipeline routes, and/ or the least intrusive construction methodologies (e.g. trenchless methods, as opposed to open-cut trench).

3.5.7 At the north-western extent of the hydrogen pipeline network various options are still being considered and assessed, having regard to engineering constraints and environmental sensitivities particularly around the Greatham Creek area. Table 3-1 provides a summary of the route options and construction methodologies being considered by the Applicant based on the studies carried out to date. However, the feasibility of a final route and construction methodology chosen will remain the subject of further studies which will continue as the EIA progresses. Final routing and methodologies will take into consideration the location of sensitive environmental receptors including but not limited to statutory designated sites (such as Ramsar sites, SPAs and SSSIs) within the area.

Table 3-1: Routing Optionality and Construction Methodologies

CONSTRUCTION METHODOLOGY	REQUIREMENT IN RELATION TO CURRENT ROUTING OPTIONS	COMMENTARY
Open Cut trench-buried	Currently being considered as a construction methodology for all route options (in-part).	For all of the route options there is open cut trenching (resulting in buried pipelines) proposed. The Applicant is considering alternative construction methodologies where possible to reduce the amount of open cut required, particularly in sensitive areas.
Trenchless (HDD/MBT)	Trenchless crossings (either HDD/MBT) are proposed for all of the River Tees crossing options. Currently being considered for some of the options, generally where the pipeline crosses particularly sensitive areas.	The Applicant is not considering any scenario other than trenchless for the crossing of the River Tees. The hydrogen pipeline around the Greatham Creek area interfaces with various environmentally sensitive receptors and constraints. The routing options include a section of HDD or use of existing pipe bridges to cross Greatham Creek, reducing the direct impacts that would be experienced as a result of open-cut trenching across the creek. HDD is the preferred option for crossing Greatham Creek. Whilst trenchless methods are proposed to avoid sensitive areas, open cut trenching is likely to be used within less sensitive areas.
Repurposing of existing pipelines	Currently being considered for part of one of the	At the northern extent of the Proposed Development Site (south

CONSTRUCTION METHODOLOGY	REQUIREMENT IN RELATION TO CURRENT ROUTING OPTIONS	COMMENTARY
	options (south of Seal Sands).	of Seal Sands) there is an option to repurpose and reuse an existing disused pipeline which crosses the Tees and avoids the need for a separate constructed crossing.
Utilising existing pipeline corridors and other pipeline infrastructure.	Currently being considered for various parts of the hydrogen pipeline corridor. This includes the parts of the route to the south of the Proposed Development Site, which follows the route of the existing main link line. One option for a crossing of Greatham Creek is utilising an existing pipe bridge to the west of Seal Sands Bay, though HDD is the preferred option for this location, as indicated above.	For the majority of the hydrogen pipeline corridor south of the River Tees, it is proposed to route along existing established pipeline corridors (generally above ground) where possible. Once the hydrogen pipeline crosses the River Tees (via trenchless methods) and emerges on the northern bank of the river, the preferred and most likely option will be to follow the existing link line corridor. In order to route to offtakers further north and as outlined in paragraph 3.5.6, various options are being considered for routing in proximity to and across Greatham Creek. One option for crossing Greatham Creek is to utilise an existing pipe bridge to the west of Seal Sands Bay. Either side of this, open cut trenching may be used to continue the pipeline route. As outlined above, HDD is the preferred option for the crossing of Greatham Creek; the engineering feasibility of this is being investigated.

Note: the above optionality applies to the main Hydrogen Connection Corridor only; not the Hydrogen Connection Corridor RBT Extension.

3.5.8 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the extent of the Hydrogen Pipeline Corridors for Main Sites A and B has been depicted as broad corridors (see Figures 5 and 5a, Appendix A). In places where the Hydrogen Pipeline Corridor includes areas of existing operational land or facilities (e.g. in the area around Wilton International) this does not imply that the Applicant is proposing to carry out works or lay pipelines in all of these areas;

at this stage, the corridor covers a wider area, and will do so until the specific routes, offtakers, and construction methodologies are defined as the design progresses. The extent of the Hydrogen Pipeline Corridors and the routing options will be refined as the preparation of the Application progresses.

3.6 Electrical Connection

3.6.1 There is existing electrical infrastructure in the area which comprises a combination of overhead and lower voltage underground cables that serve the local area and other industrial users located in proximity to the Proposed Development Site.

3.6.2 Although the Production Facility is capable of supplying a proportion of its energy requirements onsite via the STG, an alternative electricity supply will also be required. Various options are being considered which include a connection to existing and proposed 66 kilovolt (kV) substations at Teesworks or the NEP electrical connection. There is also potential to connect at other substations locally such as Lackenby, Grangetown and Kinkerdale. The final decision on substation choice will be subject to design development and further work based on constructability and electrical network resilience and capacity.

3.6.3 The size, timing and location of any connection will be determined in consultation with the relevant stakeholders. In addition to the potential connection options with Teesworks, enquiries have been submitted to NPG for at least 100 MW capacity, and potential synergies with NZT are being explored. These discussions will be ongoing as the preparation of the Application progresses.

3.6.4 At this stage in the design development, the electrical connection may be entirely above or below ground or a combination of the two.

3.6.5 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the electrical connection options for Main Sites A and B have been depicted as broad corridors (see Figures 7 and 7a, Appendix A) and it is expected that the extents of these will be refined further as the preparation of the Application progresses.

3.7 Water Connections

3.7.1 Water supply and discharge connections are required for the process at the Production Facility including for cooling water purposes and discharge of treated effluent.

3.7.2 There are two potential alternative sources of water for the Proposed Development:

- Demineralised water (DMW) from Wilton International which will not require onsite source water pre-treatment; or
- Reclaimed water (treated effluent) from Northumbrian Water Ltd's (NWL) Bran Sands Wastewater treatment plant – which might require further pre-treatment for use in the H2Teesside process either at Bran Sands (via a commercial agreement with NWL) or via a dedicated treatment plant at the Main site.

3.7.3 Effluent from the H_2 production process the process will need to be either:

- treated at the Main site and discharged via the NZT effluent outfall under a commercial arrangement with NZT; or
- sent to the Bran Sands Wastewater treatment plant by a return pipeline and discharged via NWL's permitted discharge to the Dabholm Gut.

3.7.4 The Water Connections Corridor therefore includes a pipeline route(s) between Main Sites A or B and Bran Sands WwTW as well as a potential connection to NZT and a potential route for a DMW connection between the Main Site and Wilton International. At this stage in the design development, the water connections may be entirely above or below ground or a combination of the two.

3.7.5 At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the water connection options currently proposed for Main Site A and B have been depicted as broad corridors (see Figures 8 and 8a, Appendix A). It is expected that the extents of these will be refined further as the preparation of the Application progresses.

3.8 Other Gases Connections

Other gas connection pipelines may be required for the transportation of compressed O_2 and N_2 for use at the Production Facility. At this early stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the other gases connection options currently proposed for Main Site A and B have been depicted as a broad corridor (see Figures 9 and 9a, Appendix A). It is expected that the extents of this these will be refined further as the preparation of the Application progresses. At this stage in the design development, the connections for other gases may be entirely above or below ground or a combination of the two.

3.9 Hydrogen Storage

3.9.1 On-site storage of H_2 is not included within the Proposed Development. Should there be a requirement for H_2 storage on-site, it is expected that this would be small scale pressurised storage and would need to be permitted separately.

3.9.2 Off-site storage of H_2 is not included within the Proposed Development for the DCO. Should there be the requirement for off-site storage, it is expected that these would be owned and operated by a third-party provider who would be responsible for any consenting requirements.

3.10 Material Storage

3.10.1 Chemicals required for the operation of the Production Facility will need to be stored and used at the Main Site. Some of these materials may be classed as hazardous. Where any substance could pose a risk to the environment through its uncontrolled release (e.g. through the surface water drainage system) appropriate containment

facilities will be used including (but not limited to) bunds and concrete surfaces appropriately designed and sized for their intended use.

3.10.2 An inventory of materials to be stored on the Main Site will be finalised through the detailed design. However, where storage of hazardous materials, individually or in-combination exceeds the relevant thresholds, separate permissions will be sought from the Hazardous Substances Authority, Health and Safety Executive (HSE) and Local Planning Authority (LPA) for their storage, under the Control of Major Accident Hazards (COMAH) and Hazardous Substance Consent regimes respectively. All chemical storage will be regulated by the Environment Agency through an environmental permit that will be required for the operation of the Proposed Development.

3.11 Access

3.11.1 Access to the Main Sites during the construction phase for HGV construction traffic is likely to be via the existing access road from the A1085 via the former Redcar Steelworks entrance. This route will also be used during operation for staff and other site traffic. This applies to both Main Site A and Main Site B.

3.11.2 Options for transportation of Abnormal Indivisible Loads (AILs) during construction using the local ports are still being considered. The nearest commercial port to the Proposed Development Site is Teesport which could be used for the import of containerised equipment or modular plant. Use of modular plant would minimise the number of HGV movements required for their transportation. The use of the existing wharf at RBT for transportation of abnormal loads will also be considered for modular plant. Consideration will be given to the appropriate port and any required AIL routes during the design process.

3.11.3 The Applicant is also exploring the use of railways for the import of materials to the Main Site and associated connection corridors.

3.11.4 Construction access routes for the hydrogen pipeline and connection corridors are yet to be defined. However, it is assumed that laydown areas will be identified at suitable locations along the pipeline routes located north of the River Tees to ensure disturbance is kept to a minimum.

3.11.5 It is likely that the Main Site construction laydown areas will be utilised during the construction of the sections of the Hydrogen Pipeline Corridor and other connections in proximity (e.g. Water Connections, Natural Gas Connection and Electricity Connection (south of the River Tees)). Currently it is proposed that laydown areas for the Main Site construction will be located on land within, to the east and west of the Main Sites (see Figures 3 and 3a, Appendix A), thereby minimising the distance to the Main Site. Other laydown areas for pipeline construction required will be located within the connection corridors and will be identified in the application for development consent.

3.12 Site Clearance and Remediation

3.12.1 The Main Sites will require site clearance and remediation prior to the construction of the Proposed Development, to make it fit for purpose. Main Site A is located within land owned by Teesworks which is brownfield land. This land currently contains some above and below ground structures and redundant services associated with the former Redcar Steelworks and earlier development on the site.

3.12.2 It is assumed at this stage that the removal of those structures, clearance and remediation of Main Site A to a suitable development platform level will be undertaken by Teesworks prior to the commencement of construction of the Proposed Development and that Teesworks will obtain the necessary consents and permits to do this work.

3.12.3 The ES will not include an assessment of the likely significant environmental effects of undertaking required 'enabling works' on Main Site A (including demolition and remedial works) as these will be undertaken by Teesworks. For Main Site B, demolition and remedial works may be undertaken by the Applicant and will require assessment. For both Main Sites A and B the impacts of the construction of the Proposed Development by the Applicant's contractors will need to be assessed.

3.12.4 Ground conditions vary across Main Site A depending on the historical uses. Accordingly, a programme of Ground Investigation (GI) works will be undertaken to assess these. The design and extent of these investigations is in progress and will provide the necessary information to inform the requirements of any future Environmental Permit as well as the design and layout of the Proposed Development.

3.12.5 This investigation will also inform if changes to site levels are required to facilitate the construction of the Proposed Development. For the purposes of the environmental assessments (including the Landscape and Visual Impact Assessment (LVIA)) a maximum ground level will be assessed as this represents the worst case for landscape and visual impact. The Flood Risk Assessment (FRA) will identify the minimum ground level which minimises the risk of flooding.

3.12.6 Similarly to Main Site A, remediation will be required at Main Site B prior to construction; it will either be the subject of a separate planning application under the Town and Country Planning Act 2017 or consented via the DCO. As such it will be assessed in the ES if Main Site B is selected. The scope of remediation requirements is subject to further studies, but it is assumed that some demolition will be required and that a remediation strategy would specify requirements for localised stripping of material, ground infilling and raising supported by testing and material replacement, when necessary. This would include identification and targeted removal of any contaminated material. The land level at Main Site B may need to be raised to achieve an acceptable ground elevation to minimise the risk of flooding as part of site remediation works.

3.13 Construction Programme and Management

3.13.1 Subject to being granted development consent it is anticipated that construction would commence in mid-2025 at the earliest with enabling works and site clearance (by Teesworks for Main Site A), closely followed by construction of the Phase 1 of the Production Facility including main civils, mechanical and electrical work, hydrogen pipeline and connections construction.

3.13.2 The Construction of Phase 1 is likely to last approximately two years. Phase 2 works would commence thereafter (approximately late 2027/ early 2028) and last a further two to three years, with overall construction expected to be completed by late 2029 or early 2030. The duration of the phase 2 construction might be extended when compared to phase 1 due to potential overlaps in phase 1 commencement of operation and construction activities for phase 2, requiring management of simultaneous operations and minimisation of risks and impacts arising from that.

3.13.3 Phase 1 construction works would include the Production Facility at the Main Sites options (Phase 1 components) and the various utility connections required including CO_2 export pipeline to NEP infrastructure, the natural gas, water and electricity connections. Phase 1 would also include the construction of the majority of the hydrogen pipeline except for short additional spurs of the hydrogen pipeline which will be constructed as part of Phase 2.

3.13.4 Phase 2 construction at the Main Site would include the infrastructure required for the second Hydrogen Unit train to increase the capacity of the Production Facility by a further 600 MWth. The additional Phase 2 infrastructure would be constructed within the Main Site, adjacent to the Phase 1 previously constructed infrastructure, and is likely to include (subject to detailed design):

- an additional Hydrogen Unit (up to 600 MWth);
- an additional cooling water circulation system;
- an additional ASU (if required);
- expansion of the demineralisation plant as required;
- additional pipe racking as required within the processing plant as well as to connect to the flare (constructed as part of Phase 1); and
- short additional spurs of the hydrogen, natural gas and electricity pipeline connections.

3.13.5 Suitable safety distances will be included within the site layout to facilitate the construction of Phase 2 whilst retaining full operation of Phase 1.

3.13.6 The ES will provide further details of the proposed construction activities and their anticipated duration, along with an indicative programme for each phase of the works. An outline construction programme is provided in Table 3-2.

3.13.7 The ES will be accompanied by a framework Construction Environmental Management Plan (CEMP), which will describe the specific mitigation measures to be followed to reduce impacts from construction related activities including:

- construction traffic (including parking and access requirements);
- earthworks;
- noise and vibration;
- dust generation; and
- waste generation.

3.13.8 The detailed CEMP will be secured by a requirement of the DCO and will identify the relevant procedures to be adhered to throughout construction. Where possible at this stage potential design and impact avoidance measures relevant to each topic has been included within the each of the technical chapters outlined in Section 6 of this report.

3.13.9 Contracts with companies involved in the construction works will incorporate environmental control, health and safety regulations and current guidance, including all necessary permits, with the intention that construction activities are sustainable and that all contractors involved with the construction stages are committed to agreed best practice and meet all relevant environmental legislation including: Control of Pollution Act 1974 (COPA), Environment Act 1995 and 2021, Hazardous Waste (England and Wales) Regulations 2005, and Environmental Permitting (England and Wales) Regulations 2016.

3.13.10 All construction works will adhere to the Construction (Design and Management) (CDM) Regulations 2015.

3.14 Staffing

3.14.1 Based on an initial estimate, it is considered likely that construction workforce peak numbers will be approximately 3,100 people per day for both Phases 1 and 2. This includes workers associated with both the Main Site and pipeline connections. It is not likely that peak construction phases for Phase 1 and Phase 2 will overlap (see Table 3-1 above).

3.14.2 Operation workforce peak numbers will be a maximum of 85 people (staff). Operations staffing will be on a shift basis to be spread over a 24-hour period. Normally staff levels will be 40-50 peak during the week, however, during 28-day maintenance periods which are likely to occur approximately every four years, there would be up to 400 people.

Table 3-2: Indicative Construction Programme to Inform the EIA

	2025				2026				2027				2028				2029				2030			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Construction Phase 1																								
Phase 1 Operation Commences																								
Construction Phase 2																								
Phase 2 Operation Commences																								

3.15 HGV Movements and Traffic

3.15.1 The principal vehicle movements are anticipated to be associated with the construction phase of the Proposed Development.

3.15.2 The volume of construction vehicles associated with the delivery of plant and the labour force has not been fully determined at this stage, but as a worst-case scenario at this stage, peak construction staff numbers are likely to be approximately 3,100 for both Phases 1 and 2.

3.15.3 This equates to approximately 2,660 two-way vehicle movements per day during the peak construction period, based upon an average car occupancy for workers of 2.33.

3.15.4 In terms of construction HGV and LGV movements there are predicted to be around 15,230 deliveries to the Main Site over the full period of construction.

3.15.5 In addition, there would also be approximately 4,330 HGV movements associated with the construction of the pipelines over the full period of construction, which equates to around 50 two-way movements per day during the peak month of construction. This includes the entire Hydrogen Pipeline Corridor, both north and south of the Tees.

3.15.6 During the operational phase of the Proposed Development, it is anticipated that there will be a maximum workforce of 85 staff, that will be required on a shift basis to be spread over a 24-hour period. Staff will travel to and from work in a variety of directions and the ES will make reasonable assumptions about the regional distribution of journeys to and from the Proposed Development Site.

3.15.7 Natural gas will be delivered by pipeline and other operational and maintenance consumables will be managed to be kept as low as is reasonably practicable thereby minimising traffic movements.

3.16 Lighting

3.16.1 Some external lighting will be required to ensure the Production Facility can operate safely at all times. An Indicative Lighting Strategy will be prepared and submitted as part of the Application. This will then inform the preparation of an external lighting scheme under a DCO requirement which will be designed in accordance with relevant standards, such as the Guidance Notes for the Reduction of Obtrusive Light (2021) published by the Institute of Lighting Engineers and/or Chartered Institution of Building Services Engineers (CIBSE) requirements, as appropriate. This will ensure that safe working conditions are provided whilst reducing light pollution and the visual impact on the local environment.

3.17 Environmental Management During Operation

3.17.1 The Production Facility will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016 so that any impacts of emissions to air, soil, surface and groundwater, to the environment and human health will be minimised and avoided where possible.

3.17.2 The Proposed Development will be operated in line with appropriate standards and the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

3.17.3 Any requirements for sampling and analysis of pollutants will be undertaken where required in accordance with the Environmental Permit.

3.18 Decommissioning

3.18.1 The Production Facility will have a design life of 25 years once Phase 1 is constructed and total of 28 years once Phase 2 is constructed and operational. However, the operational life could be longer subject to market conditions and plant condition. At the end of its operational life, the most likely scenario would be that the Proposed Development would be shut down, with all above ground structures on the Main Site removed, and the ground remediated as required to facilitate future re-use. The Applicant will assess at that time whether any infrastructure should be retained for future use. The same timescales would apply for the hydrogen pipeline and utility connections.

3.18.2 A Decommissioning Plan (including Decommissioning Environmental Management Plan) would be produced and agreed with the Environment Agency as part of the Environmental Permitting surrender process. The Decommissioning Environmental Management Plan would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated.

It is often the case that sufficient information is not available at the time of assessment to inform an assessment of decommissioning impacts, however, this will be assessed where possible within the ES. It is generally assumed that the environmental effects associated with the decommissioning phase would be no worse than those experienced during construction and these will be assessed on this basis.

4.0 CONSIDERATION OF ALTERNATIVES

4.1 Introduction

4.1.1 The EIA Regulations require that an ES should include an outline of the reasonable alternatives that have been studied by the Applicant and an indication of the main reasons for its choices, taking into account the likely significant environmental impacts of each alternative. Under the EIA Regulations there is no requirement to assess alternatives, only a requirement to provide a review of those alternatives that have been considered.

4.2 The Do Nothing Alternative

4.2.1 The 'Do Nothing' alternative would be where the Proposed Development would not be developed, meaning that the opportunity for industrial offtakers to transition utilising H_2 piped directly to their facilities would not be readily available and they may continue to use or opt for more carbon intensive alternatives. This would put at risk the UK Government's policy ambition of 10 GW of low carbon H_2 production by 2030.

4.2.2 In addition, carbon capture is recognised as being essential to seeing through commitments government has made to achieving net zero. The Proposed Development through its links to the NZT/ NEP development will contribute to and facilitate the path towards net zero in the UK. The 'Do Nothing' alternative scenario is generally discounted on the basis that there is a clear need for the Proposed Development. This will be outlined in more detail in Preliminary Environmental Information (PEI) Report and subsequent ES.

4.3 Site and Design Alternatives

4.3.1 The Applicant, based on the site selection process and the information and data which is emerging to inform these decisions, is progressing concept designs for two Main Site Options – Main Site A (Foundry) and Main Site B (RBT). The location of the Proposed Development Site in Teesside provides proximity to both existing and potential future users of low carbon hydrogen and access to the off-shore Endurance carbon store via NEP's nearby infrastructure.

4.3.2 Various factors are influencing the site selection process; in particular, process safety considerations. Both Main Site locations are sufficiently remote from any safety sensitive receptors, thereby minimising process safety risks. In addition, both Main Site options can be easily connected to the required infrastructure (including natural gas, water and electrical).

4.3.3 Main Site A is adjacent to the NEP onshore facilities at NZT, thereby simplifying the CO_2 connection corridor routing. Main Site A also presents an opportunity to consider locating other proposed bp projects in Teesside (such as HyGreen, a proposed green hydrogen project) adjacent to the Proposed Development Site, allowing synergies between the projects to be explored.

4.3.4 Main Site B is also in close proximity to NEP onshore facilities at NZT. It is closer to PD Ports than Main Site A, potentially enabling easier transportation by barge, and reducing the requirement for transport by road. There are no significant underground obstructions within Main Site B; as such, there is minimal requirement for extensive excavation works.

4.3.5 Alternative development layouts within the Main Site are also being evaluated for both Main Sites A and B. It is proposed that other project alternatives will be considered, and options refined as the Application progresses including (but not limited to):

- the layout of the Proposed Development including the configuration of the structures and buildings within the chosen Main Site;
- the design of the Proposed Development (e.g. the solution chosen in terms of O_2 and N_2 (whether sourced locally or requiring an ASU));
- the options and refinement of routes carried forward for connection to the Natural Gas and Electricity Grids within the currently proposed connection corridors;
- the options and refinement of routing for the hydrogen pipeline within the currently proposed Hydrogen Pipeline Corridor; and
- the options and refinement of routing for the Water Connection within the currently proposed Water Connections Corridor.

4.3.6 Where alternatives are examined and assessed during the pre-application process, details of the options and reasons for selection (or otherwise) will be included within the ES for the Proposed Development.

4.3.7 Where, at the time of application, alternatives still exist for any particular element of the Proposed Development, the assessments to be included within the EIA and presented in the ES will consider and assess the 'worst case' impacts, in accordance with the Rochdale Envelope principle outlined in PINS Advice Note Nine: Rochdale Envelope (Planning Inspectorate, 2018).

5.0 PLANNING POLICY AND NEED

5.1 Introduction

5.1.1 This chapter of the EIA Scoping Report provides an overview of the planning and energy policy of relevance to the Proposed Development, and where that policy identifies the need for the Proposed Development.

5.1.2 The application for development consent will include a Planning Statement that will set out in more detail the policy of relevance to the Proposed Development and include an assessment of how it complies with that policy.

5.1.3 The following planning and energy policy is of relevance to the Proposed Development:

- National Policy Statements (NPSs) for Energy;
- Marine Policy Statements (MPSs) and Plans;
- Government Energy and Climate Change Policy;
- The National Planning Policy Framework (NPPF); and
- Local Planning Policy.

5.1.4 These are considered in the sections below.

5.2 National Policy Statements for Energy

5.2.1 Under the PA 2008 regime, the policy framework for examining and determining applications for development consent is provided by NPSs. Section 5 of the PA 2008 allows the relevant SoS to designate NPSs setting out national policy in relation to the types of NSIPs listed at Section 14 of the Act. The NPSs are the primary policy used by the relevant SoS to examine and determine applications for NSIPs.

5.2.2 Section 104 of the PA 2008 provides that where a NPS has effect, the SoS must determine the application in accordance with the relevant NPSs and appropriate marine policy documents (if any) having regard to any local impact report produced by the relevant LPA; any matters prescribed in relation to development of the description to which the application relates; and any other matters which the SoS thinks are both "*important and relevant*" to their decision, unless this would:

- lead to the UK being in breach of its international obligations;
- be in breach of any statutory duty that applies to the SoS;
- be unlawful;
- result in the adverse impacts of the development outweighing the benefits; or
- be contrary to any condition prescribing how decisions regarding an NSIP application are to be taken.

5.2.3 Section 105 of the PA 2008 relates to decision on applications where no NPS has effect, that is, where there is no NPS in place relating to the specific type of

development. In such cases, Section 105 states that in deciding the application the SoS must have regard to any relevant local impact report produced by the relevant LPA; any matters prescribed in relation to development of the description to which the application relates; and any other matters which the SoS thinks are both important and relevant to their decision.

5.2.4 In light of recent case law, and until revised NPSs are designated which change the position (as they are anticipated to do), the Applicant recognises that those aspects of the Proposed Development which are automatically NSIP would be determined under Section 104 and those aspects which are development for which development consent is required pursuant to the Section 35 Direction would be determined under Section 105.

Current NPSs

5.2.5 Several NPSs have been designated in relation to energy infrastructure. The current energy NPSs were published in July 2011 by the SoS for the Department for Energy and Climate Change (now Business, Energy and Industrial Strategy). The designated NPSs include an overarching NPS setting out general policies and assessment principles for energy infrastructure and a number of technology specific NPSs. The NPSs considered to be of relevance to the Proposed Development are:

- the Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a);
- the NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (DECC, 2011b); and
- the NPS for Electricity Networks Infrastructure (EN-5) (DECC, 2011c).

5.2.6 Part 3 of EN-1 *'The need for new nationally significant energy infrastructure projects'* defines and sets out the *'need'* for nationally significant energy infrastructure. Paragraph 3.1.1 states that the UK needs all types of energy infrastructure covered by the NPS to achieve energy security at the same time as dramatically reducing greenhouse gas (GHG) emissions. Paragraph 3.1.2 goes on to state that it is for industry to propose the type of energy infrastructure and that the Government does not consider it appropriate for planning policy to set targets for or limits on different technologies.

5.2.7 While the current NPSs for energy infrastructure do not include policy specifically relating to H_2 infrastructure, they do include policy that is of relevance to the Proposed Development.

5.2.8 Part 4 of EN-1 sets out several '*assessment principles*' that must be taken into account by applicants and the SoS in preparing and determining applications for nationally significant energy infrastructure. General points include (paragraph 4.1.2) the requirement for the SoS, given the level and urgency of need for the infrastructure covered by the energy NPSs, to start with a presumption in favour of granting consent for applications for energy NSIPs. This presumption applies unless any more specific and relevant policies set out in the relevant NPS clearly indicate

that consent should be refused or any of the considerations referred to in Section 104 of the PA 2008 (noted above) apply.

5.2.9 Other assessment principles include the matters to be covered within any ES; the Habitats and Species Regulations; the consideration of alternatives; criteria for *'good design'*; grid connection; consideration of CCS; climate change adaptation; pollution control and environmental regulatory regimes; safety; hazardous substances; health; common law and statutory nuisance and security, amongst others.

5.2.10 Part 5 of EN-1 deals with the '*Generic Impacts*' of energy infrastructure. These include impacts that occur in relation to all or most types of energy infrastructure in addition to others that may only be relevant to certain technologies. Paragraph 5.1.2 stresses that the list of impacts is not exhaustive and that applicants should identify the impacts of their projects in the ES in terms of both those covered by the NPSs and others that may be relevant. Generic impacts include land use; socio economics; air quality and emissions; noise and vibration; dust, odour, artificial light, steam and smoke; traffic and transport; civil and military aviation; biodiversity and geological conservation; historic environment; landscape and visual; water quality and resources; flood risk and waste, amongst others. In relation to each of the generic impacts listed within Part 5, guidance is provided on how the Applicant should assess these within their application and the considerations that the SoS should consider in decision-making.

5.2.11 In addition to the assessment principles and generic impacts covered by EN-1, NPSs EN-4 and EN-5 set out the factors (e.g. those influencing site selection) and *'assessment and technology specific'* considerations to be considered in the preparation and assessment of applications for gas pipelines and electricity network infrastructure, including relevant environmental matters.

Draft Revised NPSs

5.2.12 Draft revised NPSs for energy infrastructure were published by the Government for consultation in September 2021, partly in response to the Government's legally binding commitment to achieve net zero in terms of GHG emissions by 2050. No date has been set for the designation of the revised energy NPSs. While the current suite of NPSs for energy infrastructure remain relevant Government policy and have effect for NSIP applications for the purposes of the PA 2008, it is considered that the draft revised NPSs are also a matter that is important and relevant to the Proposed Development. The following draft revised NPSs are relevant:

- Draft Overarching NPS for Energy (EN-1) (BEIS, 2021a);
- Draft NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (BEIS, 2021b); and
- Draft NPS for Electricity Networks Infrastructure (EN-5) (BEIS, 2021c).

5.2.13 Paragraph 1.3.3 of draft EN-1 states that where the need for a particular type of energy infrastructure set out in paragraph 1.3.2 is established by the NPS, but that type of infrastructure is outside the scope of one of the technology specific NPSs, EN-

1 will have effect alone and will be the primary basis for the SoS's decision making. It goes onto state that:

"This will be the case for, but is not limited to, hydrogen pipeline and storage infrastructure, Carbon Capture Storage (CCS) pipeline infrastructure and other forms of low carbon generation infrastructure not included in EN-2 or EN-3."

5.2.1 As confirmed at Section 1.0 of this EIA Scoping Report, on the 22nd December 2022, the SoS issued a Direction under Sections 35(1) and 35ZA that the Proposed Development is to be treated as development for which development consent is required. Paragraph 1.3.5 of draft EN-1 clarifies that EN-1, in conjunction with any relevant technology specific NPS, will be the primary policy for the SoS's decision making on projects in the field of energy for which a direction has been given under Section 35.

5.2.2 Draft revised EN-1 includes new policy in relation to H_2 infrastructure and confirms (paragraphs 3.4.11 to 3.4.15) that "*The government is committed to developing low carbon hydrogen, which will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050, with the potential to help decarbonise vital UK industry sectors and provide flexible deployment across heat, power and transport"* and there is an "*urgent need for all types of low carbon hydrogen infrastructure*".

5.2.3 It is noted that the Government will release updated drafts of the Energy National Policy Statements shortly after submission of this Scoping Report. These will be taken into account by the Applicant moving forward through development of the Proposed Development.

5.3 Marine Policy Statements & Plans

5.3.1 Section 104 of the PA 2008 requires the SoS to have regard to "…*the appropriate marine policy documents…*" relevant to the NSIP. It is considered that such documents would also be important and relevant considerations under section 105. A number of elements of the Proposed Development involve works within the UK Marine Area, under the tidal River Tees. The relevant marine policy documents are the UK MPS (HM Government, 2011) and the North East Inshore and North East Offshore Marine Plan (Defra, 2021).

UK Marine Policy Statement (March 2011)

5.3.2 The UK MPS, adopted in March 2011, provides the policy framework for preparing marine plans and taking decisions affecting the marine environment. It has been prepared and adopted for the purposes of Section 44 of the Marine and Coastal Access Act 2009 and is intended to sit alongside terrestrial consenting regimes, including the PA 2008 regime. The MPS was subject to updates in September 2020 relating to how references to EU law should be interpreted from 1 January 2021 following the UK's withdrawal from the EU.

5.3.3 Chapter 3 sets out the policy objectives for key activities that take place in the marine environment. Section 3.3 deals specifically with 'Energy production and infrastructure development'. Paragraph 3.3.1 notes that a secure, sustainable and affordable supply of energy is of central importance to the economic and social well-being of the UK. Paragraph 3.3.4 sets out issues that decision maker should consider when examining and determining applications for energy infrastructure. Those of relevance to the Proposed Development, which will connect to a Carbon Capture, Usage and Storage (CCUS) cluster in Teesside, include:

- The national level of need for new energy infrastructure, as set out in the Overarching NPS for Energy (EN-1);
- The positive wider environmental, societal and economic benefits of CCS as key technologies for reducing CO_2 emissions;
- That the physical resources and features that form oil and gas fields or suitable sites for CO_2 storage occur in relatively few locations and need first of all to be explored for and can then only be exploited where they are found; and
- The UK's programme to support the development and deployment of CCS clusters and in particular the need for suitable locations that provide for the permanent storage of CO_2.

North East Inshore and North East Offshore Marine Plan (June 2021)

5.3.4 Marine plans are intended to set out detailed policy and spatial guidance for a particular area. The UK is divided into several marine planning regions with associated plan authorities that are responsible for preparing marine plans. In England the MMO is the plan authority. Marine plans are a material consideration.

5.3.5 The Proposed Development Site lies within the 'North East Inshore Marine Area', which stretches from Flamborough Head in Yorkshire to the Scottish Border. The Plan Area has three main tidal rivers, including the River Tees.

5.3.6 The North East Marine Plan is intended to provide a strategic approach to decision-making, considering future use and providing a clear approach to managing resources, activities and interactions within the area.

5.3.7 Policy NE-CCUS-3 is of relevance to the Proposed Development as it supports proposals associated with the deployment of low carbon infrastructure for industrial clusters such as that being proposed on Teesside as part of the East Coast Cluster being advanced by the NEP. The policy states:

"The government identified potential regional clusters which can be utilised for low carbon development in the Delivering clean growth: CCUS Cost Challenge Taskforce report and the subsequent plan, The UK carbon capture, usage and storage (CCUS) deployment pathway: an action plan. NE-CCUS-3 supports the development of low carbon industrial clusters where low carbon infrastructure, including carbon capture, usage and storage technologies could be deployed. Encouraging developments

associated with industrial clusters aims to reduce the capital costs of deploying carbon capture, usage and storage, maximising the economies of scale."

5.4 Energy and Climate Change Policy

5.4.1 Other matters that the SoS may consider important and relevant include recent UK energy and climate change policy.

5.4.2 The Proposed Development will support the overarching objective of the Government to continue transitioning the UK to a low carbon economy and meeting the legally binding target of net zero GHG emissions by 2050. The important role that H_2, coupled with CCS/ CCUS, has to play in achieving this transition is confirmed by recent Government energy and climate change policy including:

- The Ten Point Plan for a Green Industrial Revolution (HM Government, 2020);
- The Energy White Paper (BEIS, 2020);
- Industrial Decarbonisation Strategy (BEIS, 2021d);
- North Sea Transition Deal (BEIS, 2021e);
- UK Hydrogen Strategy (BEIS, 2021f);
- Net Zero Strategy: Build Back Greener (BEIS, 2021g); and
- British Energy Security Strategy (BESS) (HM Government, 2022).

5.4.3 These policy documents are considered below.

<u>The Ten Point Plan for a Green Industrial Revolution (November 2020)</u>

5.4.4 'The Ten Point Plan for a Green Industrial Revolution – Building back better, supporting green jobs, and accelerating out path to net zero', was published on 18 November 2020 and is aimed at delivering a 'Green Industrial Revolution' in the UK, with the foreword by the Prime Minister stating that the Plan will aim to mobilise £12 billion of government investment and potentially three times as much from the private sector, to create and support up to 250,000 green jobs.

5.4.5 The Introduction to the Ten Point Plan (page 6) states:

"We will generate new clean power with offshore wind farms, nuclear plants <u>and by investing up to half a billion pounds in new hydrogen technologies</u>. We will use this energy to carry on living our lives, running our cars, buses, trucks and trains, ships and planes, and heating our homes while keeping bills low. And to the extent that we still emit carbon, we will pioneer a new British industry dedicated to its capture and return to under the North Sea. Together these measures will reinvigorate our industrial heartlands, creating jobs and growth, and pioneering world-leading SuperPlaces that unite clean industry with transport and power …

The cumulative effect of this plan will be to reduce the UK emissions by 180 million tonnes of carbon dioxide equivalent (Mt CO_2 e) between 2023 and 2032, equal to taking all of today's cars off the road for around two years…." [our underlining]

5.4.6 The 'Ten Points' of the Plan are summarised at page 7. Point 2 'Driving the Growth of Low Carbon Hydrogen' is covered at pages 10 to 11 and states (page 10):

"Working with industry the UK is aiming for 5GW of low carbon hydrogen production capacity by 2030. Hubs where renewable energy, CCUS and hydrogen congregate will put our industrial 'SuperPlaces' at the forefront of technological development."

5.4.7 It highlights how 5 GW of low carbon H_2 production by 2030 could see the UK benefit from around 8,000 jobs across its industrial heartlands. This will be supported by a range of measures, including a £240 million Net Zero Hydrogen Fund. It goes onto state that (page 10):

"Producing low carbon hydrogen at scale will be made possible by carbon capture and storage infrastructure, and we plan to grow both of these new British industries side by side so our industrial 'SuperPlaces' are envied around the world." [our underlining]

5.4.8 Point 8 *'Investing in Carbon Capture, Usage and Storage'* (pages 22 and 23) identifies the ambition to capture 10 Mt of CO_2 a year by 2030 and the Government's commitment to invest up to £1 billion to support the establishment of CCUS in four industrial clusters in areas such as the North East and goes onto state how CCUS will be developed alongside H_2 production in these locations.

5.4.9 The Proposed Development will help deliver the Ten Point Plan by delivering low carbon H_2 production at scale within what is an emerging CCUS cluster on Teesside.

The Energy White Paper (December 2020)

5.4.10 The Energy White Paper 'Powering our Net Zero Future' ('EWP'), was presented to Parliament in December 2020 and builds on the Ten Point Plan. At the core of the EWP is the commitment to tackle climate change and achieve net zero. The EWP seeks to put in place a strategy for the wider energy system that transforms energy, supports a green recovery and creates a fair deal for consumers (page 4). As with the Ten Point Plan, the EWP confirms the Government's support for new H_2 technologies and CCUS drawing upon the resources provided by the North Sea.

5.4.11 The Government estimates (Introduction, page 15) that the measures in the EWP could reduce emissions across power, industry and buildings by up to 230 Mt CO_2 in the period to 2032 and enable further savings in other sectors such as transport. In doing so, these measures could support up to 220,000 jobs per year by 2030. These figures include the energy measures from the Ten Point Plan as well as additional measures set out in the EWP. However, the EWP recognises that more will need to be done to meet key milestones on the journey to net zero.

5.4.12 The EWP (pages 16 to 17) provides an overview of the Government's key commitments to put the UK on a course to net zero. These are grouped under several headings and include:

"SUPPORT A GREEN RECOVERY FROM COVID-19 …

- *Increasing the ambition in our Industrial Clusters Mission four-fold, aiming to deliver four low-carbon clusters by 2030 and at least one fully net zero cluster by 2040.*
- *Investing £1 billion up to 2025 to facilitate the deployment of CCUS in two industrial clusters by the mid-2020s, and a further two clusters by 2030, supporting our ambition to capture 10 Mt per year by the end of the decade.*
- *Working with industry, aiming to develop 5GW of low-carbon hydrogen production capacity by 2030."* [our underlining]

5.4.13 Chapter 2 *'Power'* of the EWP set out how it is proposed to decarbonise the power sector the generation of electricity. This includes a commitment to consult on steps to ensure that new thermal plants can convert to low carbon technologies either through the retrofit of carbon capture plant or "…*conversion to firing clean hydrogen*" (page 48).

5.4.14 Chapter 5 *'Industrial Energy'* sets out the goal for emissions from industry to fall by around 90% from today's levels by 2050. To achieve this (page 118) the Government:

"…will:

- *Create a sustainable future for UK manufacturing industry through improved energy efficiency and the adoption of clean energy technologies*
- *Establish the UK as a world leader in the deployment of CCUS and clean hydrogen, supporting up to 60,000 jobs by 2030."* [our underlining]

5.4.15 The EWP confirms that manufacturing and refineries, which form the bulk of industrial emissions, still account for around 1% of the UK's GHG emissions. About half of those emissions are concentrated in the UK's six major industrial clusters. This includes Teesside (Figure 8.1, page 121) which accounts for 3.9 Mt CO_{2e} of emissions (2018 figures).

5.4.16 To transform industrial energy, the EWP (page 122) states that we cannot rely on energy efficiency alone to reduce emission in line with the Government's 2050 goal. Manufacturing industry will also need to capture its carbon for onward transport and storage and switch from using fossil fuels to low-carbon alternatives, such as H_2.

5.4.17 To bring about change in the industrial, the EWP includes a commitment (page 124) to increase the *'Industrial Clusters Mission'* to support the delivery of four low-carbon industrial clusters by 2030 and at least one fully net zero cluster by 2040. The EWP states that the Government will focus on the UK's industrial clusters:

"… centres where related industries have congregated and can benefit from utilising shared clean energy infrastructure, such as CCUS and low-carbon hydrogen production and distribution. Decarbonisation in clusters will enable economies of scale, reducing the unit cost for each tonne of carbon abated, while clusters provide high quality jobs which tend to pay above the UK average wage." [our underlining]

5.4.18 The EWP notes (page 124) that many clusters are in regions in need of economic revitalisation and that decarbonising those clusters can act as a driver of prosperity for the surrounding areas. Furthermore, that investments in key technologies like CCUS and H_2, will be crucial to enhancing local economic growth and creating jobs together with prosperity.

5.4.19 Chapter 5 of the EWP includes a section on 'Clean Hydrogen' (pages 127 to 128). It identifies that H_2 will be critical in reducing emissions from heavy industry, as well as in power, heat and transport. Clean H_2 includes using natural gas and capturing the CO_2 by-product with CCUS or using renewable electricity to split water into H_2 and O_2. It includes commitments to:

- work with industry to develop 5 GW of low-carbon H_2 production capacity by 2030; and
- create a Net Zero Hydrogen Fund to support low-carbon H_2 production, providing £240 million of capital co-investment out to 2024/25.

5.4.20 The EWP underlines (page 128) that a variety of H_2 production technologies will be required to satisfy the level of anticipated demand for clean H_2 by 2050 and that the Government hopes to see 1GW of H_2 production capacity by 2025 on route to its 2030 goal.

5.4.21 The Proposed Development is clearly consistent with commitments in the EWP to deliver low carbon H_2 production at scale, coupled with CCUS, within one (Teesside) of the UK's major industrial clusters.

Industrial Decarbonisation Strategy (March 2021)

5.4.22 The Industrial Decarbonisation Strategy is the first strategy published by a major economy, which sets out how industry can be decarbonised in line with net zero, while remaining competitive and without pushing emissions abroad. It builds on the Ten Point Plan and sets out the Government's vision for a prosperous, low carbon UK industrial sector by 2050, and aims to provide industry with the long-term certainty it needs to invest in decarbonisation.

5.4.23 The Ministerial Foreword (page 6) emphasises that the 2020s will be crucial to industrial decarbonisation, with the UK needing to deploy key technologies such as CCUS while beginning the journey of switching from fossil fuel combustion to low carbon alternatives such as H_2.

5.4.24 Chapter 1 *'Why we need a strategy and our approach'* sets out the Government's ambition for decarbonising industry in line with net zero. The expectation is that emissions will need to reduce by at least two-thirds by 2035 and by at least 90% by

2050, with 3 Mt CO_2 per annum captured through CCUS and a significant switching to low carbon fuels such as H_2 by 2030. Significantly, the Strategy (page 18) recognises that government should play a key role in the delivery of large infrastructure projects for key technologies such as H_2 networks where there is a sharing of benefits, and the risk or cost is too great for the private sector.

5.4.25 Chapter 2 *'Getting investors to choose low carbon'* confirms the Government's commitment (Action 2.2) to put in place funding mechanisms to support the deployment and use of CCUS and low carbon H_2 infrastructure. It states that (pages 29-30):

"CCUS will be crucial to reaching net zero, and low carbon hydrogen has the potential to play a key role in enabling the economic transformation of the UK's industrial regions. With both technologies at early stages of development, government will need to play an active role in overcoming market failures; sharing the risk and costs of scaling up deployment of both CCUS and low carbon hydrogen.

…. We have already committed to a £1 billion CCS Infrastructure Fund to provide industry with certainty to deploy CCUS at pace and scale, alongside a £240 million Net Zero Hydrogen Fund. Later in 2021 will bring forward further details of the revenue mechanism to support business models for both industrial carbon capture and low carbon hydrogen projects." [our underlining]

5.4.26 With regard to fuel switching (Action 4.2, pages 51 and 52), Chapter 4 of the Strategy confirms that the Government is committed to developing a low carbon H_2 economy in the UK. The Government sees it as critical to demonstrate fuel switching to H_2 in industrial sites in parallel to ramping up low carbon H_2 production.

5.4.27 The Proposed Development will make a significant contribution to industrial decarbonisation in the UK through the production of and supply of low carbon H_2 to a number of industrial users/offtakers on Teesside.

North Sea Transition Deal (March 2021)

5.4.28 The North Sea Deal is a transformational sector deal for the offshore oil and gas sector in recognition of the key role that it can play in helping the UK meet its net zero commitments. The document recognises (Foreword, page 6) that with declining output of hydrocarbons from the UK Continental Shelf ('UKCS') and a projected decline in domestic demand, there is a clear need for determined action to be taken to build on the proven capabilities and skills within the existing sector to support the transition to net zero. It continues:

"The UK already has the capability and skills within the existing sector to lead in new and emerging energy technologies such as Carbon Capture, Usage and Storage (CCUS) and the hydrogen economy as well as to support the growth of new sectors such as offshore wind.

… Delivering large-scale decarbonisation solutions will strengthen the position of the existing UK energy sector supply chain in a net zero world, securing new high-value jobs in the UK, supporting the development of regional economies and competing in clean energy export markets." [our underlining]

5.4.29 The Executive Summary (page 8) states that the North Sea Deal is aimed at delivering on the commitments set out in the oil and gas chapter of the EWP and is closely aligned with the Prime Minister's Ten Point Plan. It seeks to do this through the implementation of several commitments and measures, including supporting up to 40,000 direct and indirect supply chain jobs in decarbonising UKCS production and the CCUS and H_2 sectors.

5.4.30 The Deal is built on five key outcomes – supply decarbonisation; CCUS; H_2; supply chain transformation; and people and skills. These are seen as being closely interlinked, meaning that they must be delivered as an integrated whole for the Deal to achieve its full potential. With regard to H_2, the Deal notes that:

"Hydrogen is essential to meeting our net zero commitment in the UK. It could provide a clean source of energy across the economy, from industrial and domestic heat, to heavy transport, and flexible power and energy storage. The UK already has world-leading offshore wind potential and electrolyser capability, alongside unparalleled CCS sites that the UK can maximise to scale up low carbon hydrogen production.

The hydrogen commitment in the North Sea Transition Deal focuses on creating the economic environment in which low carbon hydrogen production can flourish. This will help unlock billions of pounds of investment from the sector. The oil and gas sector is positioned to enable the production of low-carbon hydrogen at scale as part of a long-term competitive market, supporting the UK's ambition to deliver 5 GW of low carbon hydrogen production capacity by 2030."

5.4.31 The Proposed Development is well placed to support the commitments set out in the North Seas Transition Deal, being able to link into NZT (part of the East Coast Cluster), which will make use of offshore skills, capabilities and resources.

<u>UK Hydrogen Strategy (August 2021)</u>

5.4.32 The UK Hydrogen Strategy sets out the Government's approach to developing a thriving low carbon H_2 sector in the UK to meet its ambition for up to 5 GW of low carbon H_2 production capacity by 2030.

5.4.33 Chapter 1 *'The case for low carbon hydrogen'* confirms that low carbon H_2 will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050 and Carbon Budget Six in the mid-2030s. H_2 can support the deep decarbonisation of the UK economy, particularly in the "hard to electrify" UK industrial sectors, and can provide greener, flexible energy across power, heat and transport (page 7). It goes onto state (page 8):

"Today most hydrogen produced and used in the UK and globally is high carbon, coming from fossil fuels with no carbon capture; only a small fraction can be called low carbon. For hydrogen to play a part in our journey to net zero, all current and future production will need to be low carbon."

5.4.34 Section 1.3 of Chapter 1 *'The UK's hydrogen opportunity'* sets out the Government's *'twin track'* approach to H_2 production, which seeks to capitalise on the UK's potential to produce large quantities of both electrolytic 'green' and CCUS enabled 'blue' hydrogen. It states that the UK has the technology, know-how and storage potential to scale up CCUS across the country, unlocking new routes to CCUS-enabled H_2 production (page 10). It goes onto state (Page 10):

"Early deployment of CCUS technology and infrastructure will likely be located in industrial clusters. Many of these are in coastal locations, with important links to CO_2 storage sites such as disused oil and gas fields. Government aims to establish CCUS in four industrial clusters by 2030 at the latest, supporting our ambition to capture 10 Mt/ CO_2 per annum.

In turn, industrial clusters and wider industry are significant potential demand centres for low carbon hydrogen. Today, numerous industrial sectors from chemicals to food and drink are exploring the role that hydrogen can play in their journey to net zero. UK Research and Innovation's (UKRI's) Industrial Decarbonisation Challenge provides up to £170 million – matched by £261 million from industry – to invest in developing industrial decarbonisation infrastructure including CCUS and low carbon hydrogen." [our underlining]

5.4.35 Figure 1.3 at Chapter 1 of the Strategy identifies Teesside as a location for both green and blue (CCUS-enabled) H_2 production (page 11).

5.4.36 The Strategy (page 33) highlights to potential of CCUS-enabled blue H_2 production, stating:

"Our Hydrogen Production Cost 2021 report suggests that, under central fuel price assumptions, CCUS-enabled methane reformation is currently the lowest cost low carbon hydrogen production technology. Given the potential production capacity of CCUS-enabled hydrogen plants, we would expect this route to be able to deliver a greater scale of hydrogen production as we look to establish a UK hydrogen economy during the 2020s."

5.4.37 The Strategy considers the *'Use of hydrogen in industry'* (pages 52 and 53) stating:

"It is clear that UK industrial sectors will play a vital role in developing a hydrogen economy over the next decade. Industry produced 16 per cent of UK emissions in 2018, and hydrogen will be critical to decarbonise industrial processes that would be hard to abate with CCUS or electrification. The Industrial Decarbonisation Strategy published earlier this year sets out the policy and technology principles to

decarbonise industry by 2050, including the installation of deep decarbonisation infrastructure such as hydrogen and CCUS networks in the 2020s.

Our industrial heartlands will likely lead the way for large scale low carbon hydrogen supply, and industrial users are expected to provide the most significant new demand for hydrogen by 2030 through industrial fuel switching. Today's hydrogen economy will need to scale up from its current base in the oil refining and chemical sectors, to enter other parts of industry and the wider energy system. We will develop policy to support and deliver this change, and to drive the decarbonisation of existing industrial hydrogen use." [our underlining]

5.4.38 Since the UK Hydrogen Strategy was published, the British Energy Security Strategy (April 2022) has doubled the UK's H_2 production ambition from 5 GW to 10 GW by 2030. The is reflected in the latest '*Hydrogen Strategy update to the market*' issued to BEIS in December 2022. The Hydrogen Strategy update to the market also includes the announcement on shortlisted hydrogen projects in the BEIS Phase 2 Cluster Sequencing Process (Cluster sequencing Phase-2: shortlisted projects (power CCUS, hydrogen and ICC), August 2022)), which identifies H2Teesside as one of the shortlisted projects to have moved to the due diligence stage of the process.

Net Zero Strategy: Build Back Greener (October 2021)

5.4.39 The '*Net Zero Strategy: Build Back Greener*' expands on key commitments in the Ten Point Plan and the EWP and sets out the next steps the Government proposes to take to cut emissions, seize green economic opportunities and leverage further private investment into net zero. The Strategy sets an indicative delivery pathway for emissions reductions to 2037 by sector. It is intended to put the UK on the path for Carbon Budget 6 and ultimately on course for net zero by 2050.

5.4.40 Regarding power, the Strategy states that the UK will fully decarbonise its power system by 2035 subject to security of supply. It states that the power system will consist of abundant, cheap renewables, cutting edge new nuclear power stations, underpinned by flexibility including storage, gas with CCUS and H_2 (page 19).

5.4.41 For industry, the Net Strategy states (page 21) that it will deliver four CCUS clusters, capturing 20-30 Mt CO_2 across the economy, including 6 Mt CO_2 of industrial emissions, per year by 2030. This will be done by supporting industry to switch to cleaner fuels, such as low carbon H_2 alongside renewable energy and CCUS. These clusters, including the East Coast Cluster, which includes NZT, could have the opportunity to access support under the Government's CCUS programme (£1 billion). The Strategy also states that the Government has set up the Industrial Decarbonisation and Hydrogen Revenue Support Scheme, providing up to £140 million to fund new H_2 and industrial carbon capture business models. This is in addition to £240 million Net Zero Hydrogen Fund.

5.4.42 Whilst the Net Zero Strategy was the subject of a successful Judicial Review, the Court's decision did not quash the Strategy, but instead ordered the Government to

provide an update to that strategy in March 2023 to add further explanation as to how the Government's aims set out in the Strategy would be met.

British Energy Security Strategy (April 2022)

5.4.43 The BESS was published largely in response to soaring energy prices as a result of a sudden surge in demand following the Coronavirus (COVID-19) pandemic, compounded by the Russian invasion of Ukraine. Much of the focus of the strategy is upon providing financial assistance to families and businesses struggling with higher energy bills, but it also looks at improved energy efficiency, reducing the amount of energy we need and addressing the underlying vulnerability to international oil and gas prices by reducing the UK's dependence on imported oil and gas.

5.4.44 Notably, the BESS identifies the importance of low carbon H_2, with an increased commitment to achieve up to 10 GW of H_2 production by 2030, including CCUS-enabled blue H_2.

5.5 National Planning Policy Framework

5.5.1 The NPPF (MHCLG, 2021), introduced in March 2012 (last updated July 2021), sets out the Government's planning policies for England. It is a material consideration in planning decisions. Although paragraph 5 of the NPPF confirms that NSIPs are to be determined in accordance with the decision-making framework of the PA 2008 and relevant NPSs, decisions on NSIPs should also take account of any other matters that are "*relevant*", which may include the NPPF. The NPPF is supported by the Planning Practice Guidance (PPG), which provides more detailed guidance on various aspects of planning.

5.5.2 Section 2 *'Achieving sustainable development'* confirms (paragraph 7) that the purpose of the planning system is to contribute to the achievement of sustainable development, summarised as "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*". Paragraph 8 goes on to identify three overarching objectives to the achievement of sustainable development, which are interdependent and need to be pursued in mutually supportive ways. These are:

- an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

- an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

5.5.3 Central to the NPPF is "*the presumption in favour of sustainable development*". This is set out at Paragraph 11. For decision-making, this means approving applications that accord with the development plan without delay.

5.5.4 The NPPF is supportive of infrastructure projects. One of the methods of fulfilling the objective of sustainable development listed at paragraph 8 under 'a) an economic objective' is through the "*provision of infrastructure*".

5.5.5 Paragraph 152 in Section 14 *'Meeting the challenge of climate change, flooding and coastal change'* states:

"The planning system should support the transition to a low carbon future in a changing climate … it should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure". [underlining added]

5.5.6 Paragraph 158 states that when determining application for renewable and low carbon development, there should be no requirement for applicants to demonstrate the overall need for renewable or low carbon energy and that applications for renewable or low carbon development should be approved if their impacts are (or can be made) acceptable.

5.5.7 NPPF policies of particular relevance include:

- building a strong, competitive economy;
- making effective use of land;
- meeting the challenge of climate change, flooding and coastal change; and
- conserving and enhancing the natural environment.

5.5.8 A summary of those policies is provided in Table 5-1 below.

Table 5-1: Relevant National Planning Policy Framework Policies

POLICY	POLICY SUMMARY
Chapter 6 – Building a strong, competitive economy	Confirms that the Government is committed to securing economic growth and productivity and allowing each area to build on its strengths, counter any weaknesses and address the challenges of the future. Paragraphs 81 and 82 make it clear that the planning system should do all it can to support sustainable economic growth though, amongst other measures, planning

POLICY	POLICY SUMMARY
	proactively and removing barriers to investment such as a lack of infrastructure.
Chapter 11 – Making effective use of land	Aimed at promoting the effective use of land, including by (paragraph 120c) giving substantial weight to the use of suitable brownfield land.
Chapter 14 – Meeting the challenge of climate change, flooding and coastal change	Focuses upon adapting to and mitigating the effects of climate change. Paragraph 152 highlights that planning plays a key role in helping shape places to secure radical reductions in GHG emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy. Paragraph 159 warns that inappropriate development in areas at risk of flooding should be avoided but where it is necessary the development should be made safe for its lifetime without increasing flood risk elsewhere. If it is not possible for development to be in zones with a lower risk of flooding the exception test may have to be applied.
Chapter 15 – Conserving and enhancing the natural environment	Aimed at protecting and enhancing value landscapes, recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital, minimising impacts on and providing net gains for biodiversity and preventing new and existing development from contributing to, being put at unacceptable risk from or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

5.5.9 The above NPPF policies will be considered in detail within the Planning Statement.

5.5.10 The Government has launched a consultation on proposed reforms to National Planning Policy. A revised NPPF is expected to be published in Spring 2023. The Planning Statement will consider any policy changes within the revised NPPF of relevance to the Proposed Development.

5.6 Local Planning Policy

Development Plan Documents

5.6.1 Both Main Site (A and B) are located within the administrative boundary of RCBC.

5.6.2 The hydrogen pipelines and other connections involve crossings of the River Tees and encompass land within the administrative boundaries of RCBC, STBC and HBC.

5.6.3 The relevant Development Plan Documents (DPDs) for the Proposed Development Site are therefore as follows:

- the Redcar & Cleveland Local Plan and Policies Map (adopted May 2018; RCBC, 2018a);
- Stockton-on-Tees Borough Council Local Plan (adopted January 2019; STBC, 2019);

- Hartlepool Local Plan (adopted May 2018; HBC, 2018); and
- The Tees Valley Joint Minerals and Waste DPDs (adopted September 2011; Darlington Borough Council *et al*., 2011).

5.6.4 The Tees Valley Joint Minerals and Waste DPDs comprise a Minerals and Waste Core Strategy DPD and a Minerals and Waste Policies and Sites DPD. The Joint Minerals and Waste DPDs were prepared together by RCBC, STBC, HBC and Darlington and Middlesbrough Councils. The Joint Minerals and Waste DPD is of limited relevance to the Proposed Development.

Supplementary Planning Documents

5.6.5 Parts of the Proposed Development Site lie within the boundary of the South Tees Development Corporation (STDC) area, which is now known as Teesworks. STDC is a Mayoral Development Corporation, established to further the economic development of the South Tees Area through physical, social and environmental regeneration, however, RCBC retains planning powers for the area and continues to act as the LPA in respect of planning policy and development management and the processing and determination of planning applications.

5.6.6 STDC has produced a Master Plan (the 'South Tees Regeneration Master Plan') to provide a flexible framework for the regeneration of the Teesworks/South Tees Area. The Master Plan was prepared throughout 2017 (later revised in 2019 as STDC (2019)) as a supporting visioning and development strategy document to inform the preparation of a Supplementary Planning Document (SPD) by RCBC for the South Tees Area. Following consultation, the Master Plan was launched alongside the South Tees Area SPD, which was formally adopted by RCBC in May 2018 (RCBC, 2018b).

Planning Allocations/ Designations

5.6.7 The key planning allocations/designation and related development plan policies (based upon the relevant policies maps) and relevant SPD designations and policies that apply to the Proposed Development Site within the administrative areas of RCBC, STBC and HBC are listed below.

5.6.8 The key planning allocations/designations and related development plan policies that apply to the Proposed development Site within the RCBC area are:

- Development Limits – Policy SD3;
- Protected Employment Area – Policy ED6;
- South Tees Development Corporation Area – Policy LS4;
- 30 km wind farm safeguarding area for Durham Tees Valley Airport – Policy SD6;
- Sensitive Landscape Areas – Policy N1;
- Restoration Landscape Areas – Policy N1;
- Strategic Landscape Areas – Policy N2;
- Special Protection Areas (SPAs) – Policy N4;

- Sites of Special Scientific Interest (SSSIs) – Policy N4;
- 6 km SPA Buffer Zone – Policy N4;
- Local Wildlife Sites – Policy N4;
- Marine Dredged Sand and Gravel – Policies MWC4 and MWC5;
- General Location for Large Waste Management Facilities – Policy MWC8;
- South Tees Eco Park – Policies MWP8 and MWP10(b); and
- Safeguarded Wharves – Policy MWC11.

5.6.9 Figure 2 of the South Tees SPD shows indicative clusters for key industries and processes within the South Tees Area. Main Sites A and Main Site B are identified as clusters for manufacturing, manufacturing and energy, while within their vicinity clusters are shown for port-related uses, bulks and other processing, advanced manufacturing and training, testing and research.

5.6.10 The SPD divides the South Tees Area into five main development zones (as shown by Figure 6 of the SPD). These are the North Industrial Zone; North East Industrial Zone; Central Industrial Zone; South Industrial Zone; and Coastal Community Zone. The North Industrial Zone, which encompasses the Main Sites A and B, is identified for development proposals relating to port related industry, major space users/large scale manufacturing, energy innovation, power generation and storage, bulk materials and mineral processing.

5.6.11 The SPD sets out several '*Development Principles*' to guide the development of the Teesworks/South Tees Area. Those of particular relevance to the Proposed Development include:

- Development Principle STDC6: Energy Innovation;
- Development Principle STCD7: Natural Environmental Protection and Enhancement;
- Development Principle STDC10: Utilities; and
- Development Principle STDC11: North Industrial Zone.

5.6.12 Development Principle STDC6 *'Energy Innovation'* (pages 33 to 34) supports new energy generation within the area, including the promotion of renewable energy and innovative energy projects. STDC11 *'North Industrial Zone'* states that STDC will encourage development proposals relating to port related industry, major space users/large scale manufacturing, energy innovation, power generation and storage and bulk materials and processing within this area.

5.6.13 Key planning allocations/designations and related development plan policies for the STBC administrative area are:

- Development Limits – Policies SD2, SD3, SD4 and SD5;
- General Employment Allocation/Locations – Policies SD4 and EG1;

- Employment Areas/Specialist Use Locations – Policies SD4 and EG4;
- Reserve Housing Land – Polices H1 and H2;
- Durham Tees Valley Airport Safeguarding Area – Policy EG5;
- Internationally Designated Sites (SPAs and Ramsar sites) – Polices SD5 and ENV5;
- Nationally Designated Sites (SSSIs) – Policies SD5 and ENV5;
- Locally Designated Sites (Local Nature Reserves) – Policies SD5 and ENV5;
- Locally Designated Sites (Local Wildlife Sites) – Policies SD5, ENV5; and
- Open Space – Policies SD5 and ENV5.

5.6.14 Key planning allocations/designations and related development plan policies for the HBC administrative area are:

- Development Limits – Policies LS1 and RUR2;
- Strategic Gaps – Policy LS1;
- Underground Storage – Policy EMP6;
- Safeguarded Land for Future Road Schemes – Policy INF2;
- Internationally Designated Sites – Policy NE1a; and
- Local Wildlife Sites – Policy NE1c.

5.6.15 The above policies and development principles, and how the Proposed Development complies with them, will be considered in detail within the Planning Statement that will form part of the application for development consent.

Summary

5.6.16 The current NPSs confirm the need that exists for new energy infrastructure and are the key basis for decision-making by the SoS on development consent applications.

5.6.17 Although the current NPSs do not contain policies that specifically relate to H_2 infrastructure, they do contain policy that is relevant to the Proposed Development, while the draft revised NPSs include new policy in relation to H_2 infrastructure, which confirms (paragraphs 3.4.11 to 3.4.15) that "*The government is committed to developing low carbon hydrogen, which will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050, with the potential to help decarbonise vital UK industry sectors and provide flexible deployment across heat, power and transport*" and there is an "*urgent need for all types of low carbon hydrogen infrastructure".*

5.6.18 While the NPSs are the key basis for decisions by the SoS on development consent applications, the SoS can take account of any other matters that are both important and relevant to their decision. It is considered that such matters include recent Government energy and climate policy.

5.6.19 The energy and climate change policy considered in this chapter underlines the important role that H_2, coupled with CCUS, has to play in achieving the UK's transition to a low carbon economy and the Government's legally binding target of net zero GHG emissions by 2050. In particular, H_2 is identified as being critical to the decarbonisation of industries that are hard to electrify.

5.6.20 The Proposed Development is well placed to support large-scale industrial decarbonisation, being in one of the UK's major industrial clusters, with the potential to supply H_2 to a number of industrial users/offtakers, while linking into the NEP infrastructure for the transportation and storage of the CO_2 generated during the H_2 production process.

5.6.21 Other important and relevant matters can include the NPPF and local planning policy.

5.6.22 The application for development consent will include a Planning Statement that will set out in more detail the policy of relevance to the Proposed Development and include an assessment of how it complies with that policy.

6.0 POTENTIALLY SIGNIFICANT ENVIRONMENTAL EFFECTS

6.1 Introduction

6.1.1 The following sections present a discussion of the potential environmental effects associated with the Proposed Development and the topics proposed to be included as part of the EIA.

6.1.2 Each topic section has outlined the baseline conditions as well as the scope of assessment proposed based on the information currently available for the Proposed Development. The baseline sections are not intended to include a full baseline review at this stage but a summary of the main points. Some sections will be more detailed than others at this stage. However, a detailed baseline data review will be carried out for all topics as the EIA progresses and will be included within the PEI Report and subsequent ES.

6.1.3 Effects during construction, operation and decommissioning will be assessed. As identified at Section 3.18, it is often the case that sufficient information is not available at the time of assessment to inform an assessment of decommissioning impacts. However, it is generally assumed that the environmental effects associated with the decommissioning phase would be no worse than those experienced during construction and these will be assessed on this basis.

6.1.4 Please note that the baseline and scope of assessment sub-sections below are applicable to both Main Sites and the associated connection corridors unless clearly stated otherwise.

6.2 Air Quality

Baseline Conditions

6.2.1 The Environment Act 1995 requires local authorities to review air quality within their district or borough to determine where pollutant levels identified in the Air Quality Framework Directive may be in excess of the standards.

6.2.2 If pollutant levels in an area are likely to exceed statutory objectives, then local authorities must declare an Air Quality Management Area (AQMA) and draft an Air Quality Action Plan (AQAP) to achieve the statutory objectives. The Department of Environment, Food and Rural Affairs (Defra) has issued technical guidance to local authorities to assist in undertaking this task.

6.2.3 The most recent publication within the above framework is the '2022 Air Quality Annual Status Report' (RCBC, 2022).

6.2.4 There are no AQMAs designated within the administrative boundary of RCBC or the adjoining local authority areas of HBC and STBC. The nearest AQMA is located over 20 km away from the Proposed Development Site and will be outside of the Study Area for Air Quality. As outlined in '2022 Air Quality Annual Status Report' (RCBC, 2022), the Proposed Development Site is not within a smoke control area.

6.2.5 RCBC conducts local air quality monitoring for NO_2, PM_{10} and $PM_{2.5}$ (RCBC, 2022). At all locations where air quality monitoring is conducted, all pollutant concentrations are well below the relevant objectives.

6.2.6 In addition to these monitoring sites, AECOM has undertaken a three-month project specific diffusion tube monitoring survey for baseline NO_2 to establish existing concentrations within the area and adjacent to the road network surrounding the Proposed Development Site. Following completion of the survey, the results were annualised to correct for seasonal variation and make them representative of the whole year.

6.2.7 The AECOM survey recorded NO_2 concentrations which exceeded the NO_2 annual mean objective at two measurement sites (DT2 and DT6); DT2 is located approximately 1.4 km and 2.3 km south-east of Main Sites A and B respectively, and DT6 is located approximately 3.5 km and 4 km south-east of Main Sites A and B respectively. However, the locations with elevated NO_2 concentrations were situated in close proximity to major traffic routes, away from residential areas. These measurement sites are locations where people are not regularly present over the length of time represented by the annual mean air quality objective value for NO_2., Therefore, it can be assumed that there is no relevant human exposure at these locations. At residential areas near to these sites and elsewhere, where humans would be expected to be regularly present, the survey has recorded annual mean concentrations which are well within the annual mean NO_2 objective.

6.2.8 In addition to the three-month baseline survey carried out in 2021, a further three-month survey is programmed to be carried out during 2023. The purpose of the second survey is to obtain more data at locations where the original survey dataset was incomplete due to missing tubes, in addition to obtaining a longer period of monitoring throughout the study area. The update will focus on the same locations surveyed in the initial measurement period. However, a review of the monitoring sites will be conducted prior to deployment, to consider the measurement locations in the context of the latest proposed development plans.

6.2.9 If not appropriately controlled, emissions from the operation of the Proposed Development could potentially affect the health of the residents of residential areas in closest proximity to the Proposed Development Site. Emissions from road traffic could also affect human health at residential properties adjacent to traffic routes used by vehicles accessing the Proposed Development Site. Long-term impacts on ambient pollutant concentrations and the deposition of nutrient nitrogen and acid to ground could adversely affect sensitive ecosystems.

6.2.10 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both. The baseline data will be used in the air quality assessment of both human health and ecological receptors.

Scope of the Assessment

6.2.11 There are a number of potential emissions to air that may be associated with the Proposed Development. These emission sources are summarised in the following sections.

Construction and Operational Emissions from Vehicles

6.2.12 During the construction and operational phases of the Proposed Development, there is the potential for changes in traffic flows on the surrounding road network due to additional vehicles accessing the Proposed Development Site. This additional traffic could give rise to an effect on local air quality in the vicinity of nearby air quality sensitive receptors, which are currently within the air quality objective values.

6.2.13 The assessment of road traffic emissions will be based on criteria set out in guidance published by the Institute for Air Quality Management (IAQM) (2017) or National Highways (LA105, 2022), on the requirement to undertake a detailed assessment of road traffic emissions.

6.2.14 As operational amounts of daily traffic are predicted to be well-below these screening criteria of 500 Light Duty Vehicles or 100 Heavy Duty Vehicles per day, as set out in the IAQM guidance document Land-Use Planning & Development Control Guidance (IAQM, 2017), the operational impacts of traffic have been scoped out of this assessment.

6.2.15 As outlined in Section 6.9: Traffic and Transportation, a construction traffic assessment shall be conducted. After this has been completed, this data will be screened against the relevant criteria to scope the need for detailed modelling in or out of the assessment. Where the need for a detailed assessment is considered necessary, concentrations of NO_2 and particulate matter (PM_{10} and $PM_{2.5}$) at sensitive receptors due to changes traffic flows on the surrounding road network will be predicted using the ADMS Roads dispersion modelling software package. Data collected during the project-specific baseline NO_2 survey will be used to verify the performance of the model against measured values.

Construction Dust and Mobile Plant

6.2.16 Construction phase dust impacts, and the level of recommended mitigation will be qualitatively assessed based on the framework approach outlined in the IAQM guidance for construction dust (IAQM, 2016). The aim of such an assessment is to identify the recommended level of best practice mitigation required for the construction activities (including in design, dust monitoring and management of the Proposed Development Site) such that residual impacts are considered to be insignificant, using a risk-based approach. This risk-based approach will identify the unmitigated risk of dust impacts at human health and amenity receptors within 350m of the Proposed Development Site and ecological receptors within 50m of the Proposed Development Site. Dust associated with construction vehicles on the road network will also be considered for receptors within 50 m of roads, up to 500 m from the Proposed Development Site.

6.2.17 In addition to construction dust, the use of Non-Road Mobile Machinery (NRMM), such as mechanical excavators and earthmovers or mobile machinery, and generators, also have the potential to increase NO_2 and PM_{10} concentrations locally,

when in use within the construction site boundary. According to IAQM guidance (IAQM, 2014), experience of assessing the exhaust emissions from on-site plant (NRMM) and onsite traffic suggests that they are unlikely to have a significant effect on local air quality, due to the intermittent nature of their use within the confinement of the Proposed Development Site. Therefore, in most cases, they do not need to be quantitatively assessed. In this case, given the distance between the Main Sites and the nearest residential property (Marsh House Farm/Marsh Farmhouse, located approximately 1.3km and 2.2km to the east of Main Sites A and B respectively), emissions from on-site plant during construction are unlikely to generate a significant risk of effects on local air quality for either human health or ecological receptors.

6.2.18 Emissions from NRMM associated with the Proposed Development would be temporary and localised and would be controlled via the application of appropriate emissions standards and through best-practice mitigation measures, as listed within the CEMP for the Proposed Development. For that reason, construction phase NRMM emissions are highly unlikely to be significant and, have been scoped out of this assessment.

Operational Emissions from the Production Facility

6.2.19 Potential emission points to air from the Proposed Development once it is operational include:

- the direct fired heater;
- venting from the process condensate drum, via the flare stack during normal operation;
- disposal of process material via the flare stack during an emergency event;
- auxiliary boiler;
- emergency diesel generators; and
- an emergency CO_2 vent.

6.2.20 The main pollutants that could be released from these emission sources would be Nitrogen Oxides (NO_x), Sulphur Oxides (SO_x), CO, particulates and NH_3.

6.2.21 Of the sources listed above, the natural gas fuelled direct fired heater, the auxiliary boiler and the condensate flare drum vent would be assumed at this stage to operate on a continuous basis.

6.2.22 The operation of the flare and diesel generators would only take place during an emergency situation and or abnormal circumstances and during testing.

6.2.23 In addition to the emission sources listed above, there would be some emissions to air from fugitive sources. These releases would be small scale and readily diluted and would consist only of water vapour, N_2, O_2, H_2, CH_4 and CO_2 and will not require consideration within the EIA as they will be insignificant.

6.2.24 The impact of operational process emissions will be considered quantitatively using the ADMS dispersion modelling software package, at both human health and sensitive ecological receptor locations. The impact of emission sources that are continuously operational will be assessed at both national and international designated ecological receptors within up to 15 km of the Proposed Development Site.

6.2.25 It is considered that the operation of the hydrogen pipeline, natural gas connection, electrical connection and water connections would be unlikely to result in significant effects in terms of emissions to air and, therefore an assessment of operational impacts of these parts of the Proposed Development has been scoped out of the assessment.

6.2.26 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.3 Surface Water, Flood Risk and Water Resources

Baseline Conditions

Topography, Land-Use and Climate

6.3.1 Both Main Site A and Main Site B are characterised by the flat, low-lying coastal topography. Main Site A has typical ground levels of approximately 6-8 m AOD. Main Site B has typical ground levels of approximately 2-7m AOD. Ground levels for the majority of Main Site B are approximately 5-7m AOD; the north-western corner of Main Site B is lower at approximately 2 m AOD.

6.3.2 The land use of the surrounding areas to the south and west of the Proposed Development Site is predominantly industrial, around the River Tees. The average rainfall varies throughout the year, with the wettest period being in the late summer to autumn, and driest in late winter to early spring. Average monthly rainfall is generally less than 60 mm throughout the year, except in August and November when it is between 60 mm and 65 mm. February is the driest month with an average of approximately 33 mm between 1981 and 2010.

Surface Waterbodies and Features

6.3.3 Water Framework Directive (WFD) waterbodies close to the Proposed Development Site include the Tees Estuary, Tees Coastal, Tees Estuary (South Bank) (fluvial) waterbodies and the Sherwood Sandstone, Tees Mercia Mudstone and Redcar Mudstone groundwater bodies.

6.3.4 Each of the surface waterbodies is classified as being of Moderate ecological status (Environment Agency, 2019), with a fail in chemical status due to elevated levels of various priority substances. Tees Mercia Mudstone and Redcar Mudstone groundwater body had an overall classification of ‘Poor’ in 2019, due to a poor chemical-dependent surface waterbody status.

6.3.5 North-east of the Proposed Development Site, Coatham Sands is a designated bathing water (as ‘Redcar Coatham’). The Environment Agency’s Bathing Water Quality website notes that the Redcar Coatham bathing water is subject to short

term pollution caused when heavy rainfall or high tides wash faecal material to the sea from livestock, sewage and urban drainage via rivers and streams. The southern extent of the Seaton Carew North Gare Bathing Water is within 2 km of the Proposed Development Site and has a classification of Excellent for 2019.

6.3.6 In addition to the Tees Coastal waterbody and the Tees Transitional waterbody, the Proposed Development interacts with seven watercourses within the Tees Lower and Estuary Operational WFD Catchment, the baseline information on each water feature is provided in Table 6-1. Within Coatham Sands there is also a small, isolated, artificial pond. Water Constraints with 5 km of the Proposed Development Site are illustrated on Figure 11 (Appendix A). More detailed figures will be presented to illustrate all relevant water receptors at the PEI and ES stages.

Table 6-1: Water Features Which Interact with the Proposed Development

WATER FEATURE	BASELINE DESCRIPTION
Tees Coastal Water (GB650301500005)	The Tees Coastal water body stretches from approximately 20 km south-east of Redcar at Boulby, to approximately 13 km north-west of Redcar at Crimdon. It includes a total area of 88.31km^2. The Tees Coastal Water WFD waterbody is of 'Moderate' ecological potential, it's chemical status is 'Fail', and it's hydromorphological designation is 'heavily modified'.
Tees Transitional Water Body/ Seaton on Tees Channel Delta (GB510302509900)	The Tees Transitional water body extends from the Tees Barrage to the east of Stockton-on-Tees, to Teesmouth for a distance of approximately 16 km. It includes a total area of 11.44 km^2. The designation includes the mud and sand flats at Seal Sands, Tees Dock, Greatham Creek and Dabholm Gut. Greatham Creek is the estuarine section of Greatham Beck, which flows from the north of Elwick (National Grid Reference (NGR) NZ 45077 33468) to Seal Sands (NGR NZ 51667 25568) and into the Seaton on Tees Channel. The Tees Transitional WFD Waterbody is of 'Moderate' ecological potential, it's chemical status is 'Fail', and it's hydromorphological designation is 'heavily modified'.
Greatham Creek	The watercourse displays minimal historic change in planform since the early 1900s however the presence of meanders demonstrate some lateral movement historically. The Creek is formed in tidal flat deposits of sand, silt, and clay but some outer edges of meanders are encroaching upon till deposits. The upstream sections are constrained between arable land and a waste-management site with extensive management indicated by the presence of a floodplain embankment which disconnects Greatham Creek from much of the floodplain.
The Fleet/ Tees Estuary (South Bank) (GB1030250723320)	This watercourse is known on local mapping as The Fleet and is designated from adjacent to Longbeck Lane in Saltburn (NGR NZ 60988 20908). It continues north to the west of Redcar, and then flows west through the industrial works to discharge into Dabholm Gut at NGR NZ 56131 24038. The Tees Estuary (S Bank) WFD waterbody is of 'Moderate' ecological potential, it's

WATER FEATURE	BASELINE DESCRIPTION
	chemical status is 'Fail', and it's hydromorphological designation is 'heavily modified'.
The Mill Race	The course of the Mill Race is unclear as it is largely culverted but appears to emanate from a coalescence of ditches and watercourses at NGR NZ 57893 22824, then flows north of the Wilton International Site beneath the A1085. It remerges at NGR NZ 57102 24152 and flows west into The Fleet. In this section the watercourse appears to be approximately 4 m wide flowing to a culvert, with artificial concrete banks in places. Banks are step and incised. There are numerous service crossings of the watercourse at this location.
Dabholm Beck/ Gut	The Dabholm Gut is an artificial channel of around 1 km length left following historical land reclamation. Upstream is Dabholm Beck which is formed from the coalescence of numerous small watercourses and drains through an area of freshwater marshland to the north-west of the Wilton International Site (upstream of the tidal limit). At the tidal limit where it becomes Dabholm Gut, the channel widens to approximately 30 m and numerous outfalls are present. The channel width remains constant up to the confluence with the Tees. Northumbrian Water's Bran Sands WwTW discharges into the Dabholm Gut.
Mains Dike	Mains Dike watercourse rises from a spring in Wilton Wood at NGR NZ 59328 19741. The watercourse then flows north along the eastern boundary of the Wilton International Site, and into the Mill Race at NGR NZ 57893 22824. Main's Dike is characterised by being very straight, around 1 m in width and with steep incised banks rising around 4 m from the channel. There is evidence of some lateral erosion of the banks and the formation of small, alternating fine gravel lateral bars.
Kettle Beck	Kettle Beck rises at Lazenby Bank and flows approximately 4 km generally north along the edge of the Wilton International Site, beneath the A1085, beneath the Teesside Works (Lackenby), and beyond the A1053 before discharging to the Tees. The exact course of the watercourse is no clear from online mapping north of the A1085 as the watercourse is culverted.
Kinkerdale Beck	This watercourse is mapped as a surface waterbody for 320 m at the north-western extent of the Wilton International Site (NZ 56071 20996) and is then in culvert. As such, the source and exact course of the watercourse is not known, although it is known to outfall to the Lackenby Channel.
Knitting Wife Beck	This watercourse rises just north of the A66 in Grangetown (NZ 55172 20910), before flowing north for approximately 300 m towards the Lackenby Steelworks. The watercourse is then culverted and so the course alignment is unclear but is known to outfall at the Lackenby Channel.
Lackenby Channel	The Lackenby Channel is a drainage cut between the Lackenby steelworks (NZ 55305 22207) and the eastern bank of the Tees estuary (NZ 54145 23341). It is approximately 1.6 km in length

WATER FEATURE	BASELINE DESCRIPTION
	and conveys flows from Knitting Wife Beck, Kinkerdale Beck and Kettle Beck to the Tees.
Belasis Beck	Belasis Beck appears to rise from ponds in Belasis Hall Technology Park (NZ 47373 23267) and flows east for 2 km before its confluence with Holme Fleet within Saltholme Nature Reserve at NZ 49071 23577
Network of drains	A number of smaller watercourses/drains are present within the study area, and whilst they do not have individual WFD classifications, if they interact with the Proposed Development Site, they will be considered at further phases of the assessment through the WFD water body catchment that they fall within. Watercourses that do not have individual WFD classifications take the classification of the receiving water body. The watercourses are likely to be largely artificial in nature and would have been developed, or modified, to aid land drainage. As a result, they are likely to be relatively low energy and uniform in nature, with little floodplain connectivity. However, individually they may contribute to the provision of aquatic habitat within the area, even if it is not the unaltered habitat of the area and therefore may still need to be considered.

Water Resources

6.3.7 The location of surface water, and groundwater abstractions, details of pollution incidents, and discharge consents will be requested from the Environment Agency to inform the assessment. Details of Private Water Supply (PWS) abstractions will be requested from the local authorities (i.e. RCBC, STBC and HBC) to inform the baseline.

6.3.8 A small section of the Proposed Development Site at Haverton Hill Road (within the Hydrogen Pipeline Corridor, at its western end) is located within a NVZ. There are no Drinking Water Protected Areas or Drinking Water Safeguard Zones (Groundwater or Surface Water) located within 15 km of the Proposed Development Site. The closest SPZ is located approximately 3.7 km north-west of the Proposed Development Site.

6.3.9 The Teesmouth and Cleveland Coast SPA is a catchment where future development must be nutrient neutral.

Designated Nature Conservations Sites

6.3.10 There are a number of statutory designated sites for nature conservation within the study area. Section 6.6: Ecology and Nature Conversation provides a list of SPAs, SACs, Ramsar Sites and NNRs within 15 km of the Proposed Development Site, and SSSIs and LNRs within 5 km of the Proposed Development Site. The following sites could potentially be impacted by the Proposed Development, due to their proximity to and hydrological relationship with the Proposed Development Site:

- Seaton Dunes and Common SSSI and LNR;

- Charlton's Pond LNR;
- Cowpen Bewley Woodland Country Park LNR;
- Teesmouth NNR; and
- Teesmouth and Cleveland Coast SPA, Ramsar site and SSSI.

Flood Risk

6.3.11 Figure 11: Water Constraints with 5 km of the Proposed Development Site Boundary (Appendix A) illustrate the location of flood zones, main rivers, ordinary watercourse, and areas at risk of flooding from surface water as outlined below.

6.3.12 The River Tees (Main River) is located approximately 1 km west of the Main Site A and 75 m west of the Main Site B. The North Sea is located approximately 0.8 km to the north of the Main Site A and 1.1 km north of Main Site B. The Environment Agency (2022a) Flood Map for Planning' indicates that both Main Site A and Main Site B are located within Flood Zone 1, defined as, "*land having a less than 0.1% AEP of river or sea flooding*."

6.3.13 The utility connection corridors (depending on the route option selected) may cross the following watercourses (some, at multiple locations):

- River Tees (Main River);
- Greatham Creek (Main River);
- Seaton on Tees Channel delta/Teesmouth NNR;
- The Fleet (Ordinary Watercourse);
- The Mill Race (Ordinary Watercourse);
- Dabholm Beck/Gut (Ordinary Watercourse);
- Mains Dike (Ordinary Watercourse);
- Kettle Beck (Ordinary Watercourse);
- Kinkerdale Beck (Ordinary Watercourse);
- Belasis Beck; and
- A complex network of drains, ditches, and tributaries flowing into the larger watercourses associated with the tidal nature of this location.

6.3.14 The main risk of flooding to the Proposed Development Site is tidal/fluvial, associated with the North Sea and watercourses in and around the Proposed Development Site. The River Tees is tidal at this location, with the normal tidal limit approximately 14 km upstream (at the Tees Barrage). Significant parts of the River Tees floodplain are within Flood Zone 2 (between 0.1% and 1% AEP river flooding and between 0.1% and 0.5% AEP sea flooding) and Flood Zone 3 (greater than 1% AEP river flooding and greater than 0.5% AEP sea flooding). Some areas to the north of the Greatham Creek and in the Seal Sands and Haverton Hill area are shown to be benefitting from flood defences.

6.3.15 Whilst Main Site A, Main Site B, the CO_2 Export Corridors and the Natural Gas Connections Corridor are located entirely in Flood Zone 1, a significant amount of the Hydrogen Pipeline Corridor is located within Flood Zones 2 and 3, as illustrated on Figure 11: Water Constraints within 5 km of the Proposed Development Site Boundary (Appendix A). Small areas of the Electrical Connection Corridor and the Water Connections Corridor are also located within Flood Zones 2 and 3. Early discussions with the EA as well as interrogation of EA mapping illustrate that some of the current pipeline corridors interface with EA flood defences near Greatham Creek. This will be a consideration as the design and routeing of the hydrogen pipelines progress to ensure the integrity of these defences is not affected.

6.3.16 The Environment Agency Long Term Flood Risk map (Environment Agency 2022b), which includes Flood Risk from Surface Water (FRfSW), shows that the Main Site and Main Site B are generally at very low risk (less than 0.1% AEP). There are isolated pockets of low risk (between 0.1% and 1% AEP) throughout both Main Sites which appear to be associated with topographic low points. There are no pluvial flood flow routes crossing the Main Site A or Main Site B as per Environment Agency mapping. Environment Agency mapping shows surface water flow routes and areas of ponding associated with watercourses and bodies of water across the utility connection corridors.

6.3.17 Environment Agency mapping shows that a significant portion of the area is at risk of flooding in the unlikely event of a breach or failure of reservoirs. The reservoir flood extents largely follow the fluvial/tidal floodplains in the area. Both Main Site A and Main Site B are shown not to be affected, but the proposed pipeline corridors would cross the reservoir flood extents. Environment Agency mapping shows that the risk is associated with several reservoirs including: Hury Subsidiary, Balderhead, Blackton, Cow Green, Crookfoot, Grassholme, Selset. These are owned by Northumbrian Water with the exception of Crookfoot which is privately owned.

6.3.18 The Canal and River Trust online mapping (Canal and River Trust, 2022) does not identify any canals within the vicinity of the Proposed Development Site.

6.3.19 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.3.20 The following potential impacts may be associated with the Proposed Development during construction (and decommissioning) and operation phases:

- Potential impacts to water conveyance where proposed pipelines cross watercourses during construction (above and below ground pipelines) and operation (for above ground pipelines).
- Encroachment within Flood Zones 2 and 3 (including potentially the functional floodplain) could lead to the displacement of fluvial/tidal floodwater during

construction and operation (above ground); subject to the preferred route of the pipeline corridors.

- Potential impact on Environment Agency flood defences where the proposed pipeline crosses/affects these areas. The impact on the defences (during construction and operation) would need to be appropriately assessed to demonstrate that they would not be compromised by the proposals.
- Potential changes to existing surface water (pluvial) flows during construction phase (for above and below ground pipelines) and operation phase (for above ground pipelines); subject to the preferred route of the pipeline corridors.
- Potential impacts on groundwater flows during construction and operation phase (for below ground pipelines). There will be no direct discharges to groundwater. However, the potential for contaminant mobilisation from the Proposed Development and the resultant impacts to groundwater will be considered with the Geology and Hydrogeology assessments.
- Potential impacts of future flooding from all sources to and from the Proposed Development, including (but not limited to) a potential risk to construction workers during the construction phase, due to risk of fluvial/tidal and reservoir flooding.
- Pollution of surface watercourses within or near the Proposed Development Site (including associated development) during construction and decommissioning, due to chemical spillages, contaminant mobilisation or surface water run-off containing elevated concentrations of fine sediment.
- Water quality impacts to surface water features that may receive surface water runoff, cooling water or treated effluent discharges from the Proposed Development (e.g. DMW Plant, ETP and operation of the Flare). At this stage, information on effluent streams is limited and where discharges are likely to be proposed is under review. On-site treatment or return of effluent to Bran Sands WwTW are options. The use of amine will require specific waste management procedures. Options for discharge will be evaluated as part of the assessment process, including consideration of nutrient neutrality.
- Water quality impacts on receiving watercourses from an increase in foul drainage from the Proposed Development. At this stage it is assumed foul flows will be to either Bran Sands or Marske-on Sea WwTW where it will be treated in accordance with the prevailing regulatory requirements. Loads are expected to be small in comparison to the populations served by both works. Nevertheless, the assessment will qualitatively consider any change in risk from these emissions. Foul drainage from employment sites that do not increase overnight stays are exempt from any nutrient neutrality assessment requirements in respect of the Teesmouth and Cleveland Coast SPA.

6.3.21 The Production Facility will require a supply of water for operation. The source of this water is yet to be determined but may include reclaimed water from Bran Sands

WwTW or a supply of water from Northumbrian Water (which is expected to be raw water from the River Tees).

6.3.22 In both cases for water provision to the Proposed Development (i.e. use of reclaimed or raw water), the water would otherwise be present in or discharged to the River Tees. Thus, where the quality of this water remains fundamentally unchanged by its use by the Production Facility, it should be possible to discharge this water back to the River Tees whilst also maintaining the appropriate levels regarding nutrient loads. If the quality of the water is altered or it is discharged to another water feature further assessment will be undertaken, including assessment of nutrient neutrality if necessary.

6.3.23 An impact assessment will be undertaken to assess the potential effects on the water environment including a desk study to review relevant legislation, policy and guidance. The assessment will be primarily qualitative and based on a source-pathway-receptor approach. The significance of effects will be determined using best practice guidance, where the importance of the receptor is determined separately from the magnitude of impact. Where required the assessment will include recommendations for mitigation measures.

6.3.24 Hydromorphological site visits are proposed to scope potential watercourses affected, inform if watercourse crossings/alterations to existing structures are likely to need to be designed, and inform potential opportunities for mitigation or enhancement.

6.3.25 Various construction methodologies are being considered which include more intrusive approaches like open trench.

6.3.26 Although unlikely it is currently unknown at this stage whether there will be any new engineered surface water outfalls to watercourses, which can also lead to localised adverse impacts. Overall, a qualitative impact assessment shall be undertaken to determine the effect to the hydromorphology of watercourses.

6.3.27 As outlined above, at this stage, information on effluent streams and where discharges are likely to be proposed is still being evaluated. Whatever approach is progressed, the use of amine will require specific waste management procedures. The scope of assessment for these issues will be refined in consultation with relevant statutory consultees. The need for any field data collection will be determined, as well as whether further risk assessment or water quality modelling is needed.

6.3.28 A semi-quantitative surface water quality risk assessment will be undertaken for above ground infrastructure using the SuDS Manual Simple Index Approach (Construction Industry Research and Information Association (CIRIA) C753, 2016) to ensure that the surface water drainage system provides adequate treatment of runoff. This will not apply to areas of the Proposed Development Site where hazardous chemicals will be stored and used, with the risk from these locations assess qualitatively with reference to propose spillage and containment measures and emergency incident response plans.

6.3.29 Within Coatham Sands is a single open water pond that lies close to the former Redcar Steel works in an area of dunes that has formed across former slag heaps. Water quality of the pond was previously monitored by AECOM in 2020-2021 as part of baseline studies for the nearby NZT Project. It is proposed to gather 3 No. additional monthly water quality samples from the pond with the water tested at a suitable laboratory for a range of physico-chemical and nutrient parameters. If there is concern that the Proposed Development may result in an increase in nitrogen deposition on the pond, this baseline data will be used to carry out simple mass balance analysis to assess the risk of nutrient enrichment, and to provide advice on surface water runoff treatment and containment requirements if required.

Flood Risk Assessment and Drainage

6.3.30 In accordance with NPS EN-1 (DECC, 2011a) and the NPPF (Ministry of Housing, Communities and Local Government (MHCLG), 2021), applications for energy projects of 1ha or greater in Flood Zone 1 are to be accompanied by a FRA. An FRA will be prepared and will consider risks to the Proposed Development from flooding as well as the potential for the construction and operation to increase flood risk off-site. The Environment Agency and relevant Lead Local Flood Authorities (LLFAs) will be consulted for local water and flood data to inform the assessments and to confirm the assessment approach, in particular around the treatment of existing Environment Agency defences where these interface with the Proposed Development (e.g. western extents of Hydrogen Pipeline Corridor around Greatham). The assessment of flood risk will also take into account the most recent climate change allowances.

6.3.31 A surface water drainage strategy for the Main Site will be prepared to demonstrate the surface water runoff arising from the Proposed Development is managed sustainably and does not increase flood risk off-site.

Water Framework Directive Assessment

6.3.32 Due to the potential for adverse impacts on WFD designated water bodies as described above, a WFD assessment will be required. The assessment will be undertaken in accordance with the approach set out in PINS Advice Note 18: The Water Framework Directive (2017).

6.3.33 It is initially proposed that a Screening and Scoping WFD Assessment will be undertaken to define the components of the Proposed Development that are relevant, consider the impact pathways, assess the likely significance of any adverse impacts, and determine what the scope for mitigation might be. It is proposed to 'extend' this screening and scoping assessment to include a qualitative assessment of the Proposed Development to consider the potential for any non-compliance of the Proposed Development with WFD objectives for affected waterbodies, using readily available information and site observations.

6.3.34 Depending on the outcomes of the preliminary assessment, more detailed investigations may be required, which will be determined in consultation with the Environment Agency. The WFD Screening and Scoping Assessment will be prepared at the PEI stage and the Environment Agency consulted on the outcome.

Nutrient Neutrality Assessment

6.3.35 Natural England have identified the Teesmouth and Cleveland Coast SPA as a site that is impacted by excess nutrients. In particular, the Seal Sands area is known to be adversely impacted; excessive growth of algal mats are impacting feeding opportunities for the bird populations that the SPA is designated for. Any development in the catchment of the SPA that may lead to an increase in the nitrogen emissions must be supported by a robust nutrient neutrality assessment.

6.3.36 At this stage there remains uncertainty as to whether the Proposed Development will generate an increase in nitrogen in the Teesmouth and Cleveland Coast SPA catchment. Therefore, it is initially proposed to carry out a Nutrient Neutrality Screening Assessment at the PEI stage. This screening assessment will determine the need or otherwise for a full nutrient neutrality assessment for the Proposed Development. It will identify all possible sources of nitrogen from the Proposed Development (including atmospheric deposition, changes in discharges from local WwTW and direct treated effluent discharges) and consider (1) whether this is a new source or fundamentally already part of the catchments nutrient baseline; and (2) whether there is a pathway to the SPA. Where there is scope to reduce nutrient emissions compared to baseline from the site, these will also be considered. Natural England will be consulted on the outcome of the assessment during which the scope of further assessment will be agreed.

6.3.37 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.4 Geology, Hydrogeology and Contaminated Land

Baseline Conditions

Main Site A

6.4.1 The western part of the northern half of Main Site A (the 'Foundry North') and the entirety of the southern half of Main Site A (the 'Foundry South') are understood to have been previously reclaimed land from the River Tees.

6.4.2 Recent studies undertaken by bp indicate that the following geological sequence underlies the Foundry North:

- variable depth of Made Ground to 10 m below ground level (bgl), typically to 2.0 m to 6.0 m where base was proven;
- Tidal Flat Deposits;
- Glacial Till; and
- Mudstone bedrock (comprising Mercia Mudstone Group, Penarth Formation and Redcar Mudstone) from 13.50 m to 15.15 m bgl.

6.4.3 The following geological sequence underlies the Foundry South:

- variable depth of Made Ground to 7 m bgl, typically to 2.0 m to 6.0 m where base was proven;

- Tidal Flat Deposits to a maximum depth of 18.0 m bgl;
- Glacial Till identified between 12.1 m to 17.3 m bgl where encountered; and
- Mudstone bedrock (comprising Mercia Mudstone Group, Penarth Formation and Redcar Mudstone).

6.4.4 The Superficial Tidal Flat Deposits underlying Main Site A are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. Whilst not identified in the ground investigation, Glacio-lacustrine deposits may be present. These designated as Unproductive Strata when clay or a Secondary A aquifer when silt, Redcar Mudstone Formation is designated as Secondary (Undifferentiated) aquifer, the Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer and the Mercia Mudstone bedrock is designated as Secondary B aquifer.

6.4.5 There are no SPZs, Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences within 1 km of Main Site A.

6.4.6 Groundwater is present within the Made Ground, superficial deposits and bedrock underlying Main Site A. The groundwater in the Made Ground and superficial deposits is assumed to be in hydraulic continuity. There is potential for hydraulic connection between the superficial deposits and bedrock.

6.4.7 Records indicate that within the Foundry North part of Main Site A, groundwater is present between 2.37 m AOD and 3.62 m AOD with an apparent flow towards the west to north-west. Within the Foundry South part of Main Site A, records indicate that groundwater is present between 2.29 m AOD and 5.48 m AOD, with an apparent flow towards the north-west.

6.4.8 The following are potential sources of contamination at the Foundry North part of Main Site A:

- former steelworks: blast furnace, coke ovens, gas holders, by-products plant, coke stock, effluent plant and various storage plants;
- Made Ground including slag and clinker with visual/olfactory evidence of contamination including hydrocarbon and NH_3 odours;
- localised exceedances of industrial/commercial Generic Assessment Criteria (GAC) for cyanide and selected Polycyclic Aromatic Hydrocarbons (PAHs) in Made Ground and Tidal Flat deposits;
- localised asbestos fibres in Made Ground; and
- exceedances of water quality criteria in soil leachate and groundwater in Made Ground and Tidal Flats.

6.4.9 The following are potential sources of contamination at the Foundry South part of Main Site A:

- former steel works including blended ore stocks and coke crushing plant;
- Made Ground with visual/ olfactory evidence of contamination including hydrocarbon and NH_3 odours, orange / iron staining, white mineralisation/ sulphur mineralisation on slag, localised tar cobbles, sulphur odours;
- localised asbestos fibres in Made Ground; and
- localised exceedances of industrial/commercial GAC for cyanide and selected PAHs in Made Ground and Tidal Flat deposits.

6.4.10 The following potential sources of off-site contamination are present within the vicinity of Main Site A:

- Bran Sands licensed landfill;
- Bran Sands WwTW;
- Warrenby 3A / CLE31 landfill on Teesworks Long Acres site;
- electrical substations;
- Sahaviriya Steel Industries (SSI) Steelworks (including blast furnace, sinter plant, power station, crushing and blending plant and former pellet plant);
- former Redcar and Coatham iron works;
- known Heavy Fuel Oil spill adjacent to south-east corner of the Main Site; and
- railway lines and sidings.

6.4.11 The ground beneath Main Site A has been identified in the STDC Regeneration Master Plan (RMP) (STDC, 2019) in an assessment of ground hazards. It is currently likely to contain a number of potential contaminants from former historic use, potentially including heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former coke works and by-products and a former iron making site (Redcar Blast Furnace) identified on the STDC RMP potential major hazards map.

CO_2 Export Corridors (Main Site A)

6.4.12 Publicly available British Geological Survey (BGS) borehole records and geological maps (BGS, 2022) indicate that the CO_2 Export Corridors are underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial Deposits); and
- Redcar Mudstone Formation (Bedrock).

6.4.13 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the entire area of the CO_2 Export Corridors. These deposits are likely to be associated with the land that has been reclaimed from the River Tees.

6.4.14 The CO_2 Export Corridors are located immediately adjacent to the Main Site. Therefore, historical GI data for the areas adjacent to the CO_2 Export Corridors is summarised in the section for Main Site A.

6.4.15 The Superficial Tidal Flat Deposits underlying the CO_2 Export Corridors are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. If present, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone bedrock is designated as Secondary B aquifer, the Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer and the Redcar Mudstone is designated as a Secondary (Undifferentiated) aquifer.

6.4.16 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the CO_2 Export Corridors, nor are there any groundwater, potable water or surface water abstraction licences located within 1 km of it.

6.4.17 The potential sources of off-site contamination present within the vicinity of the CO_2 Export Corridors, and the nearby authorised and historical landfills, are the same as those listed in relation to the Main Site A.

6.4.18 The ground to the north of the CO_2 Export Corridors has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use, such as heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former coke works and by-products, former iron and steel works and a former steel making site (Redcar Blast Furnace) located to the north, as identified on the STDC RMP major ground hazards map.

Hydrogen Pipeline Corridor (Main Site A)

6.4.19 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Hydrogen Pipeline Corridor is underlain by the following sequence of strata:

- Made Ground;
- Superficial deposits:
  - Tidal Flat Deposits;
  - Alluvium (Clay, Silt, Sand and Gravel);
  - Blown Sand;
  - Devensian Glaciolacustrine Deposits (Clay and Silt); and
  - Devensian Glacial Till (Boulder Clay).
- Sherwood Sandstone Group (in the western part of the Hydrogen Pipeline Corridor); and

- Mudstone bedrock (comprising Mercia Mudstone Group, Penarth Formation and Redcar Mudstone), in the eastern part of the Hydrogen Pipeline Corridor.

6.4.20 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the centre and most of the eastern area of the Hydrogen Pipeline Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees.

6.4.21 Historical GI data from Wardell Armstrong (2016) relating to the Seal Sands area located adjacent to the Hydrogen Pipeline Corridor indicates that the Made Ground present could be up to 5 m thick and be associated with fill material from the land reclamation.

6.4.22 The area within Seal Sands was used for historical landfilling for construction, non-hazardous industrial materials, slag and inert waste. A GI Factual Report from RSK (2007) noted that Made Ground is present to 3.7 m bgl with hydrocarbon and organic odours noted. Tidal Flat Deposits were encountered between 0.1 m bgl and 27 m bgl, and were approximately 15 m thick. The deposits comprised silt, sand and clay, and were found to be underlain by stiff boulder clay (Glacial Till), approximately 10 m thick. Bedrock was encountered between 25.5 m bgl and 28.5 m bgl. Monitoring undertaken by ConocoPhillips (RSK, 2007) indicated that groundwater was encountered between 0.8 m bgl and 1 m bgl.

6.4.23 The Superficial Tidal Flat Deposits underlying the Hydrogen Pipeline Corridor are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits and the Blown Sand Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the Hydrogen Pipeline Corridor are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.24 The Sherwood Sandstone Group is designated as a Principal Aquifer. Mercia Mudstone Group is designated as a Secondary B Aquifer. The Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer. The Redcar Mudstone Formation is designated as a Secondary Undifferentiated Aquifer.

6.4.25 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Hydrogen Pipeline Corridor.

6.4.26 The Groundsure (2022) Enviro Data Viewer indicates that a number of historic and authorised landfills are located within approximately 300 m of the Hydrogen Pipeline Corridor:

- Cowpen Bewley Landfill Site;
- West of Wolviston to Seal Sands Link Road Historic Landfill Site;
- Seal Sands Historic Landfill Site;
- South of Seal Sands Historic Landfill Site;

- Bran Sands Landfill Site;
- Warrenby 3A / CLE31 landfill on Teesworks Long Acres site;
- Wilton Perimeter Mounds Landfill Site;
- Redcar Trunk Road Historic Landfill Site;
- ICI No. 2 Teesport Historic Landfill Site;
- ICI No. 3 Teesport Landfill Site;
- CLE 3/8 Landfill Site;
- Fire Bund Port Clarence Historic Landfill;
- Port Clarence Non-Hazardous Landfill Site; and
- Disused Railway Cutting Historic Landfill Site.

6.4.27 However, it should be noted that the extent of the Hydrogen Corridor is anticipated to be refined. Therefore, the number of landfills in its proximity may change.

6.4.28 The ground immediately adjacent to the Hydrogen Pipeline Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from current land use, such as heavy metals, asbestos, sulphates, hydrocarbons and inorganic and organic compounds. The potential contaminants are associated with a hazardous waste landfill and an iron and steel making by-products landfill (former SSI high tip) identified on the STDC RMP major ground hazards map.

Natural Gas Connection Corridor (Main Site A)

6.4.29 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Natural Gas Connection Corridor is underlain by the following sequence of strata:

- Made Ground;
- Blown Sand (may be present underlying the eastern boundary of the Natural Gas Connection Corridor) (Superficial);
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits; and
- Redcar Mudstone Formation (Bedrock).

6.4.30 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the entire area of the Natural Gas Connection Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees.

6.4.31 The Natural Gas Corridor is located immediately adjacent to Main Site A. Therefore, historical GI data for the areas adjacent to the Natural Gas Corridor are summarised in the section relating to Main Site A.

6.4.32 The Superficial Tidal Flat Deposits underlying the Natural Gas Connection Corridor are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone bedrock is designated as Secondary B aquifer.

6.4.33 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Natural Gas Connection Corridor.

6.4.34 The Groundsure (2022) Enviro Data Viewer indicates that one landfill is located within 0.3 km of the Natural Gas Corridor. The Bran Sands authorised landfill, which accepts special waste, is located approximately 270 m south of the Natural Gas Corridor.

6.4.35 The ground immediately adjacent to the Natural Gas Connection Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use, such as heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants are associated with a former iron and steel works which falls within the Natural Gas Connection Corridor as identified on the STDC RMP major ground hazards map.

Electrical Connection Corridor (Main Site A)

6.4.36 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Electrical Connection Corridor is underlain by the following sequence of strata:

- Made Ground;
- Superficial Deposits:
  - Tidal Flat Deposits;
  - Blown Sand;
  - Devensian Glaciolacustrine Deposits (Clay and Silt); and
  - Devensian Glacial Till.
- Mudstones from the Mercia Mudstone Group, Penarth Formation and the Redcar Mudstone Formation.

6.4.37 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the western half of the Electrical Connection Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees.

6.4.38 Historical BGS boreholes located to the south of the Electrical Connection Corridor identified Made Ground in one borehole to a depth of 5 m bgl. Glaciolacustrine Deposits and Devensian Clay were identified between 0.2 m bgl and 13 m bgl with

approximate thickness of 11 m. The Redcar Mudstone was encountered at 11.2 m bgl and was described as a highly weathered grey mudstone. Groundwater was encountered further south between 2 m and 3 m bgl within soft silty clay.

6.4.39 Historical BGS boreholes and trial pit data from a recent bp study indicates that Made Ground is present to the immediate east of the Electrical Connection Corridor, within the existing British Steel Lackenby site. The Made Ground may be present to 5.8 m bgl and is comprised of slag, brick, waste demolition and cohesive fill. The superficial deposits are comprised of soft to firm brown silty clay (Glaciolacustrine Deposits) and stiff brown boulder clay (Glacial Till) to 10.7 m bgl. Stiff weathered mudstone and shale were encountered in historical boreholes. Groundwater was encountered between 0.7 m bgl and 3.4 m bgl at the interface of Made Ground and natural cohesive deposits in 38 out of 75 trial pits.

6.4.40 Further GI data for the area immediately to the north of the Electrical Connection Corridor is summarised in the previous section which relates to Main Site A.

6.4.41 The Blown Sand Deposits underlying the Electrical Connection Corridor are designated as a Secondary A aquifer. The Superficial Tidal Flat Deposits are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone Group is designated as a Secondary B Aquifer. The Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer and the Redcar Mudstone Formation is designated as a Secondary Undifferentiated Aquifer.

6.4.42 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Electrical Connections Corridor.

6.4.43 The Groundsure (2022) Enviro Data Viewer indicates that a number of historic and authorised landfills are located within 0.3 km of the Electrical Connection Corridor.

6.4.44 The following are wholly or partially located within the Electrical Connection Corridor:

- The Redcar Trunk Road Landscaping historic landfill site (last input date is recorded as 10th August 1979);
- The Wilton Perimeter Mounds Industrial Waste Landfill (factory curtilage) authorised site;
- Mushroom Grove Allotments historic landfill site (last input date recorded as 2nd April 1985); and
- Teesdock Road historic landfill site (last input date of 31st March 1983).

6.4.45 In addition to the above, Bran Sands authorised landfill site, which accepted special waste, is adjacent to the western boundary of the Electrical Connection Corridor. Warrenby Landfill Site, which accepts household, commercial and industrial waste is

located adjacent to the north-east boundary of the Electrical Connection Corridor. ICI No 2 Teesport (authorised landfill site) is located approximately 100 m west of the Electrical Connection Corridor.

6.4.46 The ground beneath the Electrical Connection Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use and current land use, such as heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former iron and steel works, a current iron and steel making closed landfill and iron and steel making waste recycling site identified on the STDC RMP major ground hazards map.

Water Connections Corridor (Main Site A)

6.4.47 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Water Connections Corridor is underlain by the following strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glaciolacustrine Deposits (Superficial);
- Glacial Till (Superficial);
- Blown Sand (may be present underlying eastern boundary of the Water Connections Corridor) (Superficial); and
- Redcar Mudstone Formation (Bedrock).

6.4.48 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the entire northern section of the Water Connections Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees. The rest of the Water Connections Corridor is not mapped as Made Ground but Made Ground is likely to be present, given current and historical development in the area.

6.4.49 The Water Connections Corridor is located immediately adjacent to Main Site A and extends approximately 1.5 km south-east of the corridor. Historical GI data for the areas adjacent to the Water Connections Corridor are summarised under the section relating to Main Site A.

6.4.50 The Blown Sand Deposits underlying the Water Connections Corridor are designated as a Secondary A aquifer. The Superficial Tidal Flat Deposits are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt. Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Redcar Mudstone Formation is designated as a Secondary Undifferentiated Aquifer.

6.4.51 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Water Connections Corridor.

6.4.52 The Groundsure (2022) Enviro Data Viewer indicates that one active and one historical landfill are located within the Water Connections Corridor. Wilton, Perimeter Mounds is located in the central area of the Water Connections Corridor and accepts industrial waste. The historical landfill site located in the central area of the Water Connections Corridor relates to Redcar Trunk Road Landscaping (last input date recorded as August 1979). Two authorised landfills and one historic landfill are also located within 0.3 km of the Water Connections Corridor:

- Bran Sands licensed landfill, which accepted special waste, is adjacent to the western boundary of the Water Connections Corridor;
- Warrenby Landfill is located adjacent to the east of the Water Connections Corridor and accepts household, commercial and industrial waste; and
- Teesport Eston Tip (historic landfill) is located approximately 300 m west of the Water Connections Corridor (last input date recorded as 17th September 1993).

6.4.53 The ground immediately adjacent to the Water Connections Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use potentially including heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former iron and steel works which encroaches onto the boundary of the Water Connections Corridor as identified on the STDC RMP major ground hazards map.

Other Gases Connection Corridor (Main Site A)

6.4.54 Publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Other Gases Connection Corridor is underlain by the following strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till;
- Glacio-lacustrine deposits;
- Blown Sand (may be present underlying small portion of the north-eastern bend of the Other Gases Connection Corridor) (Superficial);
- Penarth Formation – Mudstone (Bedrock); and
- Redcar Mudstone Formation (Bedrock).

6.4.55 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies nearly the entirety of the Other Gases Connection Corridor. These deposits are likely to be associated with the land that has been reclaimed from the River Tees. A small portion of the north-eastern bend in the corridor is not mapped as Made Ground but Made Ground is likely to be present, given current and historical development in the area.

6.4.56 The Other Gases Connection Corridor is located immediately adjacent to Main Site A and extends approximately 2 km to the south-east. Therefore, historical GI data for

the areas adjacent to the Other Gases Connection Corridor are summarised under the section above relating to Main Site A.

6.4.57 The Blown Sand Deposits underlying the Other Gases Connection Corridor are designated as a Secondary A aquifer. The Superficial Tidal Flat Deposits are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer. The Redcar Mudstone Formation is designated as a Secondary Undifferentiated Aquifer.

6.4.58 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Other Gases Connection Corridor.

6.4.59 The Groundsure (2022) Enviro Data Viewer indicates that there are no active or historical landfill are located within the Other Gases Connection Corridor. The following authorised and historical landfills are located within 0.3 km of the corridor:

- Bran Sands licensed landfill (now closed), which accepted special waste, is adjacent to the western boundary of the Other Gases Connection Corridor;
- Teesport Eston Tip (historic landfill) is located approximately0.3 km west of the Other Gases Connection Corridor (last input date recorded as 17th September 1993).

6.4.60 The ground adjacent to the Other Gases Connection Corridor has been identified in the STDC RMP in an assessment of ground hazards. It is likely to contain a number of potential contaminants from former historic use, such as heavy metals, asbestos, sulphates and hydrocarbons. The potential contaminants may be associated with a former iron and steel works to the north-east as identified on the STDC RMP major ground hazards map.

Main Site B – RBT

6.4.61 The geology, hydrogeology and contaminated land baseline data presented for the Main Site A is relevant for the Main Site B.

6.4.62 The following geological sequence underlies Main Site B:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glaciolacustrine Deposits (Superficial);
- Glacial Till (Superficial); and
- Mercia Mudstone Formation (Bedrock).

6.4.63 The Superficial Tidal Flat Deposits underlying Main Site B are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when

clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone bedrock is designated as Secondary B aquifer.

6.4.64 Main Site B has been used as an bulk import terminal for coal and iron ore amongst other raw materials for the steel industry for over 40 years. In addition to current remaining stockpiles, washed-in fines and leachable contamination from stockpiled materials from may be present below ground. Main Site B is directly adjacent to the Foundry (Main Site A), a site that has been identified in the STDC RMP as likely to contain a number of potential contaminants.

6.4.65 Potential sources of off-site contamination are considered to be the same as those identified for Main Site A.

CO_2 Export Corridor – RBT (Main Site B) Extension

6.4.66 The geology, hydrogeology and contaminated land baseline data detailed for CO_2 Export Corridor (Main Site A) is relevant to the CO_2 Export Corridor Extension associated with Main Site B.

6.4.67 The Superficial Tidal Flat Deposits underlying the CO_2 Export Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt, the Glacio-lacustrine deposits are designated as Unproductive Strata when clay or a Secondary A aquifer when silt, whilst Glacial Till is designated as a Secondary (Undifferentiated) Aquifer. The Mercia Mudstone bedrock is designated as Secondary B aquifer, the Penarth Formation is designated as a Secondary (Undifferentiated)/Secondary B aquifer and the Redcar Mudstone is designated as a Secondary (Undifferentiated) aquifer.

Hydrogen Pipeline Corridor - RBT (Main Site B) Extension

6.4.68 The geology, hydrogeology and contaminated land baseline data detailed for the Hydrogen Pipeline Corridor (associated with Main Site A) is relevant for the Hydrogen Pipeline Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Hydrogen Pipeline Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.69 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Hydrogen Pipeline Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.70 The Superficial Tidal Flat Deposits underlying the Hydrogen Pipeline Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay, or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.71 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Hydrogen Pipeline Corridor extension.

Natural Gas Connection Corridor – RBT (Main Site B) Extension

6.4.72 The geology, hydrogeology and contaminated land baseline data detailed for the Natural Gas Connection Corridor (associated with Main Site A) is relevant for the Natural Gas Connection Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Natural Gas Connection Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.73 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Natural Gas Connection Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.74 The Superficial Tidal Flat Deposits underlying the Natural Gas Connection Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.75 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Natural Gas Connection Corridor Extension.

Electrical Connection Corridor – RBT (Main Site B) Extension

6.4.76 The geology, hydrogeology and contaminated land baseline data detailed for the Electrical Connection Corridor (associated with Main Site A) is relevant for the

Electrical Connection Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Electrical Connection Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.77 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Electrical Connection Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.78 The Superficial Tidal Flat Deposits underlying the Electrical Connection Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.79 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Electrical Connection Corridor Extension.

Water Connections Corridor – RBT (Main Site B) Extension

6.4.80 The geology, hydrogeology and contaminated land baseline data detailed for the Water Connections Corridor (associated with Main Site A) is relevant for the Water Connections Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Water Connections Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.81 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Water Connections Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.82 The Superficial Tidal Flat Deposits underlying the Water Connections Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.83 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Water Connections Corridor Extension.

Other Gases Connection Corridor – RBT (Main Site B) Extension

6.4.84 The geology, hydrogeology and contaminated land baseline data detailed for the Other Gases Connection Corridor (associated with Main Site A) is relevant for the Other Gases Corridor Extension associated with Main Site B, except that publicly available BGS borehole records and geological maps (BGS, 2022) indicate that the Other Gases Connection Corridor Extension is underlain by the following sequence of strata:

- Made Ground;
- Tidal Flat Deposits (Superficial);
- Glacial Till/Glacio-lacustrine deposits;
- Mercia Mudstone Group;
- Penarth Formation; and
- Redcar Mudstone Formation.

6.4.85 The 1:50,000 Artificial Deposits BGS Map (BGS, 2022) indicates that Made Ground (Undivided Artificial Deposit) underlies the Other Gases Corridor Extension. These deposits are likely to be associated with the land that has been reclaimed from the River Tees and subsequent development as RBT.

6.4.86 The Superficial Tidal Flat Deposits underlying the Other Gases Corridor Extension are designated as either a Secondary (Undifferentiated) aquifer when clay or a Secondary A aquifer for sand and silt. The Devensian Glacial Till Deposits are designated as a Secondary (Undifferentiated) Aquifer. The Alluvial Deposits are designated as a Secondary A Aquifer. The Glaciolacustrine Deposits (clay and silt) underlying the corridor extension are designated as Unproductive Strata where clay and a Secondary A aquifer where silty.

6.4.87 There are no SPZs, Drinking Water Protected Areas and Drinking Water Safeguard Zones (Surface Water and Groundwater) within 1 km of the Other Gases Corridor Extension.

Scope of the Assessment

6.4.88 The following potential impacts may be associated with the Proposed Development:

- disturbance of contaminated soils and perched groundwater, and the creation of new pathways to sensitive receptors (including construction workers and controlled waters) during construction;
- pollution of surface watercourses within or near the Proposed Development Site during construction and decommissioning, due to spillages or polluted surface water run-off entering a watercourse (if an appropriate Environmental Management Plan is not adhered to); and
- pollution of surface watercourses within or near the Proposed Development Site during operation, due to spillages or polluted surface water runoff entering the watercourse (if materials are not appropriately stored at the Proposed Development Site in accordance with the environmental permit and an appropriate Environmental Management Plan/ system, and/or appropriate drainage systems are not implemented and maintained).

6.4.89 A Phase 1 desk-based assessment (DBA) has been completed for Main Site A to identify potential contaminative uses of the Proposed Development Site and to identify the potential for land contamination and potential pathways to sensitive receptors. A similar DBA is in preparation for Main Site B. The DBAs consider the potential for contaminants associated with current and historic land use in and around the Proposed Development Site to be present. A conceptual site model (CSM) will be developed for the land potentially affected by the Proposed Development.

6.4.90 The results of the DBA and CSM will be used to assess data gaps and uncertainties and, if required, an initial scope for additional site investigation. It is anticipated that the requirements for intrusive investigation would be discussed and agreed in advance with the Environment Agency and RCBC, as appropriate.

6.4.91 The ES will include an assessment of the potential impacts of the Proposed Development upon existing ground conditions, including the potential for the Proposed Development to result in land contamination, and how these will be prevented or minimised.

6.4.92 The EIA will inform the design as to where mitigation measures may be required during the Proposed Development's construction, operation and decommissioning. These mitigation measure may include the recommendation for further intrusive investigation to address residual data gaps or better delineate identified contamination hotspots or plumes, quantitative risk assessment, remediation and validation, although it is envisaged that the current operator of the Proposed Development Site will undertake appropriate site clean-up prior to commencement

of the Proposed Development. The assessment will also make recommendations for possible mitigation measures to be employed by contractors, on a precautionary basis, to allow for the encounter of previously unidentified contamination during the construction phase.

6.4.93 The scope of assessment set out above would be applied whether Main Site A or B (and associated corridors) is taken forward to the final development design.

6.5 Noise and Vibration

Baseline Conditions

6.5.1 Main Site A is remote from larger areas of residential receptors, with the nearest residential Noise Sensitive Receptor (NSR) to Main Site A located approximately 1.3 km to the east (Marsh House Farm/ Marsh Farmhouse). The nearest residential settlements are the town of Redcar (approximately 2.6 km east of Main Site A), including the borough of Dormanstown (approximately 1.3 km south-east of Main Site A).

6.5.2 Main Site B is also remote from larger areas of residential receptors, with the nearest residential NSR to Main Site B located approximately 2.2 km to the east (Marsh House Farm/ Marsh Farmhouse). The nearest residential settlements are the town of Redcar (approximately 3.5 km east of Main Site B), including the borough of Dormanstown (approximately 2.7 km south-east of Main Site B).

6.5.3 The nearest residential settlements to the connection corridors are:

- Dormanstown, located approximately 0.4 km to the east of the Water Connections Corridor, approximately 0.7 km to the east of the Hydrogen Pipeline Corridor and Electrical Connection Corridor, approximately 0.9 km to the south-east of the Natural Gas Connection Corridor and approximately 0.9 km to the south-east of the CO_2 Export Corridors;
- Redcar, located approximately 1.8 km to the north-east of the Electrical Connection Corridor, approximately 2 km to the north-east of the Hydrogen Pipeline Corridor, approximately 2 km to the east of the Natural Gas Connection Corridor and Water Connections Corridor, and approximately 2 km to the-east of the CO_2 Export Corridors;
- Kirkleatham, which is to the immediate east of the Hydrogen Pipeline Corridor, where it extends into the Wilton International Estate;
- Billingham and Wolviston, located approximately 1.2 km south-west and 0.6 km west of the Hydrogen Pipeline Corridor's western extent respectively;
- Grangetown, adjacent to the Electrical Connection Corridor at its southern end; and
- Greatham, located approximately 0.6 km north-west of the Hydrogen Pipeline Corridor.

6.5.4 It is noted that there are areas of public/private amenity close to the Proposed Development Site, mainly to the north around Coatham.

6.5.5 As outlined in more detail in Section 6.6: Ecology and Nature Conservation, the Teesmouth and Cleveland Coast SPA, Ramsar Site and SSSI is located to the immediate north of both Main Sites A and B. In addition, as outlined in Section 6.7: Ornithology and Section 6.8: Marine Ecology, the Proposed Development has the potential to impact on sensitive receptors relevant to these topics which will need to be considered as part of the assessment.

6.5.6 Baseline noise data is available from the results of surveys which were undertaken in 2019 and 2020 for the NZT Project (immediately east of the Proposed Development Sites). From a review of the available data, the existing dominant sound in the area is from industrial and road traffic noise sources.

6.5.7 Further project specific baseline noise monitoring will be carried out to inform the noise and vibration assessment for the Proposed Development.

6.5.8 Consultation with RCBC, STBC and HBC will be undertaken to determine NSRs and the suitability of existing data available for reuse (e.g. from the NZT Project). The extent of the Study Area will be defined to include the NSRs/communities in each direction from the Proposed Development Site, that may be affected by noise or vibration during construction or operation of the Proposed Development.

6.5.9 The results of the baseline sound surveys will be reviewed and discussed with consultees to determine whether further baseline monitoring is required. The monitoring locations will also be reviewed to ensure sufficient data is gathered to inform the application for the Environmental Permit for the Production Facility. It is also noted that monitoring surveys need to be carefully scheduled to avoid periods where known noisy activities are taking place in the area, such as demolition works, to not affect the data gathered.

6.5.10 Baseline sound survey requirements at identified sensitive ecological receptors will be agreed in conjunction with the project ecologists and Natural England.

6.5.11 There are no substantive differences in the baseline conditions between Main Site A and Main Site B. Therefore, the baseline conditions as outlined above apply and are relevant to both. In addition, the proposed baseline sound survey monitoring locations are appropriate to cover both Mains Sites A and B and the associated connection corridors.

Scope of the Assessment

6.5.12 The following potential impacts are likely to be associated with the Proposed Development:

- construction and decommissioning noise and vibration impacts (including construction and decommissioning traffic on public roads); and
- operational noise impacts from new plant, specifically at the Main Site.

6.5.13 Based on the distance between the Proposed Development Site and the nearest receptors, significant vibration impacts associated with operational activities are considered unlikely, although they will still be considered in brief as part of the EIA.

6.5.14 The scope of the noise and vibration assessment will include the following:

- identification of the nearest NSRs (as outlined above);
- liaison with the LPA's Environmental Health Officers (EHOs) and the project ecologists to agree scope and methodology of noise and vibration assessment, including baseline sound monitoring locations and measurement protocol (monitoring procedures will conform to BS 7445), including verification of use of existing data;
- establishment of baseline sound levels in the locality; and
- assessment of the impact of predicted noise levels at the nearest NSRs from construction, operation and decommissioning of the Proposed Development and associated connections including:
  - construction noise and vibration (including construction traffic on public roads); and
  - operational noise and vibration.

6.5.15 The NSRs will be representative of residential and ecological receptors. The data collected will also be used to inform the heritage assessment (with respect to potential impacts upon the settings of heritage assets).

6.5.16 The noise and vibration assessment will be carried out in accordance with the following guidance:

- DECC (2011) Overarching NPS for Energy EN-1 and revised NPS EN-1 (BEIS);
- 'Noise Policy Statement for England' (NPSE) (2010); and
- PPG for 'Noise' (2019a).

6.5.17 Additionally, reference will be made to (but not limited to) the following:

- British Standard (BS) 5228-1 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 1: Noise'.
- BS 5228-2 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 2: Vibration'.
- International Organisation for Standardisation (ISO) 9613-2: 1996 'Attenuation of sound during propagation outdoors. Part 2: General method of calculation'.
- BS 4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.
- BS 7385: 1993 'Evaluation and measurement for vibration in buildings';
- BS 6472: 2008 'Guide to evaluation of human exposure to vibration in buildings'.

- Control of Pollution Act 1974 (as amended).
- 'Calculation of Road Traffic Noise' (Department for Transport, 1988, "CRTN").
- Design Manual for Road and Bridges (DMRB) LA111 (Revision 2)' (Highways England, 2020).

6.5.18 Noise levels associated with enabling and construction works will be calculated (at chosen NSRs) using the data and procedures given in BS 5228. Further detail on construction working hours will be presented within the PEI Report and ES and will be used to inform the assessment of construction related impacts.

6.5.19 The need for prediction of vibration levels will be further considered depending upon the types of activities required during the construction of the Proposed Development. The assessment of vibration due to construction works will include the electrical, water and gas connections as required.

6.5.20 The construction of the Proposed Development may have a potential impact on traffic flows on local roads around the Proposed Development Site. The change in road traffic noise levels, at a selection of relevant receptors, will be predicted using the standard methodology outlined in the CRTN. The predictions will be based on baseline and with-development traffic data provided as part of the proposed Transport Assessment (TA) as outlined in Section 6.9: Traffic and Transportation.

6.5.21 The significance of changes in road traffic noise levels will be assessed based on a range of relevant guidance including the DMRB.

6.5.22 The potential impacts and effects of decommissioning are likely to be comparable to, or less than, those for construction activities.

6.5.23 The assessment of operational noise impacts will use computer noise modelling software (SoundPLAN or Cadna-A), based on information on indicative plant layout, and the operating conditions and the levels of noise generated by plant items and vehicles, as provided by the design team. The modelling software enables a detailed implementation of the proposed equipment and buildings, existing surrounding buildings and ground features. The software implements the methodology in ISO 9613-2 for the calculation of noise levels from industrial sources. Any assumptions made to develop the noise modelling will be clearly outlined within the assessment and its technical appendices.

6.5.24 The significance of the noise impacts of the Proposed Development during operation will be assessed using the method outlined in BS 4142 and World Health Organisation (WHO) guidance (WHO, 2009). BS4142 provides a method for rating the acceptability of increases in existing noise levels at noise-sensitive receptors affected by noise from industrial sources at proposed developments, and the WHO guidance provides information regarding assessment of sleep disturbance. Further details of the approach will be discussed and agreed as required with RCBC and STBC.

6.5.25 Additionally, the tonal, impulsive and irregular characteristics of the noise emissions from the Production Facility will be considered and assessed against the prevailing noise climate to the NSRs.

6.5.26 As outlined in Section 6.9: Traffic and Transportation, the Proposed Development is unlikely to have a significant impact upon traffic flows on local roads around the Proposed Development Site during operation. Therefore, it is proposed to scope this out of the assessment of noise and vibration.

6.5.27 Development design and impact avoidance measures will be used to inform the assessment of likely significant effects. These measures have not been fully defined for the Proposed Development. However, for noise this is likely to include standard best practices approaches such as avoidance of working in the more sensitive evening and night-times where possible. All measures will be outlined with the CEMP.

6.5.28 Any likely remaining significant adverse effects will be mitigated where possible through further mitigation. Following the implementation of mitigation any residual effects on residential and ecological receptors will be identified.

6.5.29 The scope of assessment set out above would be applied whether Main Site A or B (and their associated corridors) are taken forward to the final development design.

6.6 Ecology and Nature Conservation (Including Aquatic Ecology)

Baseline Conditions

6.6.1 The baseline for Ecology and Nature Conservation is considered against the 'Zone of Influence' (ZoI) for the Proposed Development which is the area over which ecology and nature conservation features may be affected by biophysical changes because of the Proposed Development and associated activities (Chartered Institute of Ecology and Environmental (CIEEM), 2022). This approach will be the same regardless of which Main Site (A or B) is selected. Therefore, the Study Area for baseline data gathering has been defined on a precautionary basis to obtain sufficient data to determine the ZoI for the purpose of the ecological impact assessment (EcIA) for either scenario. The approach taken is described below.

6.6.2 A 15 km Study Area around the Proposed Development Site has been applied to identify European Sites, SSSIs and NNRs that need to be considered in terms of the potential for impacts and effects (including for purposes of Habitats Regulations Assessment (HRA)), particularly those with mobile species such as birds[3] or marine mammals[4]. The assessment will initially consider features within a potential ZoI of up to 15 km based upon guidance for air quality impact assessment during operation as outlined in Section 6.2: Air Quality of this report.

[3] Note as ornithology will be a separate stand-alone chapter, further information on the baseline and scope of assessment of specific relevance to ornithology is outlined separately in Section 6.7 of this EIA Scoping Report.
[4] Note as marine ecology will be a separate stand-alone chapter further information on the baseline and scope of assessment of specific relevance to marine ecology is outlined separately in Section 6.8 of this EIA Scoping Report.

6.6.3 The Study Area for the identification of local statutory and non-statutory nature conservation sites, and for gathering third party records of habitats and protected and notable species is a more focussed area of 2 km around the Proposed Development Site. This distance is again informed by standard guidance for air quality impact assessment and other good practice (CIEEM, 2017 & 2022). The potential ZoI for the Proposed Development will be refined further later for the purposes of the final EcIA.

6.6.4 The desk study areas are summarised in Table 6-2.

6.6.5 The field survey area will include all land within the extent of the Proposed Development Site (subject to access) plus at least a 50 m buffer to place the Proposed Development Site in its wider habitat context, and to appraise habitat suitability for those protected species that are potentially sensitive to indirect impact sources (e.g. noise or visual disturbance). The species-specific survey areas to be observed are detailed later in this section, in Table 6-2: Summary of Ecological Surveys and Data Collection (Including Ornithology and Aquatic Ecology).

Table 6-2 Sources of Desk Study Data[5]

DATA SOURCE	SEARCH AREA	ACCESSED / DATA RECEIVED	DATA OBTAINED
Environmental Records Information Centre (ERIC) North East	2 km	August 2022	Species records, non-statutory sites, and the associated interest features/reasons for designation.
Industry Nature Conservation Association (INCA)	Data specific	23 March 2022	Species records, roost and breeding site locations for birds and protected and notable species.
Multi Agency Geographic Information for the Countryside (MAGIC) (Defra, 2022)	Up to 15 km	November 2022	15 km for European Sites, SSSIs and NNRs. 2 km for all other features (local statutory designations, ancient woodland, European Protected Species records, priority habitats).
Joint Nature Conservation Committee (JNCC) website (JNCC, 2022)	Up to 15 km	November 2022	Reasons for designation and other information on European and Ramsar sites.

[5] Sources of Desk Study Data of specific relevance to ornithology are outlined separately in Section 6.7, however it is noted that there will be some overlap in the use of certain sources of data across all of the ecology chapters.

DATA SOURCE	SEARCH AREA	ACCESSED / DATA RECEIVED	DATA OBTAINED
Natural England Designated Sites View website (Natural England, 2022b)	Up to 15 km	November 2022	Reasons for designation and other information on statutory designated sites.
Net Zero Teesside DCO, available on the Planning Inspectorate Website (AECOM, 2021)	Data Specific	November 2022	Habitat and species data.
Environment Agency Ecology and Fish Data explorer (EA, 2022d)	2 km	November 2022	Detailed count data for fish, records of aquatic macroinvertebrates, invasive species and aquatic plants.
National Biodiversity Network (NBN) Atlas explorer website (NBN Atlas, 2022)	2 km	November 2022	Species data

Statutory Designated Sites

6.6.6 As illustrated on Figure 13: Statutory Designated Sites within 15 km of the Proposed Development Site Boundary (Appendix A) there are the following European Sites, SSSIs and NNRs:

- Three SPAs:
  - Teesmouth and Cleveland Coast SPA, part of which falls within the Proposed Development Site;
  - North York Moors SPA, located approximately 7.9 km south-east of the Proposed Development Site; and
  - Northumbria Coast SPA, located approximately 10.4 km north-west of the Proposed Development Site.
- Three SACs:
  - North York Moors SAC, located approximately 7.9 km south-east of the Proposed Development Site;
  - Durham Coast SAC, located approximately 10.4 km north-west of the Proposed Development Site; and

  - Castle Eden Dene SAC, located approximately 13.5 km north-west of the Proposed Development Site.

- Two Ramsar sites:
  - Teesmouth and Cleveland Coast Ramsar site, part of which falls within the Proposed Development Site; and
  - Northumbria Coast Ramsar site, located approximately 10.5 km north-west of the Proposed Development Site.
- 20 SSSIs:
  - Teesmouth and Cleveland Coast SSSI, some of which is located within the Proposed Development Site;
  - Lovell Hill Pools SSSI, located approximately 2.4 km south-east of the Proposed Development Site;
  - Briarcroft pasture SSSI, located approximately 7.7 km west of the Proposed Development Site;
  - Roseberry Topping SSSI, located approximately 8 km south of the Proposed Development Site;
  - North York Moors SSSI, located approximately 8 km south-east of the Proposed Development Site;
  - Saltburn Gill SSSI, located approximately 8.2 km south-east of the Proposed Development Site;
  - Whitton Bridge Pasture SSSI, located approximately 8.3 km west of the Proposed Development Site;
  - Langbaurgh Ridge, located approximately 8.4 km south of the Proposed Development Site;
  - Cliff Ridge SSSI, located approximately 9 km south of the Proposed Development Site;
  - Durham Coast SSSI, located approximately 9.1 km north of the Proposed Development Site;
  - Hart Bog SSSI, located approximately 9.5 km north of the Proposed Development Site;
  - Pike Whin Bog SSSI, located approximately 10.4 km north-west of the Proposed Development Site;

- Kildale Hall SSSI, located approximately 11.6 km south of the Proposed Development Site;
- Hulam Fen SSSI, located approximately 12 km north of the Proposed Development Site;
- Castle Eden Dene SSSI, located 13.5 km north of the Proposed Development Site;
- Pinkney and Gerrick Woods SSSI, located approximately 13.6 km south-east of the Proposed Development Site;
- Fishburn Grassland SSSI, located approximately 13.8 km north-west of the Proposed Development Site;
- Charity Land SSSI, located approximately 13.9 km north-west of the Proposed Development Site;
- Newton Ketton Meadow SSSI, located approximately 14.6 km west of the Proposed Development Site; and
- Boulby Quarries SSSI, located approximately 14.9 km south-east of the Proposed Development Site.

- Three NNRs:
  - Teesmouth NNR, some of which is located within the Proposed Development Site;
  - Durham Coast NNR, located approximately 9.5 km north-west of the Proposed Development Site; and
  - Castle Dene NNR, located approximately 13.5 km north-west of the Proposed Development Site.

6.6.7 There are five LNRs within 2 km of the Proposed Development Site, namely:

- Cowpen Bewley Woodland Country Park LNR, part of which is located within the Proposed Development Site;
- Charlton's Pond LNR, located approximately 0.5 km west of the Proposed Development Site;
- Seaton Dunes and Common LNR, located approximately 1.3 km north-east of the Proposed Development Site;
- Billingham Beck Valley LNR, located approximately 1.4 km west of the Proposed Development Site; and

- Greatham Beck LNR, located approximately 1.8 km north-west of the Proposed Development Site.

Non-Statutory Designated Sites

6.6.8 There are 22 Local Wildlife Sites (LWS') within 2 km of the Proposed Development Site:

- Eston Pumping Station LWS and Greatham Creek North Bank Saltmarsh LWS, which are wholly located within the Proposed Development Site;
- Coatham Marsh LWS, Cowpen Bewley Woodland Park LWS, Greenabella Marsh LWS, Philips Tank Farm Grassland LWS and Saltern Saltmarsh LWS, which are partially located within the Proposed Development Site;
- Queens Meadow Wetland LWS, located approximately 0.2 km north of the Proposed Development Site;
- Tot Fenny's Meadow LWS, located approximately 0.4 km west of the Proposed Development Site;
- Billingham Norton Bottoms Reedbed Treatment System LWS, located approximately 0.7 km south of the Proposed Development Site;
- Brenda Road Sewage Works Grassland LWS, located approximately 0.7 km north of the Proposed Development Site;
- Norton Bottoms LWS, located approximately 0.8 km west of the Proposed Development Site;
- Brenda Road Brownfield LWS, located approximately 0.8 km north of the Proposed Development Site;
- Power Station Grassland and Wetland LWS, located approximately 0.9 km north of the Proposed Development Site;
- Teessaurus Park LWS, located approximately 0.9 km east of the Proposed Development Site;
- Seaton Common LWS, located approximately 1.1 km north of the Proposed Development Site;
- Wilton Woods Complex LWS, located approximately 1.2 km south of the Proposed Development Site;
- Portrack Meadows LWS, located approximately 1.3 km south of the Proposed Development Site;
- Zinc Works Bird Field LWS, located approximately 1.3 km north of the Proposed Development Site;
- Billingham Beck Valley Country Park LWS, located approximately 1.4 km west of the Proposed Development Site;

- Greatham Beck LWS, located approximately 1.6 km north-west of the Proposed Development Site; and
- Portrack Marsh LWS, located approximately 1.7 km south of the Proposed Development Site.

6.6.9 As part of the ecological desk study, the presence of all relevant non-statutory designated sites will be determined and the details will be provided with the PEI Report.

6.6.10 Other ecologically sensitive habitat sites such as RSPB reserves will also be identified through the ecological desk study and assessed within the EcIA.

Habitats

6.6.11 There are desk study records of the following known or potential terrestrial and freshwater Habitats of Principal Importance (HoPIs) within the Proposed Development Site:

- open mosaic habitat on previously developed land;
- coastal sand dunes;
- mudflats;
- coastal and floodplain grazing marsh;
- coastal saltmarsh;
- saline lagoons;
- ponds; and
- deciduous woodland.

6.6.12 The habitats present within the Proposed Development Site, including any HoPI, will be confirmed through the Phase 1 Habitat Survey. This survey will be undertaken with reference to the standard methodology (JNCC, 2010). The Phase 1 habitat survey results will be aligned with the modified UK Habitat (UKHab) Classification used for the purposes of Biodiversity Net Gain (BNG) site condition assessment with reference to the current iteration of the standard methodology (currently this is Biodiversity Metric 3.1 (Natural England, 2021)).

6.6.13 Habitat surveys will be completed for locations where permanent infrastructure may be constructed as part of the Proposed Development, along the proposed connection corridors, and temporary construction laydown areas. Data will also be collected for a 50 m buffer around the Proposed Development Site. The scope of the planned habitat surveys is set out in Table 6-3: Summary of Ecological Surveys and Data Collection (Including Ornithology and Aquatic Ecology).

Protected and Notable Species

6.6.14 It is anticipated that some habitats within the ZoI of the Proposed Development Site will have suitability to support protected and notable species including bats, badger *Meles*, otter *Lutra lutra*, water vole, reptiles *Arvicola amphibius*, great crested newt

Triturus cristatus, fish, aquatic macroinvertebrates and plants. While some desk study data is available for species, the coverage is partial and often there is a lack of precision on whether these species occur in relation to the Proposed Development Site. To address this a suite of species surveys will be completed as outlined in Table 6-3: Summary of Ecological Surveys and Data Collection (including Ornithology and Aquatic Ecology).

6.6.15 Great crested newt is scoped out as a protected species constraint for all parts of the Proposed Development Site located to the south of the River Tees. This approach has been informed by prior advice received in relation to the NZT project (as detailed in AECOM, 2021). For that project, the Industry Nature Conservation Association (INCA) advised that there are no known occurrences of great crested newt in the South Tees area of Redcar and Cleveland and that it is well established that great crested newt surveys are not required to support planning applications in the South Tees area. This species is to be considered further in relation to the parts of the Proposed Development Site located to the north of the River Tees.

6.6.16 The scope of the planned (and ongoing) ecology surveys is set out in Table 6-3. The survey methodologies will follow Natural England standing advice, CIEEM best practice guidance and industry guidance for protected species survey.

Invasive Non-Native Species (INNS)

6.6.17 Checks will be made for INNS during the habitat surveys and during the aquatic ecology surveys and will be listed in the subsequent reports for consideration in the EcIA.

Scope of the Assessment

6.6.18 The following potential impacts and their resulting effects on ecology and nature conservation features will be considered within the EcIA for the Proposed Development:

- temporary disturbance impacts and permanent loss and degradation of nature conservation designations and other relevant terrestrial habitats (including Functionally Linked Land) within the Proposed Development Site during construction, and within the wider ZoI where potential pathways for impact extend beyond the Proposed Development Site;
- direct and indirect impacts on relevant protected and notable species, e.g. as a result of injury, temporary or permanent lighting, habitat loss or noise and visual disturbance, during construction and operation;
- temporary water quality (sediment run-off, other possible emissions to water) and air quality impacts (dust emissions, emissions from construction traffic movements) on relevant habitats and species during construction; and
- long-term air quality impacts on nature conservation designations in the vicinity of, or downwind of, the Proposed Development Site during operation.

Table 6-3: Summary of Ecological Surveys and Data Collection (Including Ornithology and Aquatic Ecology)

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
Phase 1 habitat survey and Habitat Condition Assessment to inform Biodiversity Net Gain (BNG) Assessment.	A Phase 1 Habitat Survey will be conducted in accordance with the published method (JNCC, 2010). It will be supplemented by a BNG site condition assessment to meet data needs for subsequent BNG assessment. An assessment of habitat suitability for protected and notable species will also be made to inform the iterative scoping of detailed protected and notable species surveys. Record of Invasive Non-Native Species (INNS) of plants and incidental records of protected or priority species or their field signs will be made. The surveys will be supplemented by aerial habitat mapping. The information will confirm the ecological baseline and form the basis of the calculation of potential permanent and temporary habitat effects within the EcIA and for purposes of the BNG assessment.	Optimal time – April to October but can be carried out at any time of year.	Accessible terrestrial habitats within the Proposed Development Site.
Non-breeding birds within the scoping boundary and functionally linked land	Monthly wintering and passage surveys of terrestrial habitats and wetland (including intertidal and non-tidal) up to 1 km from the pipeline routes will be undertaken, using a variant of the Wetland	Between October 2022 and March 2023, and August – October 2023.[7]	Intertidal; tidal saltmarsh; other tidal and non – tidal wetland habitats; and terrestrial habitats up to a maximum of

[7] Initial engagement with Natural England on 14th February 2022 confirmed that a full season of wintering bird survey data would be required. Given the presence of qualifying features of the Teesmouth and Cleveland Coast Ramsar, SPA and SSSI all year round, agreement was reached that 12 months of survey data would be appropriate, supplemented where necessary by the available third party data available from multiple sources including (but not necessarily limited to) Natural England, the Environment Agency, INCA, ERIC Northeast and baseline data supporting other planning applications and DCOs within the Study Area.

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
	Birds Survey (WeBS)[6] method, supplemented with a 'look-see' or field count method. These will be carried out each month at low and high tides. Third party data from online sources and data providers will be used to supplement the baseline survey data. Includes all habitats that may be subject to permanent or temporary habitat losses and disturbance during construction and operation of the Proposed Development and for which sufficient data to inform impact assessment cannot be obtained from third parties.		approximately 1km[8] from the Proposed Development Site boundary.
Breeding birds within the Proposed Development Site and in functionally linked land	Monthly surveys using the above methodology would be completed. Spring passage birds will also be recorded during these surveys. Breeding bird surveys will be carried out within terrestrial habitats likely to support assemblages of breeding birds, using an appropriate methodology[9], at locations of permanent habitat loss and/or significant disturbance (such as locations of permanent above ground infrastructure and working areas where habitats capable of	Between March 2023 and July 2023.	As above for non-breeding birds. Survey areas for breeding terrestrial birds, if required, will be determined in more

[6] The Wetland Bird Survey (WeBS) is the long-term monitoring scheme for non-breeding waterbirds in the UK, which aims to provide the principal data for the conservation of their populations and wetland habitats. WeBS is a partnership between the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the last on behalf of Natural England, Natural Resources Wales, Scottish Natural Heritage and the Department of the Environment Northern Ireland) in association with the Wildfowl and Wetlands Trust. Core counts are synchronised monthly counts undertaken at wetlands throughout the UK. The surveys generate counts of water birds within pre-defined count sectors. Survey methods are available at BTO (n.d.)
[8] Plus some areas of permanently submerged offshore habitat adjacent to Coatham Sands and Bran Sands further than 1 km from the Proposed Development Site.
[9] Such as the Common Birds Census (Marchant, 1983).

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
	supporting breeding birds may be affected for extended periods of time).		detail as the Proposed Development design progresses.
Great crested newt – District Level licensing (DLL) and / or habitat suitability assessments.	In relation to the area of the Proposed Development Site to the north of the River Tees it is proposed to consult Natural England to confirm whether a DLL approach will be available for this project. If not, a desk-based exercise will be undertaken to map and categorise all waterbodies within 250m of the Proposed Development. Habitat Suitability Index (HSI) assessments of ponds in accordance with Oldham *et al.* (2000) will be undertaken. Data collected by the desk study and online information where this may be available (i.e. European protected species mitigation licence information and Natural England Open data sources, will also be reviewed).	Consultation with Natural England can be undertaken at any time. HSI assessments are proposed to be undertaken in combination with Phase 1 Habitat Survey where land parcels coincide.	All suitable waterbodies within 250m of proposed connection corridors.
Great crested newt presence / likely absence survey and population assessment surveys	In relation to the area of the Proposed Development Site to the north of the River Tees (proposed connection corridors). Where possible, environmental DNA (eDNA) surveys will be undertaken in accordance with the protocols as set out by Biggs *et al*. (2014). Where eDNA survey may not be practicable at specific waterbodies (e.g. water too shallow for sampling) consideration of the need to undertake traditional presence/absence survey techniques will be made. Where necessary standard presence/absence surveys utilising four visits will be undertaken in accordance with the standard survey methodology (English Nature, 2001). Population size class assessment surveys will be completed where this species is confirmed present (six survey visits of waterbodies with positive eDNA result or known to support this species based on desk-based data) in accordance with standard guidance (English Nature, 2001; Natural England, 2022a).	eDNA: 15th April to 30th June 2023. Traditional presence/ absence surveys: Mid-March to mid-June 2023. These surveys may need to be commenced prior to receipt of eDNA survey results being received in order to achieve required timings.	Suitable waterbodies within 250 m of the Proposed Development Site north of the Tees. The locations of ponds requiring survey will be informed by the outcome of the HSI and eDNA.

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
Bats - Preliminary Roost Features (PRF) assessment	Permanent impacts on trees will be avoided where possible. Trees to be directly impacted will be subject to a PRF assessment survey in accordance with The Bat Conservation Trust (BCT) guidance (Collins *et al*., 2016). Should a structure or building be impacted this will also be subject to PRF assessment in accordance with BCT Guidance (Collins *et al.*, 2016). Information collated on the location of trees that are suitable for roosting bats will inform design and offset buffers to avoid direct effects upon potential roost sites. Furthermore, the PRF assessment information will form the basis of the scope for roost surveys (as detailed below).	Any time of year.	The Phase 1 habitat survey will inform the extent of areas requiring PRF assessment.
Bats – Foraging / Commuting	Habitats will be appraised for their suitability to support foraging and commuting bats during the extended Phase 1 habitat survey. Activity surveys will be undertaken with reference to published guidance (Collins *et al.*, 2016) only where permanent effects upon suitable habitats are predicted. It is not considered necessary to undertake detailed bat activity surveys along the connection routes given the temporary nature of habitat loss, and the avoidance of the removal of mature trees or other structures which may support roosting bats. Where linear habitat features (e.g. watercourses/hedgerows) are affected by the Proposed Development, but which may provide commuting routes or a foraging resource for bats, appropriate robust and precedented mitigation measures can be secured via adoption of construction methods that seek to avoid these features and reduce the temporary effects to a level that would not be significant. Therefore, surveys are not considered necessary.	If required: April/May to September 2022 inclusive.	Limited to areas of suitable habitat which will be permanently lost to facilitate the Proposed Development.
Bats – roosting	It is likely that the Proposed Development will be able to avoid trees with PRFs that have potential to support a bat roost. However, where this is not possible, trees will be subject to climbing and assessment of	Any time of year. If required, between	Features with bat roost suitability identified

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
	the identified PRF features where safe to do so, to confirm if the tree could be used as a roost and/ or if there are signs of bats. Where tree climbing confirms that the PRF does have potential to support a roost and/or where it is not possible to safely climb a tree, bat emergence/re-entry surveys will be undertaken at dusk and dawn in accordance with standard survey guidance (Collins *et al.*, 2016; Bat Conservation Trust 2022). To determine appropriate mitigation, and EPSM licensing requirements, if necessary, where trees with confirmed/potential bat roosts cannot be entirely avoided.	April/May and September 2023.	during the Phase 1 Habitat Survey.
Badger	A presence/absence survey for setts and field signs will be conducted in combination with the Phase 1 habitat survey. The survey will focus on habitat suitable to support setts. Incidental records obtained through desk study data in combination with the completion of other surveys will also supplement the baseline assessment.	Any time of year – and will be combined with the Phase 1 Habitat Survey.	The Proposed Development Site plus a 50 m buffer.
Otter and Water Vole	Presence/absence surveys based on Dean *et al.* (2016) and Chanin (2003) will be conducted to , looking for field signs along watercourses and ditches where open cut crossing techniques will be required, will be conducted. A spring survey will be completed, with a second survey as required to confirm presence/ likely absence.	Otter surveys can be completed at any time. Water Vole – spring survey before end of June 2023; and if required a second survey before end September 2023.	Up to 500 m length of the watercourse – 250 m up and down stream of crossing point.
Reptiles	A desk-based habitat assessment (using aerial mapping and data sources for reptile records/mapping for the area/county) will be undertaken to highlight potential areas of interest for reptiles within the Proposed Development Site. These areas will then be subject to assessment for their potential to support reptiles as part of the Phase 1 Habitat Survey based on technical guidance by ARC Trust (Sewell *et al.*, 2013).	If required: Optimal – April to middle of June and September. However, surveys will be carried out between April and September inclusive	Only likely required at potential permanent infrastructure locations – subject to the findings of the Phase 1 Habitat Survey.

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
	Where habitats appear suitable for reptile populations and are to be permanently affected by the Proposed Development, presence/absence surveys will be undertaken following guidance provided by in Froglife Advice Sheet 10: Reptile Surveys (Froglife, 1999). Survey involves laying refugia (carpet tiles/roof felts) and leaving them in situ for 1-3 months. They will be checked 7 times and then removed after the last survey. Presence/absence reptile surveys will only be considered warranted where areas of moderate/ high value reptile habitat cannot be avoided by the Proposed Development. These data will inform the EcIA and mitigation strategy. Temporary construction effects upon small areas of suitable reptile habitat will be able to be mitigated through appropriate pre-construction measures (e.g. supervised vegetation clearance at an appropriate time of year).	depending on the weather.	
Freshwater species (Aquatic Ecology)	The scope and requirements for specific surveys will be informed by an aquatic scoping survey, and would consider requirements for surveys of ditches, watercourses, and ponds within the Proposed Development Site. The initial scoping surveys will identify where further surveys are required for fish, aquatic macroinvertebrates, aquatic plants, and pond Predictive System of Multimetrics (PSYM), including INNS.	Macroinvertebrates: Spring (April – May 2023) and Autumn (November 2022); Macrophytes: June – September 2023; Pond PSYM: Summer (June – August 2023).	Waterbodies within the Proposed Development Site that are likely to be impacted.
Terrestrial Invertebrates	The scope of survey will depend upon the habitat type and target invertebrate species. Requirements for invertebrate surveys will be reviewed as part of the desk study/extended Phase 1 Habitat survey scope.	If required, surveys will be completed between April and September.	Subject to findings of the Phase 1 Habitat Survey and value of habitats to terrestrial invertebrates – focused on areas of permanent habitat loss.

SURVEY	SCOPE	SURVEY TIMING	SURVEY EXTENTS
Plants	Surveys for protected and notable plants would be undertaken if appropriate based on the findings of the habitat surveys. Any specific relevant occurrences of notable plants identified by the desk study would also be targeted for survey. Pond plants will be identified as part of the pond PSYM method which requires the identification of aquatic plants and macroinvertebrates. Aquatic plant INNS will also be assessed.	Summer 2023 (June-August 2023).	Relevant habitats as identified by the Phase 1 Habitat survey. Locations indicated by the desk study results. Accessible ponds within the Proposed Development Site that are likely to be impacted.

6.6.19 Considering the above, an assessment of terrestrial and freshwater ecology and nature conservation is scoped into the future impact assessment.

6.6.20 The EcIA will be undertaken in accordance with good practice guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2022). It will not be necessary in the assessment to address all ecological features with potential to occur, and instead the focus should be on those that are 'relevant'.

6.6.21 CIEEM (2022) makes clear that there is no need to "*carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*". This does not mean that efforts would not be made to safeguard wider biodiversity, and requirements in support of this would be considered. National policy documents emphasise the need to achieve no net loss of biodiversity and enhancement of biodiversity.

6.6.22 The results of the ecological desk study, the habitat and species surveys, and the outcomes of any consultation responses will be used to inform the relevant ecological features to be addressed in the EcIA.

6.6.23 To support focussed EcIA there is a need to determine the scale at which the relevant ecological features are of value. Consistent with good practice (CIEEM, 2022), the value of each relevant ecological feature will be defined with reference to the geographical level at which it matters. The frames of reference used for this assessment are therefore:

- International (typically this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (North-East England);
- County (Tees Valley);
- District (Redcar and Cleveland, Stockton-on-Tees and Hartlepool);
- Local (features that do not meet criteria for valuation at a District or higher level, but that have sufficient value at the site level to merit retention or mitigation); and
- Negligible (common and widespread features that have very low value at the level of the Proposed Development Site, and which do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status, or to deliver wider relevant biodiversity objectives and can be screened out).

6.6.24 Design and impact avoidance measures will be used to inform the assessment of likely significant effects. These measures will be defined later in the EIA process but would include consideration of options to minimise impacts to relevant terrestrial and freshwater ecology features or otherwise to achieve legislative compliance (e.g. in relation to dust management or water quality). Measures during construction,

including best practice, will be included and implemented through the CEMP or permitting regimes.

6.6.25 Any remaining significant adverse effects will be mitigated or compensated for, and ecological enhancements may be recommended where appropriate. Following the implementation of mitigation and compensation, any residual effects on relevant ecological features will be identified.

6.6.26 The scope of assessment set out above would be applied whether Main Site A or B (and their associated corridors) are taken forward to the final development design. The specific survey requirements relevant to the Main Sites may differ slightly, but overall, the approach to the assessment for both sites would be the same.

Habitats Regulations Assessment

6.6.27 A HRA will be undertaken to assess whether the Proposed Development is likely to have a significant effect on European Sites. The need to undertake HRA is implemented in English and Welsh law by the Conservation of Habitats and Species Regulations 2017 (as amended).

6.6.28 Stage 1 of the HRA process (Test of Likely Significant Effects) will consider the potential pathways of effect between the Proposed Development and European Sites within 15 km of the Proposed Development Site (on the basis that it is unlikely that a project such as this will affect sites further afield), and whether there is potential to have a significant adverse effect on the integrity of the European Sites, either alone or in combination with other plans or projects. Information used to support the HRA process will include desk study data and the results of relevant species surveys outlined in Table 6-3 (as well as the surveys identified below in Section 6.7: Ornithology and Section 6.8: Marine Ecology).

6.6.29 Where there is potential for the Proposed Development to have a significant effect upon the qualifying features of European Sites, the pathway will be taken forward to Stage 2 – Appropriate Assessment. At Appropriate Assessment, the measures that will be implemented to either avoid the impact in the first place, or to mitigate the ecological effect to such an extent that it is no longer significant, will be set out.

6.6.30 The HRA will be prepared in line with Planning Inspectorate (2022) Advice Note 10 (Habitats Regulations Assessment) including completion of the necessary matrices. The HRA process will be in line with the EIA process. There would be a 'Test of Likely Significant Effects Report' at the PEI Report stage, and this will be updated as necessary for the Application including a report to inform Appropriate Assessment, if required.

6.6.31 The scope of the report to inform the HRA will be determined through consultation with Natural England and other key stakeholders. It is recognised that HRA is a multi-stage process and, therefore, the Applicant will continue to consult with Natural England as the HRA progresses.

Biodiversity Net Gain Assessment

6.6.32 Schedule 15 of the Environment Act 2021 makes provision for BNG in relation to development consent for NSIPs. The requirement for BNG for NSIPs will not become mandatory until 2025, however this project will aspire to achieve a net gain in

biodiversity. A BNG assessment will be undertaken for the Proposed Development in accordance with the published Natural England (currently this is Biodiversity Metric 3.1 (Natural England, 2022c)).

6.7 Ornithology

Baseline Conditions

Statutory and Non- Statutory Designated Sites

6.7.1 The statutory and non-statutory designated sites relevant to ornithology are summarised in Section 6.6: Ecology and Nature Conservation and are not repeated here.

Species

6.7.2 Preliminary baseline data gathering was carried out to inform the initial design phase of the Proposed Development, between August 2021 and March 2022, by means of a desk study and a limited suite of non-breeding wetland bird surveys.

6.7.3 Sources of desk study information are summarised in

6.7.4 Table 6-4.

Table 6-4: Sources of Desk Study Data Relevant to Ornithology[10]

DATA SOURCE[11]	SEARCH AREA[12]	ACCESSED/DATA RECEIVED	DATA OBTAINED
Environmental Records Information Centre (ERIC) North East	Up to 2 km	11th August 2021	Bird records
Industry Nature Conservation Association (INCA)	Data specific	23rd March 2022	Bird records, roost and breeding site locations for several species.

[10] As outlined in Section 6.6: Ecology and Nature Conservation (Table 6-2) there will be some overlap in the use of certain sources of data across all of the ecology chapters so not all are repeated here again.
[11] Further data will be requested, as required, to address the current extent of the Proposed Development, as stated in paragraph 6.1.213
[12] Search areas are expressed as a radius from the collective boundaries of the preliminary Proposed Development area identified in January 2022 which was larger than the Proposed Development Site. WeBS data are typically requested for a minimum of 500 m from the Proposed Development, however this distance is adjusted where appropriate to account for continuity and connectivity of habitats, the spatial context of WeBS count sectors in relation to the Proposed Development, consistency and/or age of count data and the Zone of Influence of potential impacts of the proposed Development.

DATA SOURCE[11]	SEARCH AREA[12]	ACCESSED/DATA RECEIVED	DATA OBTAINED
British Trust for Ornithology Wetland Birds Survey (WeBS) (BTO, 2022)	Data specific	10th May 2022	Detailed count data for wetland birds occurring within selected wetland habitat count areas across Teesside.

6.7.5 Wetland bird counts were completed between January and March 2022 (inclusive), within the broad areas summarised in Table 6-5.

Table 6-5: Summary of Ornithology Surveys Completed to Date

SURVEY AREA	JANUARY 2022	FEBRUARY 2022	MARCH 2022
The Foundry (Main Site) and adjacent coastal/wetland habitats	1 High Tide 1 Low Tide	2 High Tide 2 Low Tide	2 High Tide 2 Low Tide
Seal Sands Bay and adjacent coastal/wetland habitats	No surveys	2 High Tide 2 Low Tide	2 High Tide 2 Low Tide

6.7.6 The entirety of the Teesside coast can be considered to support significant populations of non-breeding birds and populations of some breeding water birds for which the Teesmouth and Cleveland Coast SPA, Ramsar and SSSI are designated. Furthermore, the baseline data gathered to date have identified some locations or broad areas in proximity to the Proposed Development Site that are very sensitive due to the reliance of birds on them during either during potentially adverse tide and/or weather conditions, or on a regular basis irrespective of the conditions.

6.7.7 Within the Foundry survey area these include:

- Dabholm Gut, which supports large numbers of feeding waders and ducks;
- Bran Sands Lagoon, which supports roost a range of roosting and feeding waders, ducks and gulls;
- Bran Sands Bay, which regularly supports feeding waders and other water birds, and includes several regularly used roosts; and
- the northern edge of Coatham Dunes and the wider coastline of Coatham Sands, which provides feeding and roosting habitat for several species of wader, terns and a wide range of other water birds.

6.7.8 Within the Seal Sands survey area these include:

- the entirety of Seal Sands Bay and its periphery, including the sea wall and the promontory/spit of land at its eastern extent and some of the grasslands immediately to the south of the bay, which are used predominantly by roosting and feeding waders;

- Greenabella Marsh, to the west of the bay, the pools within which are used by several species of feeding and roosting waterbirds, and by several species of breeding water bird; and
- the pools and grasslands immediately south-west of the bay, which support feeding and roosting waders.

6.7.9 West of Seal Sands, the area collectively known as the North Tees Marshes, which includes Greatham Creek channel and the adjacent expanses of saltmarsh, supports large numbers of feeding and roosting waders, ducks, geese and other water birds, plus colonies of breeding waders and terns.

6.7.10 The baseline data gathered to date suggest that neither of the main sites being considered support more than small numbers of coastal and wetland birds, however some differences between the two sites can be determined at this stage. Main Site A supports very little semi-natural habitat and is within an area subject to ongoing industrial workings, building demolition, vehicle movements and continuous disturbance from human activity. The only species recorded in this area during wetland bird counts have been small numbers of gulls, mostly within the northern half of the site during high tide surveys. Herring gull (*Larus argentatus*) and black-headed gull are qualifying assemblage species of Teesmouth and Cleveland Coast SPA in winter.

6.7.11 Main Site B supports worked areas and infrastructure in its southern half and, along it's northern edge, semi-natural habitats including grassland, a small pond with reedbed, scattered scrub and open mosaic habitat immediately adjacent to the mouth of the River Tees and Seal Sands Bay. Wetland bird counts to date have detected larger (albeit still small) numbers of birds in these areas, including occasional gull roosts and the presence of feeding and roosting waders including curlew (*Numenius arquata*) and oystercatcher (*Haematopus ostralegus*) in small numbers. Larger numbers of water birds, predominantly waders and ducks for which Teesmouth and Cleveland Coast Ramsar, SPA and SSSI are designated, were recorded within adjacent intertidal habitats.

6.7.12 However, overall the baseline conditions as outlined above apply and are relevant to both Main Site A and Main Site B.

Scope of the Assessment

6.7.13 The Proposed Development Site is located predominantly onshore (i.e., within terrestrial habitats). However, some elements of the Proposed Development are proposed beneath, through or within estuarine and wetland habitats including intertidal habitat, tidal saltmarshes and land-locked non-tidal wetlands, plus adjacent terrestrial non-wetland habitats that may support foraging or roosting water birds.

6.7.14 Further baseline data will be gathered as per the methods and within the areas summarised in Table 6-3 to 6-4, including further surveys as outlined. This includes all of the habitats surveyed previously, plus a wider area that includes more habitat

to the north-west, west and south of the Proposed Development Site, including the North Tees Marshes.

6.7.15 The ornithology chapter will assess the potential impacts and effects on relevant bird designations and bird species (hereafter 'relevant bird features') as a result of the Proposed Development. The methodology will be the same as that described in Section 6.6: Ecology and Nature Conservation.

The potential impacts of the Proposed Development on relevant bird features will include those arising from construction and operation. The following potential impacts and effects will be considered in the ornithology chapter:

- the effects on birds resulting from temporary impacts to and degradation of habitats within the Proposed Development Site during construction, including impacts from sediment run-off to surface waters;
- temporary disturbance of birds, principally through noise, visual, and dust emissions from construction traffic and other construction related activities;
- permanent losses or degradation of habitats used by nesting, roosting, and feeding birds during construction of new infrastructure;
- disturbance of habitats and protected species (including noise and light impacts) in the vicinity of the Proposed Development during operation; and
- long-term air quality impacts on designated habitats of importance for relevant birds in the vicinity of the Proposed Development Site during operation.

6.7.16 These potential impacts on relevant bird features will be assessed in accordance with the current good practice methodology for EcIA described in Section 6.6: Ecology and Nature Conservation.

6.7.17 The results of the ornithological desk study, further bird surveys, and outcomes of any consultation responses will be used to inform the EcIA. The assessment will also be informed by the findings of the other specialist assessments, such as those to be reported in the chapters for Noise, Air Quality, Surface Water, Flood Risk and Water Resources, Terrestrial Ecology and Marine Ecology. The findings of the HRA will also be considered.

6.7.18 Design and impact avoidance measures will be used to inform the assessment of likely significant effects. These measures will be defined later but for ornithology this is likely to include (but is not necessarily limited to) the following measures:

- consideration of routeing of proposed connection corridors to utilise existing above ground and/or underground infrastructure to limit the excavations and construction activities required and therefore habitat losses and disturbance to species and habitats;
- routeing of proposed connection corridors, where these require new infrastructure, to avoid sensitive habitats and areas of regular bird occurrence such that the potential impacts on relevant ornithological receptors are avoided or reduced to levels that are not significant;

- implementing measures to deliver compliance with industry good practice and environmental protection legislation during construction, e.g., prevention of surface and ground water pollution, fugitive dust management, and noise prevention or amelioration. These would be implemented through the CEMP or permitting regimes; and
- planning clearance of habitats suitable for breeding birds during site preparation to be undertaken outside the breeding season (typically March-August inclusive for most species), where possible.

6.7.19 Once design and impact avoidance measures have been taken into consideration any remaining significant adverse effects will be mitigated or compensated for, and ecological enhancements recommended where appropriate. Mitigation and enhancement proposals will consider wider strategic aims and options for mitigation of development in the Teesside / Redcar and Cleveland and Hartlepool areas. Following the implementation of mitigation and compensation, any residual effects on ecological receptors will be identified.

6.7.20 The scope of assessment set out above would be applied whether Main Site A or B (and their respective connection corridors) are taken forward to the final development design.

6.8 Marine Ecology

Baseline Conditions

6.8.1 The Study Area for marine ecology has a particular focus on Greatham Creek, Seaton Channel and Seal Sands as well as the Tees Estuary further downstream. Although no works are proposed within the Tees Bay area, further consideration has been given to the North Sea (including Tees Bay) for receptors with larger extents and / or greater mobility, such as fish and shellfish and marine mammals. A summary of the marine ecology baseline conditions within the Study Area is provided below. Note that the Study Area used is defined as including the likely ZoI where potential significant effects may arise from the Proposed Development. The ZoI, and therefore also the Study Area, is specific to each receptor, recognising both the mobility of each receptor and the likely impact pathways.

Benthic Ecology

6.8.2 The Study Area consists of extensive intertidal and subtidal estuarine soft sediment. Habitat mapping undertaken by the JNCC (2019) and the Environment Agency (2022c) identified Greatham Creek to consist of littoral mud (EU Nature Information System (EUNIS) A2.3), with saltmarsh habitat (EUNIS A2.5) embanking the creek. These habitats were also record at Seal Sands, including patches of littoral sand and muddy sand (EUNIS A5.2) and a small area of eulittoral boulders and stable mixed substrata (EUNIS A1.323). The seabed at Seaton Channel and in the River Tees consisted of estuarine sublittoral mud (EUNIS A5.32). Habitats with higher contents of sand, such as infralittoral fine sand (EUNIS A5.23), infralittoral muddy sand (EUNIS A5.24), and littoral mobile/fine sand shores (EUNIS A2.22 / A2.23) occur at the mouth

of the river and in Tees Bay. Small patches of mussel and subtidal kelp beds have been recorded at South Gare Breakwater, including at the mouth of the estuary.

Fish and Shellfish

6.8.3 The River Tees and Estuary is an important water body for diadromous fish species which make seasonal migrations between the sea and riverine environment. Atlantic salmon (*Salmo salar*), sea trout (*Trutta trutta*), European eel (*Anguilla anguilla*), river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*) are all known to be present and have been identified as Local Priority Species within the Tees Valley Biodiversity Action Plan (BAP), now listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The River Tees is also considered a main salmon river in England and Wales (Centre for Environment, Fisheries and Aquaculture Science (Cefas) *et al*., 2022). It has been presumed at this stage that these species may also use Greatham Creek, although there are no data to support this (such as on the Environment Agency (2022d) ecology and fish data explorer).

6.8.4 Estuarine and marine fish communities within the lower reaches of the River Tees and coastal waters represent a mixed demersal and pelagic fish assemblage typical of the central North Sea. Species such as sprat (*Sprattus sprattus*), herring (*Clupea harengus*), are plaice (Pleuronectes platessa) are most prevalent, as are lesser sand eel (*Ammodytes tobianus*) in Tees Bay. Fisheries sensitivity maps (Coull et al., 1998; Ellis et al., 2012) indicate that the Study Area is located within the nursery grounds of the following species: herring, sprat, cod (*Gadus morhua*), whiting (*Merlangius merlangus*), plaice, Nephrops sp., lemon sole (*Microstomus kitt*) and spurdog (*Squalus acanthias*). The Proposed Development Site also includes spawning areas of lemon sole and Nephrops. These spawning and nursery grounds are considered to be present mostly in the surrounding coastal areas, although some species may occur in the estuary.

Marine Mammals

6.8.5 The Proposed Development Site is located within the International Council for the Exploration of the Sea (ICES) Greater North Sea Ecoregion, which in part forms the boundaries for the Inter-Agency Marine Mammal Working Group (IAMMWG) marine mammal Management Units (MUs) for the North Sea (ICES, 2021; IAMMWG, 2022). Within this ecoregion, four species of cetacean occur commonly or are resident.

6.8.6 These are: harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*), minke whale (*Baleanoptera acutorostrata*) and white-beaked dolphin (Lagenorhynchus albirostris). An additional five species occur regularly in the ecoregion but are less common: short-beaked common dolphin (*Delphinus delphis*), Atlantic white-sided dolphin (*Lagenorhynchus acutus*), long-finned pilot whale (*Globicephala melas*), killer whale (*Orcinus orca*), and Risso's dolphin (*Grampus griseus*). However, it is considered unlikely that these species will occur in the River Tees itself, although harbour porpoise could occur in the surrounding coastal waters, such as in Tees Bay.

6.8.7 The Study Area is an important area for harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*), falling within the North East England seal management unit

(SMU)[13] for both species (Special Committee on Seals (SCOS), 2021). Seal Sands is of particular importance as the intertidal mudflat hosts a breeding colony of harbour seals, supporting 100 – 140 harbour seals during the summer period (Bond, 2019). Harbour seals are also known to haul-out at Bailey Bridge and Greatham Creek. Grey seal are also present at Seal Sands, where up to 40 individuals may be hauled-out in the summer period (Bond, 2019).

Designated Sites

6.8.8 As outlined in Section 6.6: Ecology and Nature Conservation, the Proposed Development Site is situated within close proximity to statutory designated sites for nature conservation including (but not limited to) the Teesmouth and Cleveland Coast SPA, Ramsar site and SSSI, and the Teesmouth NNR.

6.8.9 These sites are designated for the protection of breeding and non-breeding bird species and other important waterfowl species which includes a range of coastal habitats (sandflats and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) within and around the Tees Estuary, Seal Sands, and Greatham Creek.

6.8.10 The Teesmouth and Cleveland Coast SSSI encompasses a number of previously designated SSSI sites, including the Seal Sands SSSI, which protects the breeding population of harbour seal (*Phoca vitulina*) at this location (as does the Teesmouth NNR).

6.8.11 The Study Area does not overlap with any other European Sites or MCZs designated for marine species and habitats. The Southern North Sea (SNS) SAC, which is designated for harbour porpoise, is located over 100km away from the Proposed Development Site. The SNS SAC has been scoped out from further assessment, as there is considered to be no pathway for effect to this designated site.

Marine Specific Ecological Surveys and Data Collection

6.8.12 Following a review of available data, no project specific marine ecology surveys are proposed.

6.8.13 The presence of harbour and grey seals in the Study Area is well known, including abundances, seasonality, and the known haul-out locations for these species. Therefore, no effort-based surveys for marine mammals have been proposed. However, incidental sightings of seals at Seal Sands and Greatham Creek will be recorded as part of the breeding and non-breeding bird surveys proposed for the Proposed Development and will continue to be observed and recorded. This includes information on the species, their location, abundance, the presence of pups, and if seals are moulting.

[13] The SCOS SMUs have been used in preference to OSPAR Regions, as the SMUs are based on expert knowledge and opinion of seal ecology in the UK, using the most pragmatic approach to management of seals, without inferring discrete populations (SCOS, 2021).

6.8.14 Benthic ecology within the Study Area is well understood, through existing surveys undertaken by the JNCC (2019) and the Environment Agency (2022c), and the subtidal and intertidal benthic surveys completed for the NZT Project in the River Tees and Tees Bay. Open trench construction methodologies in the marine environment are not proposed within the Hydrogen Pipeline Corridor at Greatham Creek. Instead marine crossings will use trenchless technologies or existing pipeline bridges. These methods would result in the avoidance of most impact pathways to benthic habitats and species and would negate the requirement for further surveys. This will continue to be reviewed as the design progresses and following any input or requirements from statutory consultees such as Natural England and the MMO.

6.8.15 Key data sources used for the assessment will include, but not be limited to:

- habitat mapping undertaken by the JNCC (2019) – Marine Nature Conservation Review (MNCR) area summaries and the Environment Agency (2022c) – saltmarsh zonation and extent in England;
- European Marine Observation Data Network (EMODnet, 2021) Seabed Habitats Project for broad-scale habitat maps of the Study Area;
- EUNIS (European Environment Agency, 2012) for classifying benthic habitats;
- Environment Agency (2022d) ecology and fish data explorer, including Transitional and Coastal (TraC) Fish Count data;
- spawning and nursery grounds for UK waters (Coull *et al.,* 1998; Ellis *et al.,* 2012);
- Salmon Stocks and Fisheries in England and Wales (Cefas, 2022);
- Salmonid and fisheries statistics for England and Wales (Environment Agency, 2022e);
- fish landings data for the period 2016-2020 (MMO, 2020);
- ICES publications and data (ICES, 2022);
- shellfish classification zones of England and Wales (Cefas, 2022);
- SCANS (Small Cetacean Abundance in the European Atlantic and North Sea) data (Hammond *et al.,* 2021);
- IAMMWG publications (IAMMWG, 2022);
- Sea Mammal Research Unit (SMRU) (http://www.smru.st-andrews.ac.uk/) and Special Committee on Seals (SCOS) (2021);
- Habitat-based predictions of at-sea distributions for grey and harbour seals in the British Isles (Carter *et al.,* 2020);
- INCA Tees Seals Research Programme publications (Bond, 2019);
- academic papers and online reports as available for Study Area;
- designated sites condition assessments as available; and

- existing reference baseline data (where available and relevant) from other developments in the area (e.g. NZT Project will be used as background information).

6.8.16 There are no substantive differences in the baseline conditions between Main Site A and Main Site B and their respective connection corridors, with the exception that Main Site B is located closer to the Tees Estuary and Tees Mouth. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.8.17 During the construction of the Proposed Development there may be the requirement activities that would occur below MHWS, in the marine environment. At this stage, there are various construction methodologies being considered by the Applicant, but these may include the following below MHWS:.

- a crossing under of the River Tees for the proposed Hydrogen Pipeline Corridor; and
- a potential crossing of Greatham Creek for the proposed Hydrogen Pipeline Corridor (which connects further upstream to Claxton Beck) at multiple locations (including close to Seaton on Tees Channel Delta and Seal Sands), to the north-west of the Proposed Development Site.

6.8.18 Main Site A is located approximately 1 km east of the River Tees and approximately 0.7 km south of the North Sea (Tees Bay). Although the Proposed Development Site is above MHWS, it still has the potential to have effects on marine ecology and has been considered further below. Main Site B is located approximately 0.1 km east of the River Tees, and approximately 1.1 km south of the North Sea.

6.8.19 As outlined in Section 3.5: Hydrogen Pipeline, feasibility and design work on routeing options, and construction methodologies to be used within the Hydrogen Pipeline Corridor is ongoing. Currently it is proposed that the crossing under the River Tees would be constructed using either an existing pipeline/tunnel or by HDD or a MBT, thereby minimising disturbance during construction. The effects of noise and vibration on marine ecological receptors as a result of construction at this location has therefore been scoped out in.

6.8.20 For other sections of the Hydrogen Pipeline Corridor where it crosses Greatham Creek, various construction methodologies are being considered, including the use of the existing pipeline bridge close to Seal Sands, and below ground trenchless technologies (i.e., using HDD or a MBT). However, open-cut trenching is not being considered for the crossing of the Greatham Creek.

6.8.21 Given that many design elements of the Proposed Development have yet to be confirmed, development design and impact avoidance measures have not been finalised at this stage. Appropriates measures will be discussed with statutory consultees and stakeholders as the DCO progresses, including in particular with the MMO.

6.8.22 The Marine Ecology PEI and ES chapters will be completed in accordance with the CIEEM Guidelines for Ecological Impact Assessment (EcIA) in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2022). The method will be tailored to reflect the specific conditions of the marine environment, to ensure the high levels of movement of marine receptors between habitats and populations, are considered fully.

6.8.23 Permanent removal of habitat in the intertidal is not currently proposed. However, if this approach changes, consideration will be given to the requirements of the Environment Act 2021. This will include a BNG assessment which will be undertaken for the Proposed Development in accordance with the published Natural England Biodiversity Metric 3.1 (Panks *et al.*, 2022).

6.8.24 The marine ecology assessment will consider the construction, operation, and decommissioning of the Proposed Development. At this stage, there is not considered to be a pathway for effects to marine ecology as part of the operational phase of the Proposed Development, whilst effects during the decommissioning phase are considered to be the same (or less) than those during construction.

The below potential impact pathways and their resulting effects on marine ecological receptors will be considered in relation to the Proposed Development.

Direct Loss and Physical Disturbance to Habitats and Species Under the Footprint of the Marine Construction Works

- Open cut trenching within the Hydrogen Pipeline Corridor with crossings at Greatham Creek is not proposed as it could result in the temporary loss of benthic habitats and species at these locations.
- The use of trenchless technologies (i.e., HDD and MBT) and existing pipeline bridges, would result in the avoidance of this impact pathway. Non-intrusive crossings also involve excavations each side of riverbanks. However, these would be set back from the channel far enough that construction works could not cause bank instabilities and effects to nearby marine habitats and species as an embedded mitigation measure.

Physical Disturbance to Benthic Habitats and Species from Increased Suspended Sediment Concentrations (i.e. Increased Turbidity and Deposition)

- Open cut trenching at Greatham Creek is not proposed as it could result in the mobilisation of fine sediment at this location, which could be transported and deposited on habitats further downstream, such as saltmarsh and intertidal mudflats surrounding the embankments of the creek and at Seal Sands.
- Furthermore, sediment bound contaminants may also be released, although concentration of contaminants in the sediment at these locations is unknown.
- The use of trenchless technologies (i.e. HDD and MBT) and the existing pipeline bridge, would result in the avoidance of this impact pathway.

Indirect Effects to Marine Ecology from Changes in Marine Water Quality (Excluding Turbidity)

- Pollution of the River Tees and surrounding watercourses could occur due to spillages or polluted surface water run-off from construction activities as part of the Proposed Development (if an appropriate Environmental Management Plan is not adhered to and materials are not appropriately stored). These discharges have the potential to alter water quality in terms of physico-chemical, biological and chemical parameters with indirect effects to marine ecology.

Changes in the Airborne Soundscape and Visual Disturbance During Construction

6.8.25 Marine and land-based construction activities associated with the Proposed Development will create airborne sound and changes in visual cues which has the potential to disturb seals that have surfaced or have hauled out. This is particularly true of any works close to Seal Sands and Greatham Creek, where seals are known to occur.

6.8.26 It is likely that measures can be implemented either within the design of the Proposed Development or as additional mitigation to ensure no residual significant effects however as this will need to be assessed further within the noise and marine assessments and is scoped into the assessment at this stage.

6.8.27 Underwater sound has been scoped out from further assessment, on the basis of that the use of vessels has not been proposed; drilling / piling in the marine environment is not likely to be required; and Unexploded Ordnance (UXO) clearance is considered unlikely. There is also considered to be no pathway for effect for INNS.

6.8.28 The results of a full review of the available baseline data, and outcomes of any consultation responses will be used to inform the marine ecology assessment. Once the marine baseline for the Proposed Development has been fully described, any relevant marine ecology receptors that are likely to be significantly impacted by the Proposed Development will be identified.

6.8.29 Once design and impact avoidance measures have been taken into consideration any remaining significant adverse effects will be mitigated or compensated for and ecological enhancements recommended where appropriate. Following the implementation of mitigation and compensation, any residual effects on ecological receptors will be identified.

6.8.30 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.9 Traffic and Transportation

Baseline Conditions

6.9.1 The main route to the Proposed Development Site will be via the existing access/industrial roads from the A1085 trunk road, with access onto the wider local network and the A19 via the A66, A1053 and A174.

6.9.2 There are no PRoWs within Main Site A or B. The Teesdale Way long distance route runs adjacent to the northern boundary of the Main Site A and approximately 0.4 km north east of Main Site B.

6.9.3 There are 16 PRoWs within the Proposed Development Site, namely:

- bridleway 116/10/2, which runs along the eastern boundary of the Wilton International site, in Kirkleatham;
- footpaths 102/2A/1, 102/2A/2, 116/31/1, 116/31/2 and 116/31/3, which run adjacent to the Teesport Estate and Tees Dock Road;
- footpaths 102/2/1, 102/2/2 and 102/2/3 and bridleways 116/9/1 and 116/9/2, which are located to the south of the above footpaths and the Teesport Estate, and form part of the Teesdale Way long distance footpath and the England Coastal Path (Filey Brigg to Newport Bridge);
- footpath 31, which connects Cowpen Lane and Seal Sands Link Road;
- an unnamed footpath, which runs along the railway line north of Claxton Beck, north-east of Cowpen Bewley Woodland Park; and
- three unnamed footpaths, which run north-east from Tees Road to Marsh House Lane; part of the southernmost of these is part of the England Coastal path (Newport Bridge to North Gare).

6.9.4 These PRoWs may be affected by the final routes of the hydrogen pipelines and other connections.

6.9.5 In addition to the above, byway 30 is adjacent to the Proposed Development Site, north of Wolviston Back Lane. Bridleway 102/194/2 is adjacent to the Proposed Development Site in Grangetown.

6.9.6 Footpaths 116/1/1, 116/1/2, 116/2/1, 116/37/1, 116/38/1 and 116/39/1 and bridleways 116/32/1, 116/33/1 and 116/36/1 are also located to the north-east of the Proposed Development Site, in Warrenby and Coatham. Bridleways 116/32/1 and 116/36/1 are the closest of this group to the Proposed Development Site; at closest point (where they connect to the Teesdale Way long distance route), they are located approximately 310 m north-east of the Proposed Development Site. Bridleways 116/32/1 and 116/33/1 are part of the England Coastal Path (Filey Brigg to Newport Bridge).

6.9.7 Whilst some of the Proposed Development Site is located within access land in the England Coastal Margin defined by the CRoW Act (2000), public access for industrial areas in South Tees is currently restricted under the CRoW act on the grounds of public safety until 21st July 2027 (Case Number 20140873571) after which date the restriction will be reviewed.

6.9.8 Some of the options for the hydrogen pipeline routing cross the Tees Valley Railway Line. Consultation will be undertaken with Network Rail and Northern Rail (and other rail operators as appropriate) regarding the potential crossings of rail lines required.

6.9.9 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.9.10 The following potential impacts may be associated with the Proposed Development:

- generation of traffic during construction (and decommissioning) affecting the local and strategic road network; and
- construction of connections outside of the Main Site, affecting road and rail links and PRoWs.

6.9.11 During the operational phase of the Proposed Development, it is anticipated that there will be a maximum workforce of up to 85 staff that will be required on a shift basis to be spread over a 24-hour period. Staff will travel to and from work in a variety of directions.

6.9.12 Natural gas will be delivered by pipeline and other operational and maintenance consumables will be managed to be kept as low as is reasonably practicable.

6.9.13 Therefore, it is anticipated that that the effects of operational traffic would be considerably lower than those generated during the construction phase.

6.9.14 Based upon the numbers of operational staff given above, it is proposed to scope out a detailed environmental assessment of this phase, in consultation with the relevant highway authorities.

6.9.15 The principal vehicle movements are anticipated to be associated with the construction phase of the Proposed Development.

6.9.16 The volume of construction vehicles associated with the delivery of plant and the labour force has not been fully determined at this stage, but as a worst-case scenario at this stage peak construction staff numbers are likely to be approximately 3,100 for both Phases 1 and 2.

6.9.17 This would equate to approximately 2,661 two-way vehicle movements per day during the peak construction period, based upon an average car occupancy for workers of 2.33 which is consistent with other developments in the local area. This peak is expected to last for approximately four months, between August 2025 and November 2025, assuming a July 2024 start date.

6.9.18 In terms of construction HGV and LGV movements there are predicted to be approximately 15,230 deliveries to the Main Site over the full period of construction, with 435 in the overall peak month of construction, November 2025, which then equates to approximately 40 two-way HGV movements per day, assuming a Monday to Friday working week.

6.9.19 There would also be approximately 4,333 HGV movements associated with the construction of the H_2 pipeline over the full period of construction, which would equate to a total of 542 in the peak month of November 2025, (approximately 50 two-way HGV movements per day).

6.9.20 To fully address the impacts of the construction phase on the transport network, a TA will be produced (though this will be confirmed following determination of the number of construction movements, in liaison with RCBC, as the highways authority, and National Highways). The scope for the TA will follow the guidelines set out in the PPG for 'Travel Plans, Transport Assessments and Statements' (DCLG, 2014).

RCBC and National Highways will be consulted so that their specific requirements can be accommodated within the TA scope.

6.9.21 The traffic and transport chapter will summarise the salient points from the TA. It will also relate the magnitude and significance of potential impacts to criteria contained in the Institute of Environmental Assessment (IEA) (1993) 'Guidelines for the Environmental Assessment of Road Traffic' and the DMRB Volume 11 'Environmental Assessment' (National Highways, 2022).

6.9.22 The scope of the TA will cover the following key areas:

- a review of national, regional and local transport policy including the relevant aspects of the documents identified in Section 5: Planning Policy and Need;
- a description of baseline and future baseline conditions, including link and junction flows (described further below), a review of highway safety issues including examination of personal injury accident data and consideration of accessibility by all main transport modes;
- calculation of construction traffic flows over the period of construction;
- distribution and assignment of construction traffic flows to the road network, including the identification of routes for any abnormal loads required;
- local network impact analysis – the size of the study area is to be confirmed with the local authorities and Highways England, and key junctions may be identified by these stakeholders that require detailed capacity analysis;
- consideration of the local PRoW network for leisure and commuting uses, and whether their use would be affected by the Proposed Development;
- construction of H_2, gas, water and electrical connections where these affect road and rail links;
- cumulative impact assessment; and
- the formulation of mitigation measures (where required), such as a Construction Worker Travel Plan (CWTP) to promote sustainable journeys during the construction phase of the development and where possible reduce single occupant car journeys, and a Construction Traffic Management Plan (CTMP) to seek to control the routing and impact that HGVs will have on the local road network during construction.

6.9.23 Consultation with RCBC and National Highways will identify the key junctions to be included within the assessment for which junction counts and/ or existing data will be required that may be supplemented by link counts along the identified preferred routes to site. The data will be used to quantify baseline vehicular demand along key routes to and from the Proposed Development and will also form the basis of calculations to quantify the impact of construction traffic on the surrounding road network.

6.9.24 As described earlier, it is considered that traffic and transport impacts are more likely to occur during the construction phase of the Proposed Development and therefore

an operational assessment is not proposed. A summary of any residual and cumulative impacts will be provided should the proposed mitigation not fully address the impact of the development on the transport network.

6.9.25 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.10 Landscape and Visual Amenity

Baseline Conditions

6.10.1 The Tees Lowlands NCA forms a broad, open plain dominated by the meandering lower reaches of the River Tees and its tributaries, with wide views to distant hills. The large conurbation around the Lower Tees and Teesmouth contrasts with the rural area to the south and west, which is largely agricultural in character.

6.10.2 Ecological European designated sites as outlined in Section 6.6: Ecology and Nature Conservation are in close proximity to heavy industry, which has developed due to the estuary's strategic location close to mineral reserves, a network of main roads, railways and Teesport. The existing industrial installations form a dramatic skyline when viewed from the surrounding hills.

6.10.3 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Proposed Development Site and the surrounding area. However, the RCBC 'Landscape Character Supplementary Planning Document' (March 2010) notes that this industry has a strong influence on neighbouring landscape character areas.

6.10.4 Covering much of the open land north and east of the Proposed Development Site, the South Gare and Coatham Sands are classified as a sensitive landscape "…*which much landscape structure is present to give high 'strength of character' which is sensitive to change*." Areas of the South Gare and Coatham Sands designation west and south-west of the Proposed Development Site are not included within this sensitive landscape classification.

The Proposed Development Site and its Setting (Landscape)

6.10.5 The Proposed Development Site and surrounding area are heavily influenced by large industrial structures and complexes as well as the residential settlements outlined in Section 2: Description of the Existing Environment. The industrial complexes within the Teesside industrial areas are heavily lit, which increases the areas visibility during the hours of darkness. The surrounding landscape contains localised tranquil areas including along the coast, River Tees and inland nature reserves, although the large-scale structures are ever present within views.

Representative Sensitive Receptors (Visual)

6.10.6 Viewpoints, chosen to represent a typical range of views of the Proposed Development, will be agreed with relevant stakeholders such as PINS, the relevant LPAs, Natural England, the Forestry Commission and local residents. The viewpoints will be chosen to include appropriate receptor types, likely to include:

- residential receptors and PRoW users;

- recreational uses; and
- road users.

6.10.7 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.10.8 The following potential impacts may be associated with the Proposed Development:

- temporary changes to landscape character and views from sensitive receptors in the vicinity of the Proposed Development Site during construction and decommissioning; and
- permanent changes to landscape character and views from sensitive receptors in the vicinity of the Proposed Development Site during operation.

6.10.9 The proposed method of landscape and visual impact assessment has been devised to address the specific impacts likely to result from a development of its scale and nature. The methodology draws upon the following established best practice guidance:

- 'Guidelines for Landscape and Visual Impact Assessment' third edition (GLVIA3) (Landscape Institute and Institute for Environmental Management and Assessment (IEMA), 2013);
- 'Photography and photomontage in landscape and visual impact assessment' (Landscape Institute, Advice Note 01/11, 2011);
- Assessing landscape value outside national designations, Technical Guidance Note 02/21 (Landscape Institute, 2021); and
- Infrastructure, Technical Guidance Note 04/2020 (Landscape Institute, 2020).

6.10.10 The EIA process requires that a clear distinction is drawn between landscape and visual impacts, as follows:

- landscape impacts relate to the degree of change to physical characteristics or components of the landscape, which together form the character of that landscape, e.g. landform, vegetation and buildings; and
- visual impacts relate to the degree of change to an individual receptor's view of that landscape, e.g. local residents, users of public footpaths or motorists passing through the area.

6.10.11 An assessment of impacts on built heritage, including impacts on the setting of listed buildings and structures, will be included in the cultural heritage assessment as outlined in Section 6.11: Cultural Heritage.

6.10.12 A detailed study of the existing landscape components, character and views of the Proposed Development Site and an identified study area, developed following consideration of the ZTV discussed below, will be carried out in consideration of the following:

- site context (including industrial heritage);
- topography;
- vegetation including green infrastructure;
- roads, PRoWs and access;
- settlement and land-use;
- landscape character; and
- representative views.

6.10.13 This will be supported by and photographs as appropriate. The planning context with respect to landscape character and visual amenity will also be assessed, taking into account relevant European, national, regional and local planning policies. The baseline study will form the basis of the assessment of the predicted impacts of the Proposed Development.

6.10.14 Approximately 12 representative views will be identified within the Zone of Theoretical Visibility (ZTV) for the main building envelope and the potential stacks and taller columns, as well as any structures required for the connections. The ZTV will be generated using a bare ground Digital Terrain Model (DTM) and be reviewed in the field against the following criteria in order to determine the selection of representative views which form the basis of the visual assessment:

- receptor function/activity;
- distance from the Proposed Development Site;
- topography and elevation;
- degree and period of exposure;
- designation of the viewing place; and
- distribution of receptors.

6.10.15 It is anticipated sensitive visual receptors that will need to be considered will include receptors:

- to the north Seaton Carew, North Gare Sands, South Gare breakwater and the Headland at Hartlepool;
- to the east Redcar, Marske-by-the-Sea;
- to the south from Kirkleatham, New Marske, Wilton, Eston Nab, Old Lackenby; and
- to the east from Cowpen Bewley Park and Billingham.

6.10.16 An initial site visit will be undertaken together with a review of the full landscape and visual planning policy context in the vicinity of the Proposed Development Site. Using the Rochdale Envelope approach the assessment will be based upon the largest possible dimensions (maximum parameters) for the Proposed Development. Technical details regarding the height of the tallest elements of the Proposed

Development will then enable the definition of the Study Area within which landscape or visual impacts have the potential to be significant. At this stage, it is considered unlikely that the tallest element (the flare) will be higher than 100 m above ground level, however, any assumptions made in relation to the parameters defined for the purposes of the assessment will be clearly outlined.

6.10.17 Visual Representations of the Proposed Development for agreed representative views (visual receptors) will be produced in line with the guidance within the Landscape Institute Advice Note 01/11. The location of representative views and photomontages will be agreed in consultation with RCBC, STBC, HBC and other key stakeholders.

6.10.18 A full explanation of the criteria used to assess sensitivity, magnitude of impact and classification of landscape and visual effects will be outlined within the ES.

6.10.19 The impact of night-time light pollution will be considered however and given the existing high levels of lighting in the area, being industrial in nature, it is considered unlikely for significant effects on sensitive receptors there this has been scoped out of the assessment. As outlined in Section 3.16: Lighting, an Indicative Lighting Strategy will be prepared and submitted with the Application. This will be referred to as required within the LVIA chapter of the ES.

6.10.20 Where the assessment indicates the need for mitigation as a result of significant effects on landscape character or visual amenity, these will be outlined within the ES.

6.10.21 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.11 Cultural Heritage

Baseline Conditions

6.11.1 There are no designated heritage assets within the Proposed Development Site.

6.11.2 There are 505 listed buildings within 5 km of the Proposed Development Site. The closest are:

- Village Farmhouse, Little Neuk Farm Cottage, Nightingale's Farmhouse and Barn and Hall's Farmhouse, all Grade II listed and located in Cowpen Bewley, approximately 70 m south of the Proposed Development Site;
- Grade II* 'Phosphate rock silo number 15 at ICI works, Billingham', located approximately 100 m south of the Proposed Development Site; and
- three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse'), located approximately 0.2 km north-east of the Proposed Development Site in Warrenby.

6.11.3 There are 22 Conservation Areas within 5 km of the Proposed Development Site, the closest of which are Cowpen Bewley Conservation Area, part of which falls within the Proposed Development Site, Kirkleatham Conservation Area, located approximately

260 m east of the Proposed Development Site, and Greatham Conservation Area, located approximately 550 m north-east of the Proposed Development Site.

6.11.4 There are 25 scheduled monuments within 5 km of the Proposed Development Site, the closest of which are:

- Claxton medieval moated site, located approximately 2 km north-east of the Proposed Development Site;
- Eston Nab hillfort, palisaded settlement and beacon (and approximately 20 Bronze Age barrows, relating to a prehistoric settlement and funerary landscape), are located on Eston Hills, approximately 2.4 km south of the Proposed Development Site; and
- 'World War I early warning acoustic mirror 650m north west of Bridge Farm', located approximately 3 km east of the Proposed Development Site, in Redcar.

6.11.5 There are two registered parks and gardens within 5 km of the Proposed Development Site: Grade II Albert Park, Middlesborough, located approximately 2.7 km south-east of the Proposed Development Site, and Grade II* Ropner Park, Stockton-on-Tees, located approximately 4.7 km south-east of the Proposed Development Site.

6.11.6 There are no world heritage sites or registered battlefields within 5 km of the Proposed Development Site.

6.11.7 There are approximately 700 non-designated heritage assets within 1 km of the Proposed Development Site, including approximately 180 within 1 km of the Main Sites, comprising find spot evidence, sites of post-medieval and modern industrial structures that are no longer extant, former landscape features including ridge and furrow, and defensive structures dating from the First and Second World War. Several Second World War pillboxes are located to the immediate north of Main Site A, in the dunes between Main Site A and Coatham Sands.

6.11.8 Two assets recorded on the Historic Environment Record (HER) are located partially within the Main Sites, comprising the site of a jetty at South Gare and a spur of rail which linked Redcar Iron Works to the jetty. These assets are no longer extant but there is a potential for subsurface, foundation remains to be present, depending on the extent of ground disturbance at the Proposed Development Site. In addition, there may be extant features of industrial archaeological interest present within the Proposed Development Site.

6.11.9 There are no substantive differences in baseline conditions between Main Site A and Main Site B. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.11.10 The following impacts may occur as a result of the construction and operation of the Proposed Development:

- physical, permanent impacts to non-designated heritage assets within the Proposed Development Site and along the connections during construction;

- temporary impacts to designated and non-designated heritage assets arising from changes to their setting during the construction of the Proposed Development; and
- permanent impacts to designated and non-designated heritage assets arising from changes to the setting during the operational phase of the Proposed Development.

6.11.11 A cultural heritage DBA will be produced to determine, as far as is reasonably possible from existing records, the nature of the cultural heritage resource within a Study Area of 1 km for non-designated assets. This Study Area is sufficient for identifying heritage assets within the Proposed Development Site that may be physically impacted by the Proposed Development and for providing relevant context for the archaeological and historical baseline narrative.

6.11.12 An initial larger Study Area of 5 km will be used to capture designated heritage assets data. This larger Study Area will be used to identify potential impacts to heritage assets arising from changes to their setting due to visual or aural intrusion, which may arise as a result of the Proposed Development. The final extent of this larger Study Area will be informed and refined by site visits and setting assessments carried out by the heritage team and also by the ZTV produced for the LVIA as outlined in Section 6.10: Landscape and Visual Amenity and noise contour data (as applicable) produced for the Noise and Vibration assessment.

6.11.13 Data sources consulted during the production of the DBA will include but not be limited to:

- National Heritage List for England database (Historic England, 2022);
- formal searches of the Redcar and Cleveland and Tees HER, including the Historic Landscape Characterisation data;
- online resources including the BGS (2022) Geology of Britain Viewer; Defence of Britain database and the LPA portal for the Local Plan and other relevant planning information;
- published and unpublished literature (including a detailed review of reports for previous fieldwork carried out within the proximity to the Proposed Development Site);
- existing geotechnical data; and
- documentary, cartographic and other resources as deposited within the local Archives and Local Studies Library.

6.11.14 The DBA and ES will comply with relevant legislation, national and local planning policy, specifically the NPPF and relevant Local Plans, and in line with the relevant guidance, including:

- PPG, Conserving and enhancing the historic environment (MHCLG, 2019b);

- Historic Environment Good Practice Advice in Planning Note 2. Managing Significance in Decision Taking in the Historic Environment. Historic England (Historic England, 2015);
- Historic Environment Good Practice Advice in Planning Note 3. The Setting of Heritage Assets. Historic England (2nd edition) (Historic England, 2017);
- Historic Environment Statement of Heritage Significance: Analysing Significance in Heritage Assets. Historic England Advice Note 12. Historic England (Historic England, 2019);
- Commercial Renewable Energy Development and the Historic Environment. Historic England Advice Note 15 (Historic England, 2021);
- Chartered Institute for Archaeologists (CIfA) Standard and Guidance for Historic Environment Desk-Based Assessment (CIfA, 2020);
- CIfA Code of Conduct (CIfA. 2022); and
- IEMA, the Institute of Historic Building Conservation (IHBC) and CIfA, Principles of Cultural Heritage Impact Assessment in the UK (IEMA, *et al.,* 2021).

6.11.15 Consultation with relevant heritage officers will be undertaken during the production of the DBA and the ES.

6.11.16 The assessment of potential effects will first determine the heritage significance (value) of heritage assets, which is defined in the NPPF (MHCLG, 2021) as deriving from its heritage interests which may be archaeological, architectural, artistic or historic (NPPF Annex 2, Glossary).

6.11.17 Once the value of each asset is defined, including the contribution its setting makes to its value, the level and degree of impact arising from the Proposed Development will be assessed taking into account any development design and impact avoidance measure (embedded mitigation). An assessment of the effects of the Proposed Development will then be determined and additional mitigation measures may be proposed where significant effects are predicted.

6.11.18 Given that construction methodologies such as HDD or MBT will be utilised during the construction of the hydrogen pipeline beneath the River Tees to minimise disturbance to sensitive receptors at this location, it is considered unlikely that the Proposed Development will result in direct impacts to marine cultural heritage assets. No construction works are proposed in areas below MHWS where there is the potential for marine cultural heritage receptors to be located and more highly concentrated (e.g. in the area of Tees Bay and the North Sea). It is considered unlikely that the construction/ operation of the Proposed Development would result in significant effects on Marine heritage assets and an assessment of impacts on Marine Cultural Heritage (those assets below MHWS) is proposed to be scoped out of the EIA.

6.11.19 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.12 Socio Economics and Land-Use

Baseline Conditions

6.12.1 Baseline conditions are defined for the socio economics Study Area against England as a whole. Office for National Statistics (ONS) statistical geographies will be used to define the Study Area, including the Lower Layer Super Output Areas (LSOAs) and the Wider Impact Area (assumed to be the Travel to Work Area (TTWA)) that the Proposed Development Site falls into. The LSOAs that the Proposed Development Site lies within are within the boundaries of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

6.12.2 The local population and labour market are the main receptors in the assessment for employment effects. Understanding the baseline conditions enables the impact of employment generated by the Proposed Development on the local population and labour market to be determined. The impact is mostly influenced by the size of the labour market and whether it has the relevant skills, occupations and sector strengths.

6.12.3 The socio-economics baseline will include data for the following geographies, to compare statistical information for:

- H2Teesside Study Area;
- Middlesbrough and Stockton TTWA; and
- England.

6.12.4 The scoping baseline has been carried out using a number of recognised data sources including the following:

- Population Estimates (ONS, 2020)[14];
- Census 2011 (ONS, 2012);
- Indices of Multiple Deprivation (MHCLG, 2019c); and
- Business Register and Employment Survey (ONS, 2021).

6.12.5 The list above is intended to provide an outline of sources however, additional datasets may be utilised in the preparation of the assessment.

[14] Includes the following Lower Layer Super Output Areas (LSOAs): E01012107: Redcar and Cleveland 003D, E01032560: Redcar and Cleveland 003E, E01032561: Redcar and Cleveland 003F, E01012114: Redcar and Cleveland 009B, E01012109: Redcar and Cleveland 011B, E01012198: Stockton-on-Tees 003B, E01012279: Stockton-on-Tees 004B. The selection of these LSOAs is based on a "best-fit" criteria to align to the Proposed Development Site. Other LSOAs including those from Hartlepool were reviewed, but they do not accurately represent the Proposed Development Site, and therefore have been excluded from this analysis.

Population

6.12.6 The H2Teesside Study Area is located between two local authorities, Redcar and Cleveland and Stockton-on-Tees, in the North-East of England. The population of the H2Teesside Study Area was 10,000 in 2020, which accounted for approximately 2% of the Middlesbrough and Stockton TTWA (ONS, 2020). In the H2Teesside Study Area, 62% of the population are of working age[15], which is in line with national averages and the TTWA. The proportion of elderly people (65+ years) in the H2Teesside Study Area (17%) is comparatively smaller than for the TTWA (20%), and nationally (19%), implying a smaller dependency ratio in the H2Teesside Study Area. This can be seen in Plate 6-1.

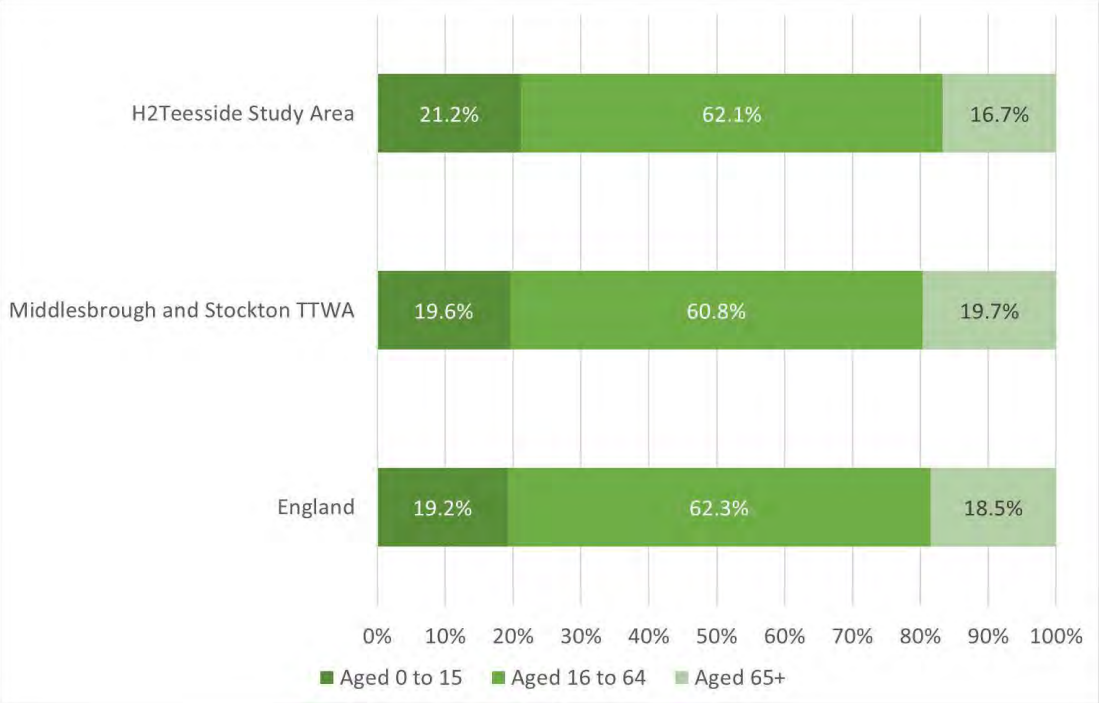

Plate 6-1: Population Age Breakdown (H2Teesside Study Area, Middlesbrough and Stockton Travel -To- Work Area, and England)

Source: Office for National Statistics Population Estimates, 2020.

Economic Activity Trends

6.12.7 Census 2011 data shows that in the H2Teesside Study Area, approximately 70% of the working age population are economically active, with the most common form of economic activity being full time employment (39%) (ONS, 2012). Rates of economic activity are higher in the H2Teesside Study Area than the TTWA area (66%) and nationally (65%). Of the economically active, approximately 4% are unemployed in the H2Teesside Study Area, compared to 6% for the TTWA and 9% nationally. Among

[15] Between 16 and 64 years of age.

the economically inactive in the H2Teesside Study Area, the most common reason is retirement.

Deprivation

6.12.8 Multiple sections of the H2Teesside Study Area lie in areas of relative deprivation. Of the seven LSOAs within the H2Teesside Study area, four are in the most deprived decile nationally (MHCLG, 2019c). More widely, areas of deprivation are prevalent in the local authorities in which the H2Teesside Study Area resides, as Redcar and Cleveland and Stockton-on-Tees are ranked the 40th and 73rd most deprived local authorities nationally.

Employment by Industry

6.12.9 In the H2Teesside Study Area, manufacturing (Sector C, 24% of total employment) is the largest industry; this percentage is considerably higher than the Middlesbrough and Stockton TTWA average (10%) and the national average (8%) (ONS, 2021). The second largest industry is transport and storage (Sector H, 18%), followed by business administration & support services (Sector N, 12%), both of which are higher percentages than the TTWA and national averages.

6.12.10 The employment percentages for the industries of mining, quarrying & utilities (Sectors B, D and E, 7%) and construction (Sector F, 7%) are comparatively higher for the Study Area than for the TTWA and national averages, whereas the percentages for retail (Sector G, 1%), education (Sector P, 3%) and health (Sector Q, 2.4%) for the Study Area are considerably lower than those for the TTWA and national averages. These trends can be seen in Plate 6-2.

Land Use

6.12.11 The Proposed Development Site is located within a largely urban area, consisting of existing and former sites of industrial installations north and south of the River Tees. The Main Sites are located on parts of the former Redcar Steelworks and the adjacent RBT Site. The connection corridors south of the River Tees are located within or in close proximity to the existing industrial area, generally following existing pipeline routes.

6.12.12 The connection corridors north of the River Tees also generally follow existing pipeline routes within existing industrial areas, but also extend into areas of open or agricultural land, north and west of the existing industrial area.

6.12.13 According to the Natural England Agricultural Land Classification (ALC) map for the North East Region (ALC001), part of the Proposed Development Site, near Kirkleatham, is located within Grade 2 'Very Good' agricultural land. ALC Grades 1 to 3 are classified as 'Best and Most Versatile' (BMV) land.

6.12.14 There are further areas of Grade 3 'Good to Moderate' agricultural land (potentially BMV) within the north-west of the Proposed Development Site, in the vicinity of Greatham. The remainder of the Proposed Development Site is located within areas of Grade 4 'Poor' or 5 'Very Poor' agricultural land, non-agricultural land ('land predominantly in urban use' or 'other land primarily in non-agricultural use'), and not BMV.

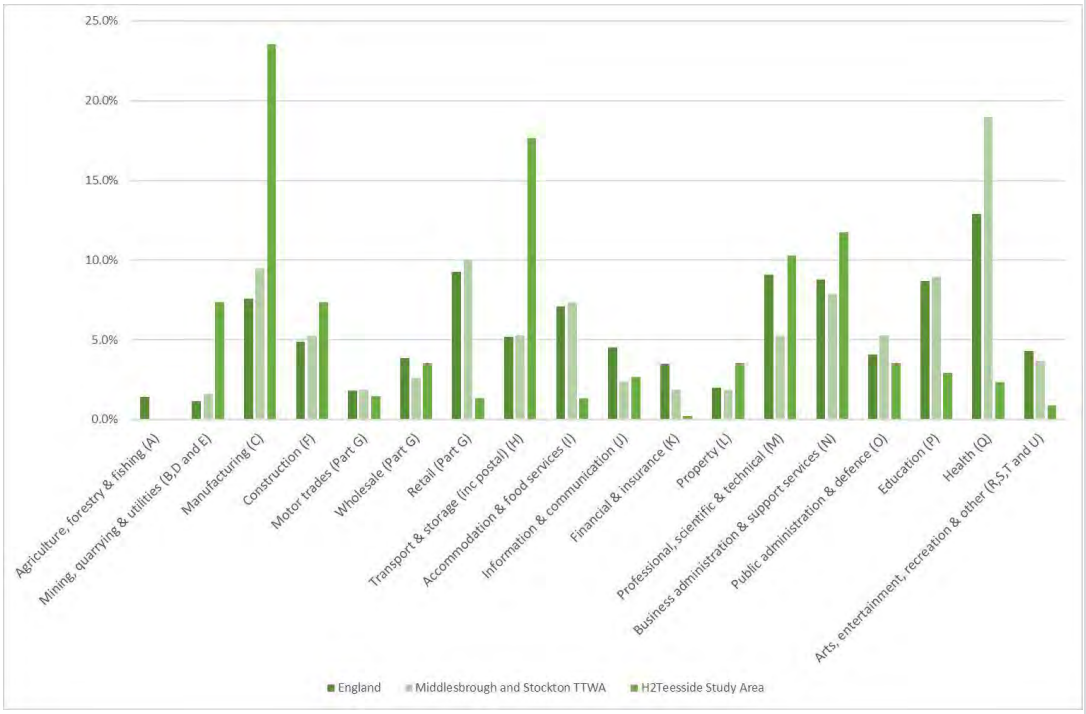

Plate 6-2: Employment by Industry (H2Teesside Study Area, Middlesbrough and Stockton Travel -To- Work Area, and England)

Source: Office for National Statistics Business Register and Employment Survey (BRES), 2020.

6.12.15 Given the locations of Mains Sites A and B, and that the connections corridor network for both is very similar, there are no substantive differences in the baseline conditions between them. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.12.16 The Proposed Development could have beneficial and adverse socio economic and land use effects that will need to be assessed. The approach to assessing the socio economics effects will be based on a proven and robust approach used for assessments of a similar nature. The assessment will be carried out using a number of recognised data sources.

6.12.17 It will consider the Proposed Development against established national and local policy standards and best practice benchmarks. This will include socio-economic policy justification for the Proposed Development and the contribution of activities associated with the Proposed Development to the socio economic policy objectives of RCBC, Tees Valley Combined Authority and STDC.

6.12.18 The chapter will also include a baseline assessment reviewing existing data outlining the relevant local policy context and a description of the existing socio economic conditions in the local study area including demographic data, labour market indicators; skills and unemployment and the local economic structure.

6.12.19 The assessment will consider the potential direct, indirect and cumulative socio economics impacts for each phase of the Proposed Development (construction, operation and decommissioning). It will draw on other assessments included in the ES where necessary. Wherever possible, the impacts identified in the assessment will be appraised against relevant national standards such as those provided by HM Treasury and Homes England (formerly the Homes and Communities Agency (HCA). Where relevant standards do not exist, professional experience and expert judgement will be applied and justified.

6.12.20 Mitigation measures (some of which may have already been considered through the development of the proposals) will be considered and key indicators for monitoring socio-economic impacts will be established.

6.12.21 The anticipated potential effects during the construction, operation, and decommissioning phases could include the following:

- direct and indirect employment creation;
- the potential for the promotion/provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits;
- temporary disruption to traffic on the local and strategic road networks;
- temporary disruption to PRoWs;
- impacts on businesses either direct or indirect via in combination effects identified by other discipline assessments; and
- any land use impacts (such as effects on planned developments).

6.12.22 Where the Proposed Development Site interacts with areas of Grade 2 (BMV) and Grade 3 (potential BMV) agricultural land, these are all located within the Hydrogen Pipeline Corridor. The land would be used for construction of pipelines (as a worst-case assumed below ground open trench) and after pipeline installation, the trench would be infilled, and the soil disturbed would be reinstated in-situ (replicating existing strata as necessary). It is considered that significant effects are not likely, with any land use effects relating to agricultural land temporary, and an assessment of impacts on Agricultural Land is not required. The remainder of the Proposed Development Site is comprised of existing or former industrial land.

6.12.23 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.13 Climate Change

6.13.1 As outlined in Section 3.1: Overview, based on current projections (including Phase 1 and Phase 2 of the Proposed Development), H2Teesside would continuously export approximately 2.84 Mt/year (at 100% utilisation) of dehydrated and compressed CO_2.

6.13.2 It is considered that the Proposed Development would represent a significant step forward in the implementation of H_2 as a viable, low carbon fuel source for industrial,

transport, and other applications that could make a significant contribution to reducing CO_2 emissions.

Baseline Conditions

6.13.3 The baseline conditions for the climate change chapter will be a business-as-usual scenario whereby the Proposed Development does not proceed, for those lifecycle stages scoped into the assessment.

6.13.4 For the GHG assessment the current and future baseline comprises existing carbon stock and sources of GHG emissions within the Proposed Development Site. It is recognised that there are a number of fuels and energy vectors that may plausibly be replaced by hydrogen For information, whilst not part of the Proposed Development, the assessment can also consider the emissions that may potentially be avoided as a result of the Proposed Development, by the replacement of fossil fuels by the H_2 generated in the Proposed Development over its operational lifetime..

6.13.5 For the Climate Change Risk Assessment the current baseline is based on historic climate data obtained from the Met Office website (Met Office, 2023) recorded by the meteorological station closest to the Proposed Development (Stockton-on-Tees) for the period 1981-2010 indicates the following:

- average annual maximum daily temperature was 13.1 °C;
- warmest month on average was July (mean maximum daily temperature of 20.4 °C);
- coldest month on average was December (mean minimum daily temperature of 0.7 °C);
- average total annual rainfall levels were 574.19 mm;
- wettest month on average was August (60.62 mm of rainfall on average for the month); and
- driest month on average was February (32.9 mm of rainfall on average for the month).

6.13.6 The Future baseline assessment considers the RCP8.5 scenario of the UK Climate Projections 2018 (UKCP18; Met Office, 2018) for the 25 km^2 grid square within which the Proposed Development Site is located.

6.13.7 For the purpose of the assessment, UKCP18 probabilistic projections for the following average climate variables have been obtained and analysed:

- mean annual temperature;
- mean summer temperature;
- mean winter temperature;
- maximum summer temperature;
- minimum winter temperature;
- mean annual precipitation

- mean summer precipitation; and
- mean winter precipitation.

6.13.8 Projected temperature and precipitation variables are presented in Table 6-6 and Table 6-7 below. UKCP18 probabilistic projections have been analysed for the 25 km grid square where the Proposed Development is located. These figures are expressed as anomalies in relation to the 1981-2010 baseline.

6.13.9 As the design life of the Proposed Development may exceed the predicted lifespan of 25 years, the assessment has considered a high emissions scenario at the 10%, 50% and 90% probability levels to assess the impact of climate change up to 2100.

Table 6-6: Projected Changes to Temperature Variables 50th Percentile (RCP 8.5) (10th to 90th Percentile Presented in Parenthesis)

CLIMATE VARIABLE	TIME PERIOD		
	2020-2049	2040-2069	2070-2099
Mean annual air temperature anomaly at 1.5m (°C)	+1.0 (+0.4 to +1.6)	+1.3 (+0.6 to +2.1)	+2.1 (+1.0 to +3.2)
Mean summer air temperature anomaly at 1.5m (°C)	+1.0 (+0.2 to +1.8)	+1.3 (+0.3 to +2.3)	+2.4 (+0.7 to +4.2)
Mean winter air temperature anomaly at 1.5m (°C)	+1.0 (+0.0 to +1.9)	+1.3 (+0.1 to +2.5)	+1.9 (+0.5 to 3.5)
Maximum summer air temperature anomaly at 1.5m (°C)	+1.1 (+0.2 to +2.1)	+1.5 (+0.3 to +2.7)	+2.6 (+0.8 to +4.6)
Minimum winter air temperature anomaly at 1.5m (°C)	+1.0 (+0.0 to +2.0)	+1.3 (+0.2 to +2.4)	+1.9 (+0.5 to +3.3)

Table 6-7: Projected Changes to Precipitation Variable (%)

CLIMATE VARIBALE	TIME PERIOD		
	2020-2049	2040-2069	2080-2099
Annual precipitation rate anomaly (%)	+4.5 (-1.5 to +11.2)	+1.5 (-3.5 to +6.9)	+0.8 (-6.0 to +8.3)
Summer precipitation rate anomaly (%)	-2.0 (-16.8 to +14.7)	-5.1 (-19.9 to +11.3)	-16.4 (-36.6 to +5.5)
Winter precipitation rate anomaly (%)	+9.5 (-3.0 to +22.8)	+12.0 (-1.2 to +26.3)	+14.6 (-4.3 to +35.7)

6.13.10 There are no substantive differences in the baseline conditions between Main Site A and Main Site B. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.13.11 The GHG Study Area includes all GHG emissions from within the Proposed Development Site arising as a result of the Proposed Development during all phases.

6.13.12 The receptor for GHG emissions is the global climate as the effects are not geographically constrained, which means all development has the potential to result in a cumulative effect on GHG emissions. The UK's relevant five-year carbon budget will be used as a proxy for the global climate.

6.13.13 A discussion of the GHG emissions from the energy sector in the UK will be provided. The GHG emissions resulting from alternative energy sources and vectors, that could realistically be replaced by low carbon H_2 from the Proposed Development will be considered. These could include natural gas, diesel fuel for HGV transport, or coke used for steel production.

6.13.14 This section will draw on guidance including the GHG Protocol (World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), 2004), PAS2080 (BSI, 2016), and the updated IEMA guidance on 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' (IEMA, 2022) such that it will provide discussion and, where relevant, assessment of:

- the scope of the assessment;
- baseline GHG emissions;
- alternative emissions (i.e., future baseline without the Proposed Development);
- net assessment of the direct emissions of the Proposed Development; and
- any mitigation (or other) CO_2 emissions savings throughout the operational life of the Proposed Development.

6.13.15 To align with the requirements of the EIA Regulations 2017 and associated published guidance, three separate aspects have been considered in scoping the climate assessment:

- Lifecycle GHG impact assessment: The effect on climate change of GHG emissions arising from the Proposed Development, including how the Proposed Development will affect the ability of UK Government to meet reduction targets within its carbon budgets. The lifecycle GHG assessment will consider emissions from the following stages:
  - Product stage: including from the manufacture and supply of the products and materials required to build the Proposed Development.
  - Construction stage: including from construction activities, transportation of workers and materials to the Proposed Development Site, and transportation and disposal of waste construction materials.
  - Operational stage: including from the consumption of energy and materials, supply of water and treatment of wastewater, and worker commuting during the operational phase. Emissions potentially avoided as a result of H_2 generated from the Proposed Development.

- Decommissioning stage-including from on-site decommissioning activity, transportation and disposal of waste materials, and worker travel. Emissions from decommissioning are frequently subject to considerable uncertainty due to the timescales involved.

- In-combination climate change impact (ICCI) assessment: The combined impact of the Proposed Development and potential climate change on receptors in the receiving environment; and
- Climate Change Resilience (CCR) assessment: The resilience of the Proposed Development to climate change impacts, including how the design takes into account projected impacts of CCR of the Proposed Development to impacts from projected climate change, using the RCP8.5 projections from UKCP18 as a worst-case scenario.

6.13.16 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.14 Major Accidents and Disasters

Baseline Conditions

6.14.1 The Study Area for assessment of Major Accidents and Disasters (MA&Ds) is not defined within regulatory guidance or standardised methodology, however it is likely that a Study Area of 5 km from the Proposed Development Site will be utilised.

6.14.2 For the purpose of EIA Scoping, a high-level review of installations in close proximity to the Proposed Development Site has been undertaken and an initial list is illustrated on Figure 14: Major Accidents and Disasters Receptors within 5 km of the Proposed Development Site Boundary (Appendix A). This area of Teesside includes installations regulated by the Control of Major Accident Hazard (COMAH) Regulations 2015 and major accident hazard pipelines regulated by the Pipelines Safety Regulations (PSR) 1996. The Study Area may be refined during later stages of assessment, as information on the location and risks associated with particular hazards is developed.

6.14.3 The following data sources have been utilised to inform the scoping baseline:

- National Risk Register of Civil Emergencies (Cabinet Office, 2017);
- BGS GeoIndex Onshore (BGS, 2022);
- HSE's COMAH 2015 Public Information Search (HSE, 2015); and
- Google aerial and street view maps covering the study area (Google, 2020).

6.14.4 As the Proposed Development's design progresses, additional datasets may be included where relevant to assist the assessment of MA&Ds.

Environmental Baseline of Relevance to MA&Ds

6.14.5 A description of the environmental baseline of the different parts of the Proposed Development Site is presented in Section 2: Description of the Existing Environment, so is not repeated here.

6.14.6 Teesside has a temperate oceanic climate typical of the UK. Four earthquakes (of maximum magnitude 3.1) have been recorded in the Study Area since 1994, but none of these were classified by the BGS as significant. As described in Section 6.3: Surface Water, Flood Risk and Water Resources, parts of the Proposed Development Site are located within Flood Zones 1, 2, and 3.

Infrastructure and Industrial Sites

6.14.7 The Teesside area is a significant industrial hub, with the chemical industry operating in this location for over a hundred years. Chemicals still make up a large proportion of the industrial sites in the area, along with oil and gas facilities and the nearby Hartlepool nuclear power station.

6.14.8 There are currently several COMAH regulated sites within the Study Area with operations in the following categories:

- bulk and fine chemical Installations, with operations (including manufacture/production, disposal, storage/warehousing and distribution);
- fuel Installations, including refining and storage/distribution;
- waste storage, treatment and disposal sites;
- water and sewage collection, supply and treatment; and
- power generation, supply and distribution.

6.14.9 Due to the nature of industry in Teesside, there is an existing network of buried pipelines present in the vicinity of the Main Sites A and B, including major hazard pipelines regulated in accordance with the PSR (1996). There is also significant infrastructure associated with the transmission and distribution of energy including high voltage (HV) 400 kV overhead power lines in the vicinity of Main Sites A and B.

6.14.10 Transport infrastructure in the area includes ports, road and railway lines. Teesport, located approximately 1 km to the south-west of Main Site A, is the UK's fifth biggest seaport, handling 28 million tonnes of cargo annually. Primary roads in the area include the A19, A174, A66, and the A689. Middlesbrough, Billingham, South Bank, Seaton Carew and South Bank train stations and their associated rail lines also fall within the Study Area. Teesside Airport is the nearest airport, located approximately 11.5 km south-west of the Proposed Development Site.

6.14.11 The nearest residential areas to Main Sites A and B include areas within the districts of Middlesbrough and Redcar & Cleveland. There are also residential receptors close to the hydrogen pipeline and connections within the districts of Stockton-on-Tees and Hartlepool.

6.14.12 The estimated total populations of Middlesbrough, Redcar & Cleveland, Stockton-on-Tees, and Hartlepool are 143,900, 136,500, 196,600, and 92,300, respectively (ONS, 2022).

Sensitive Environmental Receptors of Relevance to MA&Ds

6.14.13 The following sensitive receptors which could be vulnerable to a MA&Ds have been identified:

- private residences (and their inhabitants) within the local area;
- local economic receptors including businesses and employees;
- community receptors, including PRoW, community land, and community buildings;
- the historic and cultural environment including archaeological heritage and built heritage;
- designated ecological sites, primarily the Teesmouth and Cleveland Coast SPA, Ramsar site and SSSI;
- the water environment, including groundwater, the River Tees, and the North Sea;
- infrastructure and built environment including transport infrastructure, industrial infrastructure, and energy infrastructure; and
- the interactions between the receptors above.

Summary of Current MA&Ds Risks

6.14.14 The Proposed Development Site is located within an area which has several COMAH installations, forming a 'domino group'. These are groups of sites where the risks or consequences of a major accident may be increased due to the proximity of the sites to each other. These risks include, but are not limited to: fire, explosion, release of (flammable, toxic, asphyxiant, corrosive, environmentally harmful etc.) substances to air, water, ground and groundwater.

6.14.15 There are no substantive differences in the baseline conditions between Main Site A and Main Site B. T, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.14.16 There is no specific guidance available which sets out the approach for undertaking a MA&Ds assessment within an EIA. However, the scope of the assessment has been developed with reference to "Major Accidents and Disasters in EIA: A Primer" (IEMA, 2020) which lays out emerging best practice. In addition to this guidance, there is a considerable amount of information and guidance available to developers on the identification and control of major hazards associated with industrial chemical processes, the storage and use of chemicals, and major accident hazard pipelines conveying hazardous fluids.

6.14.17 MA&D scenarios will be considered for each phase of the Proposed Development.

6.14.18 The following process has been used to identify credible MA&Ds scenario categories, to be scoped in or out of detailed assessment in the ES:

- An assessment of the substances which will be present on site to identify those classified as hazardous in accordance with the Classification, Labelling and Packaging (CLP) Regulations 2015.

- A review of the operations and activities carried out throughout the lifecycle of the Proposed Development, to determine the potential for a loss of containment of these materials. Substances which are not classified as hazardous or are present in relatively minor quantities can be discounted at this stage.

6.14.19 Incidents which could have relatively minor consequences, regardless of the likelihood of occurrence, are scoped out of assessment as they do not fall into the definition of a MA&D.

6.14.20 Incidents which could have significant consequences to people and/ or the environment are considered credible MA&Ds scenarios. For the Proposed Development, the definition of significant consequences would align with the criteria listed within the COMAH Regulations. This includes an event which causes fatal injuries to one or more people or causes harm to 0.5 ha of a protected environmental site.

6.14.21 A long list of potential MA&Ds categories is presented in Appendix B and includes the initial assessment used to determine whether or not further assessment is required. From this list, MA&Ds which are considered very unlikely to occur (for example due to the location of the Production Facility) have been scoped out. Furthermore, any hazards for which there is no credible source-pathway-linkage have also been scoped out.

6.14.22 All remaining MA&Ds have therefore been scoped into the assessment. Where there is a lack of information at this time regarding any MA&Ds, this has been scoped in as a precautionary measure. The long list of credible MA&Ds is subject to change as more information becomes available during the course of the assessment.

6.14.23 Where a scoped-in MA&D risk is covered fully in a separate discipline chapter, this information will not be duplicated in the MA&Ds chapter but will be cross-referenced and summarised as required with relevance to MA&Ds.

6.14.24 Events with a high likelihood of occurrence and significant consequences are not associated with the Proposed Development. Legislation including COMAH and PSR ensures that facilities with this category of risk are not permitted.

6.14.25 The key substances which would be present at the Production Facility include the following:

- H_2, which is classified as extremely flammable. The production of H_2 is the purpose of the Proposed Development, however, if released, could result in a fire and/ or explosion.
- Natural gas, which is used to manufacture H_2. It is a hydrocarbon mixture comprising mostly of CH_4, which is classified as extremely flammable. If released, there is the potential for a fire and/ or explosion.
- Syngas ('Synthesis Gas'), which is produced in an intermediate process stage and is a mixture comprising H_2, CO, which is classified as toxic and CO_2. The hazards associated with this substance include a fire and/ or explosion. If unignited, the CO content of this gas could cause harm to people onsite.

- O_2, which is used in the production process, is classified as an oxidant, therefore can cause or intensify a fire if released and in contact with combustible materials. This includes both liquid and gaseous oxygen.
- CO_2, which is produced as a by-product of the manufacturing process and would be exported offsite via pipeline. If a significant quantity of CO_2 is released in high concentrations, this gas can present a risk of asphyxiation.
- Aqueous NH_3, which would be used to reduce emissions from combustion equipment. This substance is classified as harmful to the aquatic environment, however, is unlikely to present in significant quantities. There is a low potential for a major accident and can therefore be scoped out of the assessment.
- An amine solution, which would be used for carbon capture. This type of substance is generally classified as harmful, as it would cause irritation if inhaled or in contact with the skin or eyes. It is not considered to present a risk of a major accident hazard therefore is scoped out of the assessment.
- Substances would be used to treat water and effluent generated by process operations such as biocides. The quantities stored on site are considered to be relatively minor therefore a release would not be a credible MA&Ds scenario and can be scoped out.
- Diesel, which would be used on-site for fuel in backup generators, is classified as flammable and harmful to the aquatic environment. The quantity of diesel would be relatively minor and there is a low potential for a major accident therefore can be scoped out of the assessment.
- Catalyst materials, which would be used for a number of processes including gas purification and steam reformation of natural gas and hydrocarbons.
- Liquid nitrogen, which would be associated with the ASU. It would be used for purging at start-up and shutdown, and for circulation during plant warm-up.
- Substances used during construction such as liquid concrete could be present in significant quantities and would be harmful if a release occurred in which material entered a watercourse. However, the controls around the storage and use of this substance are such that this is not considered to be a credible MA&Ds scenario.
- There is the potential for ground contamination in the area of the Main Site which is a legacy of the industrial nature of the site. This could include substances which if released to the environment have the potential to cause harm.
- No specific materials have been identified at this stage which would only be present on-site during decommissioning.

6.14.26 The pipeline corridors associated with the Proposed Development would contain natural gas supplied to the site, H_2 delivered to offtakers within the Teesside industrial area and CO_2 which would be exported for geological storage.

6.14.27 The technology used for the manufacture of H_2 from natural gas is well established and the equipment to be used will be designed and constructed to precise industry

standards. This industry is subject to rigorous safety and environmental regulations, with operators of such facilities required to demonstrate integrity via the submission of Safety Case documentation. In addition, the operational site will be regulated through other consents and licences as outlined in Section 3.10: Materials Storage, such as Hazardous Substances Consent, COMAH Licensing, and an environmental permit and these regulatory regimes will demand appropriate systems, controls and management procedures to safeguard workers and off-site receptors. There is a very low risk of failure to occur which could result in a loss of containment of hazardous substances. However, if this were to happen, credible and worst-case major accident scenarios have been identified for assessment as part of the EIA.

6.14.28 For those MA&Ds category types which have been scoped in for detailed assessment in the ES, the following assessment process which will be used:

- collate and review relevant baseline information regarding location, hazardous properties of substances, and site operations;
- identify credible scenarios related to the scoped in major event types;
- determine the potential impact of credible scenarios on receptors;
- assess the magnitude and likelihood of impacts of credible scenarios;
- identify mitigation measures to eliminate risk where possible; and if not possible, to reduce risk to a level demonstrated to be as low as reasonably practicable (ALARP); and
- qualitatively consider the significance of any residual risks.

6.14.29 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.15 Materials and Waste

Baseline Conditions

6.15.1 The Study Areas for the materials and waste assessment will be defined in line with the IEMA Guide to: Materials and Waste in Environment Assessment, Guidance for a Proportionate Approach (referred from herein as the 'IEMA Guidance') (IEMA, 2020).

6.15.2 Baseline data relevant to the Proposed Development has been reviewed to date for:

- impacts on allocated/safeguarded mineral and waste sites within the Proposed Development Site (operational sites identified within local plans e.g. quarries, wharfs, concrete plants etc.);
- presence of historic and permitted landfills within the Proposed Development Site;
- presence of permitted waste sites and waste site applications within the Proposed Development Site; and
- presence of Mineral Safeguarding Areas (MSAs) within the Proposed Development Site (an area designated by Minerals Planning Authorities (MPAs)

which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development).

6.15.3 Additional baseline information will be gathered and presented in the PEI Report and ES for:

- construction and operational waste generation within the Proposed Development Site;
- use of construction materials within the Proposed Development Site;
- non-hazardous, inert and hazardous construction and operational waste management (Yorkshire and the Humber and the North-East regions);
- hazardous construction waste and operational waste management (England); and
- availability of key construction materials (nationally and Yorkshire and the Humber and the North-East regions).

6.15.4 An initial review of baseline conditions within the Proposed Development Site has been undertaken and consists of:

- historic landfill sites and permitted landfill sites as shown in the Environment Agency's Historic Landfill Sites (Environment Agency, 2021a) and Permitted Waste Sites - Authorised Landfill Site Boundaries data sets (Environment Agency, 2021b), further information is provided in Section 6.4: Geology, Hydrogeology and Contaminated Land;
- a number permitted waste sites and waste site applications as outlined in the Environment Agency's Environmental Permitting Regulations – Waste Sites (Environment Agency, 2022f);
- a safeguarded wharf, and a MSA for marine dredged Sand and Gravel at Tees Dock (Redcar and Cleveland) and a safeguarded wharf at Billingham Reach Industrial Estate (Stockton on Tees) (Tees Valley, 2011a);
- a MSA for gypsum (anhydrite) across the whole of the Tees Valley plan area (Tees Valley, 2011a) and a MSA for salt in Redcar and Cleveland Local Plan area (Redcar and Cleveland Borough Council, 2018);
- a General Location for Large Waste Management Facilities, this covers industrial areas to the north and south of the River Tees (Tees Valley, 2011a); and
- safeguarded sites at Haverton Hill (Stockton-on-Tees, construction, and demolition waste recycling) and South Tees Eco-Park (Redcar and Cleveland). The Proposed Development Site is adjacent to New Road, Billingham (Stockton-on-Tees, construction and demolition waste recycling) (Tees Valley, 2011b).

6.15.5 There are no substantive differences in the baseline conditions between Main Site A and Main Site B. Therefore, the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.15.6 The assessment will follow the methodology set out in the IEMA Guidance (IEMA, 2020).

6.15.7 For the purpose of this scoping report, materials and waste comprise:

- the consumption of materials (key construction materials only); and
- the generation and management of waste.

6.15.8 Materials are defined in the IEMA Guidance materials as "*physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt and steel.*"

6.15.9 Other material assets considered include built assets such as landfill void capacity and allocated/safeguarded mineral and waste sites.

6.15.10 Waste is defined as per the Waste Framework Directive (E Waste FD) (EU, 2008) as "*any substance or object which the holder discards or intends or is required to discard*".

6.15.11 IEMA Guidance offers two methods for the assessment of waste. Method W1 – void capacity has been selected as this is a more detailed methodology and is appropriate for larger and more complex projects.

6.15.12 The IEMA guidance *"does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources."* However, since some of the operational hazardous wastes likely to be generated by the Proposed Development may not be suitable for landfill disposal (e.g. liquid waste), where possible, hazardous operational waste will be compared to national hazardous waste management facility capacity in the assessment.

6.15.13 The assessment of materials and waste will consider:

- waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the Proposed Development Site where it is generated is transferred to a suitably licensed facility for further treatment or disposal;
- facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a license, and impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for these facilities themselves;
- as part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas; and

- MPAs are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs.

6.15.14 The following matters will be scoped out of the assessment of materials and waste:

- Waste arising from extraction, processing and manufacture of construction components and products. This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured.
- Other environmental impacts associated with the management of waste from the Proposed Development (e.g. on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste) are addressed separately in other relevant chapters.
- Direct impacts on MSAs. The Proposed Development Site lies within MSAs however impacts on MSAs are not assessed in the materials and waste assessment in accordance with the IEMA Guidance. MSAs are included for context in the baseline since MSAs are a planning consideration. The Proposed Development uses previously developed industrial land or existing utilities corridors. The Proposed Development would not sterilise or prejudice the future extraction of the mineral resource because the anhydrite and salt resources occur at depth and can either be extracted in an alternative way (mining or brine solution) or there is evidence that the resource may have been sufficiently depleted by previous extraction (anhydrite). This would be considered further in the Planning Statement submitted with the Application.
- Effects associated with decommissioning as the Proposed Development has a long design life and such it is not considered possible to reliably forecast decommissioning requirements and infrastructure far in the future. A Decommissioning Environmental Management Plan and would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated.

6.15.15 Due to the uncertainty about the nature of mitigation(s) and the method by which mitigation(s) would be secured, material use and waste generation during the construction and waste generation during operation of the Proposed Development is scoped into the assessment. Allocated/safeguarded mineral and waste sites are scoped into the assessment, such sites are a planning consideration and further consultation and assessment in accordance with MPA policies may be required.

Table 6-8 Table 6-8provides a summary of the matters to be scoped in and out of the assessment.

Table 6-8: Summary of Proposed Scope of Materials and Waste

PROPOSED DEVELOPMENT PHASE	POTENTIAL EFFECTS	SCOPE IN/ OUT
Construction	Changes in demand for materials	Scope in
	Changes in available landfill capacity	Scope in
	Changes to allocated/safeguarded mineral site	Scope in
	Changes to allocated/safeguarded waste site	Scope in
Operation	Changes in availability of materials	Scope out
	Changes in available landfill void capacity	Scope in
	Changes in available waste management facility capacity (hazardous waste only)	Scope in
Decommissioning	Changes in demand for materials	Scope out
	Changes in available landfill capacity	Scope out
	Changes to allocated/safeguarded mineral site	Scope out
	Changes to allocated/safeguarded waste site	Scope out

6.15.16 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.16 Human Health

Baseline Conditions

6.16.1 Public health profile data produced by Public Health England (PHE) (PHE, 2022a), published under the Public Health Outcomes Framework (PHOF) (PHE, 2022b) has been reviewed for the purposes of this EIA Scoping Report. A human health profile will be developed for the PEIR which focuses on key indicators identified by PHE at ward level, including a comparison with district and national averages. This profile will be consolidated by engaging with the Integrated Care Board and the relevant local authorities.

6.16.2 The Proposed Development Site intersects seven electoral wards:

- South Bank, in Redcar and Cleveland;
- Dormanstown, in Redcar and Cleveland;
- Grangetown, in Redcar and Cleveland;
- Billingham East, in Stockton-on-Tees;
- Billingham South, in Stockton-on-Tees;
- Fens and Greatham, in Hartlepool; and
- Seaton, in Hartlepool.

6.16.3 For each of these areas, indicators deemed relevant to the likely human health effects of the Proposed Development have been identified; data relating to these indicators and the comparative geographies is set out in Table 6-9.

6.16.4 An initial review of the human health baseline has been undertaken using a number of recognised data sources including:

- Census 2020 (ONS, 2021);
- Census 2011 (ONS, 2012)[16];
- Population Estimates (ONS, 2022); and
- PHE (2022a; 2022b).

6.16.5 The list above is intended to provide an outline of sources and it should be noted that additional datasets may be used in the preparation of the PEI Report.

6.16.6 There are no substantive differences in the baseline conditions between Main Site A and Main Site B, therefore the baseline conditions as outlined above apply and are relevant to both.

Scope of the Assessment

6.16.7 This chapter will identify the communities that would be subject to impacts associated with the Proposed Development and will identify the potential effects on the health and wellbeing of those communities in Redcar and Cleveland and Stockton-on-Tees, Teesside and wider area if required, as a consequence of the Proposed Development.

6.16.8 This chapter will consider the Proposed Development in the context of established national and local policy standards and best practice benchmarks. This will include human health policy alignment with the Proposed Development.

6.16.9 In November 2022, the Institute of Environmental Management and Assessment (IEMA) published new guidance on assessing human health as part of EIA (IEMA, 2022b; IEMA, 2022c). Prior to this, there was no consolidated methodology or practice for the assessment of human health effects. The human health assessment will be based on this new IEMA guidance and it will consider the potential impacts for each phase of the Proposed Development. Wherever possible, the impacts identified in the assessment will be appraised against relevant national standards. Where relevant standards do not exist, professional experience and expert judgement will be applied and justified.

[16] Please note that data from the 2011 Census has only been used in the absence of more recent data.

Table 6-9: Human Health Baseline Indicators

	FENS AND GREATHAM	SEATON	BILLINGHAM EAST	BILLINGHAM SOUTH	DORMANSTOWN	GRANGETOWN	SOUTH BANK	HARTLEPOOL	STOCKTON-ON-TEES	REDCAR AND CLEVELAND	ENGLAND
Population aged under 16 (%) (2020/21)	13.8	17.6	24.1	21.1	20.4	28.6	24.0	19.2	20.0	17.7	19.2
Population aged 65+ (%) (2020/21)	31.0	23.7	15.9	19.1	19.0	11.0	14.8	19.6	18.7	23.3	18.5
Unemployment rate (% claiming out of work benefit) (2021/22)[10]	-	-	6.8	5.8	6.9	12.7	10.7	6.8	5.4	5.5	5.0
Long-term unemployment (%) (2021/22) [10]	-	-	4.5	3.8	2.4	13.6	9.4	3.1	4.0	4.4	1.9
General Health – good or very good (%) (2011)	75.9	78.7	75.4	77.1	75.1	75.5	72.2	76.0	79.9	76.3	81.4
General Health – bad or very bad (%) (2011)	7.5	6.5	8.2	7.7	8.7	9.2	9.8	8.1	6.3	7.8	5.5
Life expectancy at birth (female) (years) (2016-20)	86.2	81.8	79.0	79.5	80.9	78.9	75.2	81.3	81.3	81.5	83.2
Life expectancy at birth (male) (years) (2016-20)	81.4	78.8	75.5	77.7	74.4	72.5	73.0	76.5	78.2	77.6	79.5

	FENS AND GREATHAM	SEATON	BILLINGHAM EAST	BILLINGHAM SOUTH	DORMANSTOWN	GRANGETOWN	SOUTH BANK	HARTLEPOOL	STOCKTON-ON-TEES	REDCAR AND CLEVELAND	ENGLAND
Obese adults (%) (2020/21)[17]	-	-	-	-	-	-	-	34.6	40.2	33.4	25.3
Obese children (reception year) (%) (2020/21)	11.1	8.3	8.6	14.3	16.6	13.7	14.0	12.8	9.8	12.0	9.9
Smoking prevalence in adults (%) (2021)[10]	-	-	-	-	-	-	-	17.3	12.5	13.3	13.0
Mortality rate from Chronic Obstructive Pulmonary Disease (COPD) (2017-19)[10]	-	-	-	-	-	-	-	77.9	62.5	79.6	52.8
Physically inactive adults (%) (2020/21)[10]	-	-	-	-	-	-	-	36.7	23.1	28.0	23.4

Sources: Census 2011 (ONS, 2011); Census 2021 (ONS, 2021); Population Estimates (ONS, 2021); Local Health Profiles (Public Health England, 2016-21).

[17] Please note that ward level data for this indicator is unavailable from PHE.

6.16.10 If a change in a wider determinant of health is likely, it should be scoped into the human health assessment. The assessment must present the 'likely significant' human health effects of the Proposed Development. At the scoping stage, there are uncertainties, and there is limited insight into significance, therefore scoping identifies whether health effects are 'potentially significant' or not. Potentially significant human health effects are anticipated relating to the following determinants:

- physical activity;
- risk taking behaviour;
- open space, leisure, and play;
- transport modes, access, and connections;
- community safety;
- community identity, culture, resilience, and influence;
- social participation, interaction, and support;
- education and training;
- employment and income;
- climate change mitigation and adaptation;
- air quality;
- water quality or availability;
- land quality;
- noise and vibration;
- health and social care services;
- built environment; and
- wider societal infrastructure and resources.

6.16.11 The following determinants have been scoped out of the assessment as they're not relevant to the Proposed Development:

- diet and nutrition;
- housing;
- relocation; and
- radiation.

6.16.12 The following other ES chapters will inform the human health assessment:

- Chapter 8: Air Quality;
- Chapter 11: Noise and Vibration;
- Chapter 15: Traffic and Transportation;

- Chapter 18: Socio Economics and Land-Use; and
- Chapter 19: Climate Change.

6.16.13 The scope of assessment set out above would be applied whether Main Site A or B is taken forward to the final development design.

6.17 Cumulative and Combined Effects

Cumulative Effects

6.17.1 In accordance with the EIA Regulations, consideration will also be given to the potential for cumulative effects to arise. Cumulative effects may occur when environmental effects associated with the Proposed Development interact with those associated with other planned projects and developments located in the vicinity.

6.17.2 The effects of the Proposed Development for each of the ES topics described above will therefore be considered in conjunction with the potential effects from other projects which are both reasonably foreseeable in terms of delivery (e.g., have planning consent) and are located within a relevant geographical scope where environmental impacts could act together to create a more significant overall effect, and reported within the ES.

6.17.3 A number of other proposed developments have been identified in the vicinity of the Proposed Development Site that could potentially result in cumulative effects during construction and operation of the Proposed Development. Those developments most likely to result in significant cumulative effects in combination with the Proposed Development are listed below and illustrated on Figure 15: Other Developments to be Considered in the Cumulative Impact Assessment (Appendix A). This is not an exhaustive list and will be developed further in the PEI Report.

6.17.4 The Applicant will consult with RCBC, STBC, HBC, and other neighbouring local authorities in order to define the full list of current and future developments/ projects to be considered.

HyGreen

6.17.5 HyGreen is another bp led project which is in the early stages of design and planning. HyGreen is a proposed green H_2 production facility, which is currently subject to further engineering and environmental studies likely to be located in close proximity to the Proposed Development Site. It is currently at pre-planning stage.

Net Zero Teesside

6.17.6 NZT is a proposed full chain CCUS project, comprising a CO_2 gathering network, including CO_2 pipeline connections from industrial facilities on Teesside to transport the captured CO_2; a CCGT electricity generating station with an abated capacity circa 860 megawatts output (gross), cooling water, gas and electricity grid connections and CO_2 capture; a CO_2 gathering/booster station to receive the captured CO_2 from the gathering network and CCGT generating station; and the onshore section of a CO_2 transport pipeline for the onward transport of the captured CO_2 to a suitable offshore geological storage site in the North Sea. The NZT Power, Capture and

Compressor (PCC) Site is proposed to be located to the immediate east of the Main Site for the Proposed Development.

6.17.7 The project will require a DCO to enable its construction and operation. The examination period closed on 10th November 2022 and the SoS decision is expected on 10th May 2023.

Tees Combined Cycle Power Plant (CCPP)

6.17.8 Tees CCPP is a proposed gas-fired combined cycle gas turbine (CCGT) power station with a maximum generating capacity of up to 1,700 MW. It is proposed on approximately 15 ha of land formerly used as a gas-fired generating station within the south-west part of the Wilton International Complex, to the south of the Proposed Development Site. The DCO application was approved in April 2019 but is understood to be undergoing an amendment to enable development of the Whitetail project – a proposed 300 MW power plant at Sembcorp Energy UK's Wilton International site, with CCS. It is expected that construction of the Tees CCPP will begin in 2024, with the generating station becoming operational in 2027.

York Potash Harbour Facilities

6.17.9 In July 2016, the SoS for Transport made the York Potash Harbour Facilities Order 2017 that came into effect in August 2017. The order authorised the installation of wharf/ jetty facilities with two ship loaders capable of loading bulk dry material at a rate of 12 million tonnes per annum (dry weight), as well as associated dredging operations, a storage building with conveyor to wharf/jetty and a materials handling facility with conveyor to storage building and jetty, to the south of Main Site A for the Proposed Development.

6.17.10 It forms part of the wider York Potash Project (now referred to as the Woodsmith Project) which includes the development of a new mine for the winning and working of the only known UK resource of polyhalite. The harbour facilities are required to enable the bulk export of polyhalite.

York Potash Material Handling Facility

6.17.11 In September 2014, York Potash Ltd submitted a planning application for a mineral (polyhalite) granulation and storage facility involving the construction of buildings, conveyor systems, substations, water treatment plant, internal access roads, car parking, attenuation ponds, landscaping, restoration and aftercare, and construction of a tunnel portal including the landforming of spoil and associated works. The development is located approximately 0.3 km to the south of Main Site A and adjacent to Main Site B. The application was granted in August 2015. Construction is currently underway.

MGT Teesside Tees Renewable Energy Plant (REP)

6.17.12 The Tees REP is a proposed 300 MW biomass fired renewable energy power station on land adjacent to the main southern dock at Teesside on the south bank of the River Tees, to the south-west of the Main Site A for the Proposed Development.

6.17.13 Construction of the project commenced in August 2016, but has experienced a number of delays, including a fire and a temporary suspension due to the Covid-19 pandemic. It is potentially going to be operational within the next 1-2 years.

Redcar Energy Centre (REC)

6.17.14 Redcar Energy Centre (REC) is a proposed a material recovery facility incorporating a bulk storage facility, an energy recovery facility, and an incinerator bottom ash recycling facility along with ancillary infrastructure and landscaping, located to the immediate west of the Main Site A for the Proposed Development. A planning application for REC was submitted in August 2020 and granted in January 2021; it was anticipated that construction would begin within approximately 15 months of the 187 decision date but as of March 2023 construction is yet to begin.

CBRE Anaerobic Biogas Production Facility

6.17.15 In July 2016, CBRE submitted a planning application for an anaerobic biogas production facility and CHP plant, southeast of the Main Site for the Proposed Development. This facility would involve the anaerobic digestion of mixed feedstock to create a biogas to be used as fuel in the CHP. Planning permission was granted in October 2016, but construction is yet to begin.

Tees Valley Lithium Project

6.17.16 In September 2022, Tees Valley Lithium Ltd submitted a planning application for the construction of a lithium hydroxide monohydrate manufacturing plant and ancillary development (the 'Tees Valley Lithium Project'), within Wilton International Estate, Redcar. Planning permission was granted in November 2022. The development is located within the Wilton International estate, south-east of Main Sites A and B. The development will be constructed on a phased basis and eventually comprise four process trains. Train 1 will employ a caustication process, whilst Trains 2, 3 and 4 will utilise an electrochemical process. It is anticipated that construction of Train 1 will be complete by Q4 2024, and construction of Trains 2, 3 and 4 will be complete by Q4 2025.

South Tees Development Corporation Projects

6.17.17 STDC have recently submitted a number of planning applications in the vicinity of the Proposed Development Site, primarily for demolition works and engineering operations associated with ground remediation and preparation for regeneration and development. They are also in the process of preparing a number of planning applications for development of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E), HGV and car parking, works to watercourse including realignment and associated infrastructure works.

Offsite Hydrogen Storage

6.17.18 As identified in Section 3.9, off-site storage of H_2 is not included within the Proposed Development. Should there be the requirement for off-site storage, it is expected that these would be owned and operated by a third-party provider who would be responsible for any consenting requirements. Detail regarding this will be limited, with any potential developments being at pre-planning stage, but the potential for cumulative effects will be assessed at a high level, based on the information available at that time.

Combined Effects

6.17.19 Combined effects may occur where several different effects from a single development collectively cause an effect of greater or lesser significance upon a particular environmental receptor.

6.17.20 An assessment of potentially significant combined effects, considering each of the ES topics described above, will be undertaken, and reported in the ES.

7.0 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

7.1 EIA Methodology and Reporting

7.1.1 The ES will set out the process followed during the EIA including the methods used for the collection of data and for the identification and assessment of impacts. Any assumptions made will be clearly identified.

7.1.2 The EIA process is designed to be capable of, and sensitive to, changes that occur as a result of changes to the design, including any mitigation measures that are incorporated during the EIA. This will be particularly important for the Proposed Development as the design and layout is still being refined, and minor changes are likely to be made following submission of this EIA Scoping Report.

7.1.3 The EIA will be based on a number of related activities, as follows:

- establishing existing baseline conditions;
- consultation with statutory and non-statutory consultees throughout the Application process;
- consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;
- consideration of technical standards for the development of significance criteria;
- review of secondary information, previous environmental studies and publicly available information and databases;
- physical surveys and monitoring;
- desk-top studies;
- computer modelling;
- reference to current legislation and guidance; and
- specialist opinion.

7.1.4 Impacts will be considered on the basis of their magnitude, duration and reversibility. Cumulative and combined effects will also be considered where appropriate. Significance will be evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies (major, moderate, minor and negligible). For the purpose of the EIA, moderate and major effects will be deemed 'significant'.

7.1.5 Where likely significant environmental effects are identified in the assessment process, measures to mitigate these effects will be recommended.

7.2 Structure of the Environmental Statement

7.2.1 The ES will address the direct effects of the Proposed Development in addition to the likely indirect, cumulative, short, medium and long term, permanent, temporary, beneficial and adverse effects. The mitigation measures envisaged in order to prevent, reduce or where possible offset significant adverse effects will also be

described. The concluding chapters will provide a summary of the cumulative and combined effects and likely significant residual environmental effects.

7.2.2 The ES will comprise the following set of documents:

- Non-Technical Summary (NTS): this document will provide a summary of the key issues and findings of the EIA in non-technical language;
- Volume I: ES: this will contain the full text of the EIA with the proposed Chapter headings as follows:
  - Introduction;
  - Assessment Methodology;
  - Description of the Existing Environment;
  - Proposed Development;
  - Construction Programme and Management;
  - Alternatives and Design Evolution;
  - Legislative and Planning Policy Context;
  - Air Quality;
  - Surface Water, Flood Risk and Water Resources;
  - Geology, Hydrogeology and Contaminated Land;
  - Noise and Vibration;
  - Ecology and Nature Conservation (including Aquatic Ecology);
  - Ornithology;
  - Marine Ecology and Nature Conservation;
  - Traffic and Transportation;
  - Landscape and Visual Amenity;
  - Cultural Heritage;
  - Socio Economics and Land-Use;
  - Climate Change;
  - Major Accidents and Disasters;
  - Materials and Waste;
  - Human Health;

- Cumulative and Combined Effects; and
- Summary of Significant Effects.

- Volume II: Technical Appendices: these will provide supplementary details of the environmental studies conducted during the EIA including relevant data tables, figures and photographs; and
- Volume III: Figures: Stand-alone figures volume containing all figures not included separately within the technical appendices.

7.3 Structure of Technical Chapters

7.3.1 The technical chapters (Volume I) will be structured based on the following sub-headings:

Introduction

7.3.2 The Introduction will describe the format of the assessment presented within the chapter.

Legislation and Planning Policy Context

7.3.3 The Legislation and Planning Policy Context section of the technical chapters will provide an overview of the relevant legislation, planning policy and technical guidance relevant to the assessment and how they have been applied.

Assessment Methodology and Significance Criteria

7.3.4 The methods used in undertaking the technical study will be outlined in this section with references to published standards (e.g., British Standards, Building Research Establishment), guidelines (e.g., DMRB and IEMA guidelines) and relevant significance criteria.

7.3.5 The significance of effects will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it is not possible to quantify impacts, qualitative assessments will be carried out, based on available knowledge and professional judgment. Where uncertainty exists, this will be noted in the relevant technical assessment chapter.

7.3.6 Specific criteria for each technical assessment will be developed, giving due regard to the following:

- extent and magnitude of the impact;
- impact duration (whether short, medium or long term);
- impact nature (whether direct or indirect, reversible or irreversible);
- whether the impact occurs in isolation, is cumulative or interactive;
- performance against environmental quality standards where relevant;
- sensitivity of the receptor; and
- compatibility with environmental policies and standards.

7.3.7 For issues where definitive quality standards do not exist, significance will be based on the:

- local, district, regional or national scale or value of the resource affected;
- number of receptors affected; and
- sensitivity of these receptors; and duration of the impact.

7.3.8 The ES will clearly explain any assumptions that have been made in the assessments including definition of the maximum parameters used in accordance with the Rochdale Envelope approach.

7.3.9 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental components, the following terminology will be used throughout the ES to define effects, unless technical chapters set out otherwise:

- adverse – detrimental or negative effect to an environmental resource or receptor; or
- beneficial – advantageous or positive effect to an environmental resource or receptor; and
- negligible – imperceptible effect to an environmental resource or receptor; or
- minor – slight, very short or highly localised effect of no significant consequence; or
- moderate – more than a slight, very short or localised effect (by extent, duration or magnitude) which may be considered significant; or
- major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

Baseline Conditions

7.3.10 In order to assess the potential impacts and effects of the Proposed Development, it is necessary to determine the environmental conditions that currently exist on site and in the surrounding area, for comparison. These are known as the 'existing baseline conditions'. Baseline conditions are determined using the results of site surveys and investigations or desk-based data searches, or a combination of these, as appropriate.

7.3.11 'Future baseline conditions', which are the likely future conditions in the study area in the absence of the Proposed Development, will also be considered and described.

7.3.12 For the purposes of assessment, each chapter will identify a reasonable 'worst case scenario' with regards in relation to optionality within the Proposed Development and future baseline scenarios.

Development Design and Impact Avoidance

7.3.13 Measures that have been integrated into the Proposed Development in order to avoid or reduce adverse environmental effects will be described. Such measures may include refinement of the design and layout of the Proposed Development to avoid impacts on sensitive receptors, implementation of a CEMP, and adherence of relevant legislation, guidance and best practice. The assessment of impacts and effects will take account of these measures already being in place.

Likely Impacts and Effects

7.3.14 This section will identify the likely impacts resulting from the Proposed Development inclusive of the design measures discussed above. The magnitude of impacts is defined with reference to the relevant baseline conditions (existing or future, as appropriate), and effects are determined in accordance with the identified methodology.

Mitigation and Enhancement Measures

7.3.15 The Mitigation and Enhancement Measures section will describe the measures that will be implemented by the Applicant to reduce any significant adverse effects identified by the assessment and enhance beneficial effects during construction and operation of the Proposed Development over and above those already included as development design and impact avoidance measures.

Limitations or Difficulties

7.3.16 Where in any case it is not possible to quantify effects, qualitative assessments will be undertaken, based on available knowledge and professional judgment. Where any uncertainty exists, this will be clearly outlined in the limitations section of each of the impact assessments chapters. The limitations presented by this uncertainty will be taken into account in defining the reasonable worst-case scenario for the topic assessments.

Cumulative Effects

7.3.17 In accordance with the EIA Regulations, consideration will be given to the potential for cumulative effects to arise as a result of the Proposed Development.

Residual Effects and Conclusions

7.3.18 Effects of the Proposed Development remaining following the implementation of available mitigation measures are known as 'residual effects'. These will be discussed for each of the potential effects, and their significance level identified.

7.4 Consultation on the EIA

7.4.1 The process of consultation is critical to the development of a comprehensive and balanced ES. The views of statutory and non-statutory consultees serve to focus the environmental studies and to identify specific issues that require further investigation. Consultation is an ongoing process, which enables mitigation

measures to be incorporated into the Proposed Development's design, thereby limiting adverse effects and enhancing environmental benefits.

7.4.2 To date, introductory meetings have been held with Natural England (16th September 2022) and the Environment Agency (4th October 2022). The purpose of these meetings was to introduce the Proposed Development, provide an overview of the programme as and discuss matters which the Applicant will be seeking input from both Natural England and the Environment Agency on, under their respective Discretionary Advice Services (DAS's). Table 7-1, summarises the outcome of these discussions to date.

Table 7-1: Consultation Undertaken to Date of relevance to the EIA

CONSULTEE	SUMMARY OF OUTCOME OF DISCUSSIONS	APPLICANT'S RESPONSE
Natural England	**Introductory Meeting September 16th, 2022 (Virtual Microsoft Teams)** A meeting was held to provide Natural England with an introduction to the Proposed Development and agree what services the Applicant would seek as part of Natural England's DAS service. Natural England noted that they were unable to provide detailed advice regarding the proposed routing. Natural England did however acknowledge that the proposed pipelines would cross the Teesmouth & Cleveland Coast SSSI, SPA & Ramsar Site, either above or below ground. Natural England have requested further detail regarding the construction phase methodology for the route options route, in order to provide a view as to whether or not the proposed works would have an adverse effect upon the site. **Advice sought via the DAS service (written) 9th December 2022** Further information on the proposals were provided to Natural England including further information on construction methodologies.	The Applicant provided further information in response to Natural England's request (see below). Further consultation will be required on various matters under the DAS throughout the application process. Natural England provided high level comments on the information presented to them.
Environment Agency	**Introductory Meeting October 4th, 2022 (Virtual Microsoft Teams)** A meeting was held to provide the Environment Agency with an introduction to the Proposed Development and agree what advice services the Applicant would seek from the Environment Agency under their DAS service.	The Environment Agency's comments are being considered, and the feasibility of the suggestions assessed as part of the design process.

CONSULTEE	SUMMARY OF OUTCOME OF DISCUSSIONS	APPLICANT'S RESPONSE
	The Environment Agency raised some specific points in relation to the proposals at the time of the introductory call. These included in summary: – Some of the proposed pipeline route corridors and interactions with other developments in the area including likely future works to the Greenabella Seawall defences, and especially around the Greatham Area to the west of the Proposed Development Site. – Some of the proposed pipeline route corridors interface with the EA's assets especially flood defences in the Greatham area.	

7.4.3 Consultation on the Proposed Development will be undertaken in Summer 2023. It will utilise a range of methods, including a project website, to provide up-to-date information and aid consultation with key stakeholders.

7.4.4 As required by Section 47 of the Planning Act 2008 (as amended), the Applicant is preparing a Statement of Community Consultation (SoCC). The SoCC will outline how the Applicant intends to formally consult with the local community about the Proposed Development. The Applicant is required to first consult the relevant local authorities on the draft SoCC, who have a period of at least 28 days following receipt of the draft SoCC to do so, prior to its publication for inspection by the public.

7.4.5 PEI in the form of a PEI Report will be provided for statutory consultation, which is likely to be undertaken in Summer 2023. The statutory consultation will use a range of methods, including the distribution of digital and printed consultation materials, face to face and virtual public events, an online virtual consultation room and postal notifications to those living within a defined zone around the Proposed Development Site, alongside document inspection venues, newspaper notices and letters to statutory consultees as required by sections 47, 48 and 42 of the Planning Act 2008.

7.4.6 All responses received during consultation will be carefully considered and taken into account as the design and EIA of the Proposed Development progresses, in accordance with Section 49 of the Planning Act 2008. Details of any responses received during consultation and the account taken of those responses will be included in a Consultation Report, as required by Section 37 of the Planning Act 2008.

7.4.7 This Consultation Report will be submitted as part of the application for development consent and will be available for public review at that point. The Consultation Report will demonstrate how the Applicant has complied with the statutory consultation requirements of the Planning Act 2008. It will be considered by PINS, both when determining whether to accept the application and in examining the application.

7.5 Transboundary Effects

7.5.1 On the basis of the information outlined within this scoping report and having regard to the location and spatial scope of the assessments is it considered that the Proposed Development is not likely to have a significant effect either alone or cumulatively on the environment in any European Economic Area (EEA) state due to the distance of the site from potential EEA receptors.

8.0 SUMMARY AND MATTERS TO BE SCOPED OUT

8.1 Matters Scoped Into the EIA

8.1.1 This Request for a Scoping Opinion has identified the potential for significant environmental effects to arise from the construction (including maintenance where relevant), operation and decommissioning of the Proposed Development. The following specialist assessments for inclusion in the EIA are proposed:

- Air Quality;
- Surface Water, Flood Risk and Water Resources;
- Geology, Hydrogeology and Contaminated Land;
- Noise and Vibration;
- Ecology and Nature Conservation (including Aquatic Ecology);
- Ornithology;
- Marine Ecology and Nature Conservation;
- Traffic and Transportation;
- Landscape and Visual Amenity;
- Cultural Heritage;
- Socio Economics and Land-Use;
- Climate Change;
- Major Accidents and Disasters;
- Materials and Waste; and
- Human Health.

8.1.2 The detailed assessments for each of these topics will be undertaken in accordance with standard guidance and best practice and reported in the ES. Where significant effects are identified, mitigation measures will be described where possible to reduce the residual effects.

8.2 Other Matters Proposed for Scoping Out of the EIA

8.2.1 Where specific matters have been scoped out of the assessments included in Section 7 this has been outlined within those sections and has not been repeated here.

8.2.2 Other matters not included elsewhere are outlined in brief below.

Electronic Interference

8.2.3 It is unlikely that the maximum building heights for any buildings proposed, and temporary construction cranes would not be significantly higher than other structures recently located in the vicinity of the Proposed Development (as a former steelworks) or associated with the proposed NZT development. In addition, there are no nearby residential properties likely to be affected. Effects from Electromagnetic

Fields (EMF) where they relate to human health will be considered and included in brief within the proposed Human Health Chapter once further information on the electrical connections is known.

8.2.4 Therefore, a standalone assessment of the Proposed Development's effect on electronic interference is not considered to be required.

8.2.5 Further to this, analogue signals have ceased to be transmitted and have been replaced by digital signals. As such, the Proposed Development's potential to interfere with television, radio (both analogue and digital) and mobile phone reception is considered negligible.

Aviation

8.2.6 It is proposed to scope out impacts on aviation based on the likely maximum height of the flare and other buildings associated with the Proposed Development. In general, it is considered that in the context of the surrounding industrial facilitates these are anticipated to be comparable to the heights of structures that have previously occupied the site at Redcar Steel works.

8.2.7 The Civil Aviation Authority (CAA) will be consulted on the Proposed Development to review any requirements for aviation lighting on the stack(s)and enable the Proposed Development to be charted in future. Should infrastructure or cranes be required which are taller than those currently expected, the need for an aviation assessment will be reviewed accordingly.

9.0 REFERENCES

9.1.1 Below is the full list of reference documents for the EIA Scoping Report, using the Harvard style (to the best of available information). References are listed in order of alphabetical by (lead) author's surname or publishing organisation (or title for legislation only), then chronological with oldest first, and then finally by order of appearance within the Report as indicated by letter following the date.

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APPENDIX A: FIGURES

APPENDIX B: LONG LIST OF MA&D CATEGORIES AND SCOPING STATUS

Table B-1: Long List of Major Accident & Disaster Hazard Categories, and Scoping Status, with Commentary

HAZARD	SCOPED IN (Y/N)	COMMENTARY
Construction Hazards		
Accident Impact/ Structural Collapse/ Utility Strike/ UXO	Y	Construction hazards can include events which have the potential for harm, including fatal injuries to workers. These include the collapse of buildings, structures and excavations, vehicle accidents, contact with HV transmission cables (overhead and buried), contact with underground utility services and UXO. This category is scoped in for further assessment.
Release of Ground Contamination	Y	Preparatory work during construction could encounter significant quantities of contaminated ground due to historic industrial use. If this material is accidentally released to the environment, there is the potential for harm. This category is scoped in for further assessment.
Operational Process Hazards		
Fire	Y	The accidental release of flammable substances could result in a fire if immediately ignited. This could result in harm to people onsite and potentially offsite. This category is scoped in for further assessment.
Explosion	Y	The accidental release of flammable substances could result in an explosion if the gas accumulates prior to ignition. This could result in significant harm to people onsite and potentially offsite. This category is scoped in for further assessment.
Toxic gas release	Y	The accidental release of syngas containing CO could result in a toxic hazard with harm to people onsite. It is unlikely that this could have an impact offsite but is scoped in for further assessment.
Asphyxiant gas release	Y	A significant release of CO_2 could result in harm to people onsite and potentially offsite therefore is scoped in for further assessment.
Environmentally harmful liquid release	N	A release of aqueous ammonia or diesel which reached environmental receptors could have an impact, however the quantity present on site will likely be relatively small and impact would not reach the criteria for a MA&D therefore is scoped out.
Domino Event	Y	A major incident occurring at a site which is part of the Teesside cluster of major hazard sites could escalate and cause an impact at the Production Facility at the Main Site. Conversely, a major incident could have an impact on neighbouring facilities. Domino effects are therefore scoped in for further assessment.

HAZARD	SCOPED IN (Y/N)	COMMENTARY
Operational Transportation Hazards		
Road traffic accident (dangerous goods)	N	Collisions/ accidents involving road tankers delivering materials to site could result in a loss of containment of diesel and aqueous ammonia. The quantity of these materials would be contained within drainage systems and unlikely to result in a major accident, therefore this category is scoped out.
Marine accident	N	The primary process materials will be transported to and from the site via pipeline, therefore marine transport is not applicable, and this category is scoped out.
Other Industrial Hazards		
Electrical failure	N	During operation, electrical failure or power loss can be caused by supply issues or disruption to infrastructure. Process equipment and instrumentation would be designed to fail to a safe condition and the Proposed Development will include installation of back-up power generation and uninterruptable power supplies (UPS). In an emergency event where all power supplies are lost, a flare will be provided for the safe disposal of gas, consequently this scenario is scoped out.
System / utilities failures	N	Disruption to water supplies and effluent disposal may have an impact on process operations however are unlikely to cause harm to the environment as this would be considered within the design of the facility and the appropriate safety systems installed. Consequently, this scenario is scoped out.
Meteorological Hazards		
High windspeed	N	There is a low probability of a hurricane force event occurring at the Production Facility, however major storms and gales could result in damage due to infrastructure. Storms will be considered during the engineering design of buildings and structures and the appropriate engineering standards used, therefore this category is scoped out.
Low temperatures and heavy snow.	N	The climate in the north-east of England is typically mild. In the event of extreme, prolonged low temperatures and snowfall, there is the potential for snow loading on buildings and freezing liquids in pipework. Operations are unlikely to be interrupted however as these potential issues will be considered within the engineering design and appropriate insulation used. This category is therefore scoped out.
High temperatures / heatwave	N	In the event of a prolonged period of hot weather there is the potential for an impact to temperature sensitive equipment such as process cooling systems and electrical switchgear. This could cause an

HAZARD	SCOPED IN (Y/N)	COMMENTARY
		operational upset but is unlikely to cause harm. These issues will be incorporated within the engineering design and therefore this category is scoped out.
Drought	N	The Proposed Development is not expected to be vulnerable to drought conditions, as there is a low risk of interruptions to the supplies of water in this location therefore this category is scoped out.
Electrical storms	N	Lightning could result in damage to the Proposed Development as a result of a direct strike to buildings or structures. There is also the potential for lightning to act as a source of ignition if damage occurred during the storm causing a loss of containment of flammable gases. Design engineering standards to be incorporated by the Proposed Development for the provision of lighting protection systems on buildings and structures are well established. Consequently, this category is scoped out.
Geophysical Hazards		
Earthquake	N	There is a low record of seismic activity observed at the location of the Proposed Development and severe damage is unlikely, therefore this category is scoped out.
Ground stability	N	Groundworks carried out prior to construction will provide a stable site at the Production Facility and within pipeline connection corridors (where required for new pipelines) prior to construction. The Teesside area has a low risk of landslides, ground collapse, ground compression, or sinkholes associated with site geology, therefore this category is scoped out.
Hydrological Hazards		
Coastal Flood	Y	The Production Facility site is located by the North Sea coast with parts in Flood Zone 3 (greater than 0.5% AEP sea flooding). The risk will be considered within the stand-alone FRA and summarised within the Surface Water, Flood Risk and Water Resources chapter . This is considered a credible MA&D scenario, therefore scoped in for further assessment.
Fluvial Flood	Y	Site is on the River Tees with parts in Flood Zone 3 (greater than 1% AEP river flooding). The risk will be considered within the stand-alone FRA and summarised assessed within the Surface Water, Flood Risk and Water Resources chapter. This is considered a credible MA&D scenario, therefore scoped in for further assessment.
Pluvial Flood	Y	Parts of the site has a low risk (between 0.1% and 1% flood risk from surface water). The risk will be considered within the stand-alone FRA and

HAZARD	SCOPED IN (Y/N)	COMMENTARY
		summarised assessed within the Surface Water, Flood Risk and Water Resources chapter. This is considered a credible MA&D scenario, therefore scoped in for further assessment.
Groundwater Flood	Y	The groundwater vulnerability map places the area of the site at Medium-High risk. This risk will be assessed within the Surface Water, Flood Risk and Water Resources chapter and is considered a credible MA&D scenario, therefore scoped in for further assessment.
Other Natural Hazards		
Poor air quality	N	Pollution episodes are known to occur in the UK but the Proposed Development is not expected to be particularly vulnerable this hazard. The development will not contribute significantly to road transport pollution in the area. Air intakes for combustion equipment will be fitted with the appropriate filtration systems to prevent damage from poor air quality. Emissions from combustion equipment will assessed for the purposes of the EIA within the Air Quality assessment and will be controlled and regulated in accordance with an environmental permit. No MA&D scenarios have been identified therefore this category has been screened out for further assessment.
Wildfires	N	Severe wildfires are infrequent in the UK and the Proposed Development is not located in an environment particularly vulnerable to wildfire, being primarily urban/industrial therefore this category has been screened out for further assessment.
Societal Hazards		
Malicious attacks	N	Malicious attack could include intentional violence to people, arson or other methods of destruction of property, cyber-attacks, or chemical, biological, or nuclear attacks by terrorists or other actors. These events have been known to occur at infrastructure sites in the UK. However, these risks will be mitigated at the national level as a matter of national security.

The Planning Inspectorate
Yr Arolygiaeth Gynllunio

SCOPING OPINION:

Proposed H2Teesside Project

Case Reference: EN070009

Adopted by the Planning Inspectorate (on behalf of the Secretary of State) pursuant to Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

17 May 2023

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APPENDIX 1: CONSULTATION BODIES FORMALLY CONSULTED

APPENDIX 2: RESPONDENTS TO CONSULTATION AND COPIES OF REPLIES

1. INTRODUCTION

1.0.1 On 06 April 2023, the Planning Inspectorate (the Inspectorate) received an application for a Scoping Opinion from H2 Teesside Limited (the Applicant) under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) for the proposed H2Teesside Project (the Proposed Development). The Applicant notified the Secretary of State (SoS) under Regulation 8(1)(b) of those regulations that they propose to provide an Environmental Statement (ES) in respect of the Proposed Development and by virtue of Regulation 6(2)(a), the Proposed Development is 'EIA development'.

1.0.2 The Applicant provided the necessary information to inform a request under EIA Regulation 10(3) in the form of a Scoping Report, available from:

http://infrastructure.planninginspectorate.gov.uk/document/EN070009-000037

1.0.3 This document is the Scoping Opinion (the Opinion) adopted by the Inspectorate on behalf of the SoS. This Opinion is made on the basis of the information provided in the Scoping Report, reflecting the Proposed Development as currently described by the Applicant. This Opinion should be read in conjunction with the Applicant's Scoping Report.

1.0.4 The Inspectorate has set out in the following sections of this Opinion where it has / has not agreed to scope out certain aspects / matters on the basis of the information provided as part of the Scoping Report. The Inspectorate is content that the receipt of this Scoping Opinion should not prevent the Applicant from subsequently agreeing with the relevant consultation bodies to scope such aspects / matters out of the ES, where further evidence has been provided to justify this approach. However, in order to demonstrate that the aspects / matters have been appropriately addressed, the ES should explain the reasoning for scoping them out and justify the approach taken.

1.0.5 Before adopting this Opinion, the Inspectorate has consulted the 'consultation bodies' listed in Appendix 1 in accordance with EIA Regulation 10(6). A list of those consultation bodies who replied within the statutory timeframe (along with copies of their comments) is provided in Appendix 2. These comments have been taken into account in the preparation of this Opinion.

1.0.6 The Inspectorate has published a series of advice notes on the National Infrastructure Planning website, including Advice Note 7: *Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping* (AN7). AN7 and its annexes provide guidance on EIA processes during the pre-application stages and advice to support applicants in the preparation of their ES.

1.0.7 Applicants should have particular regard to the standing advice in AN7, alongside other advice notes on the Planning Act 2008 (PA2008) process, available from:

https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

1.0.8 This Opinion should not be construed as implying that the Inspectorate agrees with the information or comments provided by the Applicant in their request for an opinion from the Inspectorate. In particular, comments from the Inspectorate in this Opinion are without prejudice to any later decisions taken (e.g. on formal submission of the application) that any development identified by the Applicant is necessarily to be treated as part of a Nationally Significant Infrastructure Project (NSIP) or Associated Development or development that does not require development consent.

2. OVERARCHING COMMENTS

2.1 Description of the Proposed Development

(Scoping Report Sections 2.0 and 3.0)

ID	Ref	Description	Inspectorate's comments
2.1.1	1.3.2	CO_2 export via Northern Endurance Partnership (NEP) infrastructure	The Scoping Report states that CO_2 from the Proposed Development would be exported to an offshore facility via NEP infrastructure on the adjacent Net Zero Teesside (NZT) site. NZT development consent order (DCO) application was due to be determined by the Secretary of State on 10 May 2023 but the Inspectorate notes that a new deadline of no later than 14 September 2023 was set on 9 May 2023. The ES should clearly describe the relationship between the Proposed Development and any connected projects including the offshore CO_2 facility. This should include the extent to which the Proposed Development is dependent on their delivery and the development timelines of the other projects, with an explanation of how these will be coordinated.
2.1.2	2.1.2 and Sections 3.1 and 3.2	Natural resources	The Scoping Report states that natural gas, oxygen (O_2), nitrogen (N_2) and water will be required for the operational phase of the Proposed Development. Paragraph 2.1.2 states that O_2 and N_2 will be from local sources; an alternative option for O_2 and N_2 supply from an air separation unit (ASU) is also identified (paragraph 3.1.1). The ES should include an estimate of the likely volume of the different natural resources, including those identified above, that will be required in the operation of the Proposed Development, how these will be transported to the site, and an assessment of any likely significant effects arising from the use of such resources.

ID	Ref	Description	Inspectorate's comments
2.1.3	3.1.5	Carbon capture	The Scoping Report states that CO_2 would be captured at a rate in excess of 95%, which is anticipated to be secured through an environmental permit. Should the draft DCO (dDCO) allow for the generating station component to operate independently of the carbon capture, a worst case assessment of likely significant effects should be undertaken. If assessments in the ES rely on a capture rate of 95% it should be clear how this would be secured in the dDCO.
2.1.4	3.1.7 to 3.1.8 and Sections 3.2 to 3.8	Flexibility	The Inspectorate notes the Applicant's desire to incorporate flexibility into their dDCO and its intention to apply a 'Rochdale Envelope' approach for this purpose. This includes options for the various required connection corridors required as part of the project, eg CO_2 export, hydrogen, natural gas, electrical and water connection. Paragraph 3.1.7 states that it is expected that optionality would be reduced, and preferred options confirmed prior to submission of an application. Paragraph 3.1.8 describes that some aspects and features will not be confirmed until an engineering, procurement and construction contractor has been appointed, ie post grant of any DCO. In this instance, it is stated that the Rochdale Envelope will be adopted to define appropriate parameters for use in the EIA. The Applicant should make every attempt to narrow the range of options and explain clearly in the ES which elements of the Proposed Development have yet to be finalised and provide the reasons. At the time of application, any Proposed Development parameters should not be so wide-ranging as to represent effectively different developments. The parameters should use the maximum envelope within which the built development may be undertaken to ensure a worst case assessment. The ES should identify the parameters that have been assumed as the worst case scenario for each aspect scoped in to the assessment and ensure that interactions between aspects are taken into account relevant to those scenarios.

ID	Ref	Description	Inspectorate's comments
			The development parameters should be clearly defined in the dDCO and in the accompanying ES. The Applicant, in preparing an ES, should consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the Proposed Development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of Regulation 14 of the EIA Regulations. The Inspectorate draws the Applicant's attention to Advice Note 9: Rochdale Envelope, which states that *"it will be for the authority responsible for issuing the development consent to decide whether it is satisfied, given the nature of the project in question, that it has 'full knowledge' of its likely significant effects on the environment."* Please also note the Inspectorate's comments regarding alternatives at ID 2.1.17 of this Scoping Opinion. It should be noted that if the Proposed Development materially changes prior to submission of the DCO application, the Applicant may wish to consider requesting a new scoping opinion.
2.1.5	3.1.1 and Table 3-2	Phasing	The Scoping Report states that the Proposed Development would be phased, with a total design capacity of 1.2 gigawatt (GW) thermal for hydrogen production facility across two phases of up to 600 megawatt (MW) thermal in each phase. Table 3-2 of the Scoping Report provides an indicative construction timeline, with Phase 1 commencing mid-2025 and lasting approximately 2 years and Phase 2 commencing late 2027/ early 2028 and lasting 2-3 years. The ES should include an assessment of any likely significant effects arising from the phased nature of the Proposed Development, including risks of major accidents from the proximity of construction activity to the operational hydrogen production plant. Measures required to mitigate any significant effects should be clearly described in drafts of the construction environmental management plan (CEMP)

ID	Ref	Description	Inspectorate's comments
			and/ or operational environmental management plan (OEMP) submitted with the application.
2.1.6	Section 3.2	Hydrogen production facility built parameters	Section 3.2 of the Scoping Report describes the above ground infrastructure that is likely to be required as part of the hydrogen production facility but does not specify any built parameters. The ES should confirm the final parameters (minimum and maximum height, width, length and depth) and location of each component of above ground infrastructure and assess any likely significant effects resulting from their construction, operation/ maintenance, or decommissioning.
2.1.7	Sections 3.3 to 3.8	Construction working width and pipeline trenches	The ES should define the applicable parameters for the construction working width and the pipeline trenches, including depth, or apply a worse case. It should be clear how these parameters are secured through the dDCO. Where significant effects are identified the ES should set out the mitigation proposed to avoid, reduce or offset such effects including where appropriate the specification of construction methods and / or limitations placed on construction activities, and how this would be secured. The Applicant's attention is drawn to the Environment Agency's (EA) comments in Appendix 2 regarding pipeline design.
2.1.8	Sections 3.4 to 3.8 and Table 3-2	Special crossings	The Scoping Report outlines that a range of crossing methodologies are under consideration for the natural gas supply and hydrogen pipeline corridors. This could include open cut and/ or trenchless methodologies depending on engineering and environmental constraints. The ES should confirm the minimum and maximum depths of the crossings. The ES should clarify whether it is intended to adopt a similar approach in respect of any below ground routeing for the electrical, water and other gases connections.

ID	Ref	Description	Inspectorate's comments
			Table 3-1 of the Scoping Report confirms that only trenchless techniques are being considered for crossings of the River Tees and horizontal directional drilling (HDD) or use of existing pipeline for Greatham Creek. The Inspectorate welcomes the use of trenchless techniques in environmentally sensitive areas but notes that trenchless techniques have different land requirements; the full range of environmental effects should be considered when determining a preferred construction method. The ES should confirm the crossing methodologies assumed for each connection corridor. If flexibility is sought regarding the use of open cut or trenchless techniques, the ES should assess the available options or identify and assess a worst case scenario as relevant to each aspect and identify relevant mitigation, and how this would be secured. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding construction methodologies, including those affecting existing flood defences.
2.1.9	Section 3.6	Electrical connection corridor	The Scoping Report states that in addition to on-site electricity generated from the Steam Turbine Generator, an alternative supply will be required with options under consideration. Paragraph 3.6.4 of the Scoping Report states that the electrical connection could be above or below ground or a combination. The ES should confirm the final parameters for the selected electrical connection. If above ground, this should include the maximum number, height and locations of any pylons, and length of overhead line. The assessment of likely significant effects should take account of this infrastructure alongside the plan and other associated infrastructure.

ID	Ref	Description	Inspectorate's comments
2.1.10	Section 3.11	Construction access	The ES should identify the locations of access routes to site for construction and maintenance of the connection corridors. Any likely significant effects resulting from their construction, operation and decommissioning should be assessed.
2.1.11	Section 3.11	Construction deliveries	The Scoping Report indicates that options are being explored for construction materials to be delivered by boat and/ or rail. The ES should include an assessment of the worst case allowed for in the dDCO.
2.1.12	3.11.5	Temporary working areas and construction compounds	The ES should identify the location and size of the temporary working areas for the connection corridors, as well as the temporary construction compounds. Any likely significant effects resulting from their use should be assessed.
2.1.13	Section 3.12	Site clearance and remediation	The Scoping Report states that site clearance and remediation of Main Site A would be carried out by Teesworks under a separate consent. It is therefore not proposed to assess this within the ES. The ES should make clear the scope and status of the consent for site remediation, as well as the timescales for the works, and a clear description of how and at what point the baseline has been defined for the purpose of assessment. For Main Site B these powers would be sought within the DCO application, and an assessment is proposed within the ES, should this site be selected. The ES should include an assessment of any likely significant effects arising from site clearance and remediation works, for which powers are sought within the dDCO and confirm how this is to be secured. The ES should include information about works required to facilitate development that is proposed outside of the DCO application,

ID	Ref	Description	Inspectorate's comments
			including their scope and extent, status of any relevant consents required, timescales and degree of certainty.
2.1.14	3.13.7	Waste	In order to inform a robust assessment of likely significant effects, the ES should provide information on the storage, management and disposal of waste, including tunnel arisings. Any assumptions in this regard, for example traffic movements, waste handling and contaminated land, should be clearly stated in the ES.
2.1.15	3.16.1	Lighting	In addition to operational lighting, the ES should clearly describe the location and design of lighting required along the construction working widths and at construction compounds. Any likely significant effects should be assessed.
2.1.16	3.18.2	Decommissioning	The ES assessment of impacts resulting from decommissioning should be proportionate but include a description of the process and methods of decommissioning, land use requirements and estimated timescales. A description of any assumptions made in the assessment, eg about the approach to retention or removal of pipelines, should be provided. Any decommissioning associated with dismantling and replacing elements of the Proposed Development once they reach the end of their design life should be assessed if significant effects are likely to occur. The Inspectorate notes paragraph 4.2.3 of the overarching NPS for Energy (NPS EN-1), which states that the ES should cover the environmental effects arising from decommissioning of the project.
2.1.17	Chapter 4	Alternatives	The Scoping Report identifies that several alternative options are under consideration, including two sites (Main Site A and Main Site B) for the hydrogen production plant. Paragraph 4.3.7 of the Scoping Report states that if alternatives still exist at the time of application, the ES will consider and assess the worst case impacts.

ID	Ref	Description	Inspectorate's comments
			The Inspectorate's comments at ID 2.1.4 about flexibility apply equally to alternatives. For the avoidance of doubt, the ES should consider the worst case impacts and identify mitigation as required for any options that are sought within the dDCO.
2.1.18	N/A	Easements	The description of the physical characteristics of the Proposed Development in the ES should include the details of required easements, to ensure that the extent of the likely impacts from the Proposed Development (for example, sterilisation of mineral resource) is fully understood.
2.1.19	N/A	Hydrogen pipeline safety criteria	The ES should explain what design guidelines and safety criteria are being followed for the hydrogen pipeline, and how any health and safety risks would be managed during operation/ maintenance. The Inspectorate notes that hydrogen is an emerging technology and that the regulatory framework and standards are likely to continue to evolve. Please also refer to the Inspectorate's comments at ID 3.13.3 of this Scoping Opinion.

2.2 EIA Methodology and Scope of Assessment

(Scoping Report Section 7.0)

ID	Ref	Description	Inspectorate's comments
2.2.1	7.3.4	Assessment methodology and significance criteria	The Scoping Report states that methods used in assessment will be outlined in each aspect chapter by reference to published standards, guidelines, and criteria. For some aspect sections in the Scoping Report, no reference is made to the standards proposed to be used so the Inspectorate is not able to provide substantive comment. The ES should describe the standards and guidelines used for each aspect and explain why these are appropriate to the assessment.
2.2.2	7.3.10	Baseline conditions	The Inspectorate notes that Main Sites A and B appear to partially overlap with the Order Limits of the NZT project. Any implications for the future baseline arising in the event of commencement of development authorised by the NZT DCO, should it be made, should be described in the ES.
2.2.3	Section 7.5	Transboundary	The Inspectorate on behalf of the SoS has considered the Proposed Development and concludes that the Proposed Development is unlikely to have a significant effect either alone or cumulatively on the environment in a European Economic Area State. In reaching this conclusion the Inspectorate has identified and considered the Proposed Development's likely impacts including consideration of potential pathways and the extent, magnitude, probability, duration, frequency and reversibility of the impacts. The Inspectorate considers that the likelihood of transboundary effects resulting from the Proposed Development is so low that it does not warrant the issue of a detailed transboundary screening. However, this position will remain under review and will have regard

ID	Ref	Description	Inspectorate's comments
			to any new or materially different information coming to light which may alter that decision. Note: The SoS' duty under Regulation 32 of the 2017 EIA Regulations continues throughout the application process. The Inspectorate's screening of transboundary issues is based on the relevant considerations specified in the Annex to its Advice Note Twelve, available on our website at http://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/
2.2.4	N/A	Study areas	Each ES aspect chapter should describe the study area used in the assessment. It should explain how the extent of the study area has been established by reference to guidelines and discussions with statutory consultation bodies as relevant. The ES should include a figure/ figures to identify the final study areas for each aspect, including the location of receptors considered.
2.2.5	N/A	Matters scoped into the assessment	For the avoidance of doubt, as there is no summary table identifying matters scoped in or out of the aspects listed below, this Scoping Opinion is adopted on the basis that the impacts on receptors listed at the specified paragraphs in the Scoping Report are scoped into the assessment subject to the Inspectorate's comments at 1.0.4: ▪ Surface water, flood risk and water resources – paragraph 6.3.20. ▪ Geology, hydrogeology and contaminated land – paragraph 6.4.88. ▪ Ecology and nature conservation – paragraph 6.6.18. ▪ Marine ecology – paragraph 6.8.24. ▪ Traffic and transportation – paragraph 6.9.10. ▪ Landscape and visual amenity – paragraph 6.10.8.

ID	Ref	Description	Inspectorate's comments
			▪ Cultural heritage – paragraph 6.11.10. ▪ Socio-economics and land use – paragraph 6.12.21. ▪ Climate change – paragraph 6.13.15. ▪ Materials and waste – paragraph 6.15.7.
2.2.6	N/A	Impacts from dewatering	The Scoping Report does not specify if dewatering would be required in the construction of the Proposed Development. The ES should describe the likely need for dewatering, identify sensitive receptors which may be affected and assess any likely significant effects. The ES and associated management plan documents should set out the minimum environmental requirements that have been assessed and that contractors will be required to apply when managing dewatering discharges.
2.2.7	N/A	CEMP	The Inspectorate welcomes the commitment to submit a framework CEMP with the ES. In addition to the matters listed at paragraph 3.13.7 of the Scoping Report, the Inspectorate advises that the framework CEMP should contain details of all measures referred to in the ES required to mitigate construction impacts, unless these are secured by alternative mechanisms (in which case this should be explained and the alternative mechanism confirmed). The ES should clearly describe the efficacy of proposed measures and any residual effects following implementation, and it should also assess any inter-related effects of the mitigation measures, eg the presence of any noise screening required to be considered in landscape and visual impact assessment.
2.2.8	N/A	Operational environmental management plan (OEMP)	The Scoping Report references use of an environmental management plan during operation to mitigate potential significant adverse effects. The Applicant should provide a draft/ outline version of an OEMP

ID	Ref	Description	Inspectorate's comments
			containing details of any measures referred to in the ES and demonstrate how these will be secured through the dDCO or an alternative legal mechanism.
2.2.9	N/A	Avoidance/ mitigation measures	The Scoping Report makes reference to the use of avoidance measures to reduce effects to not significant eg avoidance of tree / linear habitat feature removal. The ES should set out any measures relied upon to avoid significant effects and demonstrate how these will be secured through the dDCO or other legal mechanism.
2.2.10	N/A	Monitoring	The Scoping Report references monitoring of mitigation in several aspect sections. Where the ES concludes that monitoring is required, the Applicant should provide a document that describes the monitoring activities, who has responsibility for them, frequency, any trigger points for remedial action and how it is secured through the dDCO or other legal mechanism.

3. ENVIRONMENTAL ASPECT COMMENTS

3.1 Air Quality

(Scoping Report Section 6.2)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.1.1	6.2.14	Operational road traffic emissions	The Scoping Report identifies that operational traffic flows will be below the screening criteria of 500 Light Duty Vehicles or 100 Heavy Duty Vehicles per day, as set out in the Institute of Air Quality Management (IAQM) guidance published in 2017 and therefore seeks to scope out operational road traffic emissions. The Inspectorate agrees that providing traffic flows are confirmed as being less than the IAQM criteria for detailed assessment, this matter can be scoped out. The ES should also demonstrate that cumulative vehicle movements with other developments would not exceed the IAQM thresholds based on worst case assessments. If such confirmation is not possible, an assessment should be provided.
3.1.2	6.2.18	Construction phase Non-Road Mobile Machinery (NRMM) emissions	The Scoping Report seeks to scope out construction phase NRMM emissions. The Scoping Report references relevant guidance and distance to receptors in concluding that significant effects from NRMM when best practice measures are in place are unlikely. The Inspectorate agrees with this matter being scoped out, however best practice measures and other such mitigation should be clearly secured through the dDCO.
3.1.3	6.2.23	Operational emissions of water vapour, N_2, O_2, H_2, CH_4 and CO_2	The Scoping Report seeks to scope out the assessment of water vapour, N_2, O_2, H_2, methane (CH_4), and carbon dioxide (CO_2). The Scoping Report explains that any emissions would be small and diluted, however does not provide information on volumes or

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			evidence to substantiate this statement. The Applicant's attention is drawn to the response from the United Kingdom Health Security Agency (UKHSA) regarding assessment of 'non-threshold pollutants'. The Inspectorate therefore does not agree that these matters can be scoped out of the ES at this stage. The ES should include confirmation of the likely volume of emissions and concentration of pollutants, and assess any potential for significant effects. Please refer to the Inspectorate's comments at ID 3.12.4 regarding the assessment of CH_4 as part of the greenhouse gas (GHG) assessment in the Climate Change ES Chapter.
3.1.4	6.2.25	Emissions from the connection corridors	The Inspectorate agrees that operation of the hydrogen pipeline, natural gas, electrical and water connections is not likely to result in significant effects from emissions to air and this matter can be scoped out of the ES.

ID	Ref	Description	Inspectorate's comments
3.1.5	N/A	Public and private amenity areas	Paragraph 6.5.4 of the Scoping Report describes that there are areas of public and private amenity in proximity to the Proposed Development, eg around Coatham. These are not discussed in relation to this aspect. The assessment should consider the potential for any likely significant effects on these areas and users of the areas.
3.1.6	N/A	Construction emissions from vehicles	The assessment of effects arising from construction vehicle emissions should also be informed by Natural England's guidance relating to assessment of road traffic emissions under the Habitats Regulations, NEA001.

3.2 Surface Water, Flood Risk and Water Resources

(Scoping Report Section 6.3)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.2.1	N/A	N/A	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.2.2	6.3.11 to 6.3.19	Flood zones	The Scoping Report identifies Flood Zones across the Study Area however does not include sub-categories, such as an area of high probability (Flood Zone 3a) or functional floodplain (Flood Zone 3b). The ES should provide an accurate and consistent description of the baseline flood risk for each element of the Proposed Development and the description should clearly distinguish between Flood Zones, including Flood Zones 3a and 3b where relevant. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding Flood Zones; the Inspectorate notes that there is a discrepancy between information in the Scoping Report, which identifies that Main Site B is entirely within Flood Zone 1, and the EA's information, which states it is primarily within Flood Zone 1 but partially within Flood Zones 2 and 3. The Flood Zone should be confirmed within the ES and mitigation identified as required.
3.2.3	6.3.20	Pollution of surface watercourses during operation	The Scoping Report scopes in assessment for this matter during construction and decommissioning. Consideration of the potential for accidental spillages during operation is proposed to be assessed as part of Geology, Hydrogeology and Contaminated Land (paragraph 6.4.88 of the Scoping Report). Cross-reference should be made to the

ID	Ref	Description	Inspectorate's comments
			outcome of that assessment in the Surface Water, Flood Risk and Water Resources chapter of the ES.
3.2.4	6.3.27	Effluent streams and discharges	The ES should clearly describe the effluent streams and discharges associated with construction and operation of the Proposed Development and any permits required/ implications for existing permits. Effort should be made to agree the scope and methodology of assessment work, including water quality modelling, in respect of effluent streams and other discharges to water with relevant consultation bodies. Evidence of discussions and any agreements reached should be provided within the ES. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding assessment of foul drainage in the ES.
3.2.5	Section 6.3	Additional assessments	The Inspectorate notes that a Flood Risk Assessment (FRA), Water Framework Directive (WFD) assessment and nutrient neutrality assessment will be prepared. Information from these assessments should be used to inform preparation of the ES. The Scoping Report describes surface water bodies and groundwater bodies designated under the WFD, which are located close to the Proposed Development. The ES should include an assessment of the likely significant effects to both types of WFD water body. The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding scope of the WFD and nutrient neutrality assessments.
3.2.6	N/A	Scope of assessment – FRA	The FRA underpinning the ES assessment should additionally cover matters including the effect that temporary mounds of soil in the floodplain could have on flood risk, the volumes of water displacement involved and mitigation measures where necessary.

ID	Ref	Description	Inspectorate's comments
			The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding scope of the FRA and climate change allowances.
3.2.7	N/A	Impacts from frac-out	The ES should include an assessment of likely significant effects arising from frac-out, ie fracking fluid breakout during HDD works, on aquatic environment receptors and water resource receptors, including consideration of any impacts arising from clean-up works. The Applicant's attention is drawn to Natural England's comments in Appendix 2.
3.2.8	N/A	Scope of assessment	The ES should assess the potential for an increase in offsite flood risk arising from any proposed ground raising within the development boundary, including the pipeline corridors. Effort should be made to agree the scope of the assessment, including the requirement for flood modelling, with the EA. The ES should identify any mitigation required to address likely significant effects.

3.3 Geology, Hydrogeology and Contaminated Land

(Scoping Report Section 6.4)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.3.1	6.4.88	Potential effects	In addition to the impact pathways described at paragraph 6.4.88 of the Scoping Report, the ES should include an assessment of effects arising from changes to groundwater flow, levels and quality during construction, operation and decommissioning, including from the presence of below ground pipelines, where likely significant effects could occur. The Inspectorate notes that paragraph 6.3.20 of the Scoping Report states that potential impacts to groundwater flow would be assessed as part of this aspect.

ID	Ref	Description	Inspectorate's comments
3.3.2	6.4.88	Drainage strategy	The Scoping Report refers to implementation and maintenance of operational drainage systems to control potential impacts from pollution to surface watercourses. The Applicant should provide a draft/outline version of the drainage strategy and demonstrate how this will be secured through the dDCO or other legal mechanism. Potential construction phase impacts should also be addressed in a drainage strategy.
3.3.3	6.4.89	Baseline information	The desk-based assessments and conceptual site model should be submitted as part of the ES. In addition to Main Sites A and B, these documents should provide information about land within the connection corridors. The baseline information should be sufficient to enable an assessment of the likely significant effects arising from the construction and operation of the Proposed Development, including consideration of the range of construction methods proposed or on

ID	Ref	Description	Inspectorate's comments
			the basis of any assumed construction methods where they are not known at time of ES preparation. This should include ground investigation if deemed necessary to sufficiently understand the baseline environment. The Inspectorate notes that risk from unexploded ordnance (UXO) is scoped into the assessment of major accidents and hazards. UXO is not referenced in Section 6.4 of the Scoping Report, but the Inspectorate expects the collection of baseline data to include information to support assessment in the Major Accidents and Hazards ES Chapter.
3.3.4	6.4.90	Intrusive investigation	The ES should include a full description of any further intrusive investigation required and confirm how this is to be secured. Effort should be made to agree the scope with all relevant consultation bodies, eg Hartlepool Council and Stockton-on-Tees Council where it relates to land within their administrative area.
3.3.5	N/A	Drinking water protected areas	The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding groundwater bodies being designated as drinking water protected areas. The status of the groundwater bodies should be reflected in the baseline description and assessment of potential impacts in the ES.

3.4 Noise and Vibration

(Scoping Report Section 6.5)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.4.1	6.5.26	Operational road traffic noise	The Scoping Report seeks to scope out effects from operational road traffic noise on the basis that the Proposed Development is unlikely to have a significant impact on existing traffic flows on the local road network. Paragraph 3.15.6 of the Scoping Report identifies that there is an anticipated maximum workforce of 85 staff and that deliveries of operational and maintenance consumables will be managed to minimise traffic movements. The Inspectorate recognises that significant effects are unlikely during operation, however the ES should provide further information on the predicted number of movements required for consumables during operation to demonstrate that these will remain under the thresholds. The Inspectorate considers that providing that this information is included in the ES, based on the low number of traffic movements predicted during operation, this matter can be scoped out of the ES. Please refer to the Inspectorate's comment about operational HGV movements at ID 3.8.1 of this Scoping Opinion.

ID	Ref	Description	Inspectorate's comments
3.4.2	6.5.13	Assessment of vibration during operation	The Scoping Report states that significant vibration impacts during operation are not likely due to the distance between the Proposed Development and receptors but operational activities will be briefly considered in the ES. The ES should describe the activities likely to give rise to vibration effects.

ID	Ref	Description	Inspectorate's comments
			The Inspectorate agrees with the Applicant's approach to this matter. The ES should include confirmation of any sources of vibration, and the likely levels together with the relevant thresholds for significant effects at the nearest receptor(s) to demonstrate that significant effects are not likely to occur.

3.5 Ecology and Nature Conservation (including Aquatic Ecology)

(Scoping Report Section 6.6)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.5.1	6.6.15	Great crested newt (GCN) surveys	The Scoping Report seeks to scope out surveys on land located to the south of the River Tees on the basis that the Industry Nature Conservation Association (INCA) (a membership organisation including the Tees Valley Wildlife Trust) confirmed for the NZT project that there are known occurrences of GCN in this area. Table 6-3 of the Scoping Report states that land to the north of the River Tees would be surveyed if a District Level Licensing (DLL) approach is not agreed with Natural England. The Inspectorate agrees that surveys on land to the south of the River Tees can be scoped out of the ES.
3.5.2	6.6.18	Effects on relevant habitats and species from water quality changes during operation	The Scoping Report states that temporary effects to water quality during construction would be considered but does not reference potential effects during operation, for example from spillages or discharges, extraction of water and/ or effluent discharge. The ES should include an assessment of this matter or otherwise demonstrate why significant effects are not likely to occur. Cross-reference should be made to the assessment in the Surface Water, Flood Risk and Water Resources ES Chapter.
3.5.3	Table 6-3	Bat activity surveys along connection corridors	The Scoping Report identifies the intention to limit surveys to areas of suitable habitat where permanent effects eg loss are predicted. The Inspectorate accepts, as stated in Table 6-3 of the Scoping Report, that such surveys may not be warranted in relation to temporary habitat loss. However, the Inspectorate considers that they may be required to inform the assessment of likely significant

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			effects and the design of appropriate mitigation in relation to the effects of construction lighting and effects resulting from impacts to linear habitat features. These matters should be considered in the ES where likely significant effects could occur, supported by appropriate evidence such as bat activity survey data. The Applicant should seek agreement from relevant consultees and provide a description of the approach taken in the ES, incorporating any relevant advice.

ID	Ref	Description	Inspectorate's comments
3.5.4	6.6.18 and Section 6.2 (Air Quality)	Air quality effects on sensitive ecological receptors	The Scoping Report states that air quality impacts from construction traffic emissions and operational emissions will be considered but does not specify for which pollutants. Section 6.2 (air quality) of the Scoping Report identifies which pollutants are proposed to be assessed but does not reference nitrogen deposition or acid deposition as potential impacts which could affect sensitive ecological receptors. For the avoidance of doubt, the potential for nitrogen deposition and/or acid deposition to arise and result in effects on ecological receptors should be considered in the ES, and subject to assessment where a pathway for significant effects is identified.
3.5.5	Table 6-3	Bird surveys, including functionally linked land (FLL)	The ES should give a full description of how areas of FLL have been identified for survey, the levels of precaution applied to this process, and the outcomes of consultation and degree of agreement reached with key stakeholders. It is also advised that the scope and methodology of the ornithological surveys is discussed with the relevant consultees and agreed where possible.

ID	Ref	Description	Inspectorate's comments
3.5.6	Table 6-3	GCN – information to support of assessment of effects	With regard to the Proposed Development site to the north of the River Tees, the Scoping Report states it is proposed to consult NE about whether a District Level Licensing (DLL) approach would be available for this project. If not, it is proposed to undertake habitat suitability assessment surveys to inform the assessment in the ES, in addition to eDNA and/ or presence/ absence surveys. It also sets out the circumstances where population size class assessment surveys may be undertaken to inform the assessment of effects. The Inspectorate is content with this approach to GCN. The Applicant's attention is drawn to Natural England's comments in Appendix 2 and the Inspectorate's Advice Note 11, Annex C.
3.5.7	Table 6-3	Otter and water vole surveys	The Scoping Report states that presence/ absence surveys will be undertaken in locations where open cut crossings of watercourses and ditches will be required. The Inspectorate notes that trenchless crossings are proposed at several locations, but no information is presented as to whether otter or water vole are likely to be present here and/ or whether crossing installation would generate potential impact pathways. The survey area should include trenchless crossing locations, or the ES should otherwise demonstrate why a significant effect is not likely to occur in these locations.
3.5.8	Table 6-3	Detailed surveys for reptiles, freshwater species, terrestrial vertebrates and plants	The Scoping Report states that the requirement for species' surveys will be informed by further desk-based assessment and the findings of the Phase 1 Habitat survey. The Inspectorate agrees with the approach set out. Effort should be made to agree the survey scope and methodology with the relevant consultation bodies.

ID	Ref	Description	Inspectorate's comments
			The ES should include an assessment of likely significant effects to these receptors where these could occur, or information demonstrating absence of a likely significant effect and where agreement has been reached with relevant consultation bodies.
3.5.9	6.6.32	Biodiversity net gain (BNG)	The Scoping Report states that the project will aspire to achieve net gain and that a BNG assessment will be undertaken. The ES should clearly distinguish between mitigation for significant adverse effects on biodiversity from wider enhancement measures. The Applicant's attention is drawn to Natural England's comments in Appendix 2 regarding the latest Biodiversity Metric 4.0.
3.5.10	N/A	Scope of assessment	The assessment of temporary disturbance impacts to habitats should include consideration of likely significant effects arising from the construction of the hydrogen pipeline in proximity to Greatham Creek and Saltern Wetlands. The Applicant's attention is drawn to the EA's comments in Appendix 2 in this regard.
3.5.11	N/A	Confidential annexes	Public bodies have a responsibility to avoid releasing environmental information that could bring about harm to sensitive or vulnerable ecological features. Specific survey and assessment data relating to the presence and locations of species such as badgers, rare birds and plants that could be subject to disturbance, damage, persecution, or commercial exploitation resulting from publication of the information, should be provided in the ES as a confidential annex. All other assessment information should be included in an ES chapter, as normal, with a placeholder explaining that a confidential annex has been submitted to the Inspectorate and may be made available subject to request.

3.6 Ornithology

(Scoping Report Section 6.7)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.6.1	N/A	N/A	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.6.2	N/A	Operational discharges to water	In addition to the impact pathways identified in the Scoping Report, the Inspectorate advises that consideration should be given to the potential for operational discharges to water to results in likely significant effects to bird qualifying features of the Teesmouth and Cleveland Coast Special Protection Area and Ramsar. The ES should include an assessment of these matters where significant effects are likely, or otherwise provide evidence to demonstrate why significant effects are not likely.
3.6.3	N/A	Confidential annexes	Please refer to the Inspectorate's comments at ID 3.5.11 of this Scoping Opinion.

3.7 Marine Ecology

(Scoping Report Section 6.8)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.7.1	6.8.11	Effects to the Southern North Sea Special Area of Conservation (SAC) during construction, operation and decommissioning	The Scoping Report seeks to scope out effects to the Southern North Sea SAC, for which harbour porpoise is a qualifying feature, on the basis that it is located more than 100km from the Proposed Development and, as such, there are no impact pathways. In this regard, the Inspectorate also notes that paragraph 6.8.27 of the Scoping Report states that there are no impact pathways from underwater sound arising from the proposals. The Inspectorate agrees that the SAC can be scoped out of the ES on the basis described in the Scoping Report.
3.7.2	6.8.12	Project specific marine ecology surveys	The Scoping Report seeks to scope out surveys on the basis that the assessment will use baseline data from a range of other sources, including surveys completed for the nearby NZT project, as well as construction techniques that are designed to avoid impact pathways, eg trenchless crossings or existing pipelines for the proposed watercourse crossings. It is stated that requirement for surveys will be kept under review with NE and the MMO. The Inspectorate agrees that marine mammal and benthic ecology surveys can be scoped out on the basis set out in the Scoping Report. If the scope of the Proposed Development changes to include additional works within the marine environment (ie beyond watercourse crossings as described at paragraph 6.8.17 of the Scoping Report), the need for surveys of affected areas should be discussed with relevant consultation bodies with a view to seeking agreement on requirements and scope, as required.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			The description of the baseline environment in the ES should reference any further data collected for pre-commencement or construction monitoring surveys associated with NZT and/or other nearby developments. The ES should explain any limitations or assumptions made about use of this data, together with how the assessment has addressed these difficulties. With regard to fish surveys, the Inspectorate notes that potential impact pathways from underwater sound, and possibly entrapment and entrainment have been identified. The Applicant should determine the need for fish surveys to provide an up-to-date and adequate understanding of the baseline to support assessment of these impact pathways in the ES. Effort should be made to agree the requirement for, and scope of, any survey work with the relevant consultation bodies.
3.7.3	6.8.19 to 6.18.20	Effects from noise and vibration during construction of pipelines at River Tees and Greatham Creek	The Scoping Report seeks to scope out effects from noise and vibration on the basis that trenchless technologies and/ or existing pipelines or tunnels would be used. The Inspectorate notes that paragraph 6.8.21 of the Scoping Report states that *'many design elements… have yet to be confirmed, development design and impact avoidance measures have not been finalised.'* The Scoping Report does not include any information about the predicted noise and vibration levels from the proposed works or sensitivity of ecological receptors. The Inspectorate therefore does not have sufficient information to reasonably conclude that there will be no likely significant effects. Accordingly, the ES should include an assessment of these matters, or information demonstrating agreement with the relevant consultation bodies and the absence of likely significant effects.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.7.4	6.8.27	Effects from underwater sound during construction, operation and decommissioning	The Scoping Report seeks to scope out effects from underwater sound as there are no impact pathways eg no use of vessels, drilling/ piling and/ or UXO clearance is expected in the marine environment. The Inspectorate notes that the proposed hydrogen pipeline would cross the tidal River Tees and that there is potential for noise and vibration impacts arising from construction of the pipeline to migratory fish. This matter should be assessed in the ES. The assessment should consider the worst case construction methods sought within the dDCO, and the potential for cumulative effects with other developments in the area. The ES should identify mitigation required in respect of any significant effects identified and explain how this would be secured in the dDCO.

ID	Ref	Description	Inspectorate's comments
3.7.5	6.8.23	BNG	The Inspectorate notes that permanent loss of habitat in the intertidal area is not proposed but if the approach changes, consideration would be given to the *'requirements of the Environment Act 2021'* including a BNG assessment. The ES should clearly distinguish between mitigation for significant adverse effects on biodiversity from wider enhancement measures. The mitigation hierarchy should be adhered to where practicable.
3.7.6	N/A	Coastal saltmarsh habitat	The Applicant's attention is drawn to the EA's comments in Appendix 2 regarding the presence of coastal saltmarsh habitat adjacent to Greatham Creek. The baseline habitat should be correctly described in the ES and supporting figures. The assessment of impacts arising from installation of the proposed pipelines should include

ID	Ref	Description	Inspectorate's comments
			consideration of this habitat and identify any mitigation required for likely significant effects, and how this would be secured in the dDCO.
3.7.7	N/A	Fish entrapment and entrainment	The ES should include an assessment of effects arising from the risk of fish entrapment and entrainment associated with abstraction of water from WFD waterbodies and/ or cooling water systems required for the Proposed Development. The ES should identify any mitigation required, and how this would be secured in the dDCO.
3.7.8	N/A	Discharge of cooling waters	If cooling water is proposed to be discharged to the Tees Estuary or other WFD waterbodies, the ES should include an assessment of likely significant effects arising from thermal properties of the discharge of the cooling water. The assessment should include consideration of cumulative effects with other development in the area. Effort should be made to agree the scope of assessment, and any modelling required, with relevant consultation bodies including the EA and Natural England. The ES should identify any mitigation required, and how this would be secured in the dDCO.
3.7.9	N/A	Hard structures	If any hard structures (eg pipe outflow, rock armouring or equivalent) are proposed then the assessment of habitat loss and disturbance should also consider potential changes in coastal processes and introduction of invasive non-native species (INNS).

3.8 Traffic and Transportation

(Scoping Report Section 6.9)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.8.1	6.9.14	Impacts from operational traffic	The Scoping Report seeks to scope out operational road traffic flows from detailed assessment, stating that the anticipated maximum workforce of 85 staff on site within a 24 hour period is unlikely to give rise to significant effects. This approach is to be agreed with the Local Highway Authority. Having considered the nature and characteristics of the Proposed Development, the Inspectorate agrees that subject to confirmation of the number and type of all operational vehicle movements (ie HGVs in addition to staff) in the ES description of development, operational traffic movements are not likely to result in significant effects and that an assessment of this matter can be scoped out of the ES. Agreement should be sought from the relevant Highways Authority.

ID	Ref	Description	Inspectorate's comments
3.8.2	6.9.22	Future baseline	The ES should clearly explain how the future baseline has been calculated and how this has considered other planned development in the area using the same road network during the construction period.
3.8.3	N/A	Abnormal indivisible loads (AIL)	The Scoping Report states that local ports are being considered for transport of AIL and that consideration will be given to the appropriate port and AIL routes during the design process. The ES should include an assessment of the likely significant effects arising from transportation of AIL via each proposed transportation

ID	Ref	Description	Inspectorate's comments
			method and identify any mitigation measures required and how these would be secured.
3.8.4	N/A	Hazardous loads	The ES should include an assessment of likely significant effects arising from the transportation of hazardous loads during construction and operation of the Proposed Development, and identify any mitigation required (including drainage systems) and how this would be secured through the dDCO.

3.9 Landscape and Visual Amenity

(Scoping Report Section 6.10)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.9.1	6.10.19	Night-time light pollution impacts	The Applicant proposes to scope out impacts of night-time light pollution on landscape and visual amenity receptors. The Scoping Report states that due to the industrial nature of the surrounding area, existing levels of lighting are high and significant effects on sensitive receptors are unlikely to occur. The Inspectorate considers that, given the scale of the Proposed Development, the ES should provide an assessment of the effects of night-time light pollution on landscape and visual receptors during all phases of the Proposed Development or provide further justification for why significant effects would not arise.

ID	Ref	Description	Inspectorate's comments
3.9.2	6.10.6	Visual amenity receptors	It is not clear if users of waterways have been identified as visual receptors in the assessment. The ES should either assess effects on users of the waterways, such as the River Tees, and the Tees Bay and Estuary, or provide a justification as to why they would not experience significant effects.
3.9.3	6.10.14	Zone of Theoretical Visibility (ZTV) / Study area	The Scoping Report states that the ZTV will be generated using a bare ground Digital Terrain Model (DTM) and the representative viewpoints will be identified in the ZTV considering the main building envelope, the potential stacks and taller columns and any structures required for the connections. The ES should clearly evidence and justify the final extent of the ZTV used and ensure that any

ID	Ref	Description	Inspectorate's comments
			assessment of significance is based on the worst-case scenario. Effort should be made to agree the ZTV with relevant consultation bodies.
3.9.4	6.10.14	Representative viewpoints	The Inspectorate notes that the Applicant proposes to produce representative viewpoints from approximately 12 locations identified within the ZTV. Both winter and summer views should be included. In finalising the viewpoint locations, the Applicant should consider the production of representative viewpoints from the North York Moors National Park, national trails, River Tees/Tees Bay and Estuary and the scheduled monuments at Eston Nab to support a comprehensive assessment of visual impact to recreational users. Effort should be made to agree the locations and photomontage type with relevant consultation bodies.
3.9.5	6.10.16	Site layout and parameters	The ES should explain how the siting and design of the proposed structures (and materials to be used) have been selected with the aim of minimising impacts to landscape and visual receptors. The Applicant's attention is drawn to Natural England's comments in Appendix 2 in respect of design policies and codes.
3.9.6	6.10.20	Landscape mitigation	The ES should clearly describe any proposed planting and how the landscape and visual effects are expected to alter as any such planting matures.
3.9.7	N/A	North Yorkshire Moors National Park	North Yorkshire Moors National Park should be considered as a receptor in the assessment of effects to landscape character, where significant effects are likely to occur to this receptor, or the ES should otherwise demonstrate why significant effects are not likely to occur. Any assessment should include effects on the special qualities of the designated landscape.

ID	Ref	Description	Inspectorate's comments
3.9.8	N/A	Photomontages	The ES should ensure that the viewpoints and subsequent photomontages chosen are appropriate and representative for whether Main Site A or Main Site B is taken forward as the final design for the Proposed Development. Where flexibility is sought, the photomontages produced should demonstrate the visual impacts arising from options still under consideration to enable effects to be fully understood.

3.10 Cultural Heritage

(Scoping Report Section 6.11)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.10.1	6.11.18	Direct impacts to marine cultural heritage assets (below Mean High Water Springs (MHWS))	The Applicant intends to scope out direct impacts to marine cultural heritage assets during construction and operation of the Proposed Development. The Scoping Report states that no construction works are proposed in areas below MHWS where marine heritage assets are likely to be located and more highly concentrated. The Inspectorate agrees that based on the information provided, construction and operation of the Proposed Development is unlikely to give rise to significant effects from direct impacts to marine cultural heritage assets and is therefore content for this matter to be scoped out.
3.10.2	6.11.18	Direct impacts to marine heritage assets located in River Tees	The Applicant proposes to scope out direct impacts to heritage assets located in the River Tees as construction methodologies such as HDD or Micro-bored Tunnel (MBT) will be utilised to minimise disturbance to sensitive receptors during construction of the hydrogen pipeline beneath the river. The Inspectorate agrees that based on the information provided, construction and operation of the Proposed Development is unlikely to give rise to significant effects from direct impacts to marine cultural heritage assets in the River Tees and therefore agrees that this matter can be scoped out.

ID	Ref	Description	Inspectorate's comments
3.10.3	6.11.11	Desk-based assessment	The Scoping Report states that a desk-based assessment would be produced. No reference is made to whether any further surveys are required to inform the archaeological baseline. The Inspectorate is of the opinion that should the desk-based assessment identify the need for further investigation, such as geophysical survey, monitoring of geotechnical ground investigations or trial trenching, the Applicant should make every effort to agree the scope of such activities with relevant consultation bodies. The results and assessment of effects to archaeology should be clearly presented within the ES along with a description of any uncertainties or assumptions applied, and confirmation of any further survey and evaluation required and how this would be secured.
3.10.4	6.11.12	Study Area	The ES should clearly describe how the final study areas have been defined according to sensitivity of receiving heritage assets and potential impacts during construction and operation of the Proposed Development. The Applicant should seek agreement with the relevant consultation bodies regarding the study areas used to inform the assessment and evidence this in the ES.
3.10.5	6.11.18	Indirect impacts to marine cultural heritage assets, including those within the River Tees	Indirect impacts to marine cultural heritage assets, such as temporary and permanent changes to their setting during construction and operation of the Proposed Development respectively, have not been explicitly identified in the Scoping Report. The ES should consider the potential for indirect impacts to marine heritage assets to give rise to likely significant effects or provide a justification as to why they would not experience significant effects.
3.10.6	N/A	Historic landscape character	The ES should also assess effects to historic landscape character where significant effects are likely to occur.

3.11 Socio-Economics and Land Use

(Scoping Report Section 6.12)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.11.1	6.12.22	Effects to best and most versatile (BMV) agricultural land – construction and operation	The Scoping Report describes that parts of the proposed hydrogen pipeline corridor comprise BMV land under the Agricultural Land Classification (ALC) system. ALC Grade 2 land is located near Kirkleatham. Grade 3 land near Greatham is identified as being possible BMV land. The Applicant seeks to scope out effects on BMV land on the basis that impacts would be temporary during pipeline installation. It is stated that in the worst case scenario of open cut method, soil that is disturbed would be retained in-situ to infill the trench. The Scoping Report does not state the area of BMV land that would be affected or whether there would be a requirement for restrictions over the pipeline corridor during operation. No information is provided about soil handling and reinstatement following construction and/ or requirements for maintenance during operation. These matters should be addressed in the ES. The Inspectorate notes that National Policy Statement (NPS) EN-4, paragraph 2.23.7 requires information about mitigation measures for soil to be provided. The Inspectorate does not have sufficient information to agree that this matter can be scoped out of assessment. It is also noted that paragraph 3.5.3 of the Scoping Report states that the pipeline could be above ground and it is therefore unclear whether any BMV land would be permanently sterilised. The ES should provide an assessment of effects to BMV land and an explanation of how any loss of BMV land would be minimised, or demonstrate that impacts would

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			not give rise to likely significant effects, including evidence of agreement with relevant consultation bodies.

ID	Ref	Description	Inspectorate's comments
3.11.2	6.12.4	Baseline data	The Scoping Report states that 2011 census data would be used. The Office for National Statistics (ONS) has commenced publication of 2021 census data and the Inspectorate advises that reference should be made to 2021 data where relevant to the assessment.
3.11.3	N/A	Effects on housing affordability and availability	The Scoping Report does not reference potential impacts on housing during construction. It is noted that construction workforce peak will be approximately 3,100 people per day (paragraph 3.14.1 of the Scoping Report), but it is not stated whether these would be non-home-based workers or if there would be a requirement for temporary living accommodation. The Inspectorate advises that if a significant number of non-home-based construction workers are required, this could foreseeably have an impact on local availability of affordable housing, including from cumulative effects with other large developments nearby. The ES should provide an assessment of effects on the local private rented sector and tourist accommodation or demonstrate that impacts would not give rise to likely significant effects, including evidence of agreement with relevant consultation bodies.

3.12 Climate Change

(Scoping Report Section 6.13)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.12.1	N/A	N/A	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.12.2	Figure 10	GHG emissions arising from disturbance of landfill sites	The Inspectorate notes from Figure 10 of the Scoping Report that there are active and historic landfill sites present within the Proposed Development site. If any underground construction works cannot avoid these sites, the potential to increase, or give rise to, GHG emissions from these sites during construction should be included in the assessment.
3.12.3	N/A	CO_2 emissions	The Inspectorate notes that the CO_2 generated from the Proposed Development is proposed to be exported via the proposed NZT project and to the proposed NEP offshore storage. The ES should describe the status of these projects and any uncertainty around this method of exportation and/ or alternative proposals. Please refer to the Inspectorate's comments at ID 2.1.3 of this Scoping Opinion regarding assessment of CO_2 emissions should the dDCO seek or allow for powers for the generating station component to operate independently of the carbon capture.
3.12.4	N/A	CH_4	Paragraph 6.2.23 of the Scoping Report indicates that CH_4 would be emitted during operation of the Proposed Development. It is stated that this would be small scale and be ready diluted, but the Scoping Report does not confirm the expected volume. The Inspectorate notes that CH_4 is a GHG. The ES should include consideration of CH_4

ID	Ref	Description	Inspectorate's comments
			emissions as part of the GHG assessment or otherwise demonstrate why the emissions are so small so as not to result in likely significant effects. The ES should describe any mitigation required in respect of CH_4 emissions and confirm how this would be secured in the dDCO.

3.13 Major Accidents and Disasters

(Scoping Report Section 6.14)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.13.1	6.14.25 and Appendix B	Leaks and spills of specified substances – construction and operation (including transportation via road for diesel and aqueous ammonia)	The Scoping Report lists substances which are considered to have no to low risk of resulting in major accidents and/ or hazards, and which are therefore proposed to be scoped out of further consideration in the ES. These substances are aqueous ammonia (NH_3), amine solution, substances used to treat water and effluent, diesel and substances used during construction (including liquid concrete), which would be subject to storage controls. For NH_3 and diesel, it is also stated that the quantity present on site and/ or in tankers is likely to be small and any impact would not reach the criteria for a major accident and/ or disaster. The ES should clarify whether the criteria referred to is that which is described at paragraph 6.14.20 of the Scoping Report, taken from the Control of Major Accidents and Hazards (COMAH) Regulations for ascertaining credible major accident and disaster scenarios. Regarding potential for road traffic accidents, it is stated that the quantity of any materials would be contained within drainage systems. The Inspectorate notes that these matters will be considered in the Geology, Hydrogeology and Contaminated Land ES Chapter (noting comments about operational phase impacts at ID 3.2.3 and ID 3.8.4, that these matters should also be considered in the Surface Water, Flood Risk and Water Resources, and Traffic and Transportation ES Chapters). However, the Inspectorate does not have sufficient information to exclude the possibility of leaks and spills resulting in risks of major accidents and disasters to the surrounding water environment, which is subject to international conservation designations. The ES should therefore include an assessment or

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			otherwise explain why significant effects are not likely; cross-reference can be made to assessments in other ES Chapters to avoid duplication of effort.
3.13.2	Appendix B	Marine accident – operation	The Scoping Report states that primary process materials will be transported via pipeline and *"marine transport is not applicable."* The Inspectorate agrees that this matter can be scoped out of the ES.
3.13.3	Appendix B	Failure of electrics and other systems/ utilities (water supply and effluent disposal) – operation	The Inspectorate notes the reasoning and evidence presented in the Scoping Report, including the provision of back-up power and the installation of safety systems to avoid a credible major accident and risk scenario. The Inspectorate considers that on this basis it is unlikely that risks to or from the Proposed Development from these matters would result in significant effects but notes that hydrogen is an emerging technology and that the regulatory framework and standards are likely to continue to evolve. As such the ES should provide information about how risks from failure of systems would be managed, including the design standards proposed to be used and why these are considered to be appropriate, together with an outline of any management plans proposed to demonstrate that likely significant effects can be excluded.
3.13.4	Appendix B	Meteorological hazards – operation	The Scoping Report seeks to scope out impacts from high windspeed, low temperatures/ heavy snow, high temperatures/ heatwave, drought and electrical storms (including lightning), on the basis that such impacts would be managed through engineering design. The Inspectorate does not have sufficient evidence about the engineering design to exclude the possibility of significant effects from vulnerability to meteorological hazards. The Inspectorate is not in a position to agree to scope this matter out from the assessment.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			The ES should include an assessment of this matter or information demonstrating agreement with the relevant stakeholders and the absence of a likely significant environmental effect. The Inspectorate advises that cross-referencing can be made to assessments in other ES aspect chapters, eg Climate Change, to avoid duplication of effort.
3.13.5	Appendix B	Earthquakes and ground stability – construction and operation	Based on the reasoning and evidence presented in the Scoping Report, the Inspectorate is content that risks to or from the Proposed Development from these matters are not likely to result in significant effects. These matters can be scoped out of the assessment.
3.13.6	Appendix B	Poor air quality – operation	The Scoping Report seeks to scope out effects as combustion emissions would be controlled and regulated in accordance with an environmental permit and subject to mitigation. It is stated that the Proposed Development will not contribute significantly towards road traffic pollution. The Inspectorate notes that this matter would be considered in other parts of the ES, including an air quality assessment of operational process emissions (as described at paragraph 6.2.24 of the Scoping Report) and is unlikely to lead to significant environmental effects and is satisfied that this matter can be scoped out of the Major Accidents and Disasters ES Chapter. In reaching this conclusion, the Inspectorate notes that potential risks from accidental release of toxic and/ or asphyxiant gas are separately scoped into the assessment.
3.13.7	Appendix B	Wildfires – construction and operation	Based on the reasoning and evidence presented in the Scoping Report, the Inspectorate is content that risks to or from the Proposed Development from this matter are not likely to result in significant effects. It can be scoped out of the assessment.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.13.8	Appendix B	Malicious attacks – operation	Based on the reasoning and evidence presented in the Scoping Report, the Inspectorate is content that risks to or from the Proposed Development from intentional violence, arson, cyber attacks and terrorism, are not likely to result in significant effects. These matters can be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.13.9	6.14.27 to 6.14.28	Mitigation measures	The Inspectorate notes that the operational Proposed Development will be regulated through other consents and licences such as Hazardous Substances Consent, COMAH Licensing and environmental permits, which will include systems, controls and management procedures. A summary of the other consents and licences required, the aspects that they cover, and application status, should be included in the ES. The ES should include a clear description of mitigation measures required to reduce effects to not significant (or to a risk level as low as is reasonably practicable) and how they will be secured, including where this is through other consents and licences.
3.13.10	Appendix B	Construction hazards	In addition to the items listed in Table B-1 of the Scoping Report, potential risks of major accidents and/ or hazards from construction hazards to waterways and rail should be assessed, where significant effects likely to occur.
3.13.11	Appendix B	Nuclear facilities	Paragraph 6.14.7 of the Scoping Report states that Hartlepool nuclear power station is located nearby to the Proposed Development but no reference is made to the potential risks of major accidents and/ or hazards to or from nuclear facilities.

ID	Ref	Description	Inspectorate's comments
			The Inspectorate notes that it is proposed to scope in potential risks from domino events at the Teesside cluster of major hazard sites. This should include consideration of nuclear facilities where significant effects are likely to occur. The Applicant is referred to the comments from The Office for Nuclear Regulation at Appendix 2 of this Scoping Opinion.
3.13.12	N/A	Health and Safety Executive	The Inspectorate notes that the Proposed Development is located in an area that has several COMAH installations and that it is proposed to assess the potential risks of major accidents and disasters arising from a domino event. Effort should be made to agree the scope and methodology of assessment work with relevant consultation bodies, including the Health and Safety Executive.

3.14 Materials and Waste

(Scoping Report Section 6.15)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.14.1	6.15.14	Waste arising from extraction, processing and manufacture of construction components and products	The Inspectorate is content to scope this matter out noting controls that are in place meaning that significant effects are unlikely.
3.14.2	6.15.14	Environmental impacts associated with the management of waste	The Scoping Report states that likely significant effects on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste would be assessed in other relevant chapters within the ES. The ES should identify likely waste streams, and should ensure an assessment of effects during construction, operation and decommissioning. The Inspectorate agrees that impacts associated with management of waste do not need to be addressed in detail in the standalone Materials and Waste ES Chapter provided that adequate cross referencing is made to where it is addressed elsewhere in the ES, to ensure a full and robust assessment is undertaken.
3.14.3	6.15.14	Direct impacts on Mineral Safeguarding Areas (MSAs)	The Applicant proposes to scope out effects on MSAs (anhydrite and salt) on the basis that they occur at depth and could be extracted in an alternative manner (salt) or there is evidence that the resource has been sufficiently depleted (anhydrite). The Scoping Report does not state whether there would be a requirement for restrictions of development in the locations of the MSA (salt). The Proposed Development therefore has potential to sterilise the mineral resource and impact on any above ground infrastructure required in connection with salt extraction. The

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			Inspectorate therefore considers that this matter cannot be scoped out. Potential impacts on sterilisation of salt resource should be assessed within the Socio-economics and Land-use ES Chapter or further information should be presented to demonstrate that significant effects are not likely to occur. With regards to anhydrite, the Inspectorate is content to scope this matter out of the ES provided that information is included to demonstrate that the resource is sufficiently depleted.
3.14.4	6.15.14	Effects associated with decommissioning	The Inspectorate agrees that decommissioning effects can be scoped out of the ES providing the commitment to producing a Decommissioning Environmental Management Plan (DEMP) is secured within the dDCO. The DEMP should include assessment of matters listed in Table 6-8 of the Scoping Report.
3.14.5	Table 6-8	Operation – changes in availability of materials	Having considered the nature of the Proposed Development, the Inspectorate is satisfied that limited quantities of materials are likely to be required during operation and significant effects are therefore not likely to occur. The Inspectorate agrees that this matter can be scoped out of further assessment.

ID	Ref	Description	Inspectorate's comments
N/A	N/A	N/A	N/A

3.15 Human Health

(Scoping Report Section 6.16)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.15.1	6.16.11	Diet and nutrition, housing, relocation and radiation	Having considered the nature and characteristics of the Proposed Development, the Inspectorate agrees that there are no likely sources of impact for diet and nutrition, relocation and radiation determinants and these matters can be scoped out of the ES. Regarding housing, please refer to the Inspectorate's comments at ID 3.11.3 and comments made by UKHSA in their representation relating to availability of housing. If significant effects are likely to arise from the requirement to temporarily accommodate construction workers, then then ES should also consider the effects on human health from reduced housing availability and increased housing costs.

ID	Ref	Description	Inspectorate's comments
3.15.2	N/A	Scope of assessment – private water supplies	The Inspectorate advises that potential human health impacts, hazards and public health receptors surrounding private drinking water supplies during the construction phase, including the potential for contamination or disruption, should be scoped into further assessment work and reported upon within the human health chapter of the ES, where significant effects are likely.
3.15.3	N/A	Mental health impacts	The Scoping Report does not refer to mental health impacts. The Inspectorate advises that given the scale and nature of the Proposed Development, effects on mental health, including the potential for local public concern through understanding of risk/ risk perception for local communities and for the wider public in respect of the proposed

ID	Ref	Description	Inspectorate's comments
			hydrogen pipeline should be assessed and reported upon within the ES, where significant effects are likely.
3.15.4	N/A	Electronic and magnetic fields (EMF)	Please refer to the Inspectorate's comments at ID 3.17.1 with regard to assessment of the effects from EMF.

3.16 Cumulative and Combined Effects

(Scoping Report Section 6.17)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
3.16.1	N/A	N/A	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Description	Inspectorate's comments
3.16.2	6.17.2	Methodology	The Applicant's attention is drawn to Table 2 in the Planning Inspectorate's Advice Note 17 which sets out the expected approach to identifying projects to be included in a cumulative impact assessment. This approach includes projects wider than those with extant planning permission.
3.16.3	6.17.4	Long and short list of projects	The Inspectorate understands from the information provided that the list of projects will be revised as consultation with stakeholders is undertaken and the ES is prepared. The ES should identify a 'cut-off' date with respect to this process so that the currency of it can be understood.
3.16.4	N/A	Study area	The Inspectorate notes the information provided on Figure 15 of the Scoping Report; however, this is provided without any justification of the projects identified. The ES should explain the reasoning behind the study area and the relationship with that which has informed the aspect chapters.

3.17 Electronic Interference

(Scoping Report Section 8.2)

ID	Ref	Applicant's proposed aspect to scope out	Inspectorate's comments
3.17.1	8.2.3	Impacts to human health from EMF	The Scoping Report seeks to scope out a standalone assessment of EMF on the basis that these will be considered in the human health assessment. It is stated that there are no nearby residential properties likely to be affected. Paragraph 3.6.4 of the Scoping Report states that there is potential for installation of new above and/ or below ground electrical connections. The human health assessment should demonstrate how the Proposed Development will comply, as a minimum, with relevant EMF guidelines in respect of these components (if they are required) to demonstrate that it will not give rise to significant effects.
3.17.2	8.2.5	Electronic interference to television and radio signals, and mobile phone reception	Based on the reasoning and evidence presented in the Scoping Report, the Inspectorate is content that this matter is not likely to result in significant effects. It can be scoped out of the assessment.

3.18 Aviation

(Scoping Report Section 8.2)

ID	Ref	Applicant's proposed aspect to scope out	Inspectorate's comments
3.18.1	8.2.6	Impacts to aviation from the presence of tall structures	The Scoping Report seeks to scope out this aspect on the basis that the maximum heights of new structures are anticipated to be comparable with structures that previously occupied the site. It is stated that the Civil Aviation Authority will be consulted and that the need for an assessment will be reviewed if structures are required to be taller. The Inspectorate agrees this aspect can be scoped out on that basis. Please refer to the Inspectorate's comments at ID 2.1.6 in respect of maximum (height) parameters.

APPENDIX 1: CONSULTATION BODIES FORMALLY CONSULTED

TABLE A1: PRESCRIBED CONSULTATION BODIES[1]

SCHEDULE 1 DESCRIPTION	ORGANISATION
The Health and Safety Executive	Health and Safety Executive
The National Health Service Commissioning Board	NHS England
The relevant Integrated Care Board	NHS North East and North Cumbria Integrated Care Board
Natural England	Natural England
The Historic Buildings and Monuments Commission for England	Historic England
The relevant fire and rescue authority	Cleveland Fire Brigade
The relevant police and crime commissioner	Cleveland Police and Crime Commissioner
The relevant parish council(s) or, where the application relates to land [in] Wales or Scotland, the relevant community council	Billingham Town Council
	Greatham Parish Council
The Environment Agency	The Environment Agency
The Maritime and Coastguard Agency	Maritime & Coastguard Agency
The Maritime and Coastguard Agency - Regional Office	The Maritime and Coastguard Agency - Hull (Beverley) Marine Office
The Marine Management Organisation	Marine Management Organisation (MMO)
The Civil Aviation Authority	Civil Aviation Authority
The Relevant Highways Authority	Hartlepool Borough Council
	Redcar and Cleveland Borough Council
	Stockton-on-Tees Borough Council

[1] Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (the 'APFP Regulations')

SCHEDULE 1 DESCRIPTION	ORGANISATION
The relevant strategic highways company	National Highways
Trinity House	Trinity House
United Kingdom Health Security Agency, an executive agency of the Department of Health and Social Care	United Kingdom Health Security Agency
The Crown Estate Commissioners	The Crown Estate
The Forestry Commission	Yorkshire and North East
The Secretary of State for Defence	Ministry of Defence
The Office for Nuclear Regulation (the ONR)	The Office for Nuclear Regulation (the ONR)

TABLE A2: RELEVANT STATUTORY UNDERTAKERS[2]

STATUTORY UNDERTAKER	ORGANISATION
The relevant NHS Foundation Trust	North East Ambulance Service NHS Foundation Trust
Railways	Network Rail Infrastructure Ltd
	National Highways Historical Railways Estate
Dock and Harbour authority	PD Teesport
Licence Holder (Chapter 1 Of Part 1 Of Transport Act 2000)	NATS En-Route Safeguarding
Universal Service Provider	Royal Mail Group
Homes and Communities Agency	Homes England
The relevant water and sewage undertaker	Hartlepool Water (Anglian Water)
	Northumbrian Water
The relevant public gas transporter	Cadent Gas Limited

[2] 'Statutory Undertaker' is defined in the APFP Regulations as having the same meaning as in Section 127 of the Planning Act 2008 (PA2008)

STATUTORY UNDERTAKER	ORGANISATION
	Northern Gas Networks Limited
	Scotland Gas Networks Plc
	Wales and West Utilities Ltd
	Energy Assets Pipelines Limited
	ES Pipelines Ltd
	ESP Connections Ltd
	Fulcrum Pipelines Limited
	GTC Pipelines Limited
	Harlaxton Gas Networks Limited
	Indigo Pipelines Limited
	Last Mile Gas Ltd
	Leep Gas Networks Limited
	Squire Energy Limited
	National Grid Gas Plc
The relevant electricity generator with CPO Powers	MGT Teesside Limited
	Sofia Offshore Wind Farm Limited
	SSE Renewables Wind Farms (UK) Limited
The relevant electricity distributor with CPO Powers	Eclipse Power Network Limited
	Energy Assets Networks Limited
	ESP Electricity Limited
	Fulcrum Electricity Assets Limited
	Harlaxton Energy Networks Limited
	Indigo Power Limited
	Last Mile Electricity Ltd

STATUTORY UNDERTAKER	ORGANISATION
	Leep Electricity Networks Limited
	Mua Electricity Limited
	Optimal Power Networks Limited
	UK Power Distribution Limited
	Utility Assets Limited
	Vattenfall Networks Limited
	Northern Powergrid (Northeast) Limited
The relevant electricity transmitter with CPO Powers	National Grid Electricity Transmission Plc
	National Grid Electricity System Operator Limited

TABLE A3: SECTION 43 LOCAL AUTHORITIES (FOR THE PURPOSES OF SECTION 42(1)(B))[3]

LOCAL AUTHORITY[4]
North York Moors National Park Authority
Stockton-on-Tees Borough Council
Durham County Council
Darlington Borough Council
Hartlepool Borough Council
Middlesbrough Council
Redcar and Cleveland Borough Council
North Yorkshire Council

[3] Sections 43 and 42(B) of the PA2008

[4] As defined in Section 43(3) of the PA2008

TABLE A4: NON-PRESCRIBED CONSULTATION BODIES

ORGANISATION
Tees Valley Combined Authority
South Tees Development Corporation
Royal National Lifeboat Institution

APPENDIX 2: RESPONDENTS TO CONSULTATION AND COPIES OF REPLIES

CONSULTATION BODIES WHO REPLIED BY THE STATUTORY DEADLINE:
Environment Agency
Greatham Parish Council
Hartlepool Borough Council
Historic England
Middlesbrough Council
National Grid Electricity Transmission Plc
NATS En-Route Safeguarding
Natural England
North Yorkshire Council
Northern Gas Networks
Redcar and Cleveland Borough Council
Redcar and Cleveland Borough Council Highways Authority
South Tees Development Corporation
The Office for Nuclear Regulation
Trinity House
UK Health Security Agency

creating a better place
for people and wildlife

Environment Agency

Ms Laura Feekins-Bate
The Planning Inspectorate
3/18 Eagle Wing
Temple Quay House (2 The Square)
Temple Quay
Bristol
BS1 6PN

Our ref: NA/2023/116251/01-L01
Your ref: EN070009

Date: 09 May 2023

Dear Ms Feekins-Bate

PLANNING ACT 2008 (AS AMENDED) AND THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 (THE EIA REGULATIONS) – REGULATIONS 10 AND 11 APPLICATION BY H2 TEESSIDE LTD (THE APPLICANT) FOR AN ORDER GRANTING DEVELOPMENT CONSENT FOR THE H2TEESSIDE PROJECT (THE PROPOSED DEVELOPMENT) SCOPING CONSULTATION AND NOTIFICATION OF THE APPLICANT'S CONTACT DETAILS AND DUTY TO MAKE AVAILABLE INFORMATION TO THE APPLICANT IF REQUESTED LAND AT AND IN THE VICINITY OF THE FORMER REDCAR STEEL WORKS SITE, REDCAR AND IN STOCKTON-ON-TEES, TEESSIDE

Please find enclosed our written representations for the above Development Consent Order (DCO) on behalf of the Environment Agency (EA).

If you have any questions or require any clarification on the points below, please do not hesitate to contact me.

Yours sincerely

[redacted]
Planning Technical Specialist - Sustainable Places

Direct dial [redacted]
Direct e-mail [redacted]@environment-agency.gov.uk

Flood Risk

Flood Zones
The red line boundary for the full development (Main Sites A & B, and the pipeline) are located within flood zone 3, 2 and 1. The majority of Main Site B is situated within flood zone 1. However small portions of Main Site B are also situated within flood zone 2 and 3. Parts of the Hydrogen Pipeline Corridor are also within flood zone 2 and 3.

Flood Risk Vulnerability Classification
No information has been provided on the flood risk vulnerability classification within the Scoping Report. Therefore, we are unable to advise on our policy position in relation to flood risk until the vulnerability of the development has been confirmed by the applicant and/or the local planning authority. It should be noted that 'highly vulnerable' uses, requiring a Hazardous Substance Consent, would not be appropriate within flood zones 3. In accordance with Table 2 of the flood risk and coastal change section of the Planning Practice Guidance (PPG), 'highly vulnerable' developments are not appropriate in flood zone 3 and should not be permitted.

Flood Risk Assessment (FRA)
We welcome the inclusion of a FRA in support of the DCO application. The FRA must assess flood risk from all sources of flooding and recommend the mitigation measures that will be implemented to ensure a safe development for the design flood event (1 in 200 year including climate change). It must also demonstrate that flood risk will not be increased elsewhere.

Main Site Flood Risk Sources
The main source of potential flooding to the Main Site B is from the tidal stretch of the River Tees, but there could be other local sources of flooding such as groundwater and surface water. We have published a suite of interactive maps that indicate where possible flooding from different sources could occur Check the long term flood risk for an area in England - GOV.UK (www.gov.uk). Our maps are not suitable for a detailed Flood Risk Assessment **(**FRA), but they can indicate where further assessment may be needed.

Onsite Flood Risk
For Main Site B, flood risk mitigation measures will need to ensure it can remain safe for its' lifetime. Mitigation measures include raising the finished floor levels above the design flood event plus a freeboard allowance of 600mm.

Offsite Flood Risk
If ground raising is occurring within part of the development boundary, and the existing ground levels are below the design flood event, then an assessment will be required to confirm no increase in offsite flood risk. Given current topographical levels of the Main Site and if ground raising is significant which is below the design flood event, then flood modelling should be undertaken. If the pipeline is causing any ground raising, or is above ground which could impact local flood mechanisms, an assessment will be required to understand any increase in offsite flood risk and provide mitigation measures, this assessment could include modelling.

Flood Risk Information the Environment Agency (EA) Holds
We have an outline for a 1 in 200-year level undefended model that can be requested for the River Tees. The modelling we have for this location does not include climate change allowances and therefore this will need to be calculated in accordance with the 'Flood risk assessments: climate change allowances'. As the development location is at

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risk from tidal flooding, sea level allowances will need to be applied to the 1 in 200-year level for the lifetime of the development using both higher central and upper end allowances.

The EA's Port Clarence and Greatham tidal study (includes climate change) are available upon request. Requests for data should be sent to northeast-newcastle@environment-agency.gov.uk. Please note that requests for data can take up to 20 working days to process.

Hydrogen pipeline corridor
The proposed hydrogen pipeline corridor routes will have impacts on our existing flood defences, our land and our future schemes. These are discussed below:

Pipeline Routes
The proposed hydrogen pipeline corridor heading north towards the Venator Plant, could affect our flood defence assets along Greatham Creek and the EA's land holding at Marsh House Farm. In addition, all three routes (labelled R1, R2 and R3 on a document previously supplied to the EA ('All Utility Connection Corridor, Figure 1') could have a significant impact on Greatham Creek and its associated saltmarsh habitat - the last remaining natural area of the original Tees Estuary. In particular, R2 and R3 in particular are of significant concern to the EA.

R2 runs along the line of one of our major flood defences at Cowpen Marsh. The defence lies between the Cowpen Bewley Landfill (to the West) and the Teesmouth and Cleveland Coast Special Protection Area (SPA) (to the East). As such, any work along this corridor could impact one the three current land uses.

To the north of Greatham Creek, R2 then runs through Saltern Wetlands (an area of saltmarsh owned by the EA) and under the EA's flood embankment to the south of the ConocoPhillips tank farm. The EA has concerns that this route will have an impact on the wetland area, which lies with the SPA, and flood defences.

R1 crosses the no. 4 brinefield (owned by Sabic and used for hydrocarbon storage), and under the flood embankment on the south bank of Greatham Creek (Sabic Embankment). It also lies under the flood embankment on the north bank of Greatham Creek, which is to be significantly repaired as part of EA's Greatham North East Flood Alleviation Scheme (FAS). This route also crosses the redundant no. 5 brinefield (owned by Inovyn Chlorvinyl Ltd) and the ConocoPhillips oil pipeline corridor and Seal Sands Emergency Access Road.

R3 crosses our land at Marsh House Farm to be used for the extraction of clay in 2024-2026 for our Greatham NE FAS.

The EA is also developing a scheme (Greatham North East FAS) to improve the defences to the south of the Venator Plant. We expect to submit an application for planning permission in Spring 2024, and hope to start construction of the scheme in summer 2024. We are currently seeking contributions from beneficiaries of the scheme. As the proposed pipeline could benefit from our works, we would welcome discussions with the applicant on the potential for financial contributions from DCO, if R1 is chosen as the preferred route.

The EA would require the existing flood standard of protection, provided by the defences to be maintained both during the construction of the pipeline, and after completion of the scheme, whichever route is chosen. In order mimimise the impact of

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the DCO on our flood defences, consideration should be given to the following comments:

Pipeline Design

- Where the pipeline crosses a flood defence structure below ground, designs for the pipeline must include a load case for the top water level. This may be different at each location. The pipeline must also be at a suitable depth to ensure the stability of the flood defence structure, this is to be demonstrated in submitted designs;
- The scoping report states the pipeline will not cross our flood defence structure above ground. If this is to change, loading to our asset will need to be considered and the design must not impede access for routine maintenance and inspections of the flood defence structure;
- If the pipeline crosses a watercourse above ground, it must be appropriately designed and positioned to prevent accumulation of debris and localised increases in water levels;
- Where the pipeline is to utilise existing pipework that crosses watercourses, it is expected that modifications to the structure will be made where possible for improved conveyance and reduce debris accumulation; and
- Where ground levels near a flood defence are to be disturbed on either a permanent or temporary basis, designs must not allow additional water to pond at the toe of the flood defence.

Pipeline Construction

- Open trench methodology is not permitted when crossing a flood defence. Excavations near the footprint of a flood defence must remain a safe distance away from the toe of the defence to ensure stability of the defence. This must be demonstrated in submitted designs; and
- Directional drilling would be permitted when crossing a flood defence provided:
    - The drilling operation does not affect the stability of the flood defence structure by inducing a geotechnical failure, including when it is retaining flood water; and
    - The drilling or permanent works do not provide a conduit for water seepage underneath the flood defence structure, including when it is retaining flood water.

Pipeline Maintenance

- Repairs or future improvement works will be subject to an Environmental Permit from the EA if taking place within 16m of a flood defence; and
- Routine maintenance activities on the pipeline should be detailed within the DCO application.

Flood Defence Maintenance

In order to maintain the standard of protection, the EA requires continued access to continue routine maintenance of the existing and planned defences. Any permissions or legal agreements to allow these works to go ahead, must be agreed in advance of pipeline construction. It should be noted that the EA have statutory powers to carry out works on our assets.

Groundwater

The scoping report states there are no drinking water protected areas within 1km (or in Section 6.3.8, 15km) of the proposed development area. In terms of groundwater, all groundwater bodies in England are designated as drinking water protected areas. As such, the development area sits upon a groundwater drinking protected area. Further

information is available at Protect groundwater and prevent groundwater pollution - GOV.UK (www.gov.uk)

Section 8.1.1 of the scoping report scopes in surface water, geology, hydrogeology and contaminated land. This is welcomed.

We also support section 6.3.20 where it states 'potential impacts on groundwater flows during construction and operation phase (for below ground pipelines). There will be no direct discharges to groundwater. However, the potential for contaminant mobilisation from the Proposed Development and the resultant impacts to groundwater will be considered with the Geology and Hydrogeology assessments.'

In terms of SUDs, we would recommend that there is no increase in infiltration within the development area. This is to avoid the risk of contaminant mobilisation given the industrial heritage of the area. This ties into section 6.4.88 where the scope of assessment includes 'disturbance of contaminated soils and perched groundwater, and the creation of new pathways to sensitive receptors (including construction workers and controlled waters) during construction.'

The Water Environment (Water Framework Directive) (WFD) Regulations
The undertaking in section 6.3.33 to complete a WFD assessment is acknowledged and supported. At this stage, it is not certain that the matter of water quality will be a significant environmental concern. Therefore, the applicant should provide an assessment of the impact of the proposal on water quality in respect to the following waterbodies:

- Tees (GB510302509900)
- Tees Coastal (GB650301500005)
- Tees Estuary (South Bank) GB103025072320)

The WFD assessment will need to have regard to the Water Environment Regulations (WER) / WFD, and the Northumbria River Basin Management Plan (NRBMP).

The applicant should ensure that:

- The pipeline corridors do not add to the physical modification of the water environment unless equivalent appropriate mitigation measures are put in place; and
- Pipeline corridor routes and excavations should as far as practicable minimise or avoid the crossing of watercourses, and not run proximate and parallel to watercourses. In particular, pipeline corridors should not be situated so as to jeopardise the potential for restoration of intertidal and riverine habitats that support the recovery of the Teesmouth and Cleveland Coast SPA. Preferably pipeline corridors should follow existing physical modifications such as road infrastructure or existing pipeline corridors.

Table 6.1 provides a summary of the water features which the proposed development may interact. The inclusion of an undertaking to assess the potential impacts on non-reportable waterbodies and minor watercourses is acknowledged and supported.

For clarification of the statement at 6.3.9, the Teesmouth and Cleveland Coast SPA is within the Tees catchment where future development must be nutrient neutral to ensure no deterioration in WER (WFD) Dissolved Inorganic Nitrogen (DIN) element status. Reductions below the current baseline are required to achieve the protected area objectives.

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The undertaking in 6.3.20 (eighth bullet point) to evaluate options for discharge of effluents from the proposal, including consideration of nutrient neutrality is acknowledged and supported.

Similarly, the undertaking at 6.3.36 to carry out a Nutrient Neutrality Screening Assessment to assess likely impact on achievement of the targets for the WFD DIN element is acknowledged and supported. This should include the potential impact from emissions to air.

Scope

The scoping assessment of Major Accident Hazard and Disaster categories in Appendix B (page 213) scopes out 'Environmentally harmful liquid release' with commentary that, 'a release of aqueous ammonia or diesel which reached environmental receptors could have an impact, however the quantity present on site will likely be relatively small and impact would not reach the criteria for a MA&D therefore is scoped out.' It is recommended that the release of environmentally harmful liquid should be scoped into the assessment, in light of the international conservation designations of the surrounding water environment, their current condition assessment of unfavorable declining status, and the conservation objective of restore, including by meeting improved WFD DIN element status in the Tees estuary.

It is also recommended that the scoping assessment of 'road traffic accident (dangerous goods)' (page 214) should be scoped in to ensure that necessary mitigation is provided by way of appropriate design and operation of relevant drainage systems, the detail of which is yet to be confirmed.

Baseline conditions

Current Baseline

The Tees estuary currently fails to meet statutory environmental objectives set out in WFD legislation and the NRBMP. No deterioration of current quality is a minimum requirement of WER (WFD). Improvement and enhancement are also required to meet WFD objectives.

The Scoping Report identifies in section 2.2 that large areas of the proposed development site was historically intertidal habitat within the Tees estuary. The progressive infilling of the estuary, port development and subsequent flood protection modifications have contributed to the Tees estuary waterbody being designated as a Heavily Modified Waterbody (HMWB) under WFD. In order to achieve the overarching WFD objective of Good Ecological Potential (GEP) in HMWBs, mitigation measures must be taken to address the ongoing ecological impacts of such modifications, and prevent deterioration on this baseline. A Mitigation Measures Assessment has been undertaken and various information on appropriate mitigation measures is available. However, the limitations of the Catchment Data Explorer portal are such that this information cannot currently be provided through that platform.

Future Baseline

The Tees estuary is undergoing a period of ecological recovery after decades of industrial and sewage pollution. The future ecological baseline conditions are likely to be an improvement on the current conditions because of interventions already completed. Future baseline conditions will also be influenced by imminent legislation (Levelling Up Bill) and regulatory requirements (Water Company Price Review) that are likely to require significant reductions in the level of nutrients within the Tees estuary and within the timeframe of the proposed development. The area is also already subject

to nutrient neutrality advice that aims to ensure no deterioration of current environmental conditions. The WFD assessment should therefore take account of such future baseline conditions.

Construction Environment Management Plan (CEMP)
The provision of a CEMP is welcomed. The CEMP should specifically outline how construction and surface run-off will be managed and potential impacts mitigated. The CEMP should also include, but not limited to, the following:

- Treatment and removal of suspended solids from surface water run-off during construction works.
- Approach to ensure no sewage pollution or misconnections.
- Approach to ensure water mains are not damaged during construction works.
- Management of fuel and chemical spills during construction and operation, including the process in place to ensure the environment is not detrimentally impacted in the event of a spill.
- Due to the presence of contaminated land, construction runoff is likely to contain hazardous chemicals and elements. A scheme may be required to manage the associated risks, and minimise mobilisation of hydrocarbons, heavy metals, and any other hazardous pollutants into the water environment during construction and site operation.

Foul drainage
We would expect to see the following points to be addressed within the DCO application:

- Confirmation of which sewage treatment works will receive the foul flows.
- Confirmation that there is sufficient capacity in the receiving Northumbrian Water network to accept the flows without increasing storm overflow spills.
- Confirmation that there is sufficient capacity at the receiving sewage treatment works (STW) to accept the flows while still operating within the permitted flow and quality limits.
- The applicant will need to produce their own WFD assessment to demonstrate the impact of the proposed development on the receiving watercourse.
- If there is insufficient capacity within the network or at the STW, details of an appropriate phasing approach for the development to enable the necessary upgrades to the sewage network before connecting the development should be provided.

Marine Ecology and Fisheries

Baseline conditions
We are generally satisfied with the assessment of the baseline conditions for both marine ecology and fish. However, the applicant should be aware that large areas adjacent to Greatham Creek, which have been classified as ‘Coastal and floodplain grazing marsh’ on Figure 12, are in fact coastal saltmarsh habitat as a result of the EA’s managed realignment projects of 2014 and 2018 respectively. These projects created 53 ha of saltmarsh. One of the proposed Hydrogen pipeline corridors dissects directly through the middle of this newly created habitat at the Greatham North site.
The areas of newly created saltmarsh habitat (misclassified as Coastal and floodplain grazing marsh) outlined in purple in Figure 12 require updating.

We are pleased to see that the applicant will be submitting a WFD assessment. The WFD assessment should also consider whether the proposed scheme, in combination

with other activities, will impact on WFD water body status. A cumulative impact can arise from the repeated occurrence of one pressure or from the simultaneous occurrence of many pressures. The resulting impact of a repeated or simultaneous pressures can have a greater impact than a single pressure. Pressures from multiple sources should therefore be considered including combined impacts of activities within the proposal, existing pressures, recent schemes and other planned schemes.

Fish entrainment
The scoping report highlights potential water sources as Demineralised water (DMW) from Wilton International or Reclaimed water (treated effluent) from Northumbrian Water Ltd's (NWL) Bran Sands Wastewater treatment plant. It is preferred that the abstraction from WFD waterbodies is avoided where possible to avoid the risk of fish entrainment. If abstraction from WFD waterbodies is proposed, the impact of fish entrainment should be assessed, and appropriate mitigation proposed to prevent entrainment. Screening to prevent ingress of fish is a requirement of both the Salmon and Freshwater Fisheries Act 1975 (SAFFA) and Eels (England and Wales) Regulations 2009.

Discharge of cooling waters
If cooling waters is discharged to the Tees estuary or other WFD waterbodies, the implications of this in relation to WFD status will need to be fully considered. Further details on the nature, volume, chemical and thermal properties of the effluent would be required. Thermal modelling will be required to assess the range of the thermal discharge. Sea temperature rise due to climate change over the operational lifespan of the and cumulative impacts from all thermal discharges within the Tees estuary should also be considered.

Effect of noise on fish
Anthropogenic noise can cause physical harm and behavioural responses (e.g. altered migration) in fish. It is unclear from the Scoping Report whether there is a potential for noise and/or vibration to occur during the creation of the hydrogen pipeline corridors. Therefore, the applicant should consider potential effects from noise and vibration on migratory fish. A noise assessment should be conducted for all methods being considered for use in the construction of the proposed hydrogen pipeline corridor under the river Tees. Further consideration should also be given to potential cumulative/in-combination impacts of noise on fish, as a result of other developments taking place in the area. If the assessment identifies potential impacts from noise and/or vibration on fish, suitable mitigation should be identified.

Water volves and otters
We are satisfied with the scope and proposed survey timescales and extents outlined in table 6.3 with respect to otters and water voles.

Proximity to landfill sites
The proposed development will interact with several areas of historic landfill and is also in close proximity to operational landfill sites (as identified in section 6.4 of the scoping report). The scoping report indicates that further assessment is to be undertaken to identify pollutions risks posed by the ground disturbance. It is important that this further work assesses the risks posed by any disturbance to ground in or around the existing historic and operational landfill sites. Landfill sites can generate leachate and landfill gas which pose a risk of harm to the environment. Historic landfill sites are generally not well engineered and, as such, may pose a greater risk of pollution if disturbed

Reuse of made ground
Use of made ground in development projects is often undertaken using the CL:AIRE

Definition of Waste Code of Practice (DoWCoP). This allows waste materials to be used outside of waste legislation, providing four key factors are met relating to certainty of use, quantity used, suitability for use and the environment and human health is protected.

Reuse of the made ground on this development site is unlikely to be suitable for use under the DoWCoP. This is because the material is likely to consist of blast furnace slag and other historic contaminants. As such, reuse of the material would not be considered low risk for use under the DoWCoP as it presents a risk of causing pollution to the environment. We would therefore recommend that an Environmental Permit is sought to authorise and condition any proposed reuse of the made ground. We would encourage the developer to request pre-application advice to discuss permitting options further: Get advice before you apply for an environmental permit - GOV.UK (www.gov.uk)

Other comments
Figure 14 shows potential receptors. It is recommended North Tees Mudflats should be included as a potential receptor.

EA and Partner Projects
The EA and partners are bringing forward a programme of projects designed to mitigate the ongoing ecological impact of historical physical modifications on the Tees estuary and tributaries. The current Programme is scheduled to be completed by the commissioning date of the proposed development.

The DCO should not jeopardise attainment of these WFD mitigation measures. Therefore, the developer may wish to support these projects so as to demonstrate appropriate mitigation of any impacts, or to secure betterment of the local environment:

- The Tees Tidelands Programme is led by the EA and Stockton-on-Tees Borough Council, and consists of a number of projects that aim to restore intertidal habitats and ecologically reconnect the Tees estuary to tributaries.
- The EA Seal Sands SSSI restoration project is initially focusing on building a Tees estuary baseline hydraulic model, but in the future also seeks to identify the prioritised physical interventions to manage excess growth of macroalgae.
- The Tees Rivers Trust (TRT) are undertaking a Tees Estuary Edges project to install a suite of bio-engineered designs that enhance ecology in the highly modified Tees navigation channel.
- TRT are also undertaking species (oyster, seagrass, mussel) reintroduction projects at locations within Tees Bay and the estuary.
- The Canal and River Trust (CRT) are developing designs to secure enhanced fish passage across the Tees Barrage and so throughout the Tees catchment.

EA Consents and requirements

Flood Risk Permit
The River Tees is a designated ‘main river’ and under the Environmental Permitting Regulations certain works within 16m of a tidal main river, or within 16m of any flood defence structure on a tidal main river, require a Flood Risk Activity Permit from the Environment Agency. Assessments are required for both the temporary and permanent works. This includes works such as but not limited to; directional drilling under the River Tees, construction of outfalls, ground raising and works to construct and maintain the pipeline. You can find more information on permit requirements using the following link: Flood risk activities: environmental permits - GOV.UK (www.gov.uk). If a permit is required, it must be obtained prior to beginning the works.

Cont/d..

Water Quality Permit
You do not require a permit if you are only discharging uncontaminated surface runoff. If you intend to discharge to surface water for dewatering purposes, this may be covered by a Regulatory Position Statement (RPS) for water discharge activities. If you can comply with all the conditions within the RPS, then a permit is not required for this activity. Further information is available at Temporary dewatering from excavations to surface water: RPS 261 - GOV.UK (www.gov.uk).

Discharges that do not fully comply with the RPS, will require a bespoke discharge permit will be required. Guidance on applying for a bespoke water discharge permit is available at Discharges to surface water and groundwater: environmental permits - GOV.UK (www.gov.uk).

Water Resources Consent
If you intend to abstract more than 20 cubic metres of water per day from a surface water source e.g. a stream or from underground strata (via borehole or well) for any particular purpose then you will need an abstraction licence from the Environment Agency. There is no guarantee that a licence will be granted as this is dependent on available water resources and existing protected rights.

Dewatering is the removal/abstraction of water (predominantly, but not confined to, groundwater) to locally lower water levels near the excavation. This can allow operations to take place, such as mining, quarrying, building, engineering works or other operations, whether underground or on the surface. The dewatering activities on-site could have an impact upon local wells, water supplies and/or nearby watercourses and environmental interests. This activity was previously exempt from requiring an abstraction licence. Since 1 January 2018, most cases of new planned dewatering operations above 20 cubic metres a day will require a water abstraction licence from us prior to the commencement of dewatering activities at the site. Further information is available at Apply for a water abstraction or impounding licence - GOV.UK (www.gov.uk)

Environmental Permitting Regulations
This development will require an Environmental Permitting Regulation (EPR) permit, see below for details on applicable section of Environmental Permitting (England and Wales) Regulations 2016. When appropriate we would encourage enhanced pre-app advice is sought in a timely manner, ahead of any submission for a EPR permit application. The timeline for processing of the permit is changeable and it is advisable that the operator consults with the EA on a regular basis during the project.

Control of Major Accident Hazards (COMAH) Regulations 2015
There is no indication of volume/ tonnage of hazardous chemicals which the Operator intends to store on site. Therefore, the Operator should refer directly to COMAH Regulations 2015 Part 1 Schedule 1 and Part 2 Schedule 1 and assess their status under COMAH. Diesel fuel is mentioned (ref 34 Petroleum products “including diesel fuel oils”).

End

H2

Consideration should be made of the millions so recently invested at Greatham Creek and Marsh House by the Environment Agency. This was compensating for loss elsewhere and is still developing towards its true environmental potential. Environmental impact in this transformational area cannot be based only on what has only just begun to establish today.

Timing of any works needs to be avoid environmental impact on nesting and migrating birds and the seal population.

Public Right of Ways (PROWs) in the vicinity of Greatham – linking Greatham South to the Tees Road and South West to Cowpen Bewley. As well as protecting these valued routes the potential for enhancement should be considered. Eg. While always preferable that pipelines are hidden underground, if a pipeline crosses a waterway by bridge could this provide a new PROW route to access such as the Cowpen Landfill which will promises a new attractive environmental asset.

Historic landfill between Marsh House Farm and Greatham Creek plus PROW on Thorn Tree Lane, Greatham not shown on map figure 10

Consultation in Greatham to explain in layman's terms the proposals for the pipeline in between Greatham village and Greatham Creek would be welcomed.

Neighbourhoods & Regulatory Services

Civic Centre Level 1
Hartlepool TS24 8AY

Email: developmentcontrol@hartlepool.gov.uk

Tel: 01429 266522
DX60669 Hartlepool-1

Our Ref: H/2023/0109

Contact Officer: [redacted] ☎ [redacted]

9 May 2023

THE PLANNING INSPECTORATE
ENVIRONMENTAL SERVICES
OPERATIONS 3 GROUP
TEMPLE QUAY HOUSE
2 THE SQUARE
BRISTOL
BS1 6PN

Dear Sir/Madam

TOWN AND COUNTRY PLANNING ACT 1990

PROPOSAL: **Adjoining Authority Consultation for Request from Planning Inspectorate for LPA's view on Scoping Opinion submitted in respect of an Application by H2 Teesside Ltd (the Applicant) for an Order granting Development Consent for the H2Teesside Project (the Proposed Development)**

LOCATION: **LAND WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON ON TEES AND HARTLEPOOL**

I refer to the above noted application.

I can confirm that Hartlepool Borough Council have no comments to make on the Scoping Opinion submitted in respect of an Application by H2 Teesside Ltd (the Applicant) for an Order granting Development Consent for the H2Teesside Project (the Proposed Development), at land within the boroughs of Redcar and Cleveland and Stockton on Tees and Hartlepool.

I have sought the view of internal colleagues and can confirm that Tees Archaeology agree with the proposed scoping methodology for cultural heritage, namely that cultural heritage will be scoped into the Environmental Statement and that a cultural heritage DBA will be produced. The Council's Economic Growth team Economic Growth are aware of this project and support the proposal. The development would bring local supply chain opportunities for local businesses and job opportunities for local people.

If you would like any further information about the Council's decision please contact your case officer Stephanie Bell quoting the reference number given above.

Hartlepool Borough Council will collect and process personal information in line with our legal obligations, details of which can be found on our web site www.hartlepool.gov.uk/GDPR or by telephoning 01429 266522. Personal

Information will be handled in accordance with the General Data Protection Regulation.

Yours faithfully

[redacted]
Senior Planning Officer

Historic England

Ms Laura Feekins-Bate
The Planning Inspectorate
by email

Direct Dial: [redacted]

Our ref: PL00792835
Your ref: **EN070009**

9 May 2023

Dear Ms Feekins-Bate

Re: Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) - Regulations 10 and 11

REQUEST FOR SCOPING OPINION: EN070009 - Application by H2 Teesside Ltd for an Order granting Development Consent for the H2Teesside Project, Land at and in the vicinity of the former Redcar Steel Works site, Redcar and in Stockton-on-Tees, Teesside

Thank you for your letter of 11 April 2023 consulting Historic England about the above EIA Scoping Report.

The proposed development is for the construction, operation (including maintenance where relevant) and decommissioning of a 1.2 Gigawatt Thermal (GWth) Hydrogen Production Facility with associated Carbon Capture and hydrogen transport pipeline network on the former Steelworks land in Redcar and Cleveland. This development could potentially have an impact upon numerous designated and undesignated heritage assets and their settings.

In line with the advice in the National Planning Policy Framework (NPPF 2021) and the relevant National Policy Statements (NPS), we would expect the Environmental Statement to contain a thorough assessment of the likely effects the proposed development might have upon those elements which contribute to the significance of these assets.

We would like to draw attention to the specific NPS documents and their policies in relation to the historic environment. We would expect to see these referred to in the cultural heritage section of the ES to show how the application complies with them.

Our initial assessment broadly tallies with the baseline conditions set out in the scoping report section 6.11 (the discrepancy is likely due to slight differences in mapping of the site area polygon):

Historic England is subject to both the Freedom of Information Act (2000) and Environmental Information Regulations (2004). Any Information held by the organisation can be requested for release under this legislation.

- 54 Grade I and II* listed structures;
- 463 Gr. IIs;
- 27 Scheduled Monuments;
- 1 Gr.II* Registered Park and Garden;
- 1 Gr. II Registered Park and Garden, and
- 23 Conservation Areas.

We concur that there are no highly designated heritage assets within the red-line boundary. However, we note that there are circa 700 non-designated heritage assets both within the boundary and the defined 1km study area.

The scoping report proposes that maritime cultural heritage issues are scoped out. The proposed pipeline across the Tees will be bored and therefore will not impact any maritime heritage assets in this area. We concur that it is unlikely that there will be any significant impacts on marine cultural heritage by this proposal as noted in 6.11.18 and consequently that marine heritage can be scoped out.

However, it is clear that the terrestrial cultural heritage must be scoped into the EIA as there could be impacts to known heritage assets. At present the potential for currently unrecorded heritage assets is not known and should also be included in the assessment.

We would also expect the Environmental Statement to consider the potential impacts on non-designated features of historic, architectural, archaeological or artistic interest, since these can also be of national importance and make an important contribution to the character and local distinctiveness of an area and its sense of place. This information is available via the Redcar and Cleveland Historic Environment Record and relevant local authority staff as they are best placed to advise on:

- the local historic environment issues and priorities;
- how the proposal can be tailored to avoid and minimise potential adverse impacts on the historic environment;
- the nature and design of any required mitigation measures; and
- opportunities for securing wider benefits for the future conservation and management of heritage assets.

We would expect the assessment to clearly demonstrate that the extent of the proposed study area is of the appropriate size to ensure that all heritage assets likely to be affected by this development have been included and can be properly assessed.

It is important that the assessment is designed to ensure that all impacts are fully understood. Pre-determination archaeological evaluation such as geophysical surveys and other evaluation techniques may assist with determination of archaeological potential and ground truthing of desk-based data.

Historic England is subject to both the Freedom of Information Act (2000) and Environmental Information Regulations (2004). Any Information held by the organisation can be requested for release under this legislation.

The assessment should also take account of the potential impact associated activities (such as construction, servicing and maintenance, and associated traffic) might have upon perceptions, understanding and appreciation of the heritage assets in the area. The assessment should also consider, where appropriate, the likelihood of alterations to drainage patterns that might lead to in situ decomposition or destruction of below ground archaeological remains and deposits and can also lead to subsidence of buildings and monuments.

Position

On the basis of the information in the Scoping Report, the proposal is unlikely to have significant impacts on highly designated cultural heritage assets. We suggest that the applicant should seek advice from and liaise closely with the Local Planning Authority's Heritage / Archaeology Advisors for this application.

We anticipate, subject to seeing the assessment of impacts set out in the ES, that our involvement in this Nationally Important Infrastructure Project may be limited in nature.

Yours sincerely,

[redacted]
Inspector of Ancient Monuments
[redacted]@HistoricEngland.org.uk

cc: Tim Brown, Conservation Advisor, Redcar & Cleveland Borough Council

Historic England is subject to both the Freedom of Information Act (2000) and Environmental Information Regulations (2004). Any Information held by the organisation can be requested for release under this legislation.

Feekins-Bate, Laura

From: [redacted]@middlesbrough.gov.uk>
Sent: 18 April 2023 15:22
To: H2Teesside
Cc: H2Teesside
Subject: FW: EN070009 - H2Teesside - EIA Scoping Notification and Consultation
Attachments: H2TE - Statutory consultation letter.pdf

Good afternoon Laura

Thank you for the email consulting Middlesbrough on the proposed H2Teesside Project.

Having thoroughly considered the detailed report, there are no objections or other comments at this stage from Middlesbrough.

Regards

[redacted]
Principal Planning Officer

Address: Development Control | Middlesbrough Council | Fountain Court, 119 Grange Road | Middlesbrough | TS1 2DT
Email: [redacted]@middlesbrough.gov.uk
Telephone: [redacted]

www.middlesbrough.gov.uk

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From: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Sent: Tuesday, 11 April 2023 10:19
To: Development Control <developmentcontrol@middlesbrough.gov.uk>
Cc: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Subject: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

You don't often get email from h2teesside@planninginspectorate.gov.uk. Learn why this is important

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FAO Head of Planning

Dear Sir / Madam

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards
Laura

Laura Feekins-Bate
EIA Advisor
The Planning Inspectorate

@PINSgov The Planning Inspectorate planninginspectorate.gov.uk

Ensuring **fairness**, **openness** and **impartiality** across all our services

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National Grid House
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

Complex Land Rights
[redacted]
Development Liaison Officer
UK Land and Property
[redacted]@nationalgrid.com
Tel: [redacted]

www.nationalgrid.com

SUBMITTED ELECTRONICALLY:
h2teesside@planninginspectorate.gov.uk

02 May 2023

Dear Sir/Madam

APPLICATION BY H2 TEESIDE LTD (THE APPLICANT) FOR AN ORDER GRANTING DEVELOPMENT CONSENT FOR THE H2TEESIDE PROJECT (THE PROPOSED DEVELOPMENT)

SCOPING CONSULTATION RESPONSE

I refer to your letter dated 11th April 2023 in relation to the above proposed application. This is a response on behalf of National Grid Electricity Transmission PLC (NGET). Having reviewed the scoping report, I would like to make the following comments regarding NGET infrastructure within or in close proximity to the current red line boundary.

NGET has high voltage electricity overhead transmission lines, underground cables and a high voltage substation within the scoping area. The overhead lines and substation form an essential part of the electricity transmission network in England and Wales.

Substation

- Saltholme 275kV Substation
- Tod Point 275kV Susbtation
- Associated overhead and underground apparatus including cables

Overhead Lines

4TH 275kV OHL	Hartlepool – Saltholme
	Hartlepool – Tod Point
4TG 275kV OHL	Hartlepool – West Boldon
	Hartlepool – Hartmoor
ZZA 400kV OHL	Hartlepool – West Boldon
	Hartlepool – Hartmoor
	Hartlepool – Saltholme
	Hartlepool – Tod Point
	Lackenby – Norton
	Hartlepool – Tod Point

National Grid is a trading name for:
National Grid Electricity Transmission plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2366977

National Grid House
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

YYJ 400kV OHL	Lackenby – Norton 1
	Norton – Saltholme
YYQ 275kV OHL	Hartlepool – Tod Point
	Lackenby – Tod Point

Associated underground apparatus including cables

Cable Apparatus

- Grangetown - Lackenby 275kV underground cable

I enclose a plan showing the location of NGET's apparatus in the scoping area.

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Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

Specific Comments – Electricity Infrastructure:

- NGET's Overhead Line/s is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset

- Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. NGET recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for "overhead line clearances Issue 3 (2004)".

- If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances.

- The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's (www.hse.gov.uk) Guidance Note GS 6 "Avoidance of Danger from Overhead Electric Lines" and all relevant site staff should make sure that they are both aware of and understand this guidance.

- Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum "sag" and "swing" and overhead line profile (maximum "sag" and "swing") drawings should be obtained using the contact details above.

- If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances.

- Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or "pillars of support" of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation ("pillar of support") drawings can be obtained using the contact details above.

- NGET high voltage underground cables are protected by a Deed of Grant; Easement; Wayleave Agreement or the provisions of the New Roads and Street Works Act. These provisions provide NGET full right of access to retain, maintain, repair and inspect our assets. Hence we require that no permanent / temporary structures are to be built over our cables or within the easement strip. Any such proposals should be discussed and agreed with NGET prior to any works taking place.

- Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented.

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National Grid Electricity Transmission plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2366977

National Grid House
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

To download a copy of the HSE Guidance HS(G)47, please use the following link:
http://www.hse.gov.uk/pubns/books/hsg47.htm

Further Advice

We would request that the potential impact of the proposed scheme on NGET's existing assets as set out above and including any proposed diversions is considered in any subsequent reports, including in the Environmental Statement, and as part of any subsequent application.

Where any diversion of apparatus may be required to facilitate a scheme, NGET is unable to give any certainty with the regard to diversions until such time as adequate conceptual design studies have been undertaken by NGET. Further information relating to this can be obtained by contacting the email address below.

Where the promoter intends to acquire land, extinguish rights, or interfere with any of NGET apparatus, protective provisions will be required in a form acceptable to it to be included within the DCO.

NGET requests to be consulted at the earliest stages to ensure that the most appropriate protective provisions are included within the DCO application to safeguard the integrity of our apparatus and to remove the requirement for objection. All consultations should be sent to the following email address: **box.landandacquisitions@nationalgrid.com**

I hope the above information is useful. If you require any further information, please do not hesitate to contact me.

The information in this letter is provided not withstanding any discussions taking place in relation to connections with electricity customer services.

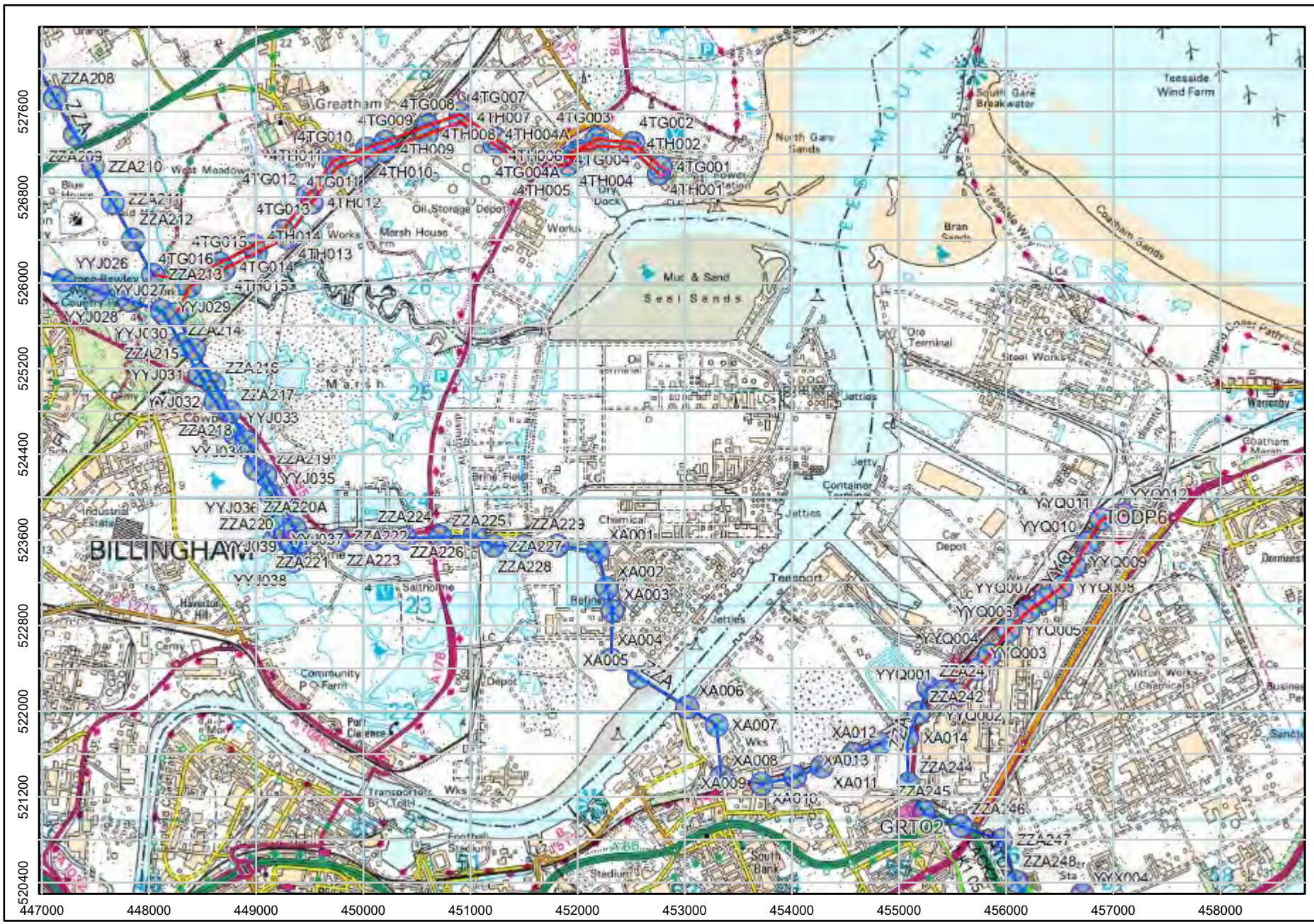
Yours faithfully

[redacted]

[redacted]
Development Liaison Officer, Complex Land Rights

National Grid is a trading name for:
National Grid Electricity Transmission plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2366977

nationalgrid | National Grid Web Map





Legend

Cable Accessories
- Pilot Cable

Fibre Cable
- Fibre Cable Commissioned

Buried Cable
- Buried Cable Commissioned

Towers
- Towers Commissioned

OHL 275Kv
- OHL 275Kv Commissioned

OHL 400Kv
- OHL 400Kv Commissioned

Substations
- Substations Commissioned

Notes

0 0.4 0.8 1.6 2.4 3.2 km

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Date: 4/25/2023
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Note: Any sketches on the map are approximate and not captured to any particular level of precision.

Woodger-Bassford, Jade

From: NATS Safeguarding <NATSSafeguarding@nats.co.uk>
Sent: 18 April 2023 08:14
To: H2Teesside
Subject: RE: EN070009 - H2Teesside - EIA Scoping Notification and Consultation [SG35165]

Our Ref: SG35165

Dear Sir/ Madam

NATS anticipates no impact from the proposal and has no comments to make on the Scoping notification.

Yours faithfully

NATS Safeguarding

E: natssafeguarding@nats.co.uk

4000 Parkway, Whiteley,
Fareham, Hants PO15 7FL
www.nats.co.uk

NATS Public

From: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Sent: 11 April 2023 09:13
To: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Subject: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

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Dear Sir/ Madam

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards
Laura

Laura Feekins-Bate
EIA Advisor
The Planning Inspectorate

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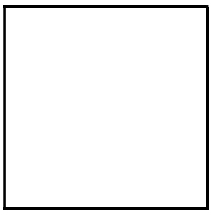

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Date: 09 May 2023
Our ref: 429363
Your ref: **EN070009**

Environmental Services
Operations Group 3
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For the attention of Laura Feekins-Bate

BY EMAIL ONLY

Consultations
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T 0300 060 900

Dear Laura,

Environmental Impact Assessment Scoping consultation under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulation 11

Proposal: Application by H2 Teesside Ltd (the Applicant) for an Order granting Development Consent for the H2Teesside Project (the Proposed Development)

Thank you for seeking our advice on the scope of the Environmental Statement (ES) in the consultation dated 11 April 2023, which we received on the same day.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

A robust assessment of environmental impacts and opportunities, based on relevant and up to date environmental information, should be undertaken prior to an application for a Development Consent Order. Annex A to this letter provides Natural England's advice on the scope of the Environmental Impact Assessment (EIA) for the proposed development.

Natural England is engaged in ongoing pre-application dialogue with the applicant's consultant team ('the applicant'). Section 7.4[1] of the EIA scoping report refers. Our dialogue to date has been high level and focused primarily on ecological survey requirements for the scheme's current red line boundary. We acknowledge and welcome the applicant's clear reference to the preliminary status of the red line boundary and reference to the 'Rochdale envelope' principle accordingly. In view of the high level and geographically focused nature of dialogue so far we are unable to provide detailed comments on direct and indirect impact pathways relating to the designated sites listed in section 6.6[2] of the scoping report.

Detailed advice on scoping the Environmental Statement is available in the attached Annex.

[1] 7.4 - Consultation on the EIA
[2] 6.6 - Ecology and nature conservation - including aquatic ecology

For any further advice on this consultation please contact me using email – [redacted]@naturalengland.org.uk - and copy to consultations@naturalengland.org.uk.

Yours sincerely

[redacted]
Senior Adviser – Northumbria Area Team

Annex A – Natural England Advice on EIA Scoping

1. General Principles

Based on the content of the EIA Scoping report and our dialogue with the applicant so far Natural England is satisfied that the general principles laid out within Regulation 11 of the Infrastructure Planning Regulations 2017 - (The EIA Regulations) are being addressed.

We note that significant elements of the proposal have yet to be confirmed (Selection of main site location and hydrogen pipeline route corridors). We welcome the applicant's clear reference to the preliminary status of the red line boundary and reference to the 'Rochdale envelope' principle accordingly.

2. Cumulative and in-combination effects

Natural England acknowledges the applicant's description of projects[3] needing to be assessed for cumulative and in combination effects alongside the proposal. We are not aware of additional projects needing assessment.

We draw the examining authority's attention to the need for and benefits of an early consideration of the proposal's relationship with wider environmental issues in the Tees estuary e.g. the nutrient neutrality theme and the wider need to restore water quality in the Tees catchment to achieve favourable condition of relevant water dependent designated sites such as the Teesmouth & Cleveland Coast Special Protection Area (SPA). For further information please see our comments under Section 9 Water Quality. Further relevant references are made within section 4 (Biodiversity & Geodiversity), with respect to ecological impact pathways for designated sites and Section 10 Climate Change – delivering mitigation and building resilience.

3. Environmental data

At the time of writing Natural England is arranging to provide the applicant with wild bird survey data for the 'Seal Sands' part of the Teesmouth & Cleveland Coast Special Protection Area (SPA).

Similarly we are checking the scope for use of the Great Crested Newt District Level Licensing scheme in relation to land within (or up to 250m from) the red line boundary lying north of the River Tees.

4. Biodiversity and Geodiversity

The assessment will need to include potential impacts of the proposal upon sites and features of nature conservation interest. We welcome the applicant's approach to gathering relevant data so far and for their reference to including opportunities for nature recovery through biodiversity net gain (BNG)[4].

[3] Figure 15 'Other Developments to be Considered in the Cumulative Impact Assessment (Indicative)' and supporting paragraphs)
[4] EIA Scoping Report - paragraph 6.6.32

4.1 Designated nature conservation sites

4.1.1 International and European sites

The development site is within or may impact on the **European/internationally designated nature conservation sites set out in the table below.**

Aside from the Teesmouth & Cleveland Coast SPA and Ramsar Site the proposal would not appear likely to cause direct impacts upon Habitats Sites within 15km of the application site. Nevertheless, based on the information available so far uncertainty exists over the scope for impacts on sites within this distance threshold. The Habitats Sites listed below fall within 15km of the proposal and have been listed accordingly to allow consideration of indirect effects from the proposal. We welcome inclusion of the listed Habitats Sites within paragraph 6.6.6 accordingly. Figure 13 of EIA scoping report shows these sites' geographical distribution.

The ES should thoroughly assess the potential for the proposal to affect internationally designated sites of nature conservation importance / European sites, including marine sites where relevant. This includes Special Protection Areas (SPA), Special Areas of Conservation (SAC), listed Ramsar sites, candidate SAC and proposed SPA.

Article 6 (3) of the Habitats Directive requires an appropriate assessment where a plan or project is likely to have a significant effect upon a European Site, either individually or in combination with other plans or projects.

Table 1: Potential risk to International designated sites: the development is within or may impact on the following European/Internationally designated site(s)

Site name with link to conservation objective	**Features which the ES will need to consider**	**Potential impact pathways where further information/assessment is required.**
Teesmouth & Cleveland Coast SPA **Link - https://publications.naturalengland.org.uk/publication/6619918699069440**	Over-wintering/passage waterbirds and breeding sea birds – including named spp. Little Tern (Sterna albifrons), Sandwich Tern (Sterna sandvicensis), Knot (Calidris canutus islandica),	Uncertain pending confirmation of main site and route corridor selection – Example impact pathways likely to include water quality (construction phase pathways and operational discharges), air quality (pending confirmation of types of emissions to air) and wild bird disturbance (noise and vibration, movement, lighting)

	Redshank (Tringa totanus totanus) Plus overwintering waterbird assemblage	
North Yorkshire Moors SPA Link - **https://publications.naturalengland.org.uk/publication/6207512114102272**	Supporting habitats for Merlin (Falco columbarius) and Golden Plover (Pluvialis apricaria) Blanket bog, wet and dry heath.	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts (see comments under North Yorkshire Moors SAC)
Northumbria Coast SPA Link - https://publications.naturalengland.org.uk/publication/6372874327687168	Supporting habitats for Arctic tern (Sterna paradisaea), Little tern , (Sterna albifrons), Purple sandpiper , (Calidris maritima maritima), Ruddy turnstone , (Arenaria interpres interpres) rocky shore (with associated boulder and cobble beaches)	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts

	intertidal mudflats and sand flats	
North Yorkshire Moors SAC Link - https://publications.naturalengland.org.uk/publication/6048216608931840	Blanket bog, wet and dry heath	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts
Durham Coast SAC Link – https://publications.naturalengland.org.uk/publication/4949450761961472	Magnesian limestone grasslands, tall-herb fen, seepage flushes and wind-pruned scrub	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts
Castle Eden Dene SAC Link – https://publications.naturalengland.org.uk/publication/5362023844020224	Yew (Taxus baccata) dominated woodland	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts
Teesmouth & Cleveland Coast Ramsar site Ramsar site info sheet - https://jncc.gov.uk/jncc-assets/RIS/UK11068.pdf	Sand and mudflats, saltmarsh, freshwater marsh and sand dune habitats Common redshank (Tringa totanus totanus), Red knot (Calidris canutus islandica)	Uncertain pending confirmation of main site and route corridor selection – Example impact pathways likely to include water quality (surface water run off related, operational discharges), air quality (pending confirmation of types of emissions) and wild bird disturbance (noise and vibration, movement, lighting)
Northumbria Coast Ramsar site Ramsar site info sheet – Link - https://jncc.gov.uk/jncc-assets/RIS/UK11049.pdf	Rocky foreshore and sandy beach habitats Little tern , (Sterna albifrons albifrons), Purple sandpiper ,	Uncertain pending confirmation of emissions to air – potential indirect air quality impacts

	(Calidris maritima maritima), Ruddy turnstone , (Arenaria interpres interpres)	

4.1.2 Marine ecology (ref Section 6.8)

In relation to the proposal's potential impacts on the marine environment we have the following preliminary comments:

Trenchless technologies:

- Horizontal Directional Drilling (HHD) – we note that this is the most likely option that the applicant proposes to use. We agree it has less impacts compared with trenching.
- With all HDD there is a risk of 'frac-out' i.e. where the fracking fluid breaks through the surface and settles on the substrate (in this case intertidal/ subtidal mud and saltmarsh)
- Frac-out poses a risk to benthos habitats as it can cause smothering. In addition however, the clean-up operation can cause more damage. Examples include vehicles driving on the habitat and efforts to dig up the frac-out liquid removing or damaging the habitat underneath.
- We recommend that the Construction and Environmental Management Plan (CEMP) or equivalent should include a frac-out contingency plan and a pollution incident response plan. These should detail the clean-up operation. We would expect to be consulted on the CEMP later in the DCO process

Unexploded ordnance (UXO):

- The EIA scoping report is contradictory. Paragraph 6.8.27 suggests that UXO clearance measures are unlikely but Table B1 includes relevant screening measures. We would recommend that such measures are included. If not an explanation of the reasoning for omitting these measures should be provided.

Fish:

- Entrapment and entrainment within the water cooling system poses a risk to fish. Uptake of water for the water cooling system should consider all life stages of fish species and reduce fish entrainment.

Water cooling system:

- An assessment for fish is needed when assessing this element of the proposal.
- We welcome the proposal to assess the water that will be discharged and that the applicant will follow current guidelines and process. A criterion focusing on water temperature will need to be included.

Invasive non-native species (INNS)

- We note the applicant's reference to INNS and would advise a biosecurity plan, making sure everything brought to site (material/ gear/ water) has been assessed for INNS.

Hard structures

- Hard structures (pipe outflow, rock armouring or equivalent) need to be assessed in the context not only of loss of habitat, but also potential changes in coastal processes and introduction of INNS.

4.2 Nationally designated sites

4.2.1 Sites of Special Scientific Interest

Natural England welcomes the applicant's approach to scoping whereby the hierarchy of designated and local wildlife sites has been considered holistically using a 15Km area of search.

Aside from the Teesmouth & Cleveland Coast SSSI the proposal would not appear likely to cause direct impacts upon SSSIs within 15km of the application site. Nevertheless, based on the information available so far uncertainty exists over the scope for impacts on sites within this distance threshold. The SSSIs listed below fall within 15km of the proposal and have been listed accordingly to allow consideration of indirect effects from the proposal. Typical ecological impact pathways for consideration include air quality impacts arising from road transport (construction phase) and aerial emissions during the operational phase.

We welcome the scoping report's reference to these designated sites at paragraph 6.6.6. Figure 13 shows these sites' geographical distribution.

The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within the SSSIs and identify appropriate mitigation measures to avoid, minimise or reduce any adverse significant effects. We welcome the applicant's proposal to include consideration of these effects within the Ecological impact assessment (EcIA).

Natural England's SSSI Impact Risk Zones can be used to help identify the potential for the development to impact on a SSSI. The dataset and user guidance can be accessed from the Natural England Open Data Geoportal

SSSI site names with link to citation
Teesmouth and Cleveland Coast SSSI (Inc Teesmouth National Nature Reserve NNR) https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000255&SiteName=Durham%20Coast&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Lovell Hill Pools SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000387&SiteName=Lovell%20Hill%20Pools&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Briarcroft pasture SSSI https://designatedsites.naturalengland.org.uk/SiteList.aspx?siteName=Briarcroft%20pasture&countyCode=&responsiblePerson=&DesignationType=SSSI
Roseberry Topping SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000120&SiteName=Roseberry%20topping&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

North York Moors SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000356&SiteName=North%20York%20Moors&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Saltburn Gill SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000289&SiteName=Saltburn%20Gill&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Whitton Bridge Pasture SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000474&SiteName=Whitton%20Bridge%20pasture&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Langbaurgh Ridge SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000256&SiteName=Langbaurgh%20&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Cliff Ridge SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1003961&SiteName=Cliff%20Ridge%20&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Durham Coast SSSI (Inc Durham Coast NNR) https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000255&SiteName=Durham%20Coast&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Hart Bog SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000052&SiteName=Hart%20bog&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Pike Whin Bog SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000785&SiteName=Pike%20Whin%20bog&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Kildale Hall SSSI https://designatedsites.naturalengland.org.uk/SiteList.aspx?siteName=Kildale%20Hall&countyCode=&responsiblePerson=&DesignationType=SSSI
Hulam Fen SSSI https://designatedsites.naturalengland.org.uk/SiteList.aspx?siteName=Kildale%20Hall&countyCode=&responsiblePerson=&DesignationType=SSSI
Castle Eden Dene SSSI (inc Castle Eden Dene NNR) https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000738&SiteName=Castle%20Eden%20Dene&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Pinkney and Gerrick Woods SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000085&SiteName=Pinkney%20and%20Gerrick&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Fishburn Grassland SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1006457&SiteName=Fishburn%20grassland&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

Charity Land SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000338&SiteName=Charity%20Land&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Newton Ketton Meadow SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1005078&SiteName=Newton%20Ketton&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Boulby Quarries SSSI https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000219&SiteName=Boulby%20Quarries&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

4.3 Regionally and Locally Important Sites

Natural England notes and welcomes the EIA scoping report's reference to Local Sites at paragraph 6.6.8. Local Sites are identified by the local wildlife trust, geoconservation group or other local group. The Tees Valley Wildlife Trust and Tees Valley Nature Partnership may be able to provide relevant information:

TVWT – email: info@teeswildlife.org Tel 01287 636382

TV LNP – Website - https://teesvalleynaturepartnership.org.uk/ - Email – Rachel Murtagh Nature Partnership Manager - [redacted]@teeswildlife.org

4.4 Protected Species

The ES should assess the impact of all phases of the proposal on protected species (including, for example, great crested newt, reptiles, birds, otter, water vole, badger and bats - paragraph 6.6.14 refers). Natural England does not hold comprehensive information regarding the locations of species protected by law. Records of protected species should be obtained from appropriate local biological record centres, nature conservation organisations and local groups. The applicant should consider the wider context of the site, for example in terms of habitat linkages and protected species populations in the wider area.

The area likely to be affected by the development should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES. Surveys should always be carried out in optimal survey time periods and to current guidance by suitably qualified and, where necessary, licensed, consultants.

We note and welcome the information presented in Table 6.3 accordingly.

Natural England has adopted standing advice for protected species, which includes guidance on survey and mitigation measures. A separate protected species licence from Natural England or Defra may also be required (For example for European Protected Species and badgers – Link - NE wildlife licences).

Applicants can also make use of Natural England's (NE) charged service Pre Submission Screening Service for a review of a draft wildlife licence application. NE then reviews a full draft licence application to issue a Letter of No Impediment (LONI) which explains that based on the information reviewed to date, that it sees no impediment to a licence being granted in the future should the DCO be issued.

NB - Please see our advice below regarding district level licensing for great crested newts.

The ES will need to consider the following **Protected Species:**

- great crested newt,
- reptiles,
- birds,
- otter,
- water vole,
- badger
- bats

4.5 District Level Licensing for Great Crested Newts

Natural England is aware that the applicant is interested in district level licensing for relevant land (within the red line boundary or relevant distance threshold for gt crested newt waterbodies). We will continue in dialogue with the applicant accordingly.

For reference, where strategic approaches such as district level licensing (DLL) for great crested newts (GCN) are used, a letter of no impediment (LONI) will not be required. Instead, the developer will need to provide evidence to the Examining Authority (ExA) on how and where this approach has been used in relation to the proposal, which must include a counter-signed Impact Assessment and Conservation Payment Certificate (IACPC) from Natural England.

The DLL approach is underpinned by a strategic area assessment which includes the identification of risk zones, strategic opportunity area maps and a mechanism to ensure adequate compensation is provided regardless of the level of impact. In addition, Natural England will undertake an impact assessment, the outcome of which will be documented in the IACPC.

If no GCN surveys have been undertaken, Natural England's risk zone modelling may be relied upon. During the impact assessment, Natural England will inform the Applicant whether their scheme is within one of the amber risk zones and therefore whether the Proposed Development is likely to have a significant effect on GCN. The IACPC will also provide additional detail including information on the Proposed Development's impact on GCN and the appropriate compensation required.

4.6 Priority Habitats and Species

Priority Habitats and Species are of particular importance for nature conservation and included in the England Biodiversity List published under section 41 of the Natural Environment and Rural Communities Act 2006. Consideration should also be given to the potential environmental value of brownfield sites, often found in urban areas and former industrial land. This is of special relevance to the application site, whose red line boundary contains a significant resource of '**open mosaic habitat**' associated with the area's industrial land use. We therefore welcome the clear presentation of such information in Figure 12 – **'**Ecological Constraints within 1 km of the Proposed Development Site Boundary'.

The Environmental Statement should include details of:

- Any historical data for the site affected by the proposal (e.g. from previous surveys)
- Additional surveys carried out as part of this proposal
- The habitats and species present
- The status of these habitats and species (e.g. whether priority species or habitat)
- The direct and indirect effects of the development upon those habitats and species
- Full details of any mitigation or compensation measures
- Opportunities for biodiversity net gain or other environmental enhancement

4.7 Biodiversity net gain

The ES should use an appropriate biodiversity metric such as Biodiversity Metric 4.0 together with ecological advice to calculate the change in biodiversity resulting from proposed development and demonstrate how proposals can achieve a net gain.

Link to Biodiversity Metric 4.0 information - https://publications.naturalengland.org.uk/publication/6049804846366720

The metric should be used to:
• assess or audit the biodiversity unit value of land within the application area
• calculate the losses and gains in biodiversity unit value resulting from proposed development
• demonstrate that the required percentage biodiversity net gain will be achieved

Biodiversity Net Gain outcomes can be achieved on-site, off-site or through a combination of both. On-site provision should be considered first. Delivery should create or enhance habitats of equal or higher value. When delivering net gain, opportunities should be sought to link delivery to relevant plans or strategies e.g. Green Infrastructure Strategies or Local Nature Recovery Strategies. These are prepared by local planning authorities.

Natural England is engaged in ongoing dialogue with the applicant over BNG.

5 Landscape

5.1 Landscape and visual impacts

The proposal lies approximately 9Km north of the **North York Moors National Park**. The associated **Cleveland Way national trail** (please see also 'Connecting People with Nature', below) traverses the northern edge of the park and offers elevated views northwards towards the Tees estuary from viewpoints such as Roseberry Topping. We note that the proposed stacks at the chosen main site are expected to reach approximately 100m in height and so careful consideration of design will help to avoid significant environmental effects.

Consideration should be given to the direct and indirect effects on this designated landscape and in particular the effect upon its purpose for designation. The management plan for the designated landscape may also have relevant information that should be considered in the EIA.

We welcome the EIA scoping report's reference to the relevant National Character Areas. These character area profiles set out descriptions of each landscape area and statements of environmental opportunity.

The EIA should include a full assessment of the potential impacts of the development on local landscape character using landscape assessment methodologies. We encourage the use of Landscape Character Assessment (LCA), based on the good practice guidelines produced jointly by the Landscape Institute and Institute of Environmental Assessment in 2013. LCA provides a sound basis for guiding, informing, and understanding the ability of any location to accommodate change and to make positive proposals for conserving, enhancing or regenerating character.

A landscape and visual impact assessment should also be carried out for the proposed development and surrounding area. Natural England recommends use of the methodology set out in *Guidelines for Landscape and Visual Impact Assessment 2013 (*(3rd edition) produced by the Landscape Institute and the Institute of Environmental Assessment and Management. For National Parks and AONBs, we advise that the assessment also includes effects on the 'special qualities' of the designated landscape, as set out in the statutory management plan for the area. These identify the particular landscape and related characteristics which underpin the natural beauty of the area and its designation status.

The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. This should include an assessment of the impacts of other proposals currently at scoping stage.

To ensure high quality development that responds to and enhances local landscape character and distinctiveness, the siting and design of the proposed development should reflect local characteristics and, wherever possible, use local materials. Account should be taken of local design policies, design codes and guides as well as guidance in the National Design Guide and National Model Design Code. The ES should set out the measures to be taken to ensure the development will deliver high standards of design and green infrastructure. It should also set out detail of layout alternatives, where appropriate, with a justification of the selected option in terms of landscape impact and benefit.

The National Infrastructure Commission has also produced Design Principles Design Principles for National Infrastructure - NIC endorsed by Government in the National Infrastructure Strategy.

6 Connecting People with nature

The ES should consider the potential impacts on the **Cleveland Way National Trail** and the **England Coast Path**. We welcome the inclusion of the coast path and local rights of way in Figure 10 – 'Environmental Constraints within 1 km of the Proposed Development Site Boundary'. The National Trails website www.nationaltrail.co.uk provides further information.

The ES should consider potential impacts on access land, common land, public rights of way, the England Coast Path and coastal access routes and coastal margin in the vicinity of the development, in line with NPPF paragraph 100. It should assess the scope to mitigate for any adverse impacts. Rights of Way Improvement Plans (ROWIP) can be used to identify public rights of way within or adjacent to the proposed site that should be maintained or enhanced. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of wider green infrastructure.

7 Soils and Agricultural Land Quality

Soils are a valuable, finite natural resource and should also be considered for the ecosystem services they provide, including for food production, water storage and flood mitigation, as a carbon store, reservoir of biodiversity and buffer against pollution. It is therefore important that the soil resources are protected and sustainably managed. Guidance is set out in the Natural England Guide to assessing development proposals on agricultural land.

With regard to best and most versatile land[5] we note the EIA scoping report's proposal that due to the temporary impacts associated with the hydrogen pipeline corridor's development no impact assessment is required. Natural England would draw the Examining Authority's attention to National Policy Statement EN4[6] paragraph 2.23.7 setting out the need for a suitable approach to mitigation of impacts on soil resources.

The following information sources are relevant:
Link - Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites and
The British Society of Soil Science Guidance Note Benefitting from Soil Management in Development and Construction.

8 Air Quality

Air quality in the UK has improved over recent decades but air pollution remains a significant issue. For example, approximately 85% of protected nature conservation sites are currently in exceedance of nitrogen levels where harm is expected (critical load) and approximately 87% of sites exceed the level of ammonia where harm is expected for lower plants (critical level of 1µg) [1]. A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The Government's Clean Air Strategy also has a number of targets to reduce emissions including to reduce damaging deposition of reactive forms of nitrogen by 17% over England's protected priority sensitive habitats by 2030, to reduce emissions of ammonia against the 2005 baseline by 16% by 2030 and to reduce emissions of NOx and SO_2 against a 2005 baseline of 73% and 88% respectively by 2030. Shared Nitrogen Action Plans (SNAPs) have also been identified as a tool to reduce environmental damage from air pollution.

Construction phase
We welcome detailed assessment of road traffic emissions and refer the applicant to our guidance for public bodies to help assess the impacts of road traffic emissions to air quality capable of affecting European Sites:
Link - Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations - NEA001.
Please note that the methodological approach set out in our guidance applies similarly to Sites of Special Scientific Interest despite the differing legislative regimes for Habitats Sites and SSSIs.

[5] Paragraphs 6.12.13-14 and 6.12.22
[6] 'Gas supply infrastructure and gas and oil supply pipelines'
[1] Report: Trends Report 2020: Trends in critical load and critical level exceedances in the UK - Defra, UK

Operational phase
Natural England notes that the applicant's EIA scoping report screens out the proposal's pipelines and connections from the Environmental Statement (paragraph 6.2.25).

We welcome screening in of the operational process at paragraph 6.2.24.
We refer the applicant to the Air Pollution Information System at www.apis.ac.uk for information on baseline levels and loads at specific designated sites for a range of pollutants recorded nationally.

The Environment Agency Screening Tool for industrial emissions can be found at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

9 Water Quality and Nutrient Neutrality

In March 2022 Natural England advised local planning authorities that the Teesmouth & Cleveland Coast Special Protection Area (SPA) and Ramsar site was considered to be in an unfavourable condition due to nutrient enrichment, specifically nitrogen.

The Teesmouth & Cleveland Coast SPA and Ramsar site includes areas of the River Tees channel, the Tees Estuary, and the Tees Bay. Natural England's advice is that qualifying bird species are being negatively affected by the growth of algal mats on their key foraging habitats within the Tees Estuary, particularly at Seal Sands.

As such, Natural England's Nutrient Neutrality advice is that new developments should not result in additional nitrogen entering the catchment of the River Tees upstream of the SPA and Ramsar site (i.e. they are nutrient neutral). Further information is available at the following link: Strategic Solutions: Nutrient Neutrality (naturalengland.org.uk)

This advice applies primarily to development involving overnight accommodation i.e. it focuses on additional volumes of treated wastewater arising as a result of new house building. However in order to restore the SPA to favourable condition the wider effects of nutrient inputs into the Tees hydrological catchment are also relevant. The link below provides further context: https://www.gov.uk/government/publications/nutrient-pollution-reducing-the-impact-on-protected-sites/nutrient-pollution-reducing-the-impact-on-protected-sites

As a result we note and welcome the applicant's recognition of the nutrient pollution theme (paragraphs 6.3.35-37). The Habitats Regulations Assessment (HRA) process provides the means to assess the proposal and we acknowledge paragraphs 6.6.27-31 accordingly. Natural England looks forward to continued dialogue with the applicant to progress this element of the proposal.

10 Climate Change

Natural England notes and acknowledges the proposal's primary purpose i.e. to produce low carbon hydrogen and capture and store carbon. Paragraph 1.1.2 (Introduction) refers.

In terms of climate change mitigation over and above the scheme's primary purpose the proposal also offers scope to:

(i) Deliver nature recovery/enhancement
(ii) Build ecosystem resilience through careful planning and implementation e.g. with reference to consideration of ongoing wider efforts to restore water quality in the Tees estuary. These include but are not restricted to the provisions of the Levelling up and Regeneration Bill which requires relevant water companies to upgrade the performance of wastewater treatment works to 'technically achievable limits' by 2030.

The applicant should explore opportunities to achieve a design solution that optimises the scope to deliver relevant technological advances and land management in the local area over the development's lifetime

NORTH YORKSHIRE COUNCIL

H2 Teeside Limited
Building E
Chertsey Road
Sunbury On Thames
Middlesex
W16 7BP

Planning Services (Scarborough Area)
North Yorkshire Council
Town Hall
St Nicholas Street
Scarborough
North Yorkshire
YO11 2HG
Tel: 0300 131 2 131
Email: planning.services.sca@northyorks.gov.uk
Web: www.northyorks.gov.uk

Our Ref ZF23/00692/OA
Date 24 April 2023

Proposal EIA Scoping Notification and Consultation - EN070009
Site Address H2 Teeside

I refer to the above consultation which was received at this office on 14 April 2023.

NYC as a Local Planning Authority makes no comment

If you require any further assistance please contact me at the above address.

Yours faithfully

Planning Services

Woodger-Bassford, Jade

From: Before You Dig <BeforeYouDig@northerngas.co.uk>
Sent: 12 April 2023 09:58
To: H2Teesside
Subject: RE: EXT:EN070009 - H2Teesside - EIA Scoping Notification and Consultation

Follow Up Flag: Follow up
Flag Status: Completed

Good Morning,

NGN has a number of gas assets in the vicinity of some of the identified "site development" locations. It is a possibility that some of these sites could be recorded as Major Accident Hazard Pipelines(MAHP), whilst other sites could contain High Pressure gas and as such there are Industry recognised restrictions associated to these installations which would effectively preclude close and certain types of development. The regulations now include "Population Density Restrictions" or limits within certain distances of some of our "HP" assets.

The gas assets mentioned above form part of the Northern Gas Networks "bulk supply" High Pressure Gas Transmission" system and are registered with the HSE as Major Accident Hazard Pipelines.
Any damage or disruption to these assets is likely to give rise to grave safety, environmental and security of supply issues.

NGN would expect you or anyone involved with the site (or any future developer) to take these restrictions into account and apply them as necessary in consultation with ourselves. We would be happy to discuss specific sites further or provide more details at your locations as necessary.

If you give specific site locations, we would be happy to provide gas maps of the area which include the locations of our assets.
(In terms of High Pressure gas pipelines, the routes of our MAHP's have already been lodged with members of the local Council's Planning Department)

Kind regards,

[redacted]

Administration Assistant
Before You Dig
Northern Gas Networks
1st Floor, 1 Emperor Way
Doxford Park
Sunderland
SR3 3XR

Before You Dig: 0800 040 7766 (option 5)
www.northerngasnetworks.co.uk
facebook.com/northerngasnetworks
twitter.com/ngngas
Alternative contact:
beforeyoudig@northerngas.co.uk

Get involved! Have your say in the future of your gas network and win great prizes, by taking part in our BIG customer survey at together.northerngasnetworks.co.uk Keep posted to take part in a range of activities from workshops to roadshows. Together, we are the network.

Northern Gas Networks Limited (05167070) | Northern Gas Networks Operations Limited (03528783) | Northern Gas Networks Holdings Limited (05213525) | Northern Gas Networks Pensions Trustee Limited (05424249) | Northern Gas Networks Finance Plc (05575923). **Registered address:** 1100 Century Way, Thorpe Park Business Park, Colton, Leeds LS15 8TU. Northern Gas Networks Pension Funding Limited Partnership (SL032251). **Registered address:** 1st Floor Citypoint, 65 Haymarket Terrace, Edinburgh, Scotland, EH12 5HD. **For information on how we use your details please read our Personal Data Privacy Notice**

From: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Sent: 11 April 2023 09:13
To: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Subject: EXT:EN070009 - H2Teesside - EIA Scoping Notification and Consultation

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External email! - Think before you click

Dear Sir/ Madam

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards
Laura

The Planning Inspectorate

Laura Feekins-Bate
EIA Advisor
The Planning Inspectorate

@PINSgov The Planning Inspectorate planninginspectorate.gov.uk

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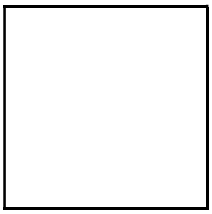
DPC:76616c646f72



Redcar & Cleveland Borough Council
Corporate Directorate of Growth, Enterprise and Environment
Redcar and Cleveland House
Kirkleatham Street
Redcar
TS10 1RT
01642 774774
[redacted]@redcar-cleveland.gov.uk
www.redcar-cleveland.gov.uk

Environmental Services
Operations Group 3
Temple Quay House
2 The Square
Bristol, BS1 6P

Our Ref: R/2023/0300/DCO
Your Ref: EN070009
Contact: Adrian Miller
Direct Line: [redacted]
Mob: [redacted]

Date: 4 May 2023

Dear Mr Sir / Madam,

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11

Application by H2 Teesside Ltd (the Applicant) for an Order granting Development Consent for the H2Teesside Project (the Proposed Development)

General Approach (Application for an Environmental Impact Assessment Scoping Opinion)

The Scoping document submitted is considered to be an appropriate approach to the preparation of an ES. The general structure and format is considered acceptable setting out;

- A background to the development
- Description of the existing environment
- The proposed Development
- Consideration of Alternatives
- Planning Policy and Need

- Potentially Significant Environmental Effects

- EIA process and
- Summary

The overall approach to the ES is considered acceptable as are the range of topic areas to be assessed under section 6 (Potentially Significant Environmental Effects) subject to the detailed comments received and set out below from consultees to the process. The Scoping report sets out in detail, the approach to be taken to the preparation of the ES and is considered to be a robust and comprehensive assessment of that process. The LPA at this stage does not see the need to materially alter or add to the approach taken in the Scoping Report in terms of the matters to be covered or the methodology.

Detailed comments from consultees

(1) Redcar and Cleveland Council service teams

Environmental Protection (Nuisance)

With reference to the above planning application, I would confirm that I have assessed the following environmental impacts which are relevant to the development and would comment as follows:

Chapter 6.5 of H2 Teesside Ltd Environmental Impact Assessment Scoping Report concerns Noise and Vibration.

The report states that baseline noise data is available from the results of surveys which were undertaken in 2019 and 2020 for the NZT Project (immediately east of the Proposed Development Sites). From a review of the available data, the existing dominant sound in the area is from industrial and road traffic noise sources, however further project specific baseline noise monitoring will be carried out to inform the noise and vibration assessment for the Proposed Development.

I have no objections to the methodology and scope for further assessment stated in the report.

Environmental Protection (Air Quality)

Chapter 6.2 of H2 Teesside Ltd Environmental Impact Assessment Scoping

Report concerns Air Quality.
I have no objections to the methodology and scope for further assessment stated in the report.

Environmental Protection (Contamination)

With reference to the above planning application, I would confirm that I have assessed the following environmental impacts which are relevant to the development and would comment as follows:

Chapter 6.4 H2 Teesside Ltd Environmental Impact Assessment Scoping Report concerns contaminated land.

The chapter describes the baseline geology together with historic contaminative use along the main sites and pipe corridors and potential impacts to human health and controlled waters from the proposed development.

A Phase 1 desk-based assessment (DBA) has been completed for Main Site A and a similar DBA is being prepared for Main site B.

In order to minimise the environmental impact and fully characterise the site I would recommend the inclusion of the full Standard Contaminated Land condition onto any planning permission which may be granted:

REASON: To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors.

Natural Heritage Manager

No comments

(2) External Stakeholder responses

SABIC Pipeline Operator

Many thanks for your notification of request dated 13 April 2023 for planning reference, R/2023/0300/DCO, at the above address.

The proposed development appears to be located in the inner, middle and outer zone of the above Major Accident Hazard Pipeline as defined by the HSE development control guidelines (PADHI – HSE's Land Use Planning Methodology document).

In terms of the safety and engineering integrity of the pipeline I would advise you that SABIC is consulted should any work within 50 metres (notification zone as required by operators of Major Accident Hazard Pipelines) is to be carried out, as this would need approval from ourselves before any work is commenced.

Should planning consent be granted, we would require to consult fully with the developer prior to construction commencing on the site to agree a method statement and ensure that our standard conditions for work in close proximity to the pipeline are met.

Northern Gas Networks

There are high pressure mains within the area so we would object to this. The link you have provided is to a document with 249 pages so can you please pinpoint the areas and provide grids for each one? – please see below:

NGN has a number of gas assets in the vicinity of some of the identified "site development" locations. It is a possibility that some of these sites could be recorded as Major Accident Hazard Pipelines(MAHP), whilst other sites could contain High Pressure gas and as such there are Industry recognised restrictions associated to these installations which would effectively preclude close and certain types of development. The regulations now include "Population Density Restrictions" or limits within certain distances of some of our "HP" assets.

The gas assets mentioned above form part of the Northern Gas Networks "bulk supply" High Pressure Gas Transmission" system and are registered with the HSE as Major Accident Hazard Pipelines.

Any damage or disruption to these assets is likely to give rise to grave safety, environmental and security of supply issues.

NGN would expect you or anyone involved with the site (or any future developer) to take these restrictions into account and apply them as necessary in consultation with ourselves. We would be happy to discuss specific sites further or provide more details at your locations as necessary. If you give specific site locations, we would be happy to provide gas maps of the area which include the locations of our assets.

(In terms of High-Pressure gas pipelines, the routes of our MAHP's have already been lodged with members of the local Council's Planning Department)

Highways England

See attached technical note

CATS North Sea

Thank you for your notification request dated 13 April 2023 in respect of planning reference R/2023/0300/DCO, at the above noted address.

The proposed development is located in proximity to the CATS terminal and pipeline (the "CATS Infrastructure"). CATS North Sea Limited ("CNSL") should be consulted in respect of any work or activities within 50 metres of the CATS Infrastructure and no such work should be commenced without the prior approval of CNSL. The safety and engineering considerations, so far as relevant to the Environmental Statement, should take account of the CATS Pipeline and any restriction zones. The application for development consent will need to ensure any risks to, or associated with, the CATS Infrastructure are suitably mitigated. CNSL will engage further in the planning process in this regard.

CNSL has no additional comments at this stage on the proposed scope of the Environmental Statement but will continue to engage with the planning process and the make comments and representations at relevant stages.

Natural England

We have since been consulted separately by the Planning Inspectorate and will submit our advice letter direct to them on 9.5.23.

Cleveland Police ALO

With regards to this application, I recommend applicant/agent contact me at earliest opportunity for any advice/guidance I can offer and to liaise with any other departments within Cleveland Police that should be aware of proposal.

Yours sincerely



Head of Planning and Development

Lynne Aspery

From: Planning Admin
Subject: FW: DCO Scoping Response - R/2023/0300/DCO - H2 Teesside Project
Attachments: DevTV0162 TM001 - Final.pdf

From: Christopher Bell (NO, North East) [redacted]@nationalhighways.co.uk>
Sent: 28 April 2023 11:15
To: Adrian Miller [redacted]@redcar-cleveland.gov.uk>
Cc: Subject: FW: DCO Scoping Response - R/2023/0300/DCO - H2 Teesside Project

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Adrian,

Please find a technical note from JSJV, National Highways consultants, to advise at this pre-application / scoping stage on this proposed development in order to assist the developer in defining an appropriate assessment of the Strategic Road Network.

Regards

[redacted]

Chris Bell, Planning Manager
National Highways (formerly Highways England) | 2 City Walk | Leeds | LS11 9AT
Tel: [redacted]
Web: http://www.highways.gov.uk
GTN: 0300 470 2339

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H2 Teesside Project – DCO Scoping

Prepared for:	Chris Bell
Prepared by:	Jack Fawdington
Date:	28th April 2023
Case Reference:	DevTV0162
Document Reference:	TM001
Reviewed/approved by:	Gavin Nicholson

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Overview

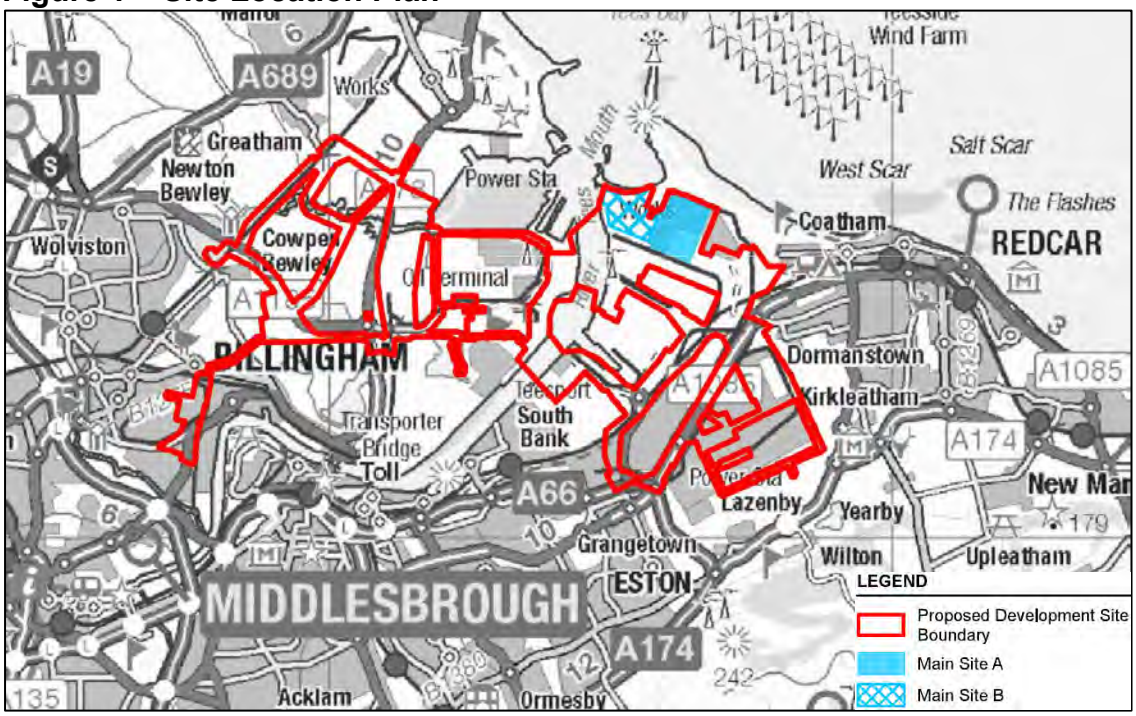
Jacobs Systra Joint Venture [JSJV] (on behalf of National Highways) has undertaken a review of an Environmental Impact Assessment [EIA] Scoping document (dated April 2023) submitted by H2 Teesside Limited [the Applicant] in reference to the proposed H2 Teesside Project at the former Redcar Steelworks site, Teesside. The H2 Teesside Project application has been classified as a Development Consent Order [DCO] (ref: R/2023/0300/DCO) due to the development being recognised by the Planning Inspectorate as a Nationally Significant Infrastructure Project.

This JSJV Technical Memorandum [TM] comments on the suitability of the EIA Scoping document with discussion provided in relation to whether the document suitably considers the impact of the development proposals upon the Strategic Road Network [SRN] across both the operational and construction phases of the development.

Site Location

The development site, located at the former Redcar Steelworks site, is composed of two proposed main sites, sites A and B, as detailed on Figure 1 below.

Figure 1 – Site Location Plan



(Source: EIA Scoping Submission Drawing – 'Figure 1')

Description of Existing Development

Proposed Development Site

The proposed development site is located primarily within the administrative boundaries of Redcar and Cleveland Borough Council [RCBC] and Stockton on Tees Borough Council [STBC]. The hydrogen pipeline corridor extends further north-west to include land within the administrative boundary of Hartlepool Borough Council [HBC] also. The proposed development site is split into distinct areas as summarised below:

- The Main Site (whether Site A or Site B) will be the location of the Production Facility together with the associated carbon capture and compression facilities and ancillary infrastructure.
- C0² Export Corridor: C0² captured from the process will be compressed at the Main Site and exported off shore for geological storage in the Southern North Sea.
- Hydrogen Pipeline Corridor: The pipeline network will connect to potential off-takers at various industrial installations across the Tees Valley.
- Natural Gases Connection Corridor: Pipelines required for the transportation of compressed gas from local sources for use in the hydrogen production process.
- Electrical Connection Corridor: To provide electrical power for the Production Facility via a connection to the National Grid Network.
- Water Connections Corridor: Required for water supply and discharge to / from the Production Facility.

Proposed Development

The proposed development comprises the construction, operation and maintenance of a 1.2 GWth Lower Heating Valve Carbon Capture and Storage [CSS] enabled Hydrogen Production Facility located in the Teesside industrial cluster area.

The Production Facility and associated infrastructure which form part of the proposed development will be located on the 'Main Site'. There are currently two Main Site options – Main Sites A and B. Main Site A would be located within land owned by Teesworks known as 'The Foundry'. Main Site B would be located to the west of Main Site A within land owned by Redcar Bulk Terminal, known as 'RBT'. Both Main Sites are located within the Redcar and Cleveland Borough, with the connection corridors extending further into Stockton-on-Tees and Hartlepool, all within Teesside.

At this stage in the design of the proposed development, there are still options being considered for various components. The design of the proposed development incorporates a necessary degree of flexibility to allow for the future selection of the preferred layout at the Main Site, as well as routing of the hydrogen pipeline and other connections.

Development Access

Access to the Main Sites during the construction phase for HGV construction traffic is likely to be via the existing access road from the A1085 (local highway network) via the former Redcar Steelworks entrance. This route will also be used during operation for staff and other site traffic. This applies to both Main Site A and Main Site B options.

Construction access routes for the hydrogen pipeline and connection corridors are yet to be defined by the Applicant. However, it is proposed that laydown areas will likely be identified at suitable locations along the pipeline routes located north of the River Tees to reduce potential disturbance. Moving forward, JSJV note that the location of both the construction laydown areas and the routing of HGV construction routes will need to be confirmed with National Highways, however, it is acknowledged that the proposed A1085 access point is unlikely to directly interact with the operation of the SRN.

Abnormal Indivisible Loads

Options for transportation of Abnormal Indivisible Loads [AIL]s during construction using the local ports are still being considered by the Applicant. The nearest commercial port to the proposed development site is Teesport which could be used for the import of containerised equipment or modular plant. The use of the existing wharf at RBT for transportation of abnormal loads is also proposed to be considered for modular plant. Consideration is also to be given to the appropriate port and any required AIL routes during the design process.

JSJV understands that the standard procedure for [AIL]s will be followed by the Applicant, however, it is noted that potential carriageway width, height and weight restrictions for the movement of such vehicles will need to be discussed and agreed with National Highways.

As such, JSJV would advise that the Applicant directly discusses any matters pertaining to AIL movements with the National Highways Abnormal Indivisible Loads team (AbnormalIndivisibleLoadsTeam@highwaysengland.co.uk).

Construction Programme & Management

As the development advances through the planning process, a detailed Environmental Statement [ES] will be submitted alongside a detailed Construction Environmental Management Plan [CEMP], which will describe the specific mitigation measures to be followed to reduce impacts from construction related activities.

The Construction of Phase 1 is likely to last approximately two years. Phase 2 works would commence thereafter (approximately late 2027/ early 2028) and last a further two to three years, with overall construction expected to be completed by late 2029 or early 2030. The potential impact of the construction of the proposed development at the SRN will also be discussed subsequently within this JSJV TM.

Staffing

Based on an initial estimate, it is proposed that the construction workforce peak numbers will be approximately 3,100 people per day across two distinct development phases. This includes workers associated with both the Main Site and pipeline connections.

Operational workforce peak numbers are proposed to be a maximum of 85 persons, working dedicated shifts over 24 hour periods. Typical staff numbers are expected to be 40 to 50 during the week, however, during 28 day maintenance periods (occurring every four years), around 400 staff may be on site.

With regards to on-site operational and construction staff, National Highways will require the expected two-way daily arrival / departure profile of staff trips to be confirmed by the Applicant. This is to ensure that the impact of the site at the SRN during the operational and construction phase can be assessed, quantified and managed if necessary.

With regards to the 28 day maintenance periods highlighted by the Applicant, JSJV recognise that these specific periods may likely incur an impact at the SRN as a result of greatly increased staff numbers. Consequently, JSJV would advise that a suitable control mechanism is agreed with National Highways through a form of Operational Traffic Management Plan [OTMP] for implementation during these periods to ensure staff trip generation can be managed and mitigated.

HGV Movements & Traffic

While the volume of construction vehicles associated with the delivery of plant and the labour force has not been fully determined at this stage, it is proposed that approximately 2,660 two-way vehicle movements will be generated per day during the peak construction period, based on an average car occupancy for workers of 2.33.

In terms of construction HGV and LGV movements, approximately 15,320 deliveries are expected to the Main Site over the full period of construction. In addition, there are also approximately 4,330 HGV movements expected to be associated with the construction of the development pipelines throughout the construction period, which equates to around 50 two-way movements per day during the peak month of construction.

National Highways will require confirmation of the expected ‘peak’ arrival / departure profile of construction vehicles, including construction staff, deliveries and associated movements during an identified ‘peak’ construction period, and how long this period may continue for, opposed to the generation of average movements or total daily / monthly movements. This is to ensure that any potential trip generation impact at the

SRN can be accurately quantified as the development advances through the construction phase.

Further detail will also need to be provided by the Applicant in relation to how it will be ensured that an average car occupancy rate of 2.33 will be achieved. This detail and the associated control mechanisms that will be required to control and mitigate the impact of the construction traffic at the SRN will need to be detailed in the Final Construction Traffic Management Plan [CTMP] submitted in support of the DCO.

In addition, the Applicant will need to confirm and evidence the anticipated routings and proportions that construction vehicles (including construction staff trips) will take to / from the site. Confirmation of the distribution of these trips is required by National Highways in order to understand which specific SRN junctions may be materially impacted by construction traffic.

Planning Policy

While not identified by the Applicant within the scoping document, National Highways will require any planning assessment to engage with and adhere to guidance contained within DfT Circular 01/2022: The Strategic Road Network and the Delivery of Sustainable Development. Circular 01/2022 sets out the way in which National Highways will engage with the development industry, public bodies and communities to assist the delivery of sustainable development. The circular is applicable to the whole of the SRN, comprising the trunk motorways and all-purpose trunk roads in England, including those roads managed by the design, build, finance and operate companies.

Environmental Impact Assessment Process

Traffic & Transportation

The scoping document identifies that in order to fully address the impacts of the construction phase on the highway network, a Transport Assessment [TA] will be produced by the Applicant following the confirmation of the specific number of construction movements associated with the proposed development. The scoping note identifies that appropriate liaison with the necessary local authorities and National Highways will be undertaken prior to TA submission.

The scope of the TA is proposed to cover the following areas:

- Review of appropriate transport policy.
- Description of baseline and future baseline conditions, including link and junction flows, a review of highway safety issues and consideration of accessibility by all modes.
- Calculation of construction traffic flows.
- Distribution and assignment of construction traffic flows to the highway network, including the identification of any AIL routes.
- Highway network impact analysis, with the identification of key junctions that may require detailed capacity analysis.
- Consideration of local PRoW network and the potential impact of the site on existing routes.

- Where the construction of the development may directly interact with existing road and / or rail links.
- The formulation of mitigation measures through both a Construction Worker Travel Plan [CWTP] and CTMP.

With reference to the preparation of the development TA, JSJV note that:

- The impact of the proposed development at the SRN over both the operational and construction phase must be understood in terms of absolute two-way flows over both morning / evening network peak hours. This is opposed to either total daily flows or proportional flows (percentage increase) in relation to baseline flows at any specific junction.
- National Highways will need to understand the trip distribution of site vehicles at the SRN associated with both the construction and operational phases of the proposed development. The study area should extend to any SRN junction where a potential impact needs to be considered (to aid discussions we suggest 30 two-way trips being a starting point for consideration).
- JSJV acknowledge that where the development (construction and / or operation) is evidenced to potentially incur a material impact at an SRN junction, appropriate collision analysis may be required.
- Where the development (construction and / operation) is evidenced to potentially incur a material impact at an SRN junction, an appropriate consideration of operational impacts and, if required, mitigation strategy, will need to be agreed with National Highways.
- National Highways will require confirmation as to where any sections of pipeline construction may interact with the SRN, i.e., where tunnelling or infrastructure works are undertaken either underneath or adjacent to the SRN. Further discussions will then be required with National Highways as to how such construction can be safety undertaken without compromising the operation or structural integrity of the SRN.
- While the production of a CWTP is welcomed by National Highways, JSJV note that a Travel Plan [TP] will also need to be prepared in relation to the operational aspect of the proposed development. Both CWTP and operational TP must outline a package of measures that will be utilised to promote and incentivise sustainable travel to / from the site, while committing to vehicle trip generation targets and a trip monitoring strategy. Detail should also be provided as to what remedial measures will be implemented should vehicular trip targets not be achieved.

In supplement, JSJV also note that the following measures will need to be taken into account by the Applicant in relation to the preparation of a CTMP for the proposed development:

- Identification of the approved haul routes to site and identification of measures to prevent the use of any unauthorised routes.
- Identification of the site access strategy.
- Identification of the proposed works programme by construction task.
- Identification of workforce numbers for the site and details of workforce travel arrangements (specifically with a view to achieving the 2.33 average car occupancy for workers that has been assumed within the initial provision of information).

- Details of site working hours and details of any exceptions (concrete pours etc).
- Measures to minimise wherever possible the use of public roads at peak periods whenever practicable (Morning and Evening Peak Hours and school start / finish times).
- Details of measures to reduce the number of delivery trips to site such as a combination of consolidated ordering, rationalising suppliers and consolidated deliveries.
- Details of measures to reduce on-site waste such as recycling and re-use of materials to minimise the number of collections from site.
- Vehicles carrying soil and other dusty materials to be fully sheeted when travelling to or leaving site.
- Use of on approved mechanical road sweeper to clean the surrounding road network of any mud or debris deposited by site vehicles. The road sweeper should be available whenever needed.
- Measures to safely manage pedestrians.
- Details for any temporary traffic management and warning signs.
- Details of a site liaison officer who will act as point of contact for the CTMP.
- Details regarding the monitoring the success of the CTMP and remedial measures which may be implemented should the CTMP not be achieving stated outcomes.

Relationship with other Planning Applications

Finally, JSJV recommends that National Highways should seek to ensure that the consideration, and subsequent delivery, of the proposals (if the DCO application is successful) is done so in a manner that is aligned with the approaches adopted and outcomes envisaged when other significant applications in the area have been considered. Clearly the aspirations outlined could have cumulative implications during both the construction and operational stages with other approved development proposals.

With a view to this, the following information is provided in relation to those permissions that are directly relatable to the proposals for this site:

- **R/2020/0821/ESM - Foundry Outline Application**

  Alongside four other significant applications made by the South Tees Development Corporation [STDC], this application has been granted with some requirements for SRN assessment and mitigation measures being the subject of a set of planning conditions.

  With a view to the site parameters plan for the Foundry application, which can be seen in Figure 2 below, it can be seen that the development boundaries contain areas that are subject to this DCO application (mainly related to the Main Site A component). National Highways would therefore request that information be provided that clarifies the relationship of the applications and developments proposed.

  Furthermore, with a view to the approach that has been established for the Foundry Outline permission (as controlled by the associated planning conditions), discussions should take place to confirm how the planning outcomes contained within the planning conditions associated with that Foundry Outline permission can

be achieved with regard to this proposal. It is recommended that discussions are held with the DCO applicant, the Local Planning Authority and STDC (as necessary - as the applicant to the outline Foundry permission) to understand the relationship between the development proposals and with a view to ensuring a holistic and consistent consideration of their outcomes.

Figure 2 – R/2020/0821/ESM – Site Parameters Plan

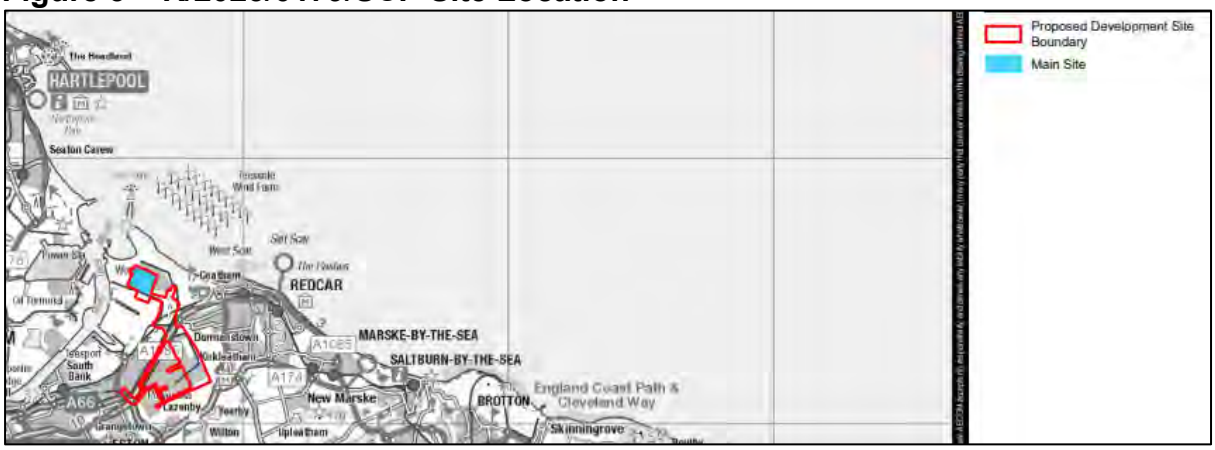


(Source: Planning Application R/2020/0821/ESM – Site Parameters Plan)

- **R/2023/0179/SCP – Hygreen Hydrogen Project**

  National Highways were consulted on the scoping opinion for the Hygreen Hydrogen Project to which initial headline comments were provided in early March 2023 (available on the Redcar and Cleveland Planning Portal for this application). With a view to the proposals form and boundary which can be seen in Figure 3 below, it can be seen that there are similarities in terms of the main site location and components of the development site boundary and that of the development being proposed in the DCO application (for the southern elements of the site boundary specifically). National Highways would therefore request that information be provided that clarifies the relationship of the applications and developments proposed.

Figure 3 – R/2023/0179/SCP Site Location



(Source: Planning Application R/2023/0179/SCP – Site Location Plan (AECOM))

Summary and Conclusions

On the basis of this review, the recommendation to National Highways in relation to this development proposals is:

Pre-application / Scoping Response – comments are made on the pre-application / scoping in order to assist defining an appropriate assessment of the Strategic Road Network.

This review has highlighted the following:

1) JSJV would advise that the Applicant directly discusses any matters pertaining to AIL movements with the National Highways Abnormal Indivisible Loads team (AbnormalIndivisibleLoadsTeam@highwaysengland.co.uk).
2) National Highways will require any planning assessment to engage with and adhere to guidance contained within DfT Circular 01/2022: The Strategic Road Network and the Delivery of Sustainable Development.
3) JSJV would advise that a suitable control mechanism is agreed with National Highways through a form of Operational Traffic Management Plan [OTMP] for implementation during the 28 day maintenance periods to ensure staff trip generation can be managed and mitigated.
4) National Highways will require confirmation of the expected 'peak' arrival / departure profile of construction vehicles, including construction staff, deliveries and associated movements during an identified 'peak' construction period, and how long this period may continue for, opposed to the generation of average movements or total daily / monthly movements.
5) The Applicant will need to confirm how it will be ensured that an average car occupancy rate of 2.33 will be achieved with regards to construction staff.
6) The Applicant will need to confirm and evidence the anticipated routings and proportions that construction vehicles (including construction staff trips) will take to / from the site. Confirmation of the distribution of these trips is required by National Highways in order to understand which specific SRN junctions may be materially impacted by construction traffic.

7) With reference to the preparation of the development TA, JSJV note that:
    a) The impact of the proposed development at the SRN over both the operational and construction phase must be understood in terms of absolute two-way flows over both morning / evening network peak hours. This is opposed to either total daily flows or proportional flows (percentage increase) in relation to baseline flows at any specific junction.
    b) National Highways will need to understand the trip distribution of site vehicles at the SRN associated with both the construction and operational phases of the proposed development. The study area should extend to any SRN junction where a potential impact needs to be considered (to aid discussions we suggest 30 two-way trips being a starting point for consideration).
    c) JSJV acknowledge that where the development (construction and / or operation) is evidenced to potentially incur a material impact at an SRN junction, appropriate collision analysis may be required.
    d) Where the development (construction and / operation) is evidenced to potentially incur a material impact at an SRN junction, an appropriate consideration of operational impacts and, if required, mitigation strategy, will need to be agreed with National Highways.
    e) National Highways will require confirmation as to where any sections of pipeline construction may interact with the SRN, i.e., where tunnelling or infrastructure works are undertaken either underneath or adjacent to the SRN. Further discussions will then be required with National Highways as to how such construction can be safety undertaken without compromising the operation or structural integrity of the SRN.
    f) While the production of a CWTP is welcomed by National Highways, JSJV note that a Travel Plan [TP] will also need to be prepared in relation to the operational aspect of the proposed development. Both CWTP and operational TP must outline a package of measures that will be utilised to promote and incentivise sustainable travel to / from the site, while committing to vehicle trip generation targets and a trip monitoring strategy. Detail should also be provided as to what remedial measures will be implemented should vehicular trip targets not be achieved.
8) The following measures will need to be taken into account by the Applicant in relation to the preparation of a CTMP for the proposed development:
    a) Identification of the approved haul routes to site and identification of measures to prevent the use of any unauthorised routes.
    b) Identification of the site access strategy.
    c) Identification of the proposed works programme by construction task.
    d) Identification of workforce numbers for the site and details of workforce travel arrangements (specifically with a view to achieving the 2.33 average car occupancy for workers that has been assumed within the initial provision of information).
    e) Details of site working hours and details of any exceptions (concrete pours etc).

f) Measures to minimise wherever possible the use of public roads at peak periods whenever practicable (Morning and Evening Peak Hours and school start / finish times).

g) Details of measures to reduce the number of delivery trips to site such as a combination of consolidated ordering, rationalising suppliers and consolidated deliveries.

h) Details of measures to reduce on-site waste such as recycling and re-use of materials to minimise the number of collections from site.

i) Vehicles carrying soil and other dusty materials to be fully sheeted when travelling to or leaving site.

j) Use of on approved mechanical road sweeper to clean the surrounding road network of any mud or debris deposited by site vehicles. The road sweeper should be available whenever needed.

k) Measures to safely manage pedestrians.

l) Details for any temporary traffic management and warning signs.

m) Details of a site liaison officer who will act as point of contact for the CTMP.

n) Details regarding the monitoring the success of the CTMP and remedial measures which may be implemented should the CTMP not be achieving stated outcomes.

9) JSJV recommends that National Highways should seek to ensure that the consideration, and subsequent delivery, of the proposals (if the DCO application is successful) is done so in a manner that is aligned with the approaches adopted and outcomes envisaged when other significant applications in the area have been considered. Clearly the aspirations outlined could have cumulative implications during both the construction and operational stages with a view to the following approved development proposals:

   a. R/2020/0821/ESM – Foundry Outline Application.

   b. R/2023/0179/SCP – Hygreen Hydrogen Project.

LICHFIELDS

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Laura Feekins-Bate
Planning Inspectorate
Environmental Services
Operations Group 3
Temple Quay House
2 The Square
Bristol
BS1 6PN

Date: 9 May 2023
Our ref: 63262/01/AGR/GB/26519535v1
Your ref: EN070009

Dear Laura

Response by Teesworks to EIA Scoping Report for H2Teesside Project

We write on behalf of our client, the South Tees Development Corporation (STDC) and South Tees Developments Limited (STDL). We write in reference to your letter dated 11 April 2023 inviting STDC, hereafter referred to as "Teesworks", to comment on the Environmental Impact Assessment ('EIA') Scoping Report in respect of the Development Consent Order (DCO) being prepared for the H2Teesside project. This letter comprises Teesworks' formal response to your request for comments on the EIA Scoping Report of the H2Teesside project.

As freehold owner, STDC has an interest in the land which is located within Main Site A ('also known as The Foundry') and, alongside STDL, areas within the Connection Corridors in the Proposed Development Site, shown within Figure 1 Site Location Plan which forms an Appendix to the EIA Scoping Report.

We have reviewed the EIA Scoping Report and wish to offer the following comments:

1 We agree with the topics proposed to be scoped into the ES set out in Section 6 'Potentially Significant Environmental Effects' and Section 8 'Summary and Matters to be Scoped Out' of the EIA Scoping Report.

2 We note the acknowledgement in para 5.6.5 which states that parts of the Proposed Development Site lie within the boundary of the South Tees Development Corporation area.

3 The commitment to consult stakeholders on final site selection as set out in para 2.1.4 of the EIA Scoping Report is crucial to the success of the project and our clients want to participate proactively and positively in this process. We therefore formally request that H2Teesside Ltd invites us to provide input into the appraisal and decision-making process on the Proposed DCO Boundary given this closely relates to on-going commercial discussions over land arrangements at Teesworks.

4 Paragraph 6.17.17 states:

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Registered office at The Minster Building, 21 Mincing Lane, London EC3R 7AG

Celebrating 60 years

STDC have recently submitted a number of planning applications in the vicinity of the Proposed Development Site, primarily for demolition works and engineering operations associated with ground remediation and preparation for regeneration and development. They are also in the process of preparing a number of planning applications for development of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E), HGV and car parking, works to watercourse including realignment and associated infrastructure works.

The above reference to there being '*a number of planning applications in the process of preparation*' is incorrect. In 2022, four applications for industrial development (Use Classes B2 and B8) were granted outline planning permission (under references R/2020/0820/ESM, R/2020/0819/ESM, R/2020/0821/ESM and R/2020/0822/ESM) for over 880,000sqm of floorspace across areas of Teesworks, including land that is identified as 'Main Site A' for the H2Teesside Project (an area that Teesworks refers to as 'The Foundry"). In total, over 1.3million sqm of floorspace for Class B2 or B8 uses across the Teesworks estate has been granted outline planning permission.

It would appear that the '*recently submitted*' applications referred to above are likely to be those for the remediation of land to facilitate the development of the Net Zero Teesside project (reference R/2021/1048/FFM) and the Prior Approval of demolition works of the former Redcar Steelworks buildings (reference R/2021/0608/PND). Both applications were, however, approved in August 2022 and August 2021 respectively.

Figure 15 identifies the location of each of the STDC Projects within and adjacent to the Proposed Development Site. We can confirm that the projects identified in respect of Teesworks land are correct at the time of writing, though the commentary in respect of these applications / permissions is not. We do, therefore, wish to engage further with H2Teesside Ltd on this matter to ensure that the full list of cumulative schemes is kept up to date, that the scope of any cumulative assessment is appropriate, and to ensure that the development proposed on Teesworks is assessed accurately within any subsequent Environmental Assessment.

5 We have undertaken a high-level review of the methodologies for each of the technical assessments provided within section 6 of the EIA Scoping Report and have no specific comments to make except in respect of 'Cumulative and Combined Effects' which are set out above.

We acknowledge that the H2Teesside project is in the early stages of development and that the detail provided in the EIA Scoping Report requires further refinement and clarity prior to consultation on the Preliminary Environmental Impact (PEI) Report which is expected in summer 2023. It is crucial that Teesworks participates in discussions with the applicant and its advisors, regarding the refinement of the red line boundary and the extent of land required for constructing and operating the H2Teesside project, particularly its pipeline routes and infrastructure corridors. As with the Net Zero Teesside scheme / DCO, it is imperative that H2Teesside Ltd reduces the red line boundary to cover only the areas of land which are absolutely necessary for the delivery of the project.

We, therefore, consider it necessary for H2Teesside Ltd to hold urgent targeted consultation with Teesworks over land availability, interaction with the wider Teesworks site plans and commercial arrangements and to allow an appropriate period for responding prior to the submission of the draft DCO documentation to PINS.

It is expected that the finalisation of the pipeline routes / infrastructure corridors and corresponding reduction in the red line boundary will give sufficient clarity to enable Teesworks to fully understand and assess the impacts of the development and to be satisfied that there would be no unacceptable implications on the overall comprehensive regeneration of the Teesworks area.

Many thanks again for consulting Teesworks at this stage and we look forward to working with you to resolve our concerns.

Yours sincerely

[redacted]

[redacted]
Senior Director

Woodger-Bassford, Jade

From: ONR Land Use Planning <ONR-Land.Use-Planning@onr.gov.uk>
Sent: 04 May 2023 13:09
To: H2Teesside
Subject: ONR Land Use Planning - Application EN070009
Attachments: image009.png; image008.png; H2TE - Statutory consultation letter.pdf; image002.png; image001.png; image010.png; image011.png

Dear Sir / Madam,

ONR have no objection to the proposed development at this stage subject to the developer liaising with EDF Energy Nuclear Generation Limited in relation to the potential external hazards the proposed development poses to Hartlepool and vice versa. Depending on future siting and layout decisions, the proposed development could pose an external hazard to Hartlepool during construction, operation and potentially decommissioning.

Further information on ONR's role in providing advice on proposed developments on and around nuclear sites is available on ONR's website: https://www.onr.org.uk/land-use-planning.htm. The developer should familiarise itself with this information including ONR's consultation zones, consultation advice and the consultation process.

Kind regards

Vicki Enston
Land Use Planning
Office for Nuclear Regulation
ONR-Land.Use-planning@onr.gov.uk

----Original Message----
From: H2Teesside <H2Teesside@planninginspectorate.gov.uk >
To: H2Teesside@planninginspectorate.gov.uk;
Cc:
Sent: 12/04/2023 13:56
Subject: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

Dear Sir/ Madam

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards

Laura

Laura Feekins-Bate

EIA Advisor

The Planning Inspectorate

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Feekins-Bate, Laura

From: H2Teesside
Subject: FW: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

---

From: Stephen Vanstone [redacted]@trinityhouse.co.uk>
Sent: 09 May 2023 09:30
To: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Cc: Trevor Harris [redacted]@trinityhouse.co.uk>
Subject: RE: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

Good morning Laura,

I note that the proposed development area includes areas within the River Tees which lie within the jurisdiction of PD Teesport Ltd.. Therefore, Trinity House advise that any marine works proposed below mean high water springs should be fully assessed in consultation with PD Teesport Ltd.

Kind regards,

Stephen Vanstone
Navigation Services Manager | Navigation Directorate | Trinity House
[redacted]@trinityhouse.co.uk | [redacted]
www.trinityhouse.co.uk

TRINITY HOUSE

From: H2Teesside <H2Teesside@planninginspectorate.gov.uk>
Sent: 11 April 2023 10:36
To: Navigation <navigation@trinityhouse.co.uk>
Cc: H2Teesside <H2Teesside@planninginspectorate.gov.uk>; Thomas Arculus [redacted]@trinityhouse.co.uk>
Subject: EN070009 - H2Teesside - EIA Scoping Notification and Consultation

FAO Steve Vanstone- Navigation Services Officer

Dear Mr Vanstone

Please see attached correspondence on the proposed H2Teesside project.

Please note that the deadline for consultation responses is **9 May 2023**, and is a statutory requirement that cannot be extended.

Kind regards
Laura

Laura Feekins-Bate
EIA Advisor
The Planning Inspectorate

@PINSgov The Planning Inspectorate planninginspectorate.gov.uk

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UK Health Security Agency

Environmental Hazards and Emergencies Department
Seaton House, City Link
London Road
Nottingham, NG2 4LA

nsipconsultations@ukhsa.gov.uk
www.gov.uk/ukhsa

Your Ref: EN070009
Our Ref: 63300CIRIS

Ms Laura Feekins-Bate,
EIA Advisor,
The Planning Inspectorate
Temple Quay House,
2 The Square,
Bristol, BS1 6PN

5th May 2023

Dear Ms Feekins-Bate,

Nationally Significant Infrastructure Project
H2Teeside Project EN070009
Scoping Consultation Stage

Thank you for including the UK Health Security Agency (UKHSA) in the scoping consultation phase of the above application. ***Please note that we request views from the Office for Health Improvement and Disparities (OHID) and the response provided below is sent on behalf of both UKHSA and OHID.*** The response is impartial and independent.

The health of an individual or a population is the result of a complex interaction of a wide range of different determinants of health, from an individual's genetic make-up to lifestyles and behaviours, and the communities, local economy, built and natural environments to global ecosystem trends. All developments will have some effect on the determinants of health, which in turn will influence the health and wellbeing of the general population, vulnerable groups and individual people. Although assessing impacts on health beyond direct effects from for example emissions to air or road traffic incidents is complex, there is a need to ensure a proportionate assessment focused on an application's significant effects.

Having considered the submitted scoping report we wish to make the following specific comments and recommendations:

Environmental Public Health

We recognise the promoter's proposal to include a health section. We believe the summation of relevant issues into a specific section of the report provides a focus which ensures that public health is given adequate consideration. The section should summarise key information, risk assessments, proposed mitigation measures, conclusions, and residual impacts, relating to human health. Compliance with the requirements of National Policy Statements and relevant guidance and standards should also be highlighted.

In terms of the level of detail to be included in an Environmental Statement (ES), we recognise that the differing nature of projects is such that their impacts will vary. UKHSA and OHID's predecessor organisation Public Health England produced an advice document *Advice on the content of Environmental Statements accompanying an application under the NSIP Regime*', setting out aspects to be addressed within the Environmental Statement[1]. This advice document and its recommendations are still valid and should be considered when preparing an ES. Please note that where impacts relating to health and/or further assessments are scoped out, promoters should fully explain and justify this within the submitted documentation.

Recommendation

Our position is that pollutants associated with road traffic or combustion, particularly particulate matter, and oxides of nitrogen, are non-threshold; i.e. an exposed population is likely to be subject to potential harm at any level and that reducing public exposure to non-threshold pollutants (such as particulate matter and nitrogen dioxide) below air quality standards will have potential public health benefits. We support approaches which minimise or mitigate public exposure to non-threshold air pollutants, address inequalities (in exposure) and maximise co-benefits (such as physical exercise). We encourage their consideration during development design, environmental and health impact assessment, and development consent.

Human Health and Wellbeing - OHID

This section of OHIDs response, identifies the wider determinants of health and wellbeing we expect the ES to address, to demonstrate whether they are likely to give rise to significant effects. OHID has focused its approach on scoping determinants of health and wellbeing under four themes, which have been derived from an analysis of the wider determinants of health mentioned in the National Policy Statements. The four themes are:

- Access
- Traffic and Transport

[1] https://khub.net/documents/135939561/390856715/Advice+on+the+content+of+environmental+statements+accompanying+an+application+under+the+Nationally+Significant+Infrastructure+Planning+Regime.pdf/a86b5521-46cc-98e4-4cad-f81a6c58f2e2?t=1615998516658

- Socioeconomic
- Land Use

Having considered the submitted Scoping Report, OHID wish to make the following specific comments and recommendations.

Hydrogen gas manufacture, storage and distribution network – Community risk perception / understanding of risk.

The broad definition of health used by the World Health Organisation (WHO), includes reference to mental health. Mental well-being is fundamental to achieving a healthy, resilient and thriving population. It underpins healthy lifestyles, physical health, educational attainment, employment and productivity, relationships, community safety and cohesion and quality of life. A scheme of this scale and nature has impacts on the over-arching protective factors, which are:

• Enhancing control
• Increasing resilience and community assets
• Facilitating participation and promoting inclusion.

The scoping report does not make reference to the potential for local public concern through understanding of risk / risk perception. Previous hydrogen distribution schemes have scoped-in community concern over hydrogen safety, due to this being a relatively new industry and the potential for major incidents.

Communities in the vicinity of the scheme will receive targeted communications as part of the normal consultation process. Communication programmes should provide a source of clear and objective information to increase knowledge and awareness. Consultations should also use the opportunity to assess levels of local concern, which can then be used to assess significance of effects and inform community consultation and the provision of information.

Recommendation

The ES should consider potential effects on mental health through risk perception / understanding of risk posed by the manufacture, storage and transportation of hydrogen and other hazardous substances.

When estimating community anxiety and stress in particular, a qualitative assessment may be most appropriate. Robust and meaningful consultation with the local community will be an important mitigation measure, in addition to informing the assessment and subsequent mitigation measures. This may involve conducting resident surveys but also information received through public consultations, including community engagement exercises. The Mental Well-being Impact Assessment Toolkit (MWIA) contains key principles that should be demonstrated in a project's community engagement and impact assessment. We would also

encourage consultation with the local authority's public health team, who are likely to have Health Intelligence specialists who will have knowledge about the availability of local data. The Mental Well-being Impact Assessment Toolkit (MWIA)[2], could be used as a methodology. The assessment should identify vulnerable populations and provide clear mitigation strategies that are adequately linked to any local services or assets. Baseline indicators the assessment would benefit from including social cohesion/connectedness, satisfaction with local area and quality of life indicators owing to their established links to mental health and wellbeing.

In terms of sources, we would draw your attention to the following:

- PHE Fingertips – Mental Health and Wellbeing JSNA
    - Area profiles with various indicators on common mental disorders (including anxiety) and severe mental illness which can be benchmarked with other local areas as well as regional and national data
- Office for National Statistics - Wellbeing Indicators
    - Range of datasets related to wellbeing available including young people's wellbeing measures, personal wellbeing estimates and loneliness rates by local authority

Socio-economics - Housing affordability and availability

The report (Para 3.14.1) recognised the potential for significant numbers of construction workers, where workforce peak numbers will be approximately 3,100 people per day. The numbers of non-home-based workers was not stated.

The report does not recognise a requirement for temporary living accommodation within reasonable commuting distance of the project such as rented housing, hotels, guest houses, bed and breakfast establishments/lodgings and official caravan parks.

Significant number of non-home-based construction workers could foreseeably have an impact on the local availability of affordable housing. Those residents looking for low cost affordable homes will have the least capacity to respond to change (for example, where there may be an overlap between construction workers seeking accommodation in the private rented sector, and people in receipt of housing benefit seeking the same lower-cost accommodation). This impact could also be compounded by the cumulative accommodation demands from a number of large developments.

[2] Mental Wellbeing Impact Assessment Toolkit, (National MWIA Collaborative (England), 2011) - A toolkit with an evidence-based framework for improving well-being through projects.

Recommendation

The peak numbers of construction workers and non-home-based workers should be established, and a proportionate assessment undertaken on the impacts for housing availability or affordability and impacts on any local services.

Any cumulative effect assessment should consider the impact on demand for housing by construction workers and the likely numbers of non-home based workers required across all schemes.

Yours sincerely

On behalf of UK Health Security Agency
nsipconsultations@ukhsa.gov.uk

Please mark any correspondence for the attention of National Infrastructure Planning Administration.

H2Teesside Project

Preliminary Environmental Information Report

Volume III – Appendices

Appendix 8A: Air Quality - Construction Assessment

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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8A.0 AIR QUALITY – CONSTRUCTION ASSESSMENT

8A.1 Introduction

8A.1.1 This Technical Appendix supports Chapter 8: Air Quality (PEI Report, Volume I). For more details about the Proposed Development refer to Chapter 4: Proposed Development (PEI Report, Volume I).

8A.1.2 Emissions to air from the Proposed Development have the potential to adversely affect human health and sensitive ecosystems if not appropriately controlled. This technical appendix identifies and proposes measures to address the potential impacts and effects of the Proposed Development on air quality during construction and decommissioning. Emissions associated with construction phase could give rise to potential localised air quality effects from traffic and dust generation, which have the potential to affect human health and sensitive ecosystems if not appropriately managed.

8A.1.3 The magnitude of air quality impacts at sensitive human receptors has been evaluated and – for traffic emissions - quantified for pollutants emitted from construction activities associated with the Proposed Development. The impact of emissions on sensitive ecological receptors has been considered in the context of relevant critical loads or critical levels for all identified ecological receptors.

8A.2 Scope

Construction Phase Emissions

8A.2.1 The assessment has considered the impact of emissions during the construction and decommissioning of the Proposed Development on local air quality. The assessment considers impacts from the earliest year in which the construction works for the Proposed Development are due to commence, namely 2025. Demolition and site clearance of the Main Site will be undertaken prior to the main works, and these do not form part of this assessment.

8A.2.2 The assessment comprises a review of the impacts of dust emissions from the various activities associated with the construction phase of the Proposed Development during planned construction works on-site and the impacts associated with the emissions from construction traffic. Impacts on the sensitive human and ecological receptors in the vicinity of the Proposed Development Site have been assessed.

Cumulative Impacts

8A.2.3 Cumulative impacts from existing sources of pollution in the area are accounted for in the adoption of site-specific background pollutant concentrations from archive sources and a programme of project-specific baseline air quality monitoring in proximity to Proposed Development Site. It is recognised, however, that there is a potential impact on local air quality from emission sources which were not present at the time of the survey.

8A.2.4 The full list of short-listed cumulative schemes to be considered for the Proposed Development is detailed within Chapter 23: Cumulative and Combined Effects (PEI Report, Volume I).

8A.2.5 There is a risk that there could be cumulative impacts at dust sensitive receptors screened into the construction dust assessment for the Proposed Development due to the construction of other committed developments happening simultaneously in the area that are within the sensitivity definition of the same receptors. The assessment of construction dust impacts reported in this assessment has been undertaken in line with industry-standard guidance to demonstrate the level of dust control required to mitigate any potential for significant effects. It is reasonable to assume that any other construction site in the vicinity of the Proposed Development will have done the same and will control dust through mitigation that is standard practice on all well managed construction sites across the UK. It is, therefore, concluded that the risk of cumulative construction dust impacts is Low and considered to be Not Significant.

8A.2.6 The traffic data used in this preliminary assessment includes predicted traffic growth on modelled roads between the current and the future year baselines. The methodology to determine the growth in traffic on the local road network is described in Chapter 15: Traffic and Transport (PEI Report, Volume I). The predicted growth included in the traffic data does not currently account for increases in traffic associated with other committed developments in the area – such allowances will be included in the assessment to be presented in the Environmental Statement (ES). Regardless, as any traffic associated with such committed developments will be included with both the with and without Proposed Development scenarios, the inclusion of traffic from committed developments is not currently anticipated to alter the assessment findings.

Sources of Information

8A.2.7 The information that has been used within this preliminary assessment includes pertinent information from:

- Chapter 4: Proposed Development (PEI Report, Volume I);
- Chapter 5: Construction Programme and Management (PEI Report, Volume I);
- details of the Proposed Development layout;
- Ordnance Survey mapping;
- construction traffic data as reported in Chapter 15: Traffic and Transport (PEI Report, Volume I); and
- baseline air quality data from AECOM diffusion tube monitoring within the air quality Study Area and from published sources and relevant local authorities.

8A.3 Methodology Overview

8A.3.1 This remainder of this appendix describes the approach that has been taken to the assessment of emissions associated with the construction phase of the Proposed Development. This is broken down into the following sub-sections.

- qualitative assessment of construction dust; and
- quantitative assessment of construction phase road traffic emissions on local roads through dispersion modelling.

8A.3.2 Non-Road Mobile Machinery (NRMM) is considered within Chapter 8: Air Quality (PEI Report, Volume I) which indicates that emissions from NRMM associated with the Proposed Development will be temporary and localised and will be controlled via the application of appropriate emissions standards and through best-practice mitigation measures. For that reason, effects associated with construction phase NRMM emissions are highly unlikely to be significant and, therefore, have been scoped out of the assessment.

8A.4 Construction Dust Assessment

8A.4.1 The following activities have been screened as potentially significant, based on the nature of construction activities proposed:

- earthworks (soil stripping, spoil movement and stockpiling);
- demolition (removal of existing buildings and infrastructure);
- construction (including on-site concrete batching); and
- trackout (Heavy Goods Vehicles (HGV) movements on unpaved roads and offsite mud on the highway).

Magnitude Definitions

8A.4.2 The potential magnitude of dust emissions has been categorised as detailed in Table 8A-1. Note that in each case not all the criteria need to be met, and that other criteria may be used if justified in the assessment.

Table 8A-1: Example Definitions of the Magnitude of Construction/Demolition Activities

MAGNITUDE	DEMOLITION	EARTHWORKS	CONSTRUCTION	TRACKOUT
Large	Total building volume >50,000 m^3, potentially dust construction material (e.g., concrete), on-site crushing and screening, demolition activities >20 m above ground level.	Site area >1 ha potentially dusty soil type (e.g., clay). >10 heavy earth moving vehicles at once, bunds >8m high, total material moved >100,000 tonnes.	Total building volume >100,000 m^3, on-site concrete batching, sandblasting.	>50 HDV (>3.5 tonne) peak outward movements per day, potentially dusty surface material (e.g., high clay content), unpaved road length >100 m.
Medium	Total building volume 20,000 – 50,000 m^3, potentially dusty construction material, demolition activities 10 to 20 m above ground level.	Site area 0.25 – 1 ha, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles at once, bunds 4-8 m high, total material moved 20,000 – 100,000 tonnes.	Total building volume 25,000 – 100,000m^3, potentially dusty materials e.g. concrete, on-site concrete batching.	10 – 50 HDV (>3.5 tonne) peak outward movements er day, moderately dusty surface material (e.g., high clay content), unpaved road length 50 – 100 m.
Small	Total building volume <20,000 m^3, construction material with low potential for dust release (e.g., metal cladding or timber), demolition activities <10 m above ground level, demolition during wetter months.	Site area <0.25 ha, large grain soil type (e.g., sand), <5 heavy earth moving vehicles at once, bunds <4 metres high, total material moved <20,000 tonnes.	Total building volume <25,000 m^3, low dust potential construction materials. e.g. metal/timber.	<10 HDV (>3.5 tonnes) peak outward movements per day, surface material low dust potential, unpaved road length <50 m.

Receptor Sensitivity Definitions

8A.4.3 The assessment of the significance of the effects of construction dust has been made with respect to the receptor and area sensitivity definitions as outlined in Table 8A-2 to Table 8A-5. Sensitivity definitions have been made with reference to the Institute of Air Quality Management (IAQM) guidance (IAQM, 2014); receptors beyond 100 m are defined as low sensitivity to construction impacts, as it is considered that beyond this distance impacts will be limited; ecological receptors (including statutory designations, and non-statutory ecological receptors of local importance such as Local Wildlife Sites, national and local nature reserves) have been included as there are a number of ecological sites within the 350 m Study Area from the Proposed Development Site boundary and 500 m Study Area from the site entrances.

Table 8A-2: Receptor Sensitivity to Construction/Demolition Dust Effects

SENSITIVITY	HUMAN PERCEPTION OF DUST SOILING EFFECTS	PM_{10} HEALTH EFFECTS	ECOLOGICAL DUST DEPOSITION EFFECTS
High	Experience a high level of amenity; appearance, aesthetics or value of property would be diminished by soiling' and receptor expected to be present continuously or regularly; for example, residential, museums, car showrooms or commercial horticulture.	Public present for eight hours per day or more, for example, residential, schools, care homes.	International/national designation and the designated feature is sensitive to dust soiling effects; for example, Special Areas of Conservation (SACs) for acid heathlands, or lichens, vascular species on Red Data List (Joint Nature Conservation Committee, JNCC).
Medium	Enjoy a reasonable level of amenity; appearance, aesthetics or value of property could be diminished by soiling; receptor not expected to be present continuously or regularly; for example, parks or places of work.	Only workforce present (no residential or high sensitivity receptors) eight hours per day or more.	Important plant species – unknown sensitivity to dust soiling; national designation which may be sensitive, for example Site of Special Scientific Interest (SSSI) with dust sensitive feature.
Low	Enjoyment of amenity not reasonably expected; appearance or aesthetics or value of property not diminished by soiling; receptors are transient or present for limited time; for example, playing fields, farmland, footpaths, short-term car parks and roads.	Transient human exposure, for example footpaths, playing fields, parks.	Local designation where feature may be sensitive to dust soiling, for example, local nature reserve.

8A.4.4 Distances have been measured from source to receptor in bands of less than 20 m, less than 50 m, less than 100 m and less than 350 m for earthworks and construction, in accordance with the IAQM guidance. For trackout the receptor distances have been measured from receptor to the trackout route (up to 50 m) and up to 500 m from the site exit. These distances bands have been applied in Table 8A-3 and Table 8A-4. For sensitivity of an area to ecological impacts, the distance bands are for less than 20 m and less than 50 m.

8A.4.5 In addition, the IAQM guidance considers the number of potentially affected receptors when defining the sensitivity i.e., the more receptors present, the more sensitive the area.

8A.4.6 The approach applied in the assessment and summarised in Table 8A-3 to Table 8A-5 differs from the default examples provided in the IAQM guidance in two respects:

- the adopted approach considers the sensitivity of individual receptors and their proximity to a source of emissions or work site, but not the absolute number of properties. This is considered to be a more robust and conservative approach than the default IAQM method; and
- distances have been calculated from the nearest boundary of the work site when considering on-site construction activities (earthworks, in this case), if the location of emissions source is not likely to be fixed throughout the duration of the works. This is a more conservative approach from the default IAQM method.

Table 8A-3: Sensitivity of the Area to Dust Soiling Effects on People/Property

INDIVIDUAL RECEPTOR SENSITIVITY	NUMBER OF RECEPTORS	DISTANCE FROM THE SOURCE (M)			
		LESS THAN 20	LESS THAN 50	LESS THAN 100	LESS THAN 350
High	1 or more	High	High	Medium	Low
Medium	1 or more	Medium	Low	Low	Low
Low	1 or more	Low	Low	Low	Low

Table 8A-4: Sensitivity of the Area to Human Health Impacts

INDIVIDUAL RECEPTOR SENSITIVITY	BASELINE ANNUAL MEAN PM_{10} CONCENTRATION	NUMBER OF RECEPTORS	DISTANCE FROM THE SOURCE (M)				
			LESS THAN 20	LESS THAN 50	LESS THAN 100	LESS THAN 200	LESS THAN 350
High	Greater than 32 µg/m^3	1 or more	High	High	High	Medium	Low
	28 to 32 µg/m^3	1 or more	High	High	Medium	Low	Low
	24 to 28 µg/m^3	1 or more	High	Medium	Low	Low	Low
	Less than 24 µg/m^3	1 or more	Medium	Low	Low	Low	Low
Medium	Greater than 32 µg/m^3	1 or more	High	Medium	Low	Low	Low
	28 to 32 µg/m^3	1 or more	Medium	Low	Low	Low	Low
	Less than 28 µg/m^3	1 or more	Low	Low	Low	Low	Low
Low	n/a	1 or more	Low	Low	Low	Low	Low

Table 8A-5: Sensitivity of the Area to Ecological Impacts

INDIVIDUAL RECEPTOR SENSITIVITY	DISTANCE FROM THE SOURCE (M)	
	LESS THAN 20	LESS THAN 50
High	High	High
Medium	Medium	Low
Low	Low	Low

Risk Definitions

8A.4.7 The potential dust emission magnitude of each type of activity and the sensitivity of the area are combined to establish the likely risk of impacts, based on the assumption of no applied mitigation. Each activity category is considered in turn, using the relationships set out in the risk matrices reported in Table 8A-6.

Table 8A-6: Classification of Risk of Unmitigated Impacts

SENSITIVITY OF AREA	SENSITIVITY OF AREA		
	LARGE	MEDIUM	SMALL
Demolition			
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible risk
Earthworks and Construction			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible risk
Trackout			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Low risk	Negligible risk
Low	Low risk	Low risk	Negligible risk

8A.4.8 Based on the risk level of dust impacts, suitable good practice measures for dust control should be applied based on the highest level of risk to the area posed by each category of activities. The IAQM have published recommended packages of mitigation measures that, based on the opinion of the membership of the professional body, represent the level of potential risk. These measures all have a long history of successful implementation in the UK, and most are established good practice measures on any large construction site.

Magnitude Assessment

8A.4.9 For the purpose of this assessment, the Proposed Development Site is considered to be a large emissions source for fugitive dust emissions from earthworks and construction, and medium sources for demolition and trackout related activities (as the Proposed Development Site has over 500 m of tarmacked road before joining the public highway), as defined in Table 8A-1.

8A.4.10 Exact details on earthworks area or construction material volumes are not known, but due to the overall scale of the Proposed Development, a "large" magnitude for all activities is a reasonable assumption. However, some areas away from the Main Site could be treated separately as lower magnitude sites as on-site activities will mainly relate to pipes installation, which as a lower dust production potential, as well as a shorter work time span.

Receptor Identification

8A.4.11 The construction area spreads on both sides of the River Tees. Representative receptors are those closest to the Proposed Development Site boundary and are predominantly commercial and industrial properties located within the existing industrial area adjacent to the Proposed Development Site, each side of the A1085 between Middlesborough and Redcar, around the river docks and east of Stockton on Tees. There are some residential properties near the edge of the Proposed Development Site boundary in Redcar and on Cowpen Lane.

8A.4.12 The Proposed Development Site boundary also extends near and across the Teesmouth and Cleveland Coast ecological site (Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar), the Redcar and Cleveland Local Wildlife Site (LWS), Hartlepool LWS and Stockton LWS.

8A.4.13 The magnitude of change in air pollutant concentrations of construction dust deposition rates will be greatest at these representative locations closest to the Proposed Development Site boundary. Assessment of the representative receptors therefore represents a worst-case assessment of the potential construction dust effects.

Area Sensitivity Assessment

8A.4.14 The sensitivity of the area is defined by considering the likely highest sensitivity receptors and the distance to the source for:

- dust soiling effects on people and amenity, including the number of affected receptors;
- human health effects of particulate matter (PM_{10}), including the number of affected receptors and consideration of existing background concentrations; and
- ecological effects of dust deposition.

8A.4.15 All sensitive receptors near to the Proposed Development Site are classified as being medium sensitive as they are all commercial properties except for some residential receptors located more than 20 m from the Proposed Development Site boundary.

8A.4.16 There are high sensitivity ecological sites within the Study Area, some less than 20 m from the Proposed Development Site boundary.

8A.4.17 The existing background PM_{10} concentration is 15.1 micrograms per cubic metre ($\mu g/m^3$), less than the lowest screening category within the IAQM methodology ($28\mu g/m^3$), therefore representing the lowest baseline risk.

8A.4.18 The sensitivity of the area to dust soiling effects at nearby sensitive receptors is classified as high based on the number of high sensitivity receptors and their distance from dust sources – refer to Table 8A-7. The sensitivity of the area to human health impacts is low based on the existing baseline PM_{10} level, the number of sensitive receptors and their distance from the sources.

Table 8A-7: Area Sensitivity for Receptors of Construction Dust

ACTIVITY	POTENTIAL IMPACT	RECEPTOR SENSITIVITY AND DISTANCE	AREA SENSITIVITY
Demolition	Dust Soiling	High sensitivity and <20 m	Medium
	Human Health	Medium Sensitivity <20 m	Low
	Ecological	High sensitivity <20 m	High
Earthworks	Dust Soiling	High sensitivity and <20 m	Medium
	Human Health	Medium Sensitivity <20 m	Low
	Ecological	High sensitivity <20 m	High
Construction	Dust Soiling	High sensitivity and <20 m	Medium
	Human Health	Medium Sensitivity <20 m	Low
	Ecological	High sensitivity <20 m	High
Trackout	Dust Soiling	High sensitivity and <20 m	Medium
	Human Health	Medium Sensitivity <20 m	Low
	Ecological	High sensitivity <20 m	High

8A.4.19 The risk of impacts from unmitigated activities has been determined through combination of the potential dust emission magnitude and the sensitivity of the area, for each activity to determine the level of mitigation that should be applied. The risk of impacts from unmitigated activities are summarised in Table 8A-8.

Table 8A-8: Risk of Impacts from Unmitigated Activities

ACTIVITY	DEMOLITION	EARTHWORKS	CONSTRUCTION	TRACKOUT
Magnitude	Medium	Large	Large	Medium
Risk of impacts from unmitigated activities				
Dust soiling	Medium Risk	Medium Risk	Medium Risk	Low Risk
Health PM_{10}	Low Risk	Low Risk	Low Risk	Low Risk
Ecology	Medium Risk	High Risk	High Risk	Medium Risk

8A.4.20 The risk assessment for construction dust indicates that there will be a low risk of unmitigated dust impacts on human health (PM_{10}) and a low to medium risk of dust impacts on dust soiling from unmitigated earthworks, construction and track out activities. The assessment also shows that the impact of unmitigated construction activities on ecological sites is likely to be high.

8A.4.21 These risk classifications are solely used to select the appropriate schedule of mitigation measures from IAQM guidance. For all but the smallest of sites, the use of the high-risk schedule of measures represents good working practice.

8A.4.22 On consideration of the likely effectiveness of these measures, additional site-specific measures will be identified in the Final Construction Environmental Management Plan (CEMP) if required by the ES, but at this stage the requirement for any such measures has not been identified as being necessary.

8A.5 Construction Traffic Assessment

Introduction

8A.5.1 For the construction traffic assessment all affected roads have been assessed at a 'detailed level' of assessment. As detailed in IAQM Guidance, a 'detailed level' assessment uses dispersion modelling to estimate pollutant concentrations more accurately, taking into account additional variables. The detailed assessment of local air quality reported herein has used the Cambridge Environmental Research Consultants (CERC) Atmospheric Dispersion Modelling System (ADMS) Roads dispersion model (version 5.0.1) to predict road pollutant contributions at identified sensitive receptors.

8A.5.2 Predictions have been made for the baseline year (2019) and the peak construction year (month 14) with the Proposed Development construction work and without the Proposed Development construction work. On the basis of these predictions, the change in key pollutant concentrations (NO_2, PM_{10} and $PM_{2.5}$) associated with the Proposed Development have been established.

8A.5.3 Predictions have been verified by comparing the baseline modelling predictions and baseline air quality monitoring data. Where systematic bias is evident in the base year verification, an adjustment factor has been calculated (as set out in the Bias Adjustment of Road Contribution Section of this Appendix) and applied to bring modelled concentrations more in line with monitored concentrations.

8A.5.4 The impact of the Proposed Development is based on modelled predictions of pollutant concentrations in the scenarios considered, and Defra Local Air Quality Management Technical Guidance (LAQM) guidance and tools, including the current version of the NO_x to NO_2 conversion approach and background maps. Predictions are also informed by two-way 24-hour Annual Average Daily Traffic (AADT) flow data as sourced from Chapter 15: Traffic and Transport (PEI Report, Volume I), and hourly sequential meteorological data from a representative meteorological station.

8A.5.5 Further details of the assessment methodology including the inputs used in the ADMS-Roads model (including meteorology data), model post-processing (e.g. NOx to NO_2 conversion) and the approach taken to model verification (including all

monitoring locations used in the verification process) are presented in the following sub-sections.

8A.5.6 Representative sensitive receptors (e.g. residential properties and ecological sites) have been selected for assessment within the local air quality assessment. These include those sensitive receptors located closest to the Study Area for construction effects.

8A.5.7 The predicted air quality impacts of the Proposed Development are evaluated against relevant national, regional and local air quality planning policy. An evaluation of the significance of the local air quality assessment findings at sensitive receptors for human health has been undertaken in accordance with IAQM/ Environmental Protection UK (EPUK) guidance. It is considered that the determination of significance using the IAQM/EPUK guidance is more conservative for the assessment of the Proposed Development than the use of significance criteria provided in National Highways (formerly Highways England) guidance, where a significant effect can only occur when there is an exceedance of an air quality standard in either future baseline or future construction phase scenarios.

8A.5.8 The significance of the effects on ecological receptors, including the magnitude of change in NOx and nitrogen deposition, are considered as part of the ecology and nature conservation assessment (see Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I)).

Screening Criteria

8A.5.9 The construction phase traffic assessment considers the impact of emissions associated with additional heavy-duty vehicles (HDV – vehicles >3.5 tonnes (t) in weight) and light duty vehicles (LDV – vehicles <3.5 t in weight) introduced to the local road network due to construction work associated with the Proposed Development, including those associated with the import and export of materials to and from Proposed Development Site and the commuting of contractors.

8A.5.10 The screening of traffic data has been undertaken using both the approach set out in the DMRB guidance and the approach set out by IAQM guidance.

8A.5.11 The IAQM approach identifies a larger air quality Study Area and more stringent criteria for the identification of affected road links, and therefore this has been applied to the assessment. The IAQM criteria is summarised in Table 8A-9.

8A.5.12 The construction traffic assessment considers those areas where a change in traffic above the criteria identified in Table 8A-9 occurs in the immediate area around the Proposed Development Site. There are no Air Quality Management Areas (AQMAs) declared within the Study Area, consequently only roads with changes of more than 500 AADT in LDVs or 100 AADT in HDVs are considered to be within the construction Study Area. The Study Area is shown in Figure 8-3 (PEI Report, Volume II).

Table 8A-9: Screening Criteria for Determining the Study Area

IF THE DEVELOPMENT WILL:	INDICATIVE CRITERIA TO PROCEED TO AN AIR QUALITY ASSESSMENT
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight)	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.

Modelled Scenarios

8A.5.13 A quantitative assessment of the impact of exhaust emissions from additional road traffic has been undertaken for the following scenarios:

- 2019 Baseline Scenario (for model verification process) (Base);
- 2025/2026 Future Construction Year Base (Future Baseline); and
- 2026 Future Construction Year Base + Peak Construction Scenario (month 14) (Future Year with Proposed Development).

Model Inputs

8A.5.14 The general model conditions that have been used in the assessment of road traffic emissions are summarised in Table 8A-10. Other more detailed data used to model the dispersion of emissions is considered below.

Table 8A-10: General ADMS Roads Model Conditions

VARIABLE	INPUT
Surface Roughness at source	0.5 m
Minimum Monin-Obukhov length for stable conditions	10 m
Receptors	Selected discrete receptors
Receptor location	X,Y co-ordinates determined by GIS. The height of residential receptors will be set at 1.5 m
Emissions	NO_X, PM_{10} and $PM_{2.5}$

VARIABLE	INPUT
Emission Factors	Emission Factor Toolkit version 11.0 for 2019 for baseline and construction year (2026) scenarios
Meteorological Data	1 year of hourly sequential data, Durham Tees Valley meteorological site (2019)
Emission Profiles	None used
Terrain Types	Flat terrain
Model Output	Long-term annual mean NO_X concentration ($\mu g/m^3$) Long-term annual mean PM_{10} concentration ($\mu g/m^3$) Long-term annual mean $PM_{2.5}$ concentration ($\mu g/m^3$)

Traffic Data

8A.5.15 The traffic data used in this assessment takes the form of AADT.

8A.5.16 The future construction base year is 2026. The construction base year is the period where the number of construction vehicles accessing the Proposed Development Site will peak and is assumed to be a worst-case scenario for assessing potential effects due to construction traffic (month 14 of construction). AADT traffic flows are presented in Table 8A-11 (refer to Chapter 15: Traffic and Transport (PEI Report, Volume I)).

Table 8A-11: Road Traffic Data

ROAD NAME	AVERAGE SPEED (KM/H)	BASE		FUTURE BASELINE		FUTURE YEAR WITH PROPOSED DEVELOPMENT	
		Total AADT	HDV	Total AADT	HDV	Total AADT	HDV
A1085 Trunk Road, 100m east of Ennis Road	70	12,274	1,049	12,948	1,107	13,162	1,107
A1085 Trunk Road, 1345m south of West Coatham Lane	82	14,387	1,275	15,176	1,345	15,933	1,444
A1042 Kirkleatham Lane, 85m south of Staintondale Avenue	52	11,791	762	12,438	804	12,545	804
A1085 Trunk Road, 500m north of A1053 Tees Dock Road	83	16,058	2,012	16,940	2,122	17,696	2,221
A1085 Broadway, 235m east of Birchington Avenue	53	8,093	521	8,537	549	8,713	549
B1380 High Street, east of Lackenby Lane	50	9,835	826	10,375	871	10,417	871
A66, east of Whitworth Road	66	19,865	3,662	20,955	3,863	21,468	3,912
A1046 Port Clarence Road, north of Beech Terrace	47	7,612	896	8,030	945	8,114	962
A178 Seaton Carew Road, north of Huntsman Drive	72	7,814	998	8,243	1,053	8,411	1,088
Unnamed Road, east of A178 Seaton Carew Road	59	4,206	860	4,437	907	4,631	941
A1053 Greystone Road	94	14,387	1,392	15,177	1,468	15,304	1,518
A174 (West of Greystone Roundabout)	106	31,758	1,936	33,502	2,042	33,587	2,092
B1275 Belasis Avenue	47	2,451	72	2,586	76	2,670	93
A1185 (west of A178 Seaton Carew Road)	72	5,651	1,026	5,961	1,082	6,022	1,117
Site Access	32	0	0	0	0	970	99

Emissions Data

8A.5.17 The magnitude of road traffic emissions for the baseline and with development scenarios have been calculated from traffic flow data using the Defra's current emission factor database tool EFT 11.0. The assessment considers the construction phase impact of road traffic emissions at receptors adjacent to roads in the vicinity of the Proposed Development Site.

Modelled Domain – Discrete Receptors

8A.5.18 In line with guidance and standard practice, representative worst-case receptors located within 200 m of road links associated with the Proposed Development (i.e., the Study Area for the traffic assessment) are considered in this assessment. For human health receptors, receptor locations represent the nearest façade of a residential property, school or medical facility to the road links considered. For ecology receptors, they represent the nearest part of each designated area to the road links, with additional receptor points set in a transect with increasing distance from the road links, to demonstrate the spatial variation in predicted impacts across each designated site.

8A.5.19 This report has considered all receptors that appear within 200 m of any road that was screened in using the criteria presented in Table 8A-9.

8A.5.20 The receptors for which the impact of road traffic emissions have been predicted are listed in Table 8A-12 and Table 8A-13 (R = Road Receptor and RE = Road Ecological Receptor).

Table 8A-12: Modelled Human Receptors

RECEPTOR ID	X (M)	Y (M)	DESCRIPTION
R_001	450068	521631	Saltview Terrace, Stockton-on-Tees, Middlesbrough TS2 1SQ
R_002	450049	521620	Saltview Terrace, Stockton-on-Tees, Middlesbrough TS2 1SQ
R_003	449463	521974	High Clarence Primary School. Port Clarence Road, Middlesbrough TS2 1SU
R_004	449092	522334	2 Fieldview Close, Stockton-on-Tees, Middlesbrough TS2 1TN
R_005	455429	520571	87 Broadway, Middlesbrough TS6 7HS
R_006	455434	520610	51 Eversham Road, Middlesbrough TS6 7ER
R_007	455189	520409	Grangetown Primary School, St Georges Rd W, Middlesbrough TS6 7JA
R_008	455306	520890	139 Bolckow Road, Grangetown, Middlesbrough TS6 7EJ

RECEPTOR ID	X (M)	Y (M)	DESCRIPTION
R_009	454846	520708	8 St Nicholas Close, Grangetown, Middlesbrough TS6 7SY
R_010	459216	524569	2 Kirkleatham Lane, Redcar TS10 5BZ
R_011	459262	524598	4 Corporation Road, Redcar TS10 1PB
R_012	456153	518576	2 Keepersgate, Eston, Middlesbrough TS6 9NY
R_013	456240	519019	19 Moorgate, Middlesbrough, TS6 9QE
R_014	456043	518989	19 Gaisdale Close, Middlesbrough, TS6 8DG
R_015	456119	518963	239 Wychgate, Middlesbrough TS6 9LW
R_016	456477	519134	23 High Street, Middlesbrough, TS6 8DL
R_017	458240	520240	North Lodge, Wilton, Lazenby, Redcar TS10 4QZ
R_018	457463	519859	Wilton Primary School, 12 High Street, Lazenby, Middlesbrough TS6 8DX
R_019	457559	519861	2 Grange Estate, Middlesbrough TS6 8EJ
R_020	457455	519763	Brookfield Care Home, High Street, Lazenby, Middlesbrough TS6 8DX
R_021	457311	519649	10 Chestnut Close, Middlesbrough TS6 8DT
R_022	457016	519403	Police House, Eston Road, Lazenby, Middlesbrough TS6 8DW

Table 8A-13: Modelled Ecological Receptors

RECEPTOR ID	X (M)*	Y (M)*	DESCRIPTION
RE001	450640	523527	Teesmouth and Cleveland Coast SSSI and SPA
RE002	458966	524537	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS
RE003	457334	525348	Teesmouth and Cleveland Coast SSSI
RE004	446972	523081	Charlton's Pond LNR
RE005	450050	521413	Teesmouth and Cleveland Coast SSSI and SPA
RE006	450744	522993	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA
RE007	450758	522995	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA
RE008	451133	523662	Teesmouth and Cleveland Coast SSSI and SPA
RE009	450050	521413	Teesmouth and Cleveland Coast SSSI and SPA

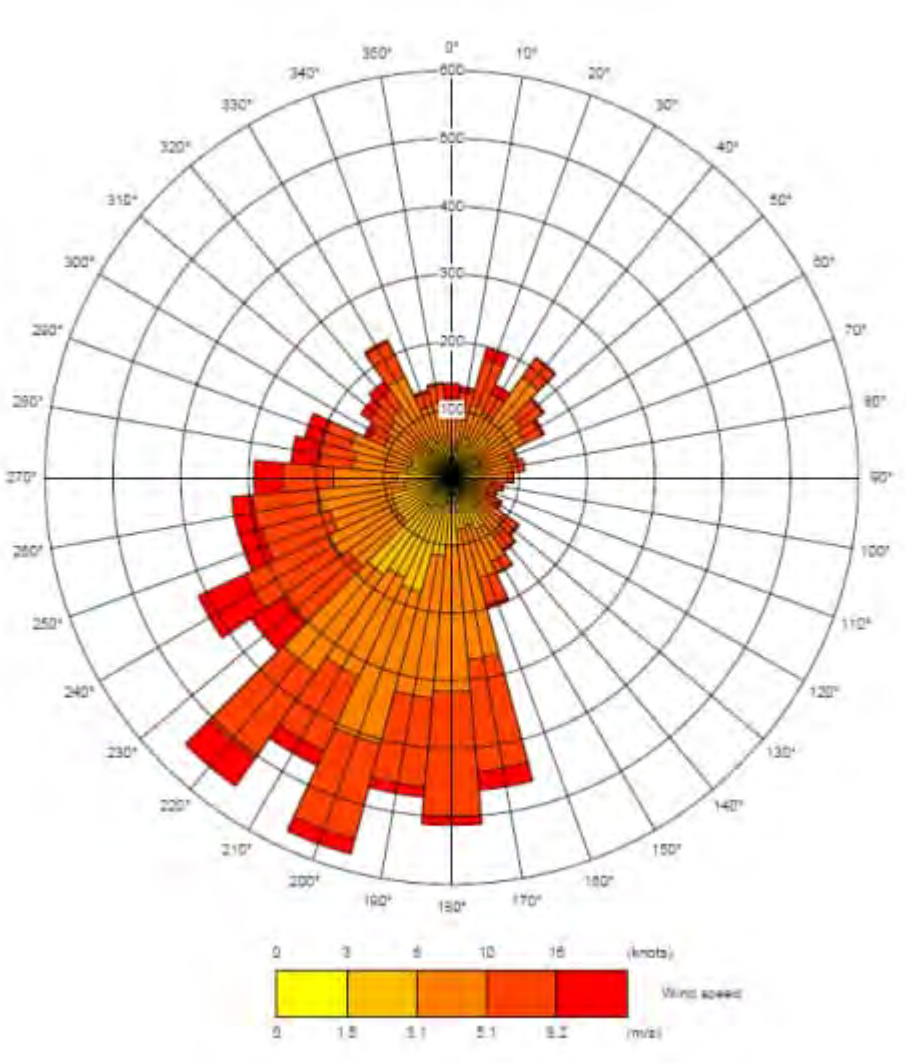
RECEPTOR ID	X (M)*	Y (M)*	DESCRIPTION
RE010	456441	518679	Wilton Woods Complex LWS

**Coordinate of the closest point to the modelled road, other points were also model to form a transect up to 200 m from the road's edge.*

Meteorological Data

8A.5.21 The model runs carried out for the Proposed Development used hourly sequential data from Durham Tees Valley, year 2019, consistent with the year chosen to verify the performance of the model against measured NO_2 concentrations. This meteorological site is located approximately 21 km south-west of the Study Area with a measured prevailing wind of between 3 and 5 m/s from south-south-west. A wind rose for this site is presented in Plate 8A-1.

Plate 8A-1: Durham Tees Valley 2019 Wind Rose



Background Concentrations

8A.5.22 Annual average background concentrations were taken from Defra's 2018 baseline 1 x 1 km background maps and adjusted using Defra's adjustment tool removing emissions from road traffic for motorways and primary or trunk A roads. The data used in the assessment is presented for the centre of each 1 x 1 km grid square in Table 8A-14. The Defra background concentrations have been compared against local authority background monitoring, which has suggested no uplift is required. Additionally, to provide for a conservative assessment, 2019 background concentrations have been used in the assessment of the construction phase, as can be seen in Table 8A-4 lower concentrations are expected in 2025 and so using 2019 backgrounds will result in higher total pollutant concentrations.

Table 8A-14: Modelled Background Concentrations

POLLUTANT	YEAR	CONCENTRATION RANGE ACROSS THE STUDY AREA ($\mu G/M^3$)
NO_2	2019	10.7 - 20.6
	2025	8.8 – 17.0
PM_{10}	2019	11.0 – 13.2
	2025	10.3 – 12.4
$PM_{2.5}$	2019	7.1 – 7.9
	2025	6.5 – 7.2

Consideration of Terrain

8A.5.23 Emissions from road traffic make the greatest contribution to pollutant concentrations at sensitive receptors adjacent to the roadside. For this reason, there is not normally a large variation in height between the emission source and residential properties next to the roads included in the model. Therefore, terrain is not included in the road traffic modelling assessment.

NO_x to NO_2 Conversion

8A.5.24 To accompany the publication of a previous version of the guidance document LAQM.TG(22) (Defra, 2022), a NO_x to NO_2 converter was made available as a tool to calculate the road NO_2 contribution from modelled road NOx contributions. The tool comes in the form of an MS Excel spreadsheet and uses borough specific data to calculate annual mean concentrations of NO_2 from dispersion model output values of annual mean concentrations of NOx. Version 8.1 (April 2019) of this tool has been used to calculate the total NO_2 concentrations at receptors from the modelled road NOx contribution and associated background concentration. Due to the location of the Proposed Development, Redcar and Cleveland Borough Council (RCBC) has been specified as the local authority and the 'All other non-urban UK traffic' mix selected.

Bias Adjustment of Road Contribution NO_x, NO_2, PM_{10} and $PM_{2.5}$

8A.5.25 The modelled road NO_x contributions from the ADMS-Roads model has been adjusted for bias following the method described in LAQM.TG(22). The purpose of this exercise is to bring the baseline model performance in line with known pollutant concentrations at set locations within the model domain. The level of adjustment identified in the baseline scenario is then applied to future scenarios.

8A.5.26 Monitoring data used for model verification typically includes that sourced from local authorities, if appropriate, and data gathered by project-specific baseline surveys. A baseline NO_2 monitoring survey has been undertaken for the Proposed Development which included 21 monitoring locations. From these 21 monitoring locations DT1, DT2, DT4, DT5, DT6, DT7, DT8, DT18 and DT21 were on the roadside of roads included in the model and therefore these were appropriate to use in the construction road traffic model verification.

8A.5.27 Where diffusion tube monitoring survey has taken place for less than 12 months, it is necessary to annualise the monitoring results using the method described in LAQM.TG(22) in order to obtain a projected annual mean concentration for the existing baseline year of the assessment. This provides a monitored dataset against which modelled concentrations can be directly compared.

8A.5.28 Annualisation involves comparing the monitored diffusion tube concentrations from the survey to concentrations monitored at nearby (<50 km away) background continuous monitoring stations over the same period (July 2022 – Oct 2022). Monitored diffusion tube concentrations are adjusted using the Ra factor, which is the average of ratios between the period mean (Pm) and annual mean (Am) for each continuous monitor. Diffusion tubes concentrations are then adjusted using a national bias adjustment factor which accounts for systematic bias arising in the treatment of diffusion tubes during laboratory analysis. 2019 was used as it is the year the traffic assessment was completed and the last year without any impacts from Covid-19. The resultant NO_2 concentrations are presented in Table 8A-15.

Table 8A-15: Annualisation of Diffusion Tube Data

SITE	UNADJUSTED MEAN ($\mu G/M^3$)	ANNUALISED MEAN, A_M ($\mu G/M^3$) / PERIOD MEAN, P_M ($\mu G/M^3$)	BIAS ADJUSTED MEAN NO_2 ($\mu G/M^3$)
DT1	23.4	1.4	29.7
DT2	34.9	1.4	44.3
DT3	14.3	1.4	18.2
DT4	16.5	1.4	20.9
DT5	17.2	1.4	21.8
DT6	39.1	1.4	49.7
DT7	23.4	1.4	29.7
DT8	17.2	1.4	21.8

SITE	UNADJUSTED MEAN (µG/M^3)	ANNUALISED MEAN, A_M (µG/M^3) / PERIOD MEAN, P_M (µG/M^3)	BIAS ADJUSTED MEAN NO_2 (µG/M^3)
DT9	12.7	1.4	16.2
DT10	9.6	1.4	12.2
DT11	11.4	1.4	14.5
DT12	9.0	1.4	11.4
DT13	15.2	1.4	19.3
DT14	13.5	1.23	15.1
DT15	15.2	1.5	20.7
DT16	14.8	1.4	18.8
DT17	14.6	1.5	19.9
DT18	18.5	1.5	25.3
DT19	13.0	1.4	16.5
DT20	15.1	1.4	19.2
DT21	19.9	1.4	25.3

The continuous monitoring stations used for annualisation are Middlesborough, Stockton-on-Tees and Billingham, all part of the Defra's Automatic Urban Rural Network (AURN)

8A.5.29 A review of existing and publicly available local authority data has been undertaken and found that no monitoring locations were suitable for model verification.

8A.5.30 Verification calculations yielded a bias adjustment factor of 3.03 with a Root Mean Square Error (RMSE) of 5.2. An RMSE of less than 10% of the air quality objective (10% of 40.0 µg/m^3 is 4.0 µg/m^3) is considered ideal and an RMSE of less than 25% of the air quality objective (25% of 40.0 µg/m^3 is 10.0 µg/m^3) is considered acceptable.

8A.5.31 A second verification zone was defined, including all tubes next to acceleration zones as the model behaved differently there. This means DT2 and DT6 were separated off the main verification zone. However, as there are no sensitive receptors nearby, this separate factor was not used for any selected receptors.

Table 8A-16: Summary of the Bias Adjustment Process

TUBE ID	ZONE	2019 ANNUALISED MONITORED ROAD NO_X	2019 ANNUAL MEAN MODELLED ROAD NO_X (µG/M^3) BEFORE ADJUST-MENT	2019 ANNUAL MEAN MODELLED ROAD NO_X (µG/M^3) AFTER ADJUSTMENT	VERIFICATION FACTOR FOR ROAD NO_X ADJUSTMENT
DT1	Main	30.7	8.2	25.0	3.03

TUBE ID	ZONE	2019 ANNUALISED MONITORED ROAD NO_X	2019 ANNUAL MEAN MODELLED ROAD NO_X ($\mu G/M^3$) BEFORE ADJUST-MENT	2019 ANNUAL MEAN MODELLED ROAD NO_X ($\mu G/M^3$) AFTER ADJUSTMENT	VERIFICATION FACTOR FOR ROAD NO_X ADJUSTMENT
DT4		15.7	7.7	19.4	
DT5		17.4	6.4	30.8	
DT7		37.1	10.2	17.4	
DT8		19.8	11.0	28.7	
DT18		19.2	5.7	19.6	
DT21		9.1	9.5	16.9	

8A.5.32 The verification factor was applied to the predicted road NOx concentrations prior to the conversion of road NOx to total NO_2 concentrations at the receptors.

8A.5.33 There is insufficient roadside measurement data for the primary pollutants PM_{10} or $PM_{2.5}$ within the Study Area. The same bias adjustment factor derived for the modelled contributions of the primary pollutant NOx has been applied to the modelled road PM_{10} and $PM_{2.5}$ contributions, as recommended in LAQM.TG(22).

Predicting the Number of Days in Which the NO_2 Hourly Mean Objective is Exceeded

8A.5.34 Research projects completed on behalf of Defra and the Devolved Administrations, have concluded that the hourly mean NO_2 objective is unlikely to be exceeded if annual mean concentrations are predicted to be less the 60 $\mu g/m^3$.

8A.5.35 In 2003, Laxen and Marner (Laxen and Marner, 2003) concluded: '*…local authorities could reliably base decisions on likely exceedances of the 1-hour objective for nitrogen dioxide alongside busy streets using an annual mean of 60 $\mu g/m^3$ and above.*'

8A.5.36 The findings presented by Laxen and Marner (2003) are further supported by AEAT (AEAT, 2008) who revisited the investigation to complete an updated analysis including new monitoring results and additional monitoring sites. The recommendations of this report are: '*Local authorities should continue to use the threshold of 60 $\mu g/m^3$ NO_2 as the trigger for considering a likely exceedance of the hourly mean nitrogen dioxide objective*.'

8A.5.37 Therefore, this assessment evaluates the likelihood of exceeding the hourly mean NO_2 objective by comparing predicted annual mean NO_2 concentrations at all receptors to an annual mean equivalent threshold of 60 $\mu g/m^3$. Where predicted concentrations are below this value, it can be concluded that the hourly mean NO_2 objective (200 $\mu g/m^3$ NO_2 not to be exceeded more than 18 times per year) will be achieved.

Predicting the Number of Days in Which the PM10 24-Hour Mean Objective is Exceeded

8A.5.38 The guidance document LAQM.TG(03) (Defra, 2003) sets out the method by which the number of days in which the PM_{10} 24hr objective is predicted to be exceeded can be obtained based on a relationship with the predicted PM_{10} annual mean concentration. The most recent guidance LAQM.TG(22) suggests no change to this method. As such, the formula used within this assessment is:

No. PM_{10} 24-hour mean exceedances = $-18.5 + 0.00145 \times C^3 + (206/C)$

Where C is the annual mean concentration of PM_{10}

Specialized Model Treatments

8A.5.39 No specialised model treatments have been used in the assessment of construction road traffic emissions.

Calculation of Nitrogen Deposition for Ecological Receptors

8A.5.40 Conversion factors for calculating nitrogen deposition from modelled NO_2 are found in the DMRB LA 105 Air Quality (Highways England, 2019).

8A.5.41 The conversion rates and factors used in the assessment are detailed in Table 8A-17.

Table 8A-17: Conversion factors – calculation of nutrient nitrogen deposition

POLLUTANT	DEPOSITION VELOCITY GRASSLANDS (M/S)	DEPOSITION VELOCITY FORESTS (M/S)	CONVERSION FACTOR (µG/M^3/S TO KG/HA/YR)
NOX as NO_2	0.0015	0.003	96

Results of the Construction Traffic Assessment

8A.5.42 The predicted change in annual mean NO_2 concentrations that are predicted to occur due to traffic associated with Proposed Development construction works at the selected sensitive receptors, are presented in Table 8A-18. Any variations in the addition of the change to the baseline concentrations are due to rounding only.

8A.5.43 The maximum predicted change in annual mean NO_2 concentrations at the selected sensitive receptors is +0.1 µg/m^3, which would occur in the vicinity of receptors near Saltview Terrace (R_001), Broadway (R_005), Eversham Road (R_006), Bolckow Road (R_008), St Nicholas Close (R_009) and Kirkleatham Lane (R_010). The reported change in NO_2 concentration at this location is predominantly due to the impact of emissions from construction road traffic.

8A.5.44 The total annual mean NO_2 at all the receptors would remain below the annual mean NO_2 Air Quality Assessment Level (AQAL), with the highest total concentration at receptor R003, therefore the change is not predicted to lead to a risk of the annual mean or the hourly mean AQAL being exceeded.

8A.5.45 The significance of the predicted change in annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations during Proposed Development construction in planning terms is discussed in Chapter 8: Air Quality (refer to PEI Report, Volume I).

Table 8A-18: Predicted change in annual mean NO_2 concentrations at discrete receptors ($\mu g/m^3$) due to construction road traffic emissions, with comparison against AQAL.

RECEPTOR	2025 BASELINE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R_001	19.4	0.1	0.1	19.5	48.6
R_002	19.7	<0.1	0.1	19.8	49.4
R_003	25.6	<0.1	0.1	25.6	64.1
R_004	18.9	<0.1	0.1	19.0	47.4
R_005	16.2	0.1	0.2	16.3	40.6
R_006	17.4	0.1	0.1	17.5	43.7
R_007	14.2	<0.1	0.1	14.2	35.6
R_008	16.1	0.1	0.2	16.2	40.4
R_009	16.1	0.1	0.1	16.2	40.5
R_010	18.2	0.1	0.1	18.3	45.7
R_011	17.8	<0.1	0.1	17.8	44.6
R_012	20.3	<0.1	<0.1	20.3	50.7
R_013	15.8	<0.1	0.1	15.8	39.5
R_014	12.8	<0.1	0.1	12.8	32.0
R_015	14.4	<0.1	<0.1	14.4	36.0
R_016	18.1	<0.1	0.1	18.2	45.4
R_017	15.3	<0.1	<0.1	15.3	38.2
R_018	12.3	<0.1	<0.1	12.3	30.8
R_019	14.0	<0.1	0.1	14.1	35.1
R_020	14.0	<0.1	0.1	14.1	35.1
R_021	14.9	<0.1	0.1	15.0	37.4
R_022	15.4	<0.1	0.1	15.4	38.6

8A.5.46 Change in annual mean PM_{10} and $PM_{2.5}$ concentrations at discrete receptors that would occur from the road traffic associated with the construction of the Proposed Development, at the selected sensitive receptors, is presented in Table 8A-19 and Table 8A-20. Any variations in the addition of the change to the baseline concentrations are due to rounding only.

8A.5.47 The maximum predicted change in annual mean PM_{10} and $PM_{2.5}$ concentrations at the selected sensitive receptors is +0.1 µg/m^3. This change in annual mean PM_{10} and $PM_{2.5}$ concentrations would not be a perceptible at air quality sensitive receptors, nor would it result in additional days on which the PM_{10} 24-hour objective is exceeded.

8A.5.48 The predicted annual mean concentrations are well below the respective AQAL for PM_{10} and $PM_{2.5}$.

Table 8A-19: Predicted change in annual mean PM_{10} concentrations at discrete receptors (µg/m^3) due to construction road traffic emissions, with comparison against AQAL.

RECEPTOR	2025 BASELINE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL	EXCEEDANCES (NB OF DAYS)
R_001	12.6	<0.1	<0.1	12.7	25.3	<1
R_002	12.7	<0.1	<0.1	12.8	25.5	<1
R_003	13.6	<0.1	<0.1	13.6	27.2	<1
R_004	12.6	<0.1	<0.1	12.6	25.3	<1
R_005	13.1	<0.1	0.1	13.1	26.2	<1
R_006	13.6	<0.1	0.1	13.6	27.3	<1
R_007	12.2	<0.1	<0.1	12.2	24.4	1
R_008	13.1	<0.1	0.1	13.2	26.4	<1
R_009	13.2	<0.1	0.1	13.2	26.4	<1
R_010	13.0	<0.1	<0.1	13.1	26.1	1
R_011	12.8	<0.1	<0.1	12.9	25.7	1
R_012	15.2	<0.1	0.1	15.2	30.4	<1
R_013	15.0	<0.1	<0.1	15.0	30.1	<1
R_014	12.5	<0.1	<0.1	12.5	25.0	1
R_015	13.1	<0.1	<0.1	13.1	26.3	<1
R_016	16.0	<0.1	<0.1	16.0	32.1	<1
R_017	13.2	<0.1	<0.1	13.2	26.3	<1
R_018	12.1	<0.1	<0.1	12.1	24.1	1
R_019	12.8	<0.1	<0.1	12.8	25.6	1
R_020	12.8	<0.1	<0.1	12.8	25.6	1
R_021	13.2	<0.1	<0.1	13.2	26.4	<1
R_022	13.3	<0.1	<0.1	13.3	26.6	<1

Table 8A-20: Predicted change in annual mean $PM_{2.5}$ concentrations at discrete receptors ($\mu g/m^3$) due to construction road traffic emissions, with comparison against AQAL.

RECEPTOR	2025 BASELINE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R_001	8.1	<0.1	0.1	8.1	40.5
R_002	8.1	<0.1	0.1	8.2	40.8
R_003	8.6	<0.1	0.1	8.7	43.3
R_004	8.0	<0.1	<0.1	8.0	40.2
R_005	8.3	<0.1	0.1	8.3	41.7
R_006	8.6	<0.1	0.1	8.6	43.2
R_007	7.9	<0.1	<0.1	7.9	39.3
R_008	8.4	<0.1	0.1	8.4	42.0
R_009	8.4	<0.1	0.1	8.4	41.9
R_010	8.4	<0.1	0.1	8.4	42.0
R_011	8.3	<0.1	<0.1	8.3	41.5
R_012	9.3	<0.1	0.1	9.3	46.5
R_013	8.9	<0.1	<0.1	8.9	44.4
R_014	7.8	<0.1	<0.1	7.8	39.0
R_015	8.2	<0.1	<0.1	8.2	40.8
R_016	9.4	<0.1	<0.1	9.4	47.1
R_017	8.0	<0.1	<0.1	8.0	40.0
R_018	7.5	<0.1	<0.1	7.6	37.8
R_019	7.9	<0.1	<0.1	8.0	39.8
R_020	7.9	<0.1	<0.1	8.0	39.8
R_021	8.2	<0.1	<0.1	8.2	40.8
R_022	8.2	<0.1	<0.1	8.2	41.1

8A.5.49 Table 8A-21 and Table 8A-22 display the relevant information and assessment results for the significance of construction traffic impacts of ecological sites to be discussed in Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I).

Table 8A-21: Dispersion modelling results for ecological receptors – NOx Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	13.7	0.1	0.3	17.9	59.7
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	13.3	0.2	0.7	28.8	95.9
RE003	Teesmouth and Cleveland Coast SSSI	13.2	0.2	0.7	13.7	45.8
RE004	Charlton's Pond LNR	14.4	0.0	<0.1	14.6	48.8
RE005	Teesmouth and Cleveland Coast SSSI and SPA	16.2	0.0	0.1	20.6	68.7
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.5	0.2	0.5	23.1	76.9
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.5	0.2	0.6	27.9	93.1
RE008	Teesmouth and Cleveland Coast SSSI and SPA	13.7	0.4	1.2	24.8	82.6
RE009	Teesmouth and Cleveland Coast SSSI and SPA	16.2	<0.1	<0.1	16.9	56.2
RE010	Wilton Woods Complex LWS	11.0	<0.1	0.1	19.6	65.4

**Full transect results available in Annex A where "change as % of AQAL" is >1%*

Table 8A-22: Dispersion modelling results for ecological receptors – nutrient nitrogen deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CRITAL LOAD (AQAL)	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	8.27	8	0.01	0.1	8.6	107.3
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	6.8	8	0.02	0.2	7.9	99.2
RE003	Teesmouth and Cleveland Coast SSSI	10.92	8	0.02	0.2	11.0	137.0
RE004	Charlton's Pond LNR	7.75	10	0.00	<0.1	7.8	78.0
RE005	Teesmouth and Cleveland Coast SSSI and SPA	8.27	8	0.00	<0.1	8.6	107.5
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	8.27	8	0.01	0.1	8.9	111.3

RECEPTOR*	SITE NAME	BACKGROUND	CRITAL LOAD (AQAL)	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	8.27	8	0.01	0.2	9.3	115.6
RE008	Teesmouth and Cleveland Coast SSSI and SPA	8.27	8	0.03	0.3	9.1	113.6
RE009	Teesmouth and Cleveland Coast SSSI and SPA	8.27	8	<0.01	<0.1	8.3	104.0
RE010	Wilton Woods Complex LWS	11.34	10	<0.01	<0.1	12.7	126.8

**Full transect results available in Annex A where "change as % of AQAL" is >1%*

8A.5.50 It is considered that the assessment of construction traffic impacts carried out would be comparable with, or less than, the likely impacts associated with traffic impacts associated with Proposed Development decommissioning activities.

Conclusions

8A.5.51 This report has assessed the impact on local air quality of the construction and demolition activities associated with the Proposed Development. The assessment has used a sensitivity assessment methodology to assess the likelihood and scale of impacts on sensitive receptors located in the vicinity of the Proposed Development Site as associated with dust arisings from the construction and demolition activities and associated road traffic.

8A.5.52 The evaluation of expected dust arisings from the proposed construction and demolition works has shown that without mitigation there could be a short-term low to medium impact of dust emissions associated with the construction phase on human health and a potential high impact on the ecological receptors, with a significant effect. However, appropriate mitigation measures for managing these risks will be set out in the CEMP and which will be in accordance with IAQM guidance. Such measures will be formalised through the Final CEMP to be prepared and implemented by the construction contractor. Through implementation of these mitigation measures, no significant dust effects are predicted on any sensitive receptors.

8A.5.53 The impacts of emissions from construction traffic are likely to result in insignificant effects, given the magnitude of change is considered to be negligible where human receptors are present.

8A.6 References

- AEAT. (2008). Analysis of the Relationship Between Annual Mean Nitrogen Dioxide Concentration and Exceedances of the 1-Hour Mean AQS Objective.
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ANNEX A

Dispersion modelling results for ecological receptor transects – NOx Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001_20.45m	Teesmouth and Cleveland Coast SSSI and SPA	13.7	0.1	0.3%	17.9	59.7%
RE001_30m		13.7	0.1	0.3%	17.1	56.8%
RE001_40m		13.7	0.1	0.2%	16.5	55.0%
RE001_50m		13.7	0.1	0.2%	16.2	53.8%
RE001_60m		13.7	<0.1	0.2%	15.9	53.0%
RE001_70m		13.7	<0.1	0.1%	15.7	52.4%
RE001_80m		13.7	<0.1	0.1%	15.6	51.9%
RE001_90m		13.7	<0.1	0.1%	15.4	51.5%
RE001_100m		13.7	<0.1	0.1%	15.4	51.2%
RE001_110m		13.7	<0.1	0.1%	15.3	50.9%
RE001_120m		13.7	<0.1	0.1%	15.2	50.7%
RE001_130m		13.7	<0.1	0.1%	15.1	50.5%
RE001_140m		13.7	<0.1	0.1%	15.1	50.3%
RE001_150m		13.7	<0.1	0.1%	15.0	50.1%
RE001_160m		13.7	<0.1	0.1%	15.0	50.0%
RE001_170m		13.7	<0.1	0.1%	15.0	49.9%
RE001_180m		13.7	<0.1	0.1%	14.9	49.8%
RE001_190m		13.7	<0.1	0.1%	14.9	49.7%
RE001_200m		13.7	<0.1	0.1%	14.9	49.6%
RE002_5m	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	13.3	0.2	0.7%	28.8	95.9%
RE002_10m		13.3	0.2	0.5%	24.8	82.7%
RE002_15m		13.3	0.2	0.5%	22.6	75.3%
RE002_20m		13.3	0.1	0.4%	21.1	70.4%
RE002_25m		13.3	0.1	0.4%	20.1	67.1%
RE002_35m		13.3	0.1	0.2%	18.7	62.4%
RE002_45m		13.3	0.1	0.2%	17.9	59.6%
RE002_55m		13.3	0.1	0.2%	17.3	57.6%
RE002_65m		13.3	0.1	0.2%	16.8	56.2%
RE002_75m		13.3	0.1	0.2%	16.5	55.0%

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE002_85m		13.3	0.1	0.2%	16.2	54.1%
RE002_95m		13.3	0.1	0.2%	16.0	53.4%
RE002_105m		13.3	<0.1	0.2%	15.8	52.7%
RE002_130m		13.3	<0.1	0.1%	15.5	51.6%
RE002_155m		13.3	<0.1	0.1%	15.2	50.7%
RE002_180m		13.3	<0.1	0.1%	15.0	50.1%
RE002_200m		13.3	<0.1	0.1%	14.9	49.7%
RE006_3.15m	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	13.2	0.2	0.7%	13.7	45.8%
RE006_10m		13.2	0.2	0.6%	13.7	45.8%
RE006_20m		13.2	0.2	0.6%	13.7	45.8%
RE006_30m		13.2	0.2	0.6%	13.7	45.8%
RE006_40m		13.2	0.2	0.6%	13.7	45.8%
RE006_50m		13.2	0.2	0.5%	13.7	45.7%
RE006_60m		13.2	0.2	0.5%	13.7	45.7%
RE006_70m		13.2	0.1	0.5%	13.7	45.7%
RE006_80m		13.2	0.1	0.5%	13.7	45.7%
RE006_90m		13.2	0.1	0.4%	13.7	45.6%
RE006_100m		13.2	0.1	0.4%	13.7	45.6%
RE006_110m		13.2	0.1	0.4%	13.7	45.6%
RE006_120m		13.2	0.1	0.4%	13.7	45.6%
RE006_130m		14.4	<0.1	0.0%	14.6	48.8%
RE006_140m		14.4	<0.1	0.0%	14.6	48.8%
RE006_150m		14.4	<0.1	0.0%	14.6	48.7%
RE006_160m		14.4	<0.1	0.0%	14.6	48.7%
RE006_170m		14.4	<0.1	0.0%	14.6	48.7%
RE006_180m		16.2	<0.1	0.1%	20.6	68.7%
RE006_190m		16.2	0.1	0.2%	19.9	66.2%
RE006_200m		16.2	0.1	0.2%	19.3	64.2%
RE007_4.05m		15.2	<0.1	0.1%	17.8	59.5%
RE007_10m		15.2	<0.1	0.1%	17.5	58.4%
RE007_20m		15.2	<0.1	0.1%	17.3	57.6%
RE007_30m		15.2	<0.1	0.1%	17.1	57.0%

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE007_40m		15.2	<0.1	0.1%	16.9	56.4%
RE007_50m		15.2	<0.1	0.1%	16.8	56.0%
RE007_60m		15.2	<0.1	0.1%	16.7	55.6%
RE007_70m		15.2	<0.1	0.1%	16.6	55.3%
RE007_80m		15.2	<0.1	0.1%	16.5	55.0%
RE007_90m		15.2	<0.1	0.1%	16.4	54.8%
RE007_100m		15.2	<0.1	0.1%	16.4	54.6%
RE007_110m		15.2	<0.1	0.1%	16.3	54.4%
RE007_120m		15.2	<0.1	0.1%	16.3	54.2%
RE007_130m		15.2	<0.1	0.1%	16.2	54.1%
RE007_140m		15.2	<0.1	0.1%	16.2	54.0%
RE007_150m		14.5	0.2	0.5%	23.1	76.9%
RE007_160m		14.5	0.1	0.3%	19.9	66.4%
RE007_170m		14.5	0.1	0.2%	18.2	60.5%
RE007_180m		14.5	0.1	0.2%	17.3	57.8%
RE007_190m		14.5	<0.1	0.2%	16.8	56.1%
RE007_200m		14.5	<0.1	0.1%	16.5	55.0%
RE008_0m	Teesmouth and Cleveland Coast SSSI and SPA	14.5	<0.1	0.1%	16.3	54.2%
RE008_10m		14.5	<0.1	0.1%	16.1	53.7%
RE008_20m		14.5	<0.1	0.1%	16.0	53.2%
RE008_30m		14.5	<0.1	0.1%	15.8	52.8%
RE008_40m		14.5	<0.1	0.1%	15.8	52.5%
RE008_50m		14.5	<0.1	0.1%	15.7	52.2%
RE008_60m		14.5	<0.1	0.1%	15.6	52.0%
RE008_70m		14.5	<0.1	0.1%	15.5	51.8%
RE008_80m		14.5	<0.1	0.1%	15.5	51.7%
RE008_90m		14.5	<0.1	0.1%	15.5	51.5%
RE008_100m		14.5	<0.1	0.1%	15.4	51.4%
RE008_110m		14.5	<0.1	0.1%	15.4	51.3%
RE008_120m		14.5	<0.1	0.1%	15.3	51.2%
RE008_130m		14.5	<0.1	0.1%	15.3	51.1%
RE008_140m		14.5	<0.1	0.1%	15.3	51.0%

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_150m		14.5	0.2	0.6%	27.9	93.1%
RE008_160m		14.5	0.2	0.5%	23.6	78.8%
RE008_170m		14.5	0.1	0.4%	20.6	68.8%
RE008_180m		14.5	0.1	0.3%	19.2	64.1%
RE008_190m		14.5	0.1	0.3%	18.4	61.2%
RE008_200m		14.5	0.1	0.2%	17.8	59.3%

Dispersion modelling results for ecological receptor transects – nutrient nitrogen deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CRITAL LOAD (AQAL)	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_0m	Teesmouth and Cleveland Coast SSSI and SPA	8.3	8	0.03	0.3%	9.1	113.6%
RE008_10m		8.3	8	0.01	0.2%	8.7	108.5%
RE008_20m		8.3	8	0.01	0.1%	8.6	107.0%
RE008_30m		8.3	8	0.01	0.1%	8.5	106.2%
RE008_40m		8.3	8	0.01	0.1%	8.5	105.8%
RE008_50m		8.3	8	0.01	0.1%	8.4	105.5%
RE008_60m		8.3	8	0.01	0.1%	8.4	105.3%
RE008_70m		8.3	8	<0.01	0.1%	8.4	105.1%
RE008_80m		8.3	8	<0.01	0.1%	8.4	105.0%
RE008_90m		8.3	8	<0.01	0.1%	8.4	104.9%
RE008_100m		8.3	8	<0.01	0.1%	8.4	104.8%
RE008_110m		8.3	8	<0.01	0.1%	8.4	104.7%
RE008_120m		8.3	8	<0.01	<0.1%	8.4	104.6%
RE008_130m		8.3	8	<0.01	<0.1%	8.4	104.6%
RE008_140m		8.3	8	<0.01	<0.1%	8.4	104.5%
RE008_150m		8.3	8	<0.01	<0.1%	8.4	104.5%
RE008_160m		8.3	8	<0.01	<0.1%	8.4	104.4%
RE008_170m		8.3	8	<0.01	<0.1%	8.4	104.4%
RE008_180m		8.3	8	<0.01	<0.1%	8.3	104.4%

RECEPTOR*	SITE NAME	BACKGROUND	CRITAL LOAD (AQAL)	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_190m		8.3	8	<0.01	<0.1%	8.3	104.4%
RE008_200m		8.3	8	<0.01	<0.1%	8.3	104.3%

H2Teesside Project

Preliminary Environmental Information Report

Volume III – Appendices

Appendix 8B: Operational Phase Assessment

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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8B.0 OPERATIONAL PHASE – AIR QUALITY ASSESSMENT

8B.1 Introduction

8B.1.1 This Technical Appendix supports Chapter 8: Air Quality, of the Preliminary Environmental Impact Report (PEI Report, Volume I) and describes the additional details for the dispersion modelling of point source emissions from the Proposed Development once operational.

8B.1.2 This assessment considers the likely significant effects on air quality as a result of the normal and non-routine (start-up and emergency) operation of the Proposed Development. For more details about the Proposed Development, refer to Chapter 4: Proposed Development (PEI Report, Volume I).

8B.1.3 Emissions associated with the operational Proposed Development have the potential to affect human health and sensitive ecosystems, if not appropriately managed. This Technical Appendix identifies and proposes measures required to address potential impacts and significant effects of the Proposed Development on air quality during its operational phase.

8B.1.4 The magnitude of air quality impacts at sensitive human and ecological receptors has been quantified for pollutants emitted from the main stacks associated with the Proposed Development. The impact of emissions on sensitive ecological receptors has been considered in the context of relevant critical levels and critical loads for designated and non-designated ecological sites.

8B.1.5 The assessment has considered emissions from the fired heaters, boilers, flares and emergency diesel generators during different operational conditions once Phase 2 is complete. Non routine emissions, such as those which may occur during the commissioning process or other short-term events would typically only occur on an infrequent basis, would be detected by the process control system and rectified within a short time period. The plant operation will be tightly regulated by the Environment Agency through the Environmental Permit required for the operation of the Proposed Development. Emissions during non-routine operation have the potential for significant short-term effects at sensitive receptors, and an assessment has been undertaken of non-routine operational scenarios.

8B.2 Scope

Operational Traffic Emissions

8B.2.1 No assessment of operational traffic emissions has been made, as the numbers of additional vehicles associated with the operational phase of the Proposed Development are below the DMRB and IAQM screening criteria for requiring such assessment. In addition, the predicted impacts for the construction phase traffic emissions showed that the effect of additional construction traffic was not significant at all receptors. The number of additional vehicles for the operational phase is well below the numbers assessed for the construction phase and therefore it is considered that the effect of operational traffic is also not significant, and that there

will therefore be no in-combination effects with the operational traffic and operation Proposed Development.

Combustion Plant and Carbon Capture Plant

8B.2.2 The assessment has considered the impact of operational process emissions on local air quality, under normal operating conditions, with the fired heater and pilot flare operating for 8,760 hours per year, as this represents the worst case for annual average impacts. The assessment considers impacts in the earliest year in which the Proposed Development is due to commence operation, 2030.

8B.2.3 The assessment also considers two non-routine operating scenarios for the assessment of short-term impacts. These scenarios include different sources and fuel types, which can lead to different emission rates than during normal operation.

8B.2.4 The scenarios and sources included in this assessment are:

- Start Up – including Fired Heater (natural gas fired), flare (to include pilot and flare operating as in Emergency scenario, and Auxiliary Boiler (natural gas fired);
- Normal operation – including Fired Heater (hydrogen and tailings gas fired) and flare in normal operation; and
- Emergency – including Emergency flare operation and emergency diesel generators.

8B.2.5 The carbon capture plant (CCP) is designed as a closed loop system, as part of the hydrogen generation process and is not part of the combustion process for the Fired Heater or Auxiliary Boilers. Due to this, there are no predicted emissions from the CCP, and no assessment of the CCP has been undertaken within this Technical Appendix.

8B.2.6 The Study Area for the operational Proposed Development point source emissions extends up to 10 km from the Fired Heater in the Proposed Development Site, in to assess the potential impacts on ecological receptors, in line with the Environment Agency risk assessment methodology (Defra and Environment Agency, 2016):

- Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar sites and Sites of Special Scientific Interest (SSSIs) within 10 km; and
- Local Nature Sites (including ancient woodlands, Local Wildlife Sites (LWS) and National and Local Nature Reserves (NNR and LNR)) within 2 km.

8B.2.7 In terms of human health receptors, impacts from the operational Proposed Development become negligible well within approximately 2 km and therefore sensitive receptors for the human health impacts only are concentrated within a 2 km Study Area.

8B.2.8 The dispersion of emissions has been predicted using the latest version of the atmospheric dispersion model ADMS (currently version 6). The results are presented in both tabular format within this Appendix and as contours of predicted ground level process contributions (PCs) overlaid on mapping of the surrounding area, and the

following figures have been produced showing the predicted isopleths (PEI Report, Volume II):

- Figure 8-6: Annual Mean NO_2 Process Contribution for the Proposed Development during Normal Operations for Phase 1 and 2 Combined – Case B, for the Worst Affected Meteorological Year of 2022;
- Figure 8-7: 99.79th Percentile 1h NO_2 Process Contribution for the Proposed Development during Normal Operations for Phase 1 and 2 Combined – Case B, for the Worst Affected Meteorological Year of 2022;
- Figure 8-8: 99.79th Percentile 1h NO_2 Process Contribution for the Proposed Development during Start Up for Phase 1 and 2 Combined – Case A, for the Worst Affected Meteorological Year of 2021;
- Figure 8-9: 99.79th Percentile 1h NO_2 Process Contribution for the Proposed Development during Emergency Operations for Phase 1 and 2 Combined – Case B, for the Worst Affected Meteorological Year of 2022;

8B.2.9 The dispersion modelling assessment has concentrated on the combustion emissions associated with the operation of the Fired Heater, auxiliary boiler, operational flares (both normal and emergency) and emergency diesel generators of oxides of nitrogen (NO_x), nitrogen dioxide (NO_2) carbon monoxide (CO), Particulate Matter (PM_{10} and $PM_{2.5}$) and sulphur dioxide (SO_2). Selective Catalytic Reduction (SCR) NOx abatement would be fitted to the Fired Heater and Auxiliary Boiler and would be used during the start-up phase while running on natural gas fuel only. This would result in short term emissions of ammonia (NH_3) due to ammonia slip until the plant are switched to the primary fuel (hydrogen). Current environmental standards have been set for the long-term impacts of ammonia and their associated effects, and short-term impacts and effects are not assessed. The short-term emissions of ammonia have not been considered within this assessment and will be reviewed for the Environmental Statement for the DCO application.

8B.2.10 Emissions from Large Combustion Plant (LCP) are currently governed by the Industrial Emissions Directive (IED Directive 2010/75/EU), which contains measures relating to the control of emissions, including setting limits on emissions to air from LCP and requires operators to monitor and report emissions.

8B.2.11 The Proposed Development would be regulated under the IED and in accordance with the LCP Best Available Technique (BAT) Reference document (BRef). The current LCP BRef and associated BAT conclusion document was issued in 2017. The recommendations of the LCP BRef are enforceable through Environmental Permits and the Environment Agency would set specific emission limits in the Environmental Permit issued to the Proposed Development, based on the BAT-associated emission levels (BAT- AELs). Emission Limits Values (ELVs) used in this assessment have been supplier by the clients FEED contractor and will be reviewed as part of the Environmental Statement.

8B.2.12 A comparison has been made between predicted model output concentrations (process contributions), and short-term and long-term Air Quality Assessment Levels (AQALs) as detailed in Chapter 8: Air Quality (PEI Report, Volume I).

Cumulative Impacts

8B.2.13 Cumulative impacts from existing sources of pollution in the area are accounted for in the adoption of site-specific background pollutant concentrations from archive sources and a programme of project-specific baseline air quality monitoring in proximity to the Proposed Development site.

8B.2.14 It is recognised, however, that there is a potential impact on local air quality from emission sources which have either received or are about to receive planning permission but have yet to come into operation.

8B.2.15 The full list of cumulative schemes to be considered for the Proposed Development has not been finalised for this PEIR, and an assessment of the cumulative impact of consented schemes with the Proposed Development will be undertaken for the Environmental Statement.

Sources of Information

8B.2.16 The information that has been used within this assessment includes pertinent information from:

- Chapter 4: Proposed Development (PEI Report Volume I);
- Data on emissions to atmosphere from the process, taken from ELVs supplied by the FEED design contractor;
- Details on the proposed site layout;
- Ordnance Survey mapping;
- Baseline air quality data from project specific monitoring, published sources and Local Authorities; and
- Meteorological data supplied by ADM Ltd.

8B.3 Methodology

Dispersion Model Selection

8B.3.1 The assessment of emissions from the Proposed Development has been undertaken using the advanced dispersion model ADMS (version V6), supplied by Cambridge Environmental Research Consultants Limited (CERC). ADMS is a modern dispersion model that has an extensive published validation history for use in the UK. This model has been extensively used throughout the UK to demonstrate regulatory compliance.

8B.3.2 The dispersion modelling undertaken for this PIER for the assessment of emissions from the operational Proposed Development includes:

- Modelling of maximum ground-level impacts at a range of release heights, between 20 m and 90 m to evaluate the effect of increasing effective release height on dispersion; and

- Reporting of impacts at identified human health and sensitive ecological receptors from the combustion plant listed in Table 8B-2 and Table 8B-3, at their design release heights above ground level.

Model Inputs

8B.3.3 The general model conditions used in the assessment are summarised in Table 8B-1. Other more detailed data used to model the dispersion of emissions is considered below.

Table 8B-1: General ADMS 5 Model Inputs

VARIABLE	INPUT
Surface Roughness at source	0.3m
surface Roughness at meteorological site	0.3m
Receptors	Selected discrete receptors (see Table 8B-6 and Table 8B-7)
	Nested receptor grid, with variable spacing (see Table 8B-8)
Receptor Location	X, Y co-ordinates determined by GIS
	Z = 1.5m for human health receptors
	Z = 0m (ground level) for ecological receptors
Source Location	See Table 8-2 and Table 8B-3
Emissions	Data provided by designer
Sources	See Table 8-2 and Table 8B-3
Meteorological Data	5 years of hourly sequential meteorological data from Durham Tees Valley Airport meteorological station (2018-2022)
Terrain Data	Not required
Buildings that may cause building downwash effects	See Table 8B-9

Emissions Data

8B.3.4 During normal operation, the Fired Heater stack would be the primary source of emissions from both the hydrogen generation processes associated with the Proposed Development.

8B.3.5 In addition, there would be a stack associated with the flare (used during normal and emergency operations), an auxiliary boiler and emergency diesel generators.

8B.3.6 The combustion emissions (NO_x, PM_{10}, $PM_{2.5}$, SO_2 and CO) associated with these sources would differ dependent on the design case taken forward. Both design cases (Case A and Case B) have been assessed, to ensure any potential differences in the predicted concentrations due to changes in the design are captured in the assessment.

8B.3.7 The main reported emissions for the Proposed Development have been modelled at a release height of approximately 40 m above finished ground level for the Fired Heater and Auxiliary Boiler, with an internal stack diameter of 1.8 m and 1.7 m respectively for Case A, and 1.35 m and 1.5 m respectively for Case B. This release height is based on the results of the Stack Height Assessment, and the design release height of the Fired Heater and Auxiliary Boiler is 65 m above ground level. It is considered that this represents a conservative assessment, and the higher release height would result in lower impacts at modelled receptor locations.

8B.3.8 For the flare, effective release heights and equivalent stack diameters have been calculated based on the operational scenario. It is considered that release parameters that would provide the greatest benefit to aid dispersion and reduce the potential impact at human health and ecological receptors, with the current model input parameters and therefore has been used in the assessment.

8B.3.9 The physical properties of assessed emission sources, as represented within the model, are shown in Table 8B-2 and Table 8B-3. The position of the stack and the buildings included within the model are illustrated in Figure 8.4: Air Quality Study Area – Operation Model Inputs Phase 1 and Figure 8.5: Air Quality Study Area – Operation Model Inputs Phase 2 (PEI Report, Volume II).

Table 8B-2: Emissions Inventory – Case A

PARAMETER	UNIT	FIRED HEATER (START-UP)	FIRED HEATER (NORMAL)	FLARE (NORMAL OPERATION)	FLARE (EMERGENCY/UPSET)	AUXILIARY BOILER (START UP)	EMERGENCY DIESEL GENERATORS
Stack Position	m	Phase 1 – 456247, 525229 Phase 2 – 456461, 525665	Phase 1 – 456247, 525229 Phase 2 – 456461, 525665	Phase 1 – 456444, 525381 Phase 2 – 456604, 525837	Phase 1 – 456444, 525381 Phase 2 – 456604, 525837	Phase 1 – 456307, 525340 Phase 2 – 456350, 525723	456506, 525203
Release Height (above ground level)	m	40	40	66.4*	103.6*	40	10
Effective internal stack diameter	m	1.8	1.8	0.9	4.4	1.7	0.96
Flue temperature	°C	214	214	1000	1000	259	600
Flue H_2O content	%	16.4	31.1	11.6	30.69	16.4	
Flue O_2 content (dry)	%	2.5	2.3	0.0	0.03	2.5	
Stack gas exit velocity	m/s	19.0	15.2	20	20	17.4	76.3
Stack flow (actual)	Am^3/s	48.4	38.5	1.0	1222.4	39.5	55.3
Stack flow (reference conditions, STP, dry)	Nm^3/s	27.1	21.6	0.2	226.7	20.7	55.3

Table 8B-3: Emissions Inventory – Case B

PARAMETER	UNIT	FIRED HEATER (START-UP)	FIRED HEATER (NORMAL)	FLARE (NORMAL OPERATION)	FLARE (EMERGENCY/UPSET)	AUXILAIRY BOILER (START UP)	AUXILAIRY BOILER (NORMAL OPERATION)	EMERGENCY DIESEL GENERATORS
Stack Position	m	Phase 1 – 456247, 525229 Phase 2 – 456461, 525665	Phase 1 – 456247, 525229 Phase 2 – 456461, 525665	Phase 1 – 456444, 525381 Phase 2 – 456604, 525837	Phase 1 – 456444, 525381 Phase 2 – 456604, 525837	Phase 1 – 456307, 525340 Phase 2 – 456350, 525723	Phase 1 – 456307, 525340 Phase 2 – 456350, 525723	456506, 525203
Release Height (above ground level)	m	40	40	66.4*	104.2*	40	40	10
Effective internal stack diameter	m	1.35	1.35	0.9	104.2	1.5	1.5	0.96
Flue temperature	°C	200	214	1000	1000	259	200	600
Flue H_2O content	%	16.4	28.8	18.2	31.0	16.4	30.9	
Flue O_2 content (dry)	%	2.5	2.3	0	0.05	2.5	1.6	
Stack gas exit velocity	m/s	17.95	15.1	20	20	22.0	15.2	76.3

PARAMETER	UNIT	FIRED HEATER (START-UP)	FIRED HEATER (NORMAL)	FLARE (NORMAL OPERATION)	FLARE (EMERGENCY/UPSET)	AUXILAIRY BOILER (START UP)	AUXILAIRY BOILER (NORMAL OPERATION)	EMERGENCY DIESEL GENERATORS
Stack flow (actual)	Am^3/s	25.7	21.6	1.0	1131.0	38.9	26.9	55.3
Stack flow (reference conditions, STP, dry)	Nm^3/s	14.8	12.1	0.2	242.7	20.0	15.5	55.3

8B.3.10 The modelled pollutant emission rates (in grams per second (g/s)) have been calculated by multiplying the emission concentration by the volumetric flow rate at normalised reference conditions. The emission rate of sulphur dioxide has been calculated based on the anticipated sulphur content of the fuel, assuming 100% conversion to sulphur dioxide. The emission limits assumed to apply to the Proposed Development are shown in Table 8B-4 and Table 8B-5..

8B.3.11 The assessment has assumed that the Proposed Development would operate at continuous design load (8,760 hours per year). No time-based variation in emissions have therefore been accounted for within the model.

Table 8B-4: Emissions Concentrations and the Assessed Emission Rates – Case A

POLLUTANT	FIRED HEATER (START-UP)		FIRED HEATER (NORMAL)		FLARE (NORMAL OPERATION)		FLARE (EMERGENCY/UPSET)		AUXILIARY BOILER (START UP)		EMERGENCY DIESEL GENERATORS	
	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)
Oxides of Nitrogen	18.81	0.510	200	4.323	13.9	0.01	88.9	20.13	78.99	1.602	195.0	10.77
Carbon monoxide	11.45	0.311	100	2.161	63.2	0.05	405.3	91.77	-[1]	0.232	51.5	2.85
Particulate Matter	5	0.136	5	0.108	33.2	0.000835	16.0	3.62	20	0.406	-[1]	-[1]
Sulphur Dioxide	-[1]	-[1]	-[1]	0.756[2]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]

1) No emission rate supplied.
2) Emissions of SO_2 calculated from sulphur content in fuel.

Table 8B-5: Emissions Concentrations and the Assessed Emission Rates – Case B

POLLUTANT	FIRED HEATER (START-UP)		FIRED HEATER (NORMAL)		FLARE (NORMAL OPERATION)		FLARE (EMERGENCY/UPSET)		AUXILAIRY BOILER (START UP)		AUXILIARY BOILER (NORMAL OPERATION)		EMERGENCY DIESEL GENERATORS	
	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/M^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)	EMISSIONS CONCENTRATION (MG/NM^3)	EMISSIONS RATE (G/S)
Oxides of Nitrogen	18.81	0.279	200	2.422	15.4	0.01	85.8	20.8	18.81	0.375	78.99	1.225	195.0	10.77
Carbon monoxide	11.45	0.170	100	1.211	70.3	0.05	391.0	94.8	11.45	0.229	-[1]	-[1]	51.5	2.85
Particulate Matter	5	0.074	5	0.061	30.9	0.000835	16.6	4.02	5	0.1	20	0.31	-[1]	-[1]
Sulphur Dioxide	-[1]	-[1]	-[1]	0.424*	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]	-[1]

1) No emission rate supplied.
2) Emissions of SO_2 calculated from sulphur content in fuel

Modelled Domain – Discrete Receptors

Sensitive Human Receptors

8B.3.12 The modelling has predicted concentrations of the modelled pollutants relevant to human health at discrete air quality sensitive receptors, as listed in Table 8B-6. The locations of these receptors are also shown in Figure 8.1: Air Quality Study Area Human Health Receptors and Monitoring (PEI Report, Volume II). The receptors are selected to be representative of residential dwellings, recreational areas, and schools in the area around the Proposed Development. (OR = Operational Receptor).

Table 8B-6: Human Receptor Locations

RECEPTOR REFERENCE	RECEPTOR DESCRIPTION	GRID REFERENCE		DISTANCE AND DIRECTION FROM THE OPERATIONAL SITE
		X	Y	
O1	Residential receptor on Tod Point Road, Warrenby	457950	525045	1.28 km east
O2	Cleveland Links Golf Club	458090	525550	1.23 km east
O3	South Gare Fishermans Association	455680	527395	1.27 km north
O4	Marine Club	455550	527345	1.27 km north
O5	Redcar Beach Caravan Park	458675	525415	1.83 km east
O6	Residential receptor on Broadway West, Dormanstown	457895	523735	1.79 km southeast
O7	Residential receptor on York Road, Coatham	458900	525060	2.15 km east
O8	Dormanston Primary Academy	458250	523585	2.16 km southeast
O9	Coatham CofE Primary School	459195	524980	2.46 km east

Sensitive Ecological Receptors

8B.3.13 In accordance with the Environmental Agency's air emissions risk assessment guidance, the impacts associated with emissions from the Proposed Development on statutory sensitive ecological sites has been quantified. The assessment considers European designated sites (Special Areas of Conservation (SACs), Special Protection

Areas (SPAs) and Ramsar sites) and Sites of Special Scientific Interest (SSSIs) within 10 km of the operational Proposed Development, as recommended by the EA's risk assessment guidance for "large emitters". The most notable of these sites is the Teesmouth and Cleveland Coast Ramsar, SPA and SSSI, which is adjacent to the Proposed Development site.

8B.3.14 In additional, Local Wildlife Sites (LWSs) within 2 km of the Proposed Development have also been included in the assessment.

8B.3.15 Ground-level concentrations of the modelled pollutants relevant to sensitive ecological receptors have been predicted at locations listed in Table 8B-7 and the locations of these receptors are shown in Figure 8.2: Air Quality Study Area Ecological Receptors (PEI Report, Volume II). The location reported for each ecology site is the point closest to the Proposed Development, taken to be representative of the worst case.

Table 8B-7: Ecological Receptor Locations

RECEPTOR IDENTIFICATION	ECOLOGY SITE	GRID REFERENCE		DISTANCE AND DIRECTION FROM THE OPERATIONAL SITE
		X	Y	
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	457283	526000	410 m northeast
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	456579	526306	290 m north
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	456127	526339	170 m north
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	455726	526273	320 m west
OE2a	Teesmouth and Cleveland Coast SPA, SSSI	456300	526098	0 m north
OE2b	Teesmouth and Cleveland Coast SPA, SSSI	456849	525878	10 m north
OE2c	Teesmouth and Cleveland Coast SPA, SSSI	455587	524856	320 m south

RECEPTOR IDENTIFICATION	ECOLOGY SITE	GRID REFERENCE		DISTANCE AND DIRECTION FROM THE OPERATIONAL SITE
		X	Y	
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	457860	524991	1.21 km east
OE4	Eston Pumping Station LWS	456474	523797	1.04 km south
OE5a	Teesmouth NNR	454525	527129	1.78 km northwest
OE5b	Teesmouth NNR	453980	526143	1.92 km west
OE6	Teesmouth and Cleveland Coast SSSI	455835	526155	170 m west

Modelled Domain – Receptor Grid

8B.3.16 Emissions from the Proposed Development have also been modelled on a receptor grid of variable spacing to determine the location and magnitude of maximum ground level impacts.

8B.3.17 The dispersion model output has been reported at specific receptors and as a nested grid of values. The inner grid extends 2,000 m at a resolution of 25 m x 25 m. The middle grid extends from 2,000 m to 5,000 m at a resolution of 100 m x 100 m. The outer grid extends from 5,000 m to 10,000 m at a resolution of 500 m x 500 m. Details of the receptor grid are summarised in Table 8B-8.

Table 8B-8: Modelled Domain, Receptor Grid

GRID SPACING (M)	DIMENSIONS (KM)	NUMBER OF NODES IN EACH DIRECTION	NATIONAL GRID REFERENCE OF SOUTH WEST CORNER
25	4x4	161	454461, 523665
100	10x10	101	451461, 520665
500	20x20	41	446461, 515665

Meteorological Data

8B.3.18 Actual measured hourly-sequential meteorological data is available for input into dispersion models, and it is important to select data as representative as possible for the site that will be modelled. This is usually achieved by selecting a meteorological station as close to the site as possible, although other stations may be used if the

local terrain and conditions vary considerably, or if the station does not provide sufficient data.

8B.3.19 The meteorological site that was selected for the assessment is Durham Tees Valley Airport, located approximately 22 km southwest of the Proposed Development Site, at a flat airfield in a principally agricultural area, and therefore a surface roughness of 0.3 m (representative of an agricultural area) has been selected for the meteorological site within the model.

8B.3.20 The modelling for this assessment has utilised 5 years of meteorological data for the period 2018 – 2022. Wind roses for each of the years within this period are shown in Plate 8B-1.

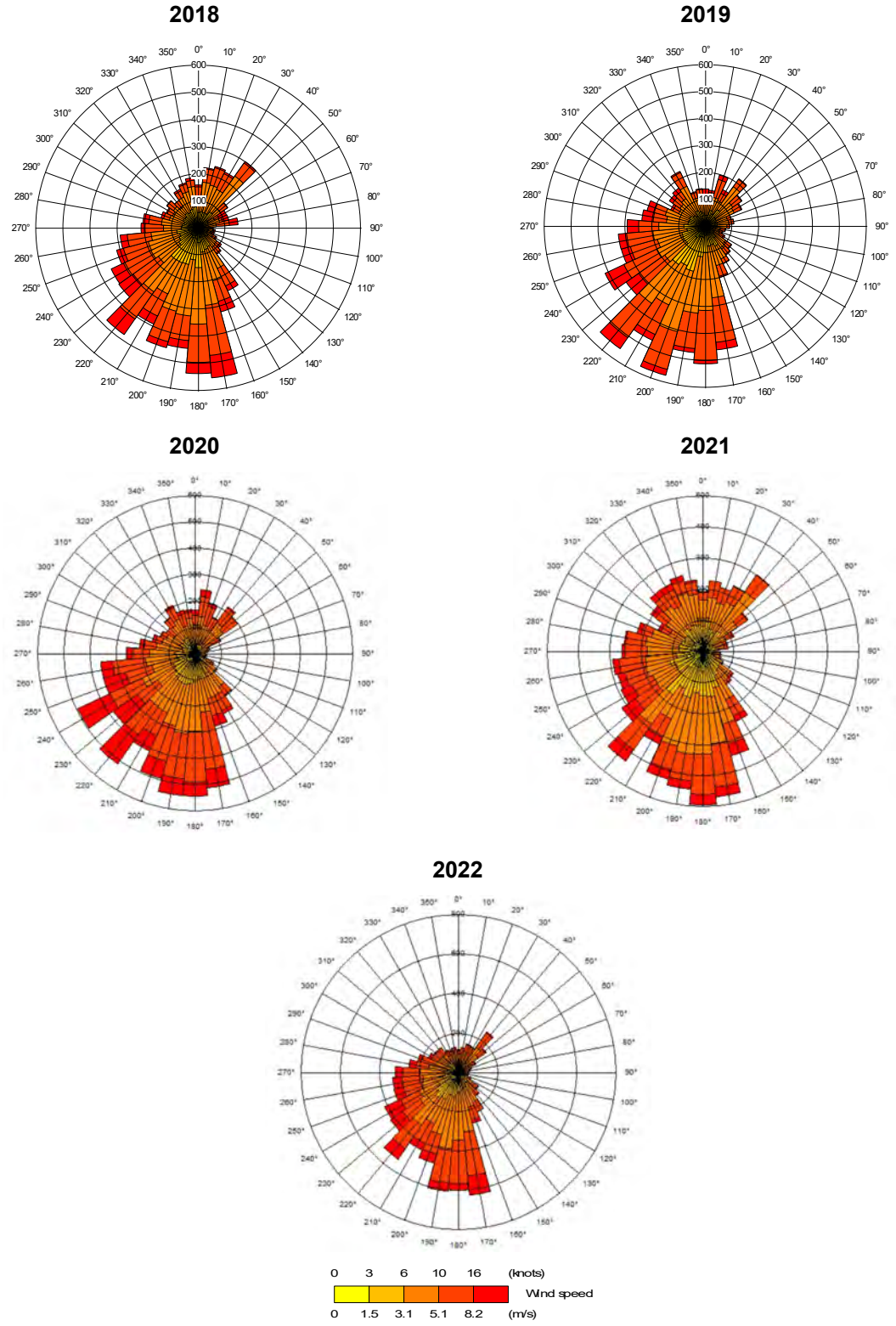


Plate 8B-1: Windroses for Durham Tees Valley Airport Meteorological Station, 2018-2022

Building Downwash Effects

8B.3.21 The buildings that make up the Proposed Development have the potential to affect the dispersion of emissions from the operational process stack. The ADMS buildings effect module has therefore been used to incorporate building downwash effects as part of the model set up. Buildings greater than one third of the range of stack heights modelled have been included within the modelling assessment.

8B.3.22 The modelled locations are shown in Table 8B-9 and a plan showing the building layout used in the ADMS simulation is illustrated in Figure 8.4: Air Quality Study Area – Operation Model Inputs Phase 1 and Figure 8.5: Air Quality Study Area – Operation Model Inputs Phase 2 (PEI Report, Volume II). The dimensions of the buildings are the maximum measurements that could potentially be required (as defined in the Rochdale Envelope) and have been provided by the Design Engineers.

Table 8B-9: Buildings Incorporated into the Modelling Assessment

BUILDING	BUILDING CENTRE GRID REFERENCE (X, Y)	HEIGHT (M)	LENGTH (M)	WIDTH (M)	ANGLE (°)
Cooler1P1	456332, 525297	15	13	33	110
Cooler2P1	456311, 525245	15	13	31	110
Cooler3P1	456283, 525173	15	13	40	110
CompHouseP1	456368, 525278	16	20	19	110
SubU1P1	456343, 525233	16	22	31	110
SubU2P1	456330, 525252	15	12	16	110
ASUP1	456429, 525043	40	26	30	110
Tank1P1	456176, 525034	22	17	17	0
Tank2P1	456185, 525056	22	17	17	0
Cooler1P2	456392, 525751	15	13	33	20
Cooler2P2	456444, 525730	15	13	31	20
Cooler3P2	456516, 525701	15	13	40	20
CompHouseP2	456412, 525787	16	20	19	20
SubU1P2	456457, 525762	16	22	31	20
SubU2P2	456438, 525748	15	12	13	20
ASUP2	456464, 525915	40	26	30	20
Tank1P2	456667, 525682	22	17	17	0
Tank2P2	456658, 525660	22	17	17	0

P1 – Phase 1, P2 – Phase 2

8B.3.23 The immediate local area downwind (north east) of the Proposed Development is flat and undeveloped land followed by the coast and the North Sea. Upwind (south west) of the Proposed Development Site is dominated by industrial land uses and relatively flat. The Site is adjacent to the River Tees Estuary to the west. A surface roughness of 0.3 m, corresponding to the minimum value associated with the terrain type, has therefore been selected to represent the local terrain.

8B.3.24 Site-specific terrain data has not been used in the model, as there are no potentially significant changes in gradient within the Study Area.

NO_x to NO_2 Conversion

8B.3.25 Emissions of nitrogen oxides from industrial point sources are typically dominated by nitric oxide (NO), with emissions from combustion sources typically in the ratio of nitric oxide to nitrogen dioxide of 9:1. However, it is nitrogen dioxide that has specified environmental standards due to its potential impact on human health. In the ambient air, nitric oxide is oxidised to nitrogen dioxide by the ozone present, and the rate of oxidation is dependent on the relative concentrations of nitric oxide and ozone in the ambient air.

8B.3.26 For the purposes of detailed modelling, and in accordance with Environment Agency technical guidance it is assumed that 70% of nitric oxide emitted from the stack is oxidised to nitrogen dioxide in the long term and 35% of the emitted nitric oxide is oxidised to nitrogen dioxide in the local vicinity of the site in the short-term.

Calculation of Deposition at Sensitive Ecological Receptors

8B.3.27 The deposition of nutrient nitrogen and acid at sensitive ecological receptors has been calculated, using the modelled process contribution predicted at the receptor points. The deposition rates are determined using conversion rates and factors contained within Environment Agency guidance, which account for variations deposition mechanisms in different types of habitats.

8B.3.28 The conversion rates and factors used in the assessment are detailed in Table 8B-10 and Table 8B-11.

Table 8B-10: Conversion Factors - Calculation of Nutrient Nitrogen Deposition

POLLUTANT	DEPOSITION VELOCITY GRASSLAND (M/S)	DEPOSITION VELOCITY WOODLAND (M/S)	CONVERSION FACTOR (µG/M3/S TO KEQ/HA/YR)
NOx as NO_2	0.0015	0.003	96
NH_3	0.02	0.03	259.7

Table 8B-11: Conversion Factors - Calculation of Acid Deposition

POLLUTANT	DEPOSITION VELOCITY GRASSLAND (M/S)	DEPOSITION VELOCITY WOODLAND (M/S)	CONVERSION FACTOR (µG/M3/S TO KEQ/HA/YR)
SO_2	0.012	0.024	9.86
NO_2	0.0015	0.003	6.85
NH_3	0.02	0.03	18.54

Specialised Model Treatments

8B.3.29 Emissions have been modelled such that they are not subject to dry and wet deposition or depleted through chemical reactions. The assumption of continuity of mass is likely to result in an over-estimation of impacts at receptors, and therefore is considered to be conservative.

8B.4 Baseline Air Quality

Overview

8B.4.1 This section presents the information used to evaluate the background and baseline ambient air quality in the area surrounding the Proposed Development. The following steps have been taken in the determination of background values. Where appropriate, the study focuses on data gathered in the vicinity of the site:

- Identification of Air Quality Management Areas;
- Review of Redcar and Cleveland Borough Council (RCBC) ambient monitoring data;
- Review of data from Defra's background mapping database;
- AECOM monitoring undertaken in the area around the application site; and
- Review of background data and site relevant critical loads from the APIS website.

Air Quality Management Areas

8B.4.2 Redcar and Cleveland Borough Council (RCBC) and Stockton on Tees Borough Council (STBC) have not declared any AQMAs within their administrative area, and there are no AQMAs declared by other Local Authorities within the Study Area.

Local Authority Ambient NO_x and NO_2 Monitoring Data

Redcar And Cleveland Borough Council

8B.4.3 RCBC currently operate one automatic monitoring site, located at Dormanstown Primary School, approximately 1.5 km to the south east of the operational Proposed Development. The site was chosen to monitor roadside and industrial emissions. Data for 2021 was available at the time of writing with annual concentrations of NO_2, PM_{10} and $PM_{2.5}$ of 11 µg/m^3, 14 µg/m^3, and 7 µg/m^3 respectively.

8B.4.4 In addition, NO_2 diffusion tube monitoring is carried out at 16 locations within the borough. The nearest NO_2 diffusion tubes are again located at Dormanstown Primary School (R17, R18, R19). At the time of writing, the most recent monitoring data available from RCBC diffusion tube monitoring is for 2021 and the average measured annual NO_2 concentration was 11.5 µg/m^3.

8B.4.5 All monitoring locations within the Study Area are below the annual mean nitrogen dioxide objective of 40µg/m^3 in 2021.

Defra Background Data

8B.4.6 Defra's 2018-based background maps are available at a 1x1 km resolution for the UK for the year 2018 and are projected forward to the year 2030. These projections of pollution concentrations across England are available for NO_2, PM_{10}, $PM_{2.5}$ and NO_x.

8B.4.7 Background concentrations from the Defra 2018-based background maps are presented for the year 2018 in Table 8B-10 taken for the grid square in which the operational Proposed Development is located (456500, 525500) for NO_x and NO_2. Background concentrations for CO are not available for the most recent Defra maps, but data for 2001-based background concentrations are available and this has been adjusted for 2018 using the Defra published year adjustment factors. Background concentrations for SO_2 are not available from Defra maps but available on APIS for 2020 (2019-2021 average).

8B.4.8 Data for 2018 has been presented, as the typical trend shown in the Defra background mapping is that over the projected time period, concentrations of NO_2 and NO_x are shown to be decreasing. This corresponds to a reduction overtime of vehicle emissions as newer, cleaner vehicles replace older ones. Therefore, assuming no reduction occurs until the opening year of the Proposed Development (2030, is considered to represent a conservative approach.

8B.4.9 A review of the background map concentrations over the Study Area for human health receptors shows that the concentration presented in Table 8B-12 for the Site location is also representative of the background concentrations at the receptor locations (the average NO_2 concentration in the grid squares with identified receptors was 12.8 µg/m^3).

Table 8B-12: 2022 DEFRA Background Concentrations (NGR 456500, 525500)

POLLUTANT	BACKGROUND CONCENTRATION (µG/M^3)
NO_2	13.3
PM_{10}	9.6
$PM_{2.5}$	6.3
CO	110.9
SO_2	2.02

AECOM Monitoring Data

8B.4.10 A 3 month diffusion tube monitoring survey of the Study Area commenced in July 2022, in order to gather data on the ambient concentrations of NO_2 at representative human health and ecological receptor locations. The data collected relevant to the Operational assessment are shown in Table 8B-13.

Table 8B-13: AECOM Nitrogen Dioxide Diffusion Tube Monitoring

SITE ID	MONITORING LOCATION	GRID REFERENCE		2021 ANNUAL MEAN CONCETRATION (µG/M^3)
		X	Y	
DT1	A1085, west of West Coatham Lane	457402	523655	24.6
DT2	A1085, east of West Coatham Lane	457668	523958	36.7
DT3	Teesmouth and Cleveland Coast SSSI, south of Warrenby	459008	524872	15.0
DT4	A1085, east of Grangetown	455455	520617	17.3
DT5	A1053, south of junction with A66	455431	520975	18.1
DT6	A1085, north of junction with A1053	455949	521326	41.2
DT7	Junction of Eston Road/A174	457131	519556	24.6
DT8	High Street, Old Lackenby	456466	519123	18.1
DT9	Woodlands Road, Normanby	455100	517473	13.4
DT10	Springhill, Ormesby	453905	517394	10.1
DT11	Mosedale Road, Grangetown	455488	519463	12.0
DT12	Lilac Cloase, Lazenby	457237	519877	9.5
DT13	South Avenue, Dormanstown	458147	523551	16.0
DT14	Seaton Common Road, Seaton Carew	453310	528182	12.0
DT15	South Gare Access Road	457341	525680	17.6
DT16	South Gare Access Road	456650	525953	15.6
DT17	South Gare Access Road	456323	526112	17.0

SITE ID	MONITORING LOCATION	GRID REFERENCE		2021 ANNUAL MEAN CONCETRATION (µG/M^3)
		X	Y	
DT18	A1046/Port clarence Road, Port Clarence	449399	522028	21.5
DT19	Limetrees Close, High Clarence	449091	522434	13.7
DT20	A178/Seaton Carew Road	450821	525066	15.9
DT21	A1046/Port clarence Road, Port Clarence	449943	521663	21.0

8B.4.11 The monitoring tube data suggests that the urban background monitoring sites have comparable or lower NO_2 concentrations that the Defra data, and therefore it was considered appropriate to use the Defra data for the assessment, as a worst case.

Ecological Site Background Data

8B.4.12 The NO_x concentrations are available from the APIS website for designated SAC, SPA and SSSI sites. The average concentrations present at the relevant habitat receptor sites are presented in Table 8B-14.

Table 8B-14: APIS Background Data NO_x

RECEPTOR ID	ECOLOGY SITE	BACKGROUND NO_x (µG/M^3)
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	16.1
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	17.7
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	17.7
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	17.7
OE2a	Teesmouth and Cleveland Coast SPA, SSSI	17.7
OE2b	Teesmouth and Cleveland Coast SPA, SSSI	18.6
OE2c	Teesmouth and Cleveland Coast SPA, SSSI	23.5
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	22.0
OE4	Eston Pumping Station LWS	18.9
OE5a	Teesmouth NNR	22.1

RECEPTOR ID	ECOLOGY SITE	BACKGROUND NO_x ($\mu G/M^3$)
OE5b	Teesmouth NNR	20.6
OE6	Teesmouth and Cleveland Coast SSSI	21.8

8B.4.13 In addition, the APIS website provides information on the relevant critical loads for the assessment of depositional impacts, as well as background nitrogen deposition and acid deposition load. This data has been presented in Table 8B-15.

Table 8B-15: APIS Background Deposition Information

RECEPTOR ID	ECOLOGY SITE	N-DEPOSITION	ACID DEPOSITION	
		(KG N/HA/YR)	(KEQ N/HA/YR)	(KEQ S/HA/YR)
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	9.27	0.72	0.21
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	10.14	0.72	0.21
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	10.14	0.72	0.21
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	10.14	0.72	0.21
OE2a	Teesmouth and Cleveland Coast SPA, SSSI	10.14	0.72	0.21
OE2b	Teesmouth and Cleveland Coast SPA, SSSI	9.38	0.72	0.21
OE2c	Teesmouth and Cleveland Coast SPA, SSSI	8.79	0.72	0.21
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	8.45	0.72	0.21
OE4	Eston Pumping Station LWS	7.86	0.72	0.21
OE5a	Teesmouth NNR	10.9	0.72	0.21

RECEPTOR ID	ECOLOGY SITE	N-DEPOSITION	ACID DEPOSITION	
		(KG N/HA/YR)	(KEQ N/HA/YR)	(KEQ S/HA/YR)
OE5b	Teesmouth NNR	10.9	0.72	0.21
OE6	Teesmouth and Cleveland Coast SSSI	10.14	0.72	0.21

8B.5 Summary of Background Air Quality

8B.5.1 For human health receptors, the background concentrations for nitrogen dioxide and CO have been taken from the Defra background mapping, as presented in Table 8B-12. Although the diffusion tube data for Dormanstown indicates slightly higher NO_2 concentrations, it is considered that as the Defra data and the automatic monitoring data at the same location show good correlation, this is most appropriate for use in the assessment.

8B.5.2 The background NO_x for ecological receptors were sourced from APIS using the specific location for the relevant ecological receptor, as detailed in Table 8B-13.

8B.5.3 There is little data on background amine concentrations in the UK and therefore background concentrations have been assumed to be zero as a worst case for the purpose of this assessment.

8B.5.4 Where no short-term concentrations are available, short-term background concentrations have been calculated by multiplying the selected annual mean background concentration by a factor of two, in accordance with the Environment Agency Risk Assessment methodology.

8B.5.5 To represent a conservative approach, it has been assumed that background concentrations would not decrease in future years. Therefore, the current background concentrations have been assumed to apply to the projected opening year of 2030

8B.6 Operational Emissions Modelling Results

Evaluation of Stack Height

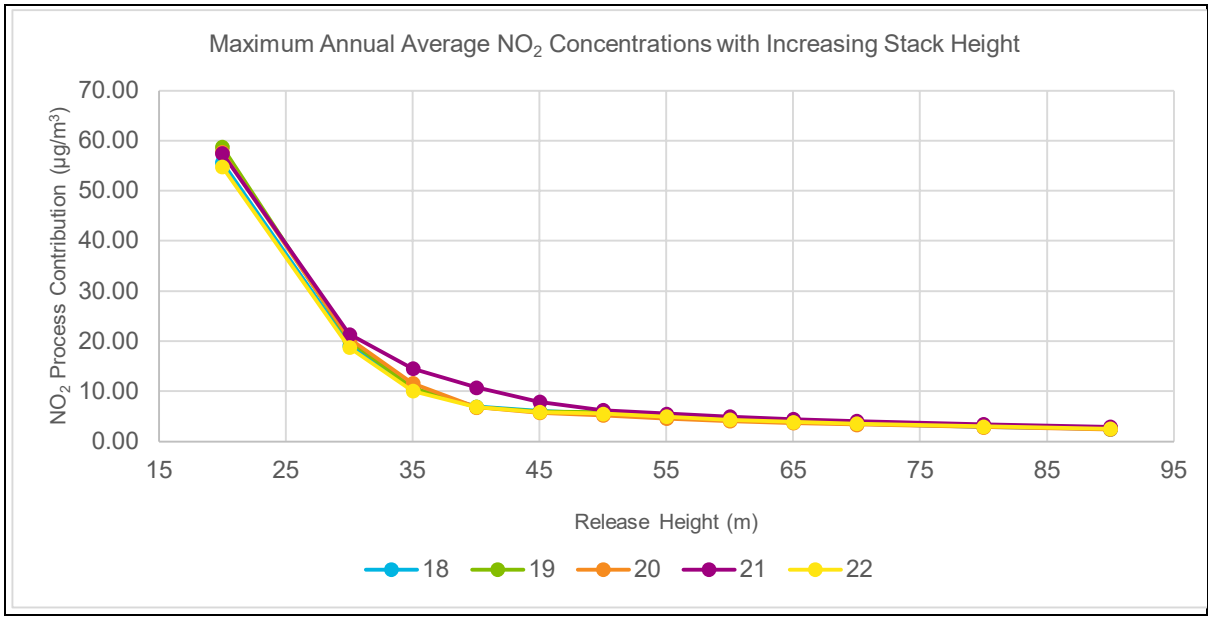
8B.6.1 The selection of an appropriate stack release height requires a number of factors to be taken into account, the most important of which is the need to balance a release height sufficient to achieve adequate dispersion of pollutants against other constraints such as the visual impact of tall stacks.

8B.6.2 Emissions from the Auxiliary Boiler and the Fired Heater stacks have been modelled at heights between 20 m and 90 m, at 5 m increments. For the flares, emissions have been modelled with an initial release height between 65m and 100m. Graphs for Case A results, showing the predicted ground level concentrations for the annual mean and maximum 1-hour NO_2 concentrations are presented in Plate 8B-2. The purpose of the graphs is to evaluate the optimum release height in terms of the

dispersion of pollutants which would occur, against the visual constraints of further increases in release height, with the 'elbow' of the resulting curve showing where the reductions in ground level concentrations become disproportionate to the increasing height.

8B.6.3 Analysis of the curves shows that the benefit of incremental increases in release heights of the Auxiliary Boiler and the Fired Heater after 40 m become less pronounced although at heights above 45 m, the air quality benefit of increasing release height further is reduced, with this levelling out after 65 m. A release height of 40 m for the Auxiliary Boilers and Fired Heater is predicted to provide a sufficient degree of dispersion such that ground level PCs are below the Environment Agency's 1% and 10% screening criteria for long term and short-term impacts respectively.

8B.6.4 For emissions from the flares, there is a predicted steady decline in ground level impacts with respect in an increase in release height, although there is no clear release height at which the rate of decline diminishes.



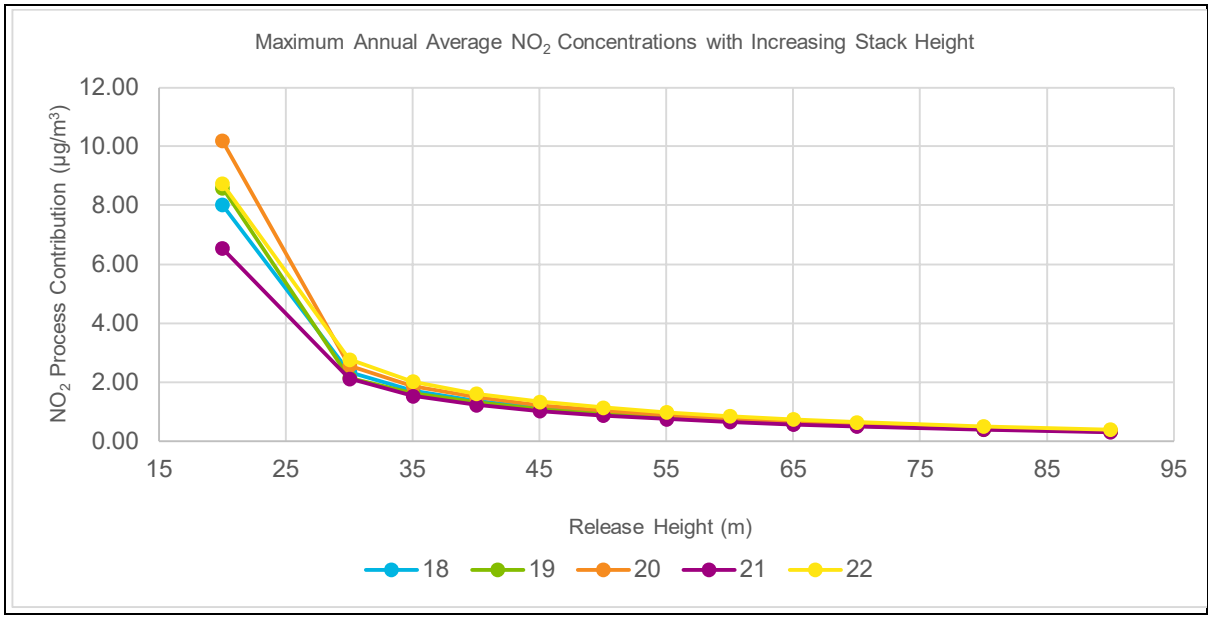


Plate 8B-2: Predicted Maximum Process Contribution to Ground Level NO_2 Concentrations at Stack Release Heights of 20m to 90m (Case A Phase 1 and 2 Fired Heater Only)

Human Health Receptor Results

Nitrogen dioxide emissions

8B.6.5 The predicted change in annual mean NO_2 concentrations that would occur during the operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-16 and Table 8B-17 for Case A and Case B scenarios respectively.

8B.6.6 The maximum predicted annual mean NO_2 concentration that occurs anywhere within the Study Area as a result of the Proposed Development is 1.7 µg/m^3, and this occurs at close to the northern boundary of the site, within the dunes of the Teesmouth and Cleveland Coast SSSI, SPA and RAMSAR site. The annual mean NO_2 predicted environmental concentration (i.e. the process contribution and the existing background concentration) is 14.9 µg/m^3 and therefore is below the annual mean NO_2 AQAL of 40 µg/m^3. NO_2 emissions from the Proposed Development are therefore not predicted to lead to a risk of the annual mean AQALs being exceeded anywhere within the Study Area.

8B.6.7 The discrete receptor most affected by long term emissions from the Proposed Development is receptor O3, South Gare Fisherman's Association with a predicted annual mean NO_2 concentration as a result of the Proposed Development of 0.3 µg/m^3, representing 0.8% of the AQAL.

8B.6.8 The significance of the predicted change in annual mean NO_2 concentrations in planning terms is discussed in Chapter 8: Air Quality (PEI Report, Volume I).

Table 8B-16: Predicted Change in Annual Mean NO_2 Concentrations – Case A, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	40	0.2	0.6%	13.3	13.5	33.8%
O2	40	0.3	0.7%	13.3	13.6	34.0%
O3	40	0.3	0.8%	13.3	13.6	34.1%
O4	40	0.3	0.7%	13.3	13.6	34.0%
O5	40	0.2	0.5%	13.3	13.5	33.8%
O6	40	0.1	0.3%	13.3	13.4	33.6%
O7	40	0.2	0.4%	13.3	13.5	33.7%
O8	40	0.1	0.3%	13.3	13.4	33.6%
O9	40	0.1	0.4%	13.3	13.4	33.6%

PC = Process Contribution, AQAL = Air Quality Assessment Level, BC = Background Concentration, PEC = Predicted Environmental Concentration

Table 8B-17: Predicted Change in Annual Mean NO_2 Concentrations – Case B, Normal Operation

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O1	40	0.2	0.6%	13.3	13.5	33.8%
O2	40	0.3	0.7%	13.3	13.6	34.0%
O3	40	0.3	0.8%	13.3	13.6	34.1%
O4	40	0.3	0.7%	13.3	13.6	34.0%
O5	40	0.2	0.5%	13.3	13.5	33.8%
O6	40	0.1	0.4%	13.3	13.4	33.6%
O7	40	0.2	0.4%	13.3	13.5	33.7%
O8	40	0.1	0.3%	13.3	13.4	33.6%
O9	40	0.1	0.3%	13.3	13.4	33.6%

PC = Process Contribution, AQAL = Air Quality Assessment Level, BC = Background Concentration, PEC = Predicted Environmental Concentration

8B.6.9 The predicted change in hourly mean NO_2 concentrations (as the 99.79th percentile of hourly averages) that would occur during the operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-18 to Table 8B-23 for Case A and Case B scenarios.

8B.6.10 The maximum predicted hourly mean NO_2 concentration (as the 99.79th percentile of hourly averages) during Normal Operation that occurs anywhere within the Study Area as a result of the Proposed Development is 9.3 µg/m^3, and this occurs again just to the north of the operational Proposed Development. The predicted environmental concentration (i.e., the process contribution and the existing background concentration) is 35.9 µg/m^3 and therefore is well below the hourly mean NO_2 AQAL of 200 µg/m^3.

8B.6.11 During the Start Up Scenario, the maximum predicted hourly mean NO_2 concentration (as the 99.79th percentile of hourly averages) during that occurs anywhere within the Study Area as a result of the Proposed Development is 5.4 µg/m^3, and this occurs to the south of the operational Proposed Development. The predicted environmental concentration (i.e., the process contribution and the existing background concentration) is 32.0 µg/m^3 and therefore is well below the hourly mean NO_2 AQAL of 200 µg/m^3.

8B.6.12 During the Emergency Scenario, the maximum predicted hourly mean NO_2 concentration (as the 99.79th percentile of hourly averages) during that occurs anywhere within the Study Area as a result of the Proposed Development is 69.5 µg/m^3, and this occurs to the south-west of the operational Proposed Development. The predicted environmental concentration (i.e., the process contribution and the existing background concentration) is 96.1 µg/m^3 and therefore is well below the hourly mean NO_2 AQAL of 200 µg/m^3.

8B.6.13 The discrete receptor most affected by short term emissions from the Proposed Development is receptor O3, South Gare Fisherman's Association, with a predicted hourly mean NO_2 Process Contribution as a result of the Proposed Development of 2.6 µg/m^3, and a PEC of 29.2 µg/m^3 during the Case B normal operation.

8B.6.14 NO_2 emissions from the Proposed Development are therefore not predicted to lead to a risk of the hourly mean air quality standard being exceeded anywhere within the Study Area.

Table 8B-18: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Case A, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	200	2.0	1.0%	26.6	28.6	14.3%
O2	200	2.1	1.0%	26.6	28.7	14.4%
O3	200	2.4	1.2%	26.6	29.0	14.5%
O4	200	2.3	1.1%	26.6	28.9	14.5%
O5	200	2.0	1.0%	26.6	28.7	14.3%
O6	200	1.9	1.0%	26.6	28.5	14.3%
O7	200	1.9	1.0%	26.6	28.5	14.3%
O8	200	1.9	0.9%	26.6	28.5	14.2%
O9	200	1.9	0.9%	26.6	28.5	14.3%

Table 8B-19: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Case B, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	200	2.0	1.0%	26.6	28.7	14.3%
O2	200	2.2	1.1%	26.6	28.8	14.4%
O3	200	2.6	1.3%	26.6	29.2	14.6%

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O4	200	2.5	1.3%	26.6	29.2	14.6%
O5	200	2.2	1.1%	26.6	28.8	14.4%
O6	200	2.1	1.1%	26.6	28.7	14.4%
O7	200	2.1	1.0%	26.6	28.7	14.3%
O8	200	1.9	1.0%	26.6	28.5	14.3%
O9	200	2.0	1.0%	26.6	28.6	14.3%

Table 8B-20: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Case A, Start Up Scenario

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O1	200	3.0	1.5%	26.6	29.6	14.8%
O2	200	3.1	1.5%	26.6	29.7	14.9%
O3	200	3.2	1.6%	26.6	29.8	14.9%
O4	200	3.1	1.5%	26.6	29.7	14.8%
O5	200	2.7	1.4%	26.6	29.3	14.7%
O6	200	2.6	1.3%	26.6	29.2	14.6%
O7	200	2.6	1.3%	26.6	29.2	14.6%

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O8	200	2.3	1.1%	26.6	28.9	14.4%
O9	200	2.3	1.2%	26.6	29.0	14.5%

Table 8B-21: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Case B, Start Up Scenario

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	200	2.7	1.3%	26.6	29.3	14.6%
O2	200	2.8	1.4%	26.6	29.4	14.7%
O3	200	2.9	1.5%	26.6	29.5	14.8%
O4	200	2.8	1.4%	26.6	29.4	14.7%
O5	200	2.5	1.3%	26.6	29.1	14.6%
O6	200	2.4	1.2%	26.6	29.0	14.5%
O7	200	2.4	1.2%	26.6	29.0	14.5%
O8	200	2.1	1.1%	26.6	28.8	14.4%
O9	200	2.2	1.1%	26.6	28.8	14.4%

Table 8B-22: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Case A, Emergency Scenario

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	200	6.1	3.1%	26.6	32.7	16.4%
O2	200	6.1	3.0%	26.6	32.7	16.4%
O3	200	6.0	3.0%	26.6	32.6	16.3%
O4	200	5.7	2.9%	26.6	32.3	16.2%
O5	200	5.2	2.6%	26.6	31.9	15.9%
O6	200	5.2	2.6%	26.6	31.8	15.9%
O7	200	5.1	2.5%	26.6	31.7	15.8%
O8	200	5.0	2.5%	26.6	31.6	15.8%
O9	200	4.9	2.5%	26.6	31.5	15.8%

Table 8B-23: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Case B, Emergency Scenario

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	200	5.8	2.9%	26.6	32.4	16.2%
O2	200	5.1	2.6%	26.6	31.7	15.9%
O3	200	4.1	2.1%	26.6	30.8	15.4%

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O4	200	4.0	2.0%	26.6	30.6	15.3%
O5	200	4.6	2.3%	26.6	31.2	15.6%
O6	200	4.0	2.0%	26.6	30.6	15.3%
O7	200	4.3	2.2%	26.6	30.9	15.5%
O8	200	3.5	1.8%	26.6	30.2	15.1%
O9	200	3.8	1.9%	26.6	30.5	15.2%

Carbon Monoxide emissions

8B.6.15 The predicted change in the maximum 8 hour rolling mean CO concentrations that would occur during the operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-24 to Table 8B-29 for Case A and Case B scenarios.

8B.6.16 The maximum 8-hour rolling mean CO PC that is predicted to occur anywhere in the study area as a result of the Proposed Development is less than 1% of the relevant AQAL. In addition, the maximum predicted PEC at any receptor is 1.4%, while at the point of maximum impact it is 1.6%. This is predicted to occur during Emergency operation scenario, and during normal operation the PC and PECs are predicted to be lower. It is considered that PC of carbon monoxide would be unlikely to give rise to significant effects at any receptor location during all modelled scenarios.

Table 8B-24: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Case A, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	10,000	2.7	0.0%	110.9	113.6	1.1%
O2	10,000	3.0	0.0%	110.9	113.9	1.1%
O3	10,000	2.9	0.0%	110.9	113.8	1.1%
O4	10,000	3.0	0.0%	110.9	113.9	1.1%
O5	10,000	2.8	0.0%	110.9	113.7	1.1%
O6	10,000	2.4	0.0%	110.9	113.3	1.1%
O7	10,000	2.4	0.0%	110.9	113.3	1.1%
O8	10,000	2.1	0.0%	110.9	113.0	1.1%
O9	10,000	2.4	0.0%	110.9	113.3	1.1%

Table 8B-25: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Case B, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	10,000	1.8	0.0%	110.9	112.7	1.1%
O2	10,000	2.0	0.0%	110.9	112.9	1.1%
O3	10,000	1.9	0.0%	110.9	112.8	1.1%

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O4	10,000	2.0	0.0%	110.9	112.9	1.1%
O5	10,000	2.0	0.0%	110.9	112.9	1.1%
O6	10,000	1.7	0.0%	110.9	112.6	1.1%
O7	10,000	1.8	0.0%	110.9	112.7	1.1%
O8	10,000	1.5	0.0%	110.9	112.4	1.1%
O9	10,000	1.8	0.0%	110.9	112.7	1.1%

Table 8B-26: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Case A, Start Up Scenario

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O1	10,000	27.9	0.3%	110.9	138.8	1.4%
O2	10,000	29.9	0.3%	110.9	140.8	1.4%
O3	10,000	28.7	0.3%	110.9	139.6	1.4%
O4	10,000	28.4	0.3%	110.9	139.3	1.4%
O5	10,000	26.0	0.3%	110.9	136.9	1.4%
O6	10,000	23.6	0.2%	110.9	134.5	1.3%
O7	10,000	23.3	0.2%	110.9	134.2	1.3%

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O8	10,000	23.8	0.2%	110.9	134.7	1.3%
O9	10,000	21.4	0.2%	110.9	132.3	1.3%

Table 8B-27: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Case B, Start Up Scenario

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	10,000	30.1	0.3%	110.9	141.0	1.4%
O2	10,000	31.8	0.3%	110.9	142.7	1.4%
O3	10,000	30.7	0.3%	110.9	141.6	1.4%
O4	10,000	30.0	0.3%	110.9	140.9	1.4%
O5	10,000	27.4	0.3%	110.9	138.3	1.4%
O6	10,000	24.6	0.2%	110.9	135.5	1.4%
O7	10,000	24.4	0.2%	110.9	135.3	1.4%
O8	10,000	24.8	0.2%	110.9	135.7	1.4%
O9	10,000	22.4	0.2%	110.9	133.3	1.3%

Table 8B-28: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Case A, Emergency Scenario

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	10,000	30.0	0.3%	110.9	140.9	1.4%
O2	10,000	31.9	0.3%	110.9	142.8	1.4%
O3	10,000	30.5	0.3%	110.9	141.4	1.4%
O4	10,000	30.2	0.3%	110.9	141.1	1.4%
O5	10,000	27.4	0.3%	110.9	138.3	1.4%
O6	10,000	24.9	0.2%	110.9	135.8	1.4%
O7	10,000	24.5	0.2%	110.9	135.4	1.4%
O8	10,000	24.9	0.2%	110.9	135.8	1.4%
O9	10,000	22.5	0.2%	110.9	133.4	1.3%

Table 8B-29: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Case B, Emergency Scenario

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	10,000	30.4	0.3%	110.9	141.3	1.4%
O2	10,000	32.3	0.3%	110.9	143.2	1.4%
O3	10,000	31.3	0.3%	110.9	142.2	1.4%

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O4	10,000	30.4	0.3%	110.9	141.3	1.4%
O5	10,000	27.8	0.3%	110.9	138.7	1.4%
O6	10,000	25.6	0.3%	110.9	136.5	1.4%
O7	10,000	24.8	0.2%	110.9	135.7	1.4%
O8	10,000	25.5	0.3%	110.9	136.4	1.4%
O9	10,000	22.8	0.2%	110.9	133.7	1.3%

Particulate Matter (PM_{10})

8B.6.17 The predicted change in annual mean PM_{10} concentrations that would occur during the operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-30 and Table 8B-31 for Case A and Case B scenarios respectively. The predicted change in the 90.41th percentile of 24 hour (daily) mean PM_{10} concentrations are shown in Table 8B-32 to Table 8B-37.

8B.6.18 The annual mean PM_{10} PC that is predicted to occur anywhere in the study area as a result of the Proposed Development is less than 1% of the relevant AQALs for both long-term (annual mean) and short-term (daily mean) impacts. In addition, the maximum predicted short-term PEC at any receptor is 38.7%, while at the point of maximum impact it is 39.1%. This is predicted to occur during Emergency operation scenario, and during normal operation the PC and PECs are predicted to be lower. It is considered that the PC of PM_{10} would be unlikely to give rise to significant effects at any receptor location during all modelled scenarios.

Table 8B-30: Predicted Change in Annual Mean PM_{10} Concentrations – Case A, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	40	0.01	0.0%	9.6	9.6	24.0%
O2	40	0.01	0.0%	9.6	9.6	24.0%
O3	40	0.01	0.0%	9.6	9.6	24.0%
O4	40	0.01	0.0%	9.6	9.6	24.0%
O5	40	0.01	0.0%	9.6	9.6	24.0%
O6	40	0.01	0.0%	9.6	9.6	24.0%
O7	40	0.01	0.0%	9.6	9.6	24.0%
O8	40	0.00	0.0%	9.6	9.6	24.0%
O9	40	0.01	0.0%	9.6	9.6	24.0%

Table 8B-31: Predicted Change in Annual Mean PM_{10} Concentrations – Case B, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	40	0.03	0.1%	9.6	9.6	24.0%
O2	40	0.04	0.1%	9.6	9.6	24.1%
O3	40	0.05	0.1%	9.6	9.6	24.1%

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O4	40	0.04	0.1%	9.6	9.6	24.1%
O5	40	0.03	0.1%	9.6	9.6	24.0%
O6	40	0.02	0.0%	9.6	9.6	24.0%
O7	40	0.02	0.1%	9.6	9.6	24.0%
O8	40	0.02	0.0%	9.6	9.6	24.0%
O9	40	0.02	0.0%	9.6	9.6	24.0%

Table 8B-32: Predicted Change in 24 Hour Mean PM_{10} Concentrations (as the 90.41th Percentile of 24 Hour averages) – Case A, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	50	0.03	0.1%	19.2	19.2	38.4%
O2	50	0.04	0.1%	19.2	19.2	38.4%
O3	50	0.04	0.1%	19.2	19.2	38.4%
O4	50	0.04	0.1%	19.2	19.2	38.4%
O5	50	0.03	0.1%	19.2	19.2	38.4%
O6	50	0.02	0.0%	19.2	19.2	38.4%
O7	50	0.02	0.0%	19.2	19.2	38.4%

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O8	50	0.01	0.0%	19.2	19.2	38.4%
O9	50	0.02	0.0%	19.2	19.2	38.4%

Table 8B-33: Predicted Change in 24 Hour Mean PM_{10} Concentrations (as the 90.41th Percentile of 24 Hour averages) – Case B, Normal Operation

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O1	50	0.1	0.2%	19.2	19.3	38.6%
O2	50	0.1	0.3%	19.2	19.3	38.6%
O3	50	0.2	0.4%	19.2	19.4	38.7%
O4	50	0.2	0.3%	19.2	19.3	38.7%
O5	50	0.1	0.2%	19.2	19.3	38.6%
O6	50	0.1	0.1%	19.2	19.2	38.5%
O7	50	0.1	0.2%	19.2	19.3	38.5%
O8	50	0.1	0.1%	19.2	19.2	38.5%
O9	50	0.1	0.2%	19.2	19.3	38.5%

Table 8B-34: Predicted Change in 24 Hour Mean PM_{10} Concentrations (as the 90.41th Percentile of 24 Hour averages) – Case A, Start Up Scenario

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	50	0.2	0.4%	19.2	19.4	38.8%
O2	50	0.3	0.7%	19.2	19.5	39.0%
O3	50	0.3	0.7%	19.2	19.5	39.0%
O4	50	0.3	0.5%	19.2	19.4	38.9%
O5	50	0.2	0.5%	19.2	19.4	38.8%
O6	50	0.1	0.3%	19.2	19.3	38.6%
O7	50	0.2	0.4%	19.2	19.4	38.8%
O8	50	0.1	0.2%	19.2	19.3	38.6%
O9	50	0.2	0.4%	19.2	19.4	38.7%

Table 8B-35: Predicted Change in 24 Hour Mean PM_{10} Concentrations (as the 90.41th Percentile of 24 Hour averages) – Case B, Start Up Scenario

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	50	0.2	0.3%	19.2	19.3	38.7%
O2	50	0.3	0.5%	19.2	19.4	38.9%
O3	50	0.2	0.5%	19.2	19.4	38.8%

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O4	50	0.2	0.3%	19.2	19.3	38.7%
O5	50	0.2	0.4%	19.2	19.4	38.8%
O6	50	0.1	0.2%	19.2	19.3	38.5%
O7	50	0.2	0.3%	19.2	19.3	38.7%
O8	50	0.1	0.2%	19.2	19.3	38.5%
O9	50	0.1	0.3%	19.2	19.3	38.6%

Table 8B-36: Predicted Change in 24 Hour Mean PM_{10} Concentrations (as the 90.41th Percentile of 24 Hour averages) – Case A, Emergency Scenario

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O1	50	0.1	0.2%	19.2	19.3	38.5%
O2	50	0.2	0.3%	19.2	19.3	38.7%
O3	50	0.1	0.3%	19.2	19.3	38.6%
O4	50	0.1	0.2%	19.2	19.3	38.5%
O5	50	0.1	0.3%	19.2	19.3	38.6%
O6	50	0.1	0.1%	19.2	19.2	38.4%
O7	50	0.1	0.2%	19.2	19.3	38.6%

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O8	50	0.0	0.1%	19.2	19.2	38.4%
O9	50	0.1	0.2%	19.2	19.3	38.5%

Table 8B-37: Predicted Change in 24 Hour Mean PM_{10} Concentrations (as the 90.41th Percentile of 24 Hour averages) – Case B, Emergency Scenario

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O1	50	0.1	0.2%	19.2	19.3	38.6%
O2	50	0.2	0.4%	19.2	19.4	38.7%
O3	50	0.2	0.3%	19.2	19.3	38.7%
O4	50	0.1	0.2%	19.2	19.3	38.6%
O5	50	0.2	0.3%	19.2	19.3	38.7%
O6	50	0.1	0.1%	19.2	19.2	38.5%
O7	50	0.1	0.2%	19.2	19.3	38.6%
O8	50	0.1	0.1%	19.2	19.2	38.5%
O9	50	0.1	0.2%	19.2	19.3	38.6%

Particulate Matter ($PM_{2.5}$)

8B.6.19 The predicted change in annual mean $PM_{2.5}$ concentrations that would occur during the operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-38 and Table 8B-39 for Case A and Case B scenarios respectively.

8B.6.20 The annual mean $PM_{2.5}$ PC that is predicted to occur anywhere in the study area as a result of the Proposed Development is less than 1% of the relevant AQAL. In addition, the maximum predicted short-term PEC at any receptor is 31.7%, while at the point of maximum impact it is 32.7%. This is predicted to occur during normal operation. It is considered that the PC of $PM_{2.5}$ would be unlikely to give rise to significant effects at any receptor location during all modelled scenarios.

Table 8B-38: Predicted Change in Annual Mean $PM_{2.5}$ Concentrations – Case A, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	20	0.01	0.0%	6.3	6.3	31.5%
O2	20	0.01	0.1%	6.3	6.3	31.5%
O3	20	0.01	0.1%	6.3	6.3	31.5%
O4	20	0.01	0.1%	6.3	6.3	31.5%
O5	20	0.01	0.0%	6.3	6.3	31.4%
O6	20	0.01	0.0%	6.3	6.3	31.4%
O7	20	0.01	0.0%	6.3	6.3	31.4%
O8	20	0.00	0.0%	6.3	6.3	31.4%
O9	20	0.01	0.0%	6.3	6.3	31.4%

Table 8B-39: Predicted Change in Annual Mean $PM_{2.5}$ Concentrations – Case B, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	20	0.03	0.2%	6.3	6.3	31.6%
O2	20	0.04	0.2%	6.3	6.3	31.6%
O3	20	0.05	0.2%	6.3	6.3	31.7%

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O4	20	0.04	0.2%	6.3	6.3	31.6%
O5	20	0.03	0.1%	6.3	6.3	31.5%
O6	20	0.02	0.1%	6.3	6.3	31.5%
O7	20	0.02	0.1%	6.3	6.3	31.5%
O8	20	0.02	0.1%	6.3	6.3	31.5%
O9	20	0.02	0.1%	6.3	6.3	31.5%

Sulphur Dioxide

8B.6.21 The predicted change in SO_2 concentrations that would occur during the operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-40 and Table 8B-45 for Case A and Case B scenarios.

8B.6.22 The SO_2 PC that is predicted to occur anywhere in the study area as a result of the Proposed Development is less than 1% of the relevant AQALs for short-term (24 hour mean, 1 hour mean and 15-minute mean) impacts. In addition, the maximum predicted short-term PEC at any receptor is 3.7% for the 24-hour mean, while at the point of maximum impact it is 5.1%. For all other averaging periods, the PC and PEC are predicted to be lower. It is considered that the PC of SO_2 would be unlikely to give rise to significant effects at any receptor location during all modelled scenarios.

Table 8B-40: Predicted Change in 15 Minute Mean SO_2 Concentrations (as the 99.9th Percentile of 15 Minute averages) – Case A, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	260	1.2	0.5%	4.0	5.3	1.5%
O2	260	1.2	0.5%	4.0	5.3	1.5%
O3	260	1.3	0.5%	4.0	5.4	1.5%
O4	260	1.5	0.6%	4.0	5.5	1.6%
O5	260	1.2	0.5%	4.0	5.2	1.5%
O6	260	1.2	0.5%	4.0	5.2	1.5%
O7	260	1.1	0.4%	4.0	5.2	1.5%
O8	260	1.3	0.5%	4.0	5.3	1.5%
O9	260	1.2	0.5%	4.0	5.2	1.5%

Table 8B-41: Predicted Change in 15 Minute Mean SO_2 Concentrations (as the 99.9th Percentile of 15 Minute averages) – Case B, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	260	0.9	0.3%	4.0	4.9	1.4%
O2	260	0.9	0.3%	4.0	4.9	1.4%
O3	260	1.0	0.4%	4.0	5.0	1.4%

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O4	260	1.0	0.4%	4.0	5.0	1.4%
O5	260	0.9	0.3%	4.0	4.9	1.4%
O6	260	0.8	0.3%	4.0	4.9	1.4%
O7	260	0.8	0.3%	4.0	4.9	1.4%
O8	260	0.8	0.3%	4.0	4.8	1.4%
O9	260	0.8	0.3%	4.0	4.9	1.4%

Table 8B-42: Predicted Change in 1 Hour Mean SO_2 Concentrations (as the 99.73th Percentile of 1 Hour averages) – Case A, Normal Operation

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O1	350	1.0	0.3%	4.0	5.0	1.4%
O2	350	1.0	0.3%	4.0	5.1	1.4%
O3	350	1.1	0.3%	4.0	5.2	1.5%
O4	350	1.1	0.3%	4.0	5.2	1.5%
O5	350	1.0	0.3%	4.0	5.0	1.4%
O6	350	0.9	0.3%	4.0	5.0	1.4%
O7	350	0.9	0.3%	4.0	5.0	1.4%

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O8	350	0.9	0.3%	4.0	4.9	1.4%
O9	350	0.9	0.3%	4.0	5.0	1.4%

Table 8B-43: Predicted Change in 1 Hour Mean SO_2 Concentrations (as the 99.73th Percentile of 1 Hour averages) – Case B, Normal Operation

RECEPTOR	AQAL ($\mu G/M^3$)	PREDICTED CONCENTRATION (PC) ($\mu G/M^3$)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) ($\mu G/M^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu G/M^3$)	PEC/AQAL (%)
O1	350	0.7	0.2%	4.0	4.7	1.3%
O2	350	0.7	0.2%	4.0	4.7	1.4%
O3	350	0.8	0.2%	4.0	4.9	1.4%
O4	350	0.8	0.2%	4.0	4.8	1.4%
O5	350	0.7	0.2%	4.0	4.8	1.4%
O6	350	0.7	0.2%	4.0	4.7	1.3%
O7	350	0.7	0.2%	4.0	4.7	1.3%
O8	350	0.6	0.2%	4.0	4.7	1.3%
O9	350	0.6	0.2%	4.0	4.7	1.3%

Table 8B-44: Predicted Change in 24 Hour Mean SO_2 Concentrations (as the 99.18th Percentile of 24 Hour averages) – Case A, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	125	0.5	0.4%	4.0	4.5	3.6%
O2	125	0.5	0.4%	4.0	4.6	3.7%
O3	125	0.5	0.4%	4.0	4.6	3.7%
O4	125	0.5	0.4%	4.0	4.6	3.7%
O5	125	0.4	0.3%	4.0	4.4	3.6%
O6	125	0.5	0.4%	4.0	4.5	3.6%
O7	125	0.3	0.3%	4.0	4.4	3.5%
O8	125	0.4	0.3%	4.0	4.4	3.5%
O9	125	0.3	0.2%	4.0	4.3	3.5%

Table 8B-45: Predicted Change in 24 Hour Mean SO_2 Concentrations (as the 99.18th Percentile of 24 Hour averages) – Case B, Normal Operation

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O1	125	0.3	0.3%	4.0	4.4	3.5%
O2	125	0.4	0.3%	4.0	4.4	3.5%
O3	125	0.3	0.3%	4.0	4.4	3.5%

RECEPTOR	AQAL (µG/M^3)	PREDICTED CONCENTRATION (PC) (µG/M^3)	PC/AQAL (%)	BACKGROND CONCENTRATION (BC) (µG/M^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µG/M^3)	PEC/AQAL (%)
O4	125	0.3	0.3%	4.0	4.4	3.5%
O5	125	0.3	0.2%	4.0	4.3	3.4%
O6	125	0.3	0.2%	4.0	4.3	3.5%
O7	125	0.2	0.2%	4.0	4.3	3.4%
O8	125	0.2	0.2%	4.0	4.3	3.4%
O9	125	0.2	0.2%	4.0	4.2	3.4%

Ecological Receptors Results

8B.6.23 The results of the dispersion modelling of predicted impacts on sensitive ecological receptors are presented in Table 8B-46 to Table 8B-53. The tables set out the predicted PC to atmospheric concentrations of NOx and SO_2 and also nutrient nitrogen and acid deposition.

8B.6.24 Specific significance criteria relating to impacts on sensitive designated ecological receptors are set out within the Environmental Agency air emissions risk assessment guidance. The impact of stack emissions can be regarded as insignificant at sites with statutory designations if:

- The long-term PC is less than 1% of the critical level, or if greater than 1% then the PEC is less than 70% of the critical level.
- The short-term PC is less than 10% of the critical level.

8B.6.25 The impact of stack emissions can be regarded as insignificant at sites of local importance if:

- The long-term PC is less than 100% of the critical level.
- The short-term PC is less than 100% of the critical level

8B.6.26 The effect of atmospheric NOx concentrations, nitrogen deposition rates and acid deposition rates on the modelled receptor locations have been considered in detail in the Habitats Regulations Assessment Report (Document Ref. 5.13) submitted with the Application. Further discussion on the significance of the impact on sensitive ecological receptors is provided in Chapter 12: Terrestrial Ecology and Nature Conservation (PEI Report, Volume I).

Oxides of nitrogen emissions – Critical Levels

8B.6.27 The assessment results show that the predicted annual average NOx impacts are below the criteria for likely insignificance at nice of the 12 receptors, and predicted daily averages are below the criteria for likely significance at 6 of the 12 receptors.

8B.6.28 PCs of more than 1% of the long-term critical level and 10% of the daily critical level for NOx occur at the adjacent Teesmouth and Cleveland Coast SPA, SSSI and Ramsar, and the Coatham Marsh LWS.

8B.6.29 The annual average PEC at the Teesmouth and Cleveland Coast site is 68% of the annual average critical level and 61% of the daily average critical level respectively. The annual average value is therefore just under 70% of the critical level threshold for likely insignificance.

8B.6.30 The daily critical level screening criteria is predicted to be exceeded for the Teesmouth and Cleveland Coast SSSI, however there is also no exceedance of the daily average critical level predicted. Significant effects at this location cannot be screened out based on the critical level criteria, and further assessment of the effects of oxides of nitrogen impacts from the Proposed Development has been undertaken in Chapter 12: Terrestrial Ecology and Nature Conservation (PEI Report, Volume I).

8B.6.31 Annual average impacts at the Coatham Marsh LWS represent 1.1% of the critical level and is well below the 100% threshold for likely insignificance at sites of local importance.

8B.6.32 The background NOx concentration at the site represents 90% of the critical level without the contribution from the Proposed Development, and therefore the PEC represents 74.5% of the annual critical level. This is below the level of likely insignificance for LWSs. The daily PC represents 5% of the critical level, and therefore is screened as being likely insignificant.

8B.6.33 Due to the worst-case assumptions used in the assessment, it is considered that the predicted impacts are conservative and that an exceedance of the critical level is unlikely to occur as a result of the emissions from the operational development.

Sulphur Dioxide – Critical Levels

8B.6.34 The assessment results show that the predicted annual average SO_2 impacts are below the criteria for likely insignificance (<1% of the critical level) at nine of the twelve receptors, and therefore can be considered as likely to be insignificant. The predicted annual average SO_2 impacts at parts of the Teesmouth and Cleveland coast receptor are slightly over the threshold of insignificance at 1.7% of the critical level, however in combination with the background concentration it represents only 11% of the critical level and therefore can be considered likely to be insignificant.

Nitrogen deposition – Critical Loads

8B.6.35 The Environment Agency and Natural England have agreed that depositional impacts that are below 1% of the relevant critical load for a site can be regarded as likely to be insignificant. Guidance from the Institute of Air Quality Management clarifies that the 1% threshold is not intended to be precise to a set number of decimal places but to the nearest whole number (paragraph 5.5.2.6 of Institute of Air Quality Management, 2020[1]). Further interpretation of the significance of the depositional results is provided in Chapter 12: Terrestrial Ecology and Nature Conservation (PEI Report, Volume I).

[1] Institute of Air Quality Management (2020). A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites, Version 1.1 [Online]. Available from: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf

Table 8B-46: NO_x Dispersion Modelling Results for Ecological Receptors – Case A

RECEPTOR ID	SITE NAME	ANNUAL AVERAGE (µG/M^3)					24 HOUR AVERAGE (µG/M^3)					
		CL	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	CRITICAL LEVEL (CL)	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	PEC % OF CL
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	30	1.05	3.5%	16.1	17.2	75	7.84	10.5%	32.2	40.0	53.4%
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		1.70	5.7%	17.7	19.4		10.69	14.3%	35.4	46.1	61.4%
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		1.25	4.2%	17.7	18.9		8.73	11.6%	35.4	44.1	58.8%
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		0.48	1.6%	17.7	18.2		6.08	8.1%	35.4	41.5	55.3%
OE2a	Teesmouth and Cleveland Coast SPA, SSSI		1.90	6.3%	17.7	19.6		11.00	14.7%	35.4	46.4	61.8%
OE2b	Teesmouth and Cleveland Coast SPA, SSSI		1.80	6.0%	18.6	20.4		12.74	17.0%	37.2	50.0	66.6%
OE2c	Teesmouth and Cleveland Coast SPA, SSSI		0.53	1.8%	23.5	24.0		10.66	14.2%	47.0	57.7	76.9%

RECEPTOR ID	SITE NAME	ANNUAL AVERAGE (µG/M^3)					24 HOUR AVERAGE (µG/M^3)					
		CL	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	CRITICAL LEVEL (CL)	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	PEC % OF CL
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		0.33	1.1%	22.0	22.4		3.77	5.0%	44.1	47.8	63.8%
OE4	Eston Pumping Station LWS		0.28	0.9%	18.9	19.2		4.28	5.7%	37.9	42.1	56.2%
OE5a	Teesmouth NNR		0.13	0.4%	22.1	22.2		2.46	3.3%	44.2	46.6	62.2%
OE5b	Teesmouth NNR		0.07	0.2%	20.6	20.6		1.99	2.7%	41.1	43.1	57.5%
OE6	Teesmouth and Cleveland Coast SSSI		0.61	2.0%	21.8	22.4		6.92	9.2%	43.6	50.5	67.3%

Table 8B-47: NO_x Dispersion Modelling Results for Ecological Receptors – Case B

RECEPTOR ID	SITE NAME	ANNUAL AVERAGE (µG/M^3)					24 HOUR AVERAGE (µG/M^3)					
		CL	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	CRITICAL LEVEL (CL)	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	PEC % OF CL
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	30	1.01	3.4%	16.1	17.1	75	6.75	9.0%	32.2	38.9	51.9%

RECEPTOR ID	SITE NAME	ANNUAL AVERAGE (µG/M^3)					24 HOUR AVERAGE (µG/M^3)					
		CL	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	CRITICAL LEVEL (CL)	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	PEC % OF CL
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		1.76	5.9%	17.7	19.5		10.69	14.3%	35.38	46.1	61.4%
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		1.38	4.6%	17.7	19.1		10.09	13.5%	35.38	45.5	60.6%
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		0.49	1.6%	17.7	18.2		6.29	8.4%	35.38	41.7	55.6%
OE2a	Teesmouth and Cleveland Coast SPA, SSSI		2.25	7.5%	17.7	19.9		12.01	16.0%	35.38	47.4	63.2%
OE2b	Teesmouth and Cleveland Coast SPA, SSSI		1.80	6.0%	18.6	20.4		11.03	14.7%	37.22	48.3	64.3%
OE2c	Teesmouth and Cleveland Coast SPA, SSSI		0.54	1.8%	23.5	24.1		9.53	12.7%	47.02	56.6	75.4%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		0.33	1.1%	22.0	22.4		3.92	5.2%	44.06	48.0	64.0%

RECEPTOR ID	SITE NAME	ANNUAL AVERAGE (µG/M^3)					24 HOUR AVERAGE (µG/M^3)					
		CL	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	CRITICAL LEVEL (CL)	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	PEC % OF CL
OE4	Eston Pumping Station LWS		0.29	1.0%	18.9	19.2		4.00	5.3%	37.86	41.9	55.8%
OE5a	Teesmouth NNR		0.13	0.4%	22.1	22.2		2.52	3.4%	44.18	46.7	62.3%
OE5b	Teesmouth NNR		0.07	0.2%	20.6	20.6		2.13	2.8%	41.12	43.2	57.7%
OE6	Teesmouth and Cleveland Coast SSSI		0.62	2.1%	21.8	22.4		7.32	9.8%	43.58	50.9	67.9%

Table 8B-48: SO_2 Dispersion Modelling Results for Ecological Receptors - Case A

RECEPTOR ID	SITE NAME	ANNUAL AVERAGE (µG/M^3)					
		CL	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	PEC % OF CL
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	20	0.9%	1.8	1.98	9.9%	0.9%
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		1.5%	1.9	2.15	10.7%	1.5%
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		1.1%	1.8	2.05	10.2%	1.1%
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		0.4%	2.1	2.21	11.1%	0.4%
OE2a	Teesmouth and Cleveland Coast SPA, SSSI		1.7%	1.9	2.18	10.9%	1.7%
OE2b	Teesmouth and Cleveland Coast SPA, SSSI		1.6%	2.0	2.33	11.7%	1.6%
OE2c	Teesmouth and Cleveland Coast SPA, SSSI		0.5%	2.4	2.49	12.5%	0.5%

RECEPTOR ID	SITE NAME	ANNUAL AVERAGE (µG/M^3)					
		CL	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	PEC % OF CL
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		0.3%	4.1	4.16	20.8%	0.3%
OE4	Eston Pumping Station LWS		0.2%	2.6	2.60	13.0%	0.2%
OE5a	Teesmouth NNR		0.1%	2.2	2.18	10.9%	0.1%
OE5b	Teesmouth NNR		0.1%	2.2	2.25	11.3%	0.1%
OE6	Teesmouth and Cleveland Coast SSSI		0.5%	2.1	2.24	11.2%	0.5%

Table 8B-49: SO_2 Dispersion Modelling Results for Ecological Receptors - Case B

RECEPTOR ID	SITE NAME	ANNUAL AVERAGE (µG/M^3)					
		CL	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	PEC % OF CL
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	20	0.12	0.6%	1.8	1.9	9.6%
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		0.21	1.1%	1.9	2.1	10.3%
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		0.15	0.7%	1.8	2.0	9.9%
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI		0.06	0.3%	2.1	2.2	10.9%
OE2a	Teesmouth and Cleveland Coast SPA, SSSI		0.24	1.2%	1.9	2.1	10.4%
OE2b	Teesmouth and Cleveland Coast SPA, SSSI		0.22	1.1%	2.0	2.2	11.2%
OE2c	Teesmouth and Cleveland Coast SPA, SSSI		0.06	0.3%	2.4	2.5	12.3%

RECEPTOR ID	SITE NAME	ANNUAL AVERAGE (µG/M^3)					
		CL	PC (µG/M^3)	PC % OF CL	BC (µG/M^3)	PEC (µG/M^3)	PEC % OF CL
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		0.04	0.2%	4.1	4.1	20.7%
OE4	Eston Pumping Station LWS		0.04	0.2%	2.6	2.6	12.9%
OE5a	Teesmouth NNR		0.02	0.1%	2.2	2.2	10.9%
OE5b	Teesmouth NNR		0.01	0.0%	2.2	2.2	11.2%
OE6	Teesmouth and Cleveland Coast SSSI		0.07	0.4%	2.1	2.2	11.0%

Table 8B-50: Dispersion Modelling Results for Ecological Receptors – Nutrient Nitrogen Deposition (Kg/Ha/Yr), Case A

RECEPTOR ID	SITE NAME	BACKGROUND NITROGEN DEPOSITION (KG N/HA/YR)	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (KGN/HA/YR)	PC % CRITICAL LOAD	PEC (KGN/HA/YR)	PEC % CRITICAL LOAD
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	9.27	Coastal stable dune grassland (calcareous type)	10	0.15	1.5%	9.42	94.2%
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.24	2.4%	10.38	103.8%

RECEPTOR ID	SITE NAME	BACKGROUND NITROGEN DEPOSITION (KG N/HA/YR)	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (KGN/HA/YR)	PC % CRITICAL LOAD	PEC (KGN/HA/YR)	PEC % CRITICAL LOAD
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.18	1.8%	10.32	103.2%
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.07	0.7%	10.21	102.1%
OE2a	Teesmouth and Cleveland Coast SPA, SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.27	2.7%	10.41	104.1%
OE2b	Teesmouth and Cleveland Coast SPA, SSSI	9.38	Coastal stable dune grassland (calcareous type)	10	0.26	2.6%	9.64	96.4%
OE2c	Teesmouth and Cleveland Coast SPA, SSSI	8.79	Coastal stable dune grassland (calcareous type)	10	0.08	0.8%	8.87	88.7%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	8.45	Sub-atlantic semi-dry calcareous grassland	15	0.05	0.3%	8.50	56.6%

RECEPTOR ID	SITE NAME	BACKGROUND NITROGEN DEPOSITION (KG N/HA/YR)	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (KGN/HA/YR)	PC % CRITICAL LOAD	PEC (KGN/HA/YR)	PEC % CRITICAL LOAD
OE4	Eston Pumping Station LWS	7.86	Sub-atlantic semi-dry calcareous grassland	15	0.04	0.3%	7.90	52.7%
OE5a	Teesmouth NNR	10.9	Coastal stable dune grassland (calcareous type)	10	0.02	0.2%	10.92	109.2%
OE5b	Teesmouth NNR	10.9	Coastal Saltmarsh	20	0.01	0.0%	10.91	54.5%
OE6	Teesmouth and Cleveland Coast SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.09	0.9%	10.23	102.3%

Table 8B-51: Dispersion Modelling Results for Ecological Receptors – Nutrient Nitrogen Deposition (Kg/Ha/Yr), Case B

RECEPTOR ID	SITE NAME	BACKGROUND NITROGEN DEPOSITION (KG N/HA/YR)	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (KGN/HA/YR)	PC % CRITICAL LOAD	PEC (KGN/HA/YR)	PEC % CRITICAL LOAD
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	9.27	Coastal stable dune grassland (calcareous type)	10	0.15	1.5%	9.42	94.2%

RECEPTOR ID	SITE NAME	BACKGROUND NITROGEN DEPOSITION (KG N/HA/YR)	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (KGN/HA/YR)	PC % CRITICAL LOAD	PEC (KGN/HA/YR)	PEC % CRITICAL LOAD
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.25	2.5%	10.39	103.9%
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.20	2.0%	10.34	103.4%
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.07	0.7%	10.21	102.1%
OE2a	Teesmouth and Cleveland Coast SPA, SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.32	3.2%	10.46	104.6%
OE2b	Teesmouth and Cleveland Coast SPA, SSSI	9.38	Coastal stable dune grassland (calcareous type)	10	0.26	2.6%	9.64	96.4%
OE2c	Teesmouth and Cleveland Coast SPA, SSSI	8.79	Coastal stable dune grassland (calcareous type)	10	0.08	0.8%	8.87	88.7%
OE3	Coatham Marsh LWS and Teesmouth and	8.45	Sub-atlantic semi-dry calcareous grassland	15	0.05	0.3%	8.50	56.6%

RECEPTOR ID	SITE NAME	BACKGROUND NITROGEN DEPOSITION (KG N/HA/YR)	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (KGN/HA/YR)	PC % CRITICAL LOAD	PEC (KGN/HA/YR)	PEC % CRITICAL LOAD
	Cleveland Coast SPA, SSSI							
OE4	Eston Pumping Station LWS	7.86	Sub-atlantic semi-dry calcareous grassland	15	0.04	0.3%	7.90	52.7%
OE5a	Teesmouth NNR	10.9	Coastal stable dune grassland (calcareous type)	10	0.02	0.2%	10.92	109.2%
OE5b	Teesmouth NNR	10.9	Coastal Saltmarsh	20	0.01	0.1%	10.91	54.6%
OE6	Teesmouth and Cleveland Coast SSSI	10.14	Coastal stable dune grassland (calcareous type)	10	0.09	0.9%	10.23	102.3%

Table 8B-52: Dispersion Modelling Results for Ecological Receptors – Acid Deposition N (Keq/Ha/Yr) – Case A

RECEPTOR ID	SITE NAME	CRITICAL LOAD	ACID DEPOSITION (KEQ/HA/YR)			PC ACID DEPOSITION (KEQ/HA/YR)		
			BASELINE	LOWEST CRITICAL LOAD CLASS APLICABLE	BASELINE % OF CRITICAL LOAD	PC	PC % OF CRITICAL LOAD	PEC % OF CRITICAL LOAD
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.033	0.54%	5.8%
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.053	0.88%	6.1%
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.039	0.64%	5.9%

RECEPTOR ID	SITE NAME	CRITICAL LOAD	ACID DEPOSITION (KEQ/HA/YR)			PC ACID DEPOSITION (KEQ/HA/YR)		
			BASELINE	LOWEST CRITICAL LOAD CLASS APLICABLE	BASELINE % OF CRITICAL LOAD	PC	PC % OF CRITICAL LOAD	PEC % OF CRITICAL LOAD
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.015	0.25%	5.5%
OE2a	Teesmouth and Cleveland Coast SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.059	0.98%	6.2%
OE2b	Teesmouth and Cleveland Coast SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.056	0.93%	6.2%

RECEPTOR ID	SITE NAME	CRITICAL LOAD	ACID DEPOSITION (KEQ/HA/YR)			PC ACID DEPOSITION (KEQ/HA/YR)		
			BASELINE	LOWEST CRITICAL LOAD CLASS APLICABLE	BASELINE % OF CRITICAL LOAD	PC	PC % OF CRITICAL LOAD	PEC % OF CRITICAL LOAD
OE2c	Teesmouth and Cleveland Coast SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.016	0.27%	5.5%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	Min CL min N 1.07 Min CL Max N 5.071 Min CL Max S 4.0	0.78	Calcareous grassland	4.5%	0.010	0.17%	4.7%
OE4	Eston Pumping Station LWS	Min CL min N 1.07 Min CL Max N 5.071 Min CL Max S 4.0	0.81	Calcareous grassland	4.8%	0.009	0.15%	4.9%

RECEPTOR ID	SITE NAME	CRITICAL LOAD	ACID DEPOSITION (KEQ/HA/YR)			PC ACID DEPOSITION (KEQ/HA/YR)		
			BASELINE	LOWEST CRITICAL LOAD CLASS APLICABLE	BASELINE % OF CRITICAL LOAD	PC	PC % OF CRITICAL LOAD	PEC % OF CRITICAL LOAD
OE5a	Teesmouth NNR	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	No background determined		0.0%	0.004	0.07%	0.1%
OE5b	Teesmouth NNR	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	No background determined		0.0%	0.002	0.04%	0.0%
OE6	Teesmouth and Cleveland Coast SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.019	0.32%	5.6%

Table 8B-53: Dispersion Modelling Results for Ecological Receptors – Acid Deposition N (Keq/Ha/Yr) – Case B

RECEPTOR ID	SITE NAME	CRITICAL LOAD	ACID DEPOSITION (KEQ/HA/YR)			PC ACID DEPOSITION (KEQ/HA/YR)		
			BASELINE	LOWEST CRITICAL LOAD CLASS APLICABLE	BASELINE % OF CRITICAL LOAD	PC	PC % OF CRITICAL LOAD	PEC % OF CRITICAL LOAD
OE1a	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.025	0.36%	5.6%
OE1b	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.043	0.62%	5.9%
OE1c	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.032	0.44%	5.7%

RECEPTOR ID	SITE NAME	CRITICAL LOAD	ACID DEPOSITION (KEQ/HA/YR)			PC ACID DEPOSITION (KEQ/HA/YR)		
			BASELINE	LOWEST CRITICAL LOAD CLASS APLICABLE	BASELINE % OF CRITICAL LOAD	PC	PC % OF CRITICAL LOAD	PEC % OF CRITICAL LOAD
OE1d	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.012	0.17%	5.4%
OE2a	Teesmouth and Cleveland Coast SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.051	0.70%	6.0%
OE2b	Teesmouth and Cleveland Coast SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.044	0.64%	5.9%

RECEPTOR ID	SITE NAME	CRITICAL LOAD	ACID DEPOSITION (KEQ/HA/YR)			PC ACID DEPOSITION (KEQ/HA/YR)		
			BASELINE	LOWEST CRITICAL LOAD CLASS APLICABLE	BASELINE % OF CRITICAL LOAD	PC	PC % OF CRITICAL LOAD	PEC % OF CRITICAL LOAD
OE2c	Teesmouth and Cleveland Coast SPA, SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.013	0.18%	5.4%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	Min CL min N 1.07 Min CL Max N 5.071 Min CL Max S 4.0	0.78	Calcareous grassland	4.5%	0.008	0.12%	4.6%
OE4	Eston Pumping Station LWS	Min CL min N 1.07 Min CL Max N 5.071 Min CL Max S 4.0	0.81	Calcareous grassland	4.8%	0.007	0.10%	4.9%

RECEPTOR ID	SITE NAME	CRITICAL LOAD	ACID DEPOSITION (KEQ/HA/YR)			PC ACID DEPOSITION (KEQ/HA/YR)		
			BASELINE	LOWEST CRITICAL LOAD CLASS APLICABLE	BASELINE % OF CRITICAL LOAD	PC	PC % OF CRITICAL LOAD	PEC % OF CRITICAL LOAD
OE5a	Teesmouth NNR	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0		0.0%	0.003	0.04%	0.0%
OE5b	Teesmouth NNR	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0		0.0%	0.002	0.02%	0.0%
OE6	Teesmouth and Cleveland Coast SSSI	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.93	Calcareous grassland	5.3%	0.015	0.22%	5.5%

8B.7 Assessment of Limitations and Assumptions

8B.7.1 This section outlines the potential limitations associated with the dispersion modelling assessment. Where assumptions have been made, this is also detailed here.

8B.7.2 The greatest uncertainty associated with any dispersion modelling assessment arises through the inherent uncertainty of the dispersion modelling process itself. Nevertheless, the use of dispersion modelling is a widely applied and accepted approach for the prediction of impacts from industrial sources.

8B.7.3 To minimise the likelihood of under-estimating the PC to ground level concentrations from the main stack, the following conservative assumptions have been made within the assessment:

- The operational Proposed Development has been assumed to operate on a continuous basis i.e., for 8,760 hour per year, although in practice the plant would require routine maintenance periods;
- The modelling predictions are based on the use of five full years of meteorological data from Durham Tees Valley Airport meteorological station for the years 2015 to 2019 inclusive, with the highest result being reported for all years assessed; This is considered to be conservative.
- The largest possible building sizes within the Rochdale Envelope have been included in the assessment, including for the stack height assessment; therefore, the stack height represents the lowest required to achieve the impacts presented in this assessment;
- Emission concentrations for the process are calculated based on the use of IED limits, BAT-AEL concentrations, or maximum envisaged emission rates from licensors; in practice annual average rates would be below this to enable continued compliance with environmental permit requirements.

8B.7.4 The following assumption has been made in the preparation of the assessment:

- 70% NOx to NO_2 conversion rate has been assumed in predicting the long-term process contribution, and 35% for the short-term process contribution respectively.

8B.8 Conclusions

8B.8.1 This report has assessed the impact on local air quality of the operation of the Proposed Development. The assessment has used the dispersion model ADMS to predict the increases in pollutant species released from the operational Development to the local Study Area.

8B.8.2 Emissions from the fired Heater stack, Auxiliary Boiler, flare and emergency generator stacks would result in small increases in ground-level concentrations of the modelled pollutants. Taking into account available information on background concentrations within the modelled domain, predicted operational concentrations of the modelled

pollutants would be within current environmental standards for the protection of human health.

8B.8.3 The modelling of impacts at designated ecological sites (SACs / Ramsar / SPAs and SSSIs) has predicted that emissions would be unlikely to give rise to significant impacts with regard to increases in atmospheric concentrations of NOx and SO_2 at the majority of modelled receptor locations, however depositional impacts of nutrient nitrogen are above the insignificance threshold at the Teesmouth and Cleveland Coast SPA. Further interpretation and discussion of these impacts is provided in the Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I).

H2Teesside Project

Preliminary Environmental Information Report

Volume III – Appendices

Appendix 9A: Preliminary Flood Risk Assessment

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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9A.0 FLOOD RISK ASSESSMENT

9A.1 Introduction

9A.1.1 This preliminary Flood Risk Assessment (FRA) has been prepared on behalf of H2 Teesside Ltd, a bp company (the Applicant) for the Development Consent Order (DCO) application for the construction, operation (including maintenance where relevant) and decommissioning of H2Teesside, an approximately 1.2 Gigawatt Thermal (GWth) Carbon Capture Usage & Storage (CCUS) enabled Hydrogen Production Facility and supporting associated connections (the Proposed Development Site) on land in Redcar and Cleveland, Stockton-on-Tees, and Hartlepool, on Teesside.

9A.1.2 This report describes the approach and findings of the preliminary FRA undertaken for the Proposed Development Site. The terms of reference used to describe the Proposed Development in this report are consistent with those defined within the Preliminary Environmental Information (PEI) Report.

9A.1.3 The Proposed Development Site boundary is shown on Figure 1-1: Proposed Development Site Location Plan (PEI Report, Volume II). For the purposes of this report the terms used to identify the various parts of the Proposed Development Site are outlined below and are consistent with the terms used elsewhere in the PEI Report.

9A.1.4 The Proposed Development Site is divided into the following areas (described in more detail in Chapter 3: Description of the Existing Environment and Chapter 4: Proposed Development (PEI Report Volume I)):

- The Production Facility (Main Site, also known as The Foundry);
- CO_2 Export Corridor;
- Natural Gas Connection Corridor;
- Electricity Connection Corridor;
- Other Gases Connection Corridor;
- Water Connections Corridor (including water supply and discharge); and
- Hydrogen Pipeline Corridor.

9A.1.5 The location of the Main Site, Hydrogen Pipeline Corridor and other indicative Connection Corridors are shown on Figures 4-1 to 4-8 (PEI Report, Volume II).

9A.1.6 Surface watercourses identified within the Study Area are presented on Figure 9-1: Surface Water Features and their Attributes (PEI Report Volume II), and their associated flood zone extents on Figure 9-3: Fluvial Flood Risk (PEI Report, Volume II), which specifically illustrates areas of the Proposed Development Site located within areas at risk of flooding.

9A.2 Purpose and Scope of the Assessment

Context

9A.2.1 The Environment Agency's online Flood Map for Planning (FMfP) (Environment Agency, n.d.b) (Figure 9-3: Fluvial Flood Risk (PEI Report, Volume II)) indicates that the Main Site is located entirely in Flood Zone 1. Areas located within Flood Zone 1 are defined as having a 'low risk' of flooding from fluvial or tidal sources. The definition of flood zones in accordance with the Flood Risk and Coastal Change PPG (Department for Communities and Local Government, 2022) are summarised in Table 9A-6.

9A.2.2 The Environment Agency's FMfP (Figure 9-3: Fluvial Flood Risk (PEI Report, Volume II)) indicates the connection corridors/pipelines (CO_2 Export, Other Gasses Connection, Natural Gas Connection, Water Connection, Electrical Connection and Hydrogen Pipeline) are located predominantly in Flood Zone 1, however, some sections of these connection corridors/pipelines are located within Flood Zone 2 (medium risk of flooding from fluvial or tidal sources) and Flood Zone 3 (high risk of flooding from fluvial or tidal sources). In particular, the majority of the Hydrogen Pipeline Corridor to the north of the River Tees is within Flood Zones 2 and 3 (for example the Hydrogen Pipeline Corridor crosses Flood Zones 2 and 3 at the delta of Greatham Creek flowing into the Seaton on Tees Channel). Small areas of the Electrical Connection Corridor and the Water Connections Corridor to the south of the River Tees are also located within Flood Zones 2 and 3.

9A.2.3 Works undertaken in Flood Zones 2 and 3 will be temporary in nature and will be involve either the construction of underground tunnels/pipelines or the installation of pipes on existing/extended pipe racks in existing service corridors. Where tunnels or borings are proposed for the Hydrogen Pipeline Corridor, the majority of the launch and receiving areas are outside Flood Zone 3, with the exception of the open-trench channel running to the east and alongside of the Seaton Carew Road, the trenchless channel crossing the Greatham Creek to the west of Tees Road, and the trenchless channel crossing the Greatham Creek mouth from the Seaton Carew Road.

Scope

9A.2.4 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) and the Flood Risk and Coastal Change Planning Practice Guidance (PPG) (Department for Communities and Local Government, 2022) specify that applications for development proposals greater than 1 hectare (ha) in area located in Flood Zone 1, and all development proposals located in Flood Zone 2 or 3, should be accompanied by a site-specific FRA that identifies and assesses all forms of flooding to and from the development. The FRA should demonstrate how flood risk will be managed so that the development remains safe throughout its lifetime, taking into account the vulnerability of the development and the potential impact of climate change on risk.

9A.2.5 The Overarching National Policy Statement (NPS) for Energy (EN-1), Section 5.7 (Flood Risk) (Department for Energy and Climate Change (DECC), 2011) details that

projects of 1 ha or greater in Flood Zone 1 in England and all proposals for energy projects located in Flood Zones 2 and 3 in England should be accompanied by an FRA.

9A.2.6 This preliminary FRA is proportionate and appropriate to the nature and scale of the Proposed Development, which assesses existing flood risk at the Proposed Development Site and arising from the Proposed Development Site, and, where required, recommends suitable mitigation measures.

9A.2.7 The objectives of this report are to:

- collect and review existing information relating to the flood risk posed to the Proposed Development Site from all sources (e.g. fluvial, tidal, surface water, artificial, groundwater, drain and sewer flooding);
- consult with the Environment Agency and Lead Local Flood Authorities (LLFAs) in relation to flood risk and their requirements for management of any risk;
- assess the flood risk to the Proposed Development Site under existing and post-development conditions (taking into account climate change); and
- outline any mitigation measures needed to ensure the Proposed Development Site and its occupants will be safe for the lifetime of the development and to meet the requirements of the NPS and NPPF.

9A.3 Data Sources

9A.3.1 The baseline conditions for the Proposed Development Site have been established through a desk study including a review of publicly available information and supporting modelling and hydrology study reports (where available), and via consultation with the associated Lead Local Flood Authorities (LLFAs) and the Environment Agency. Relevant consultation responses are provided in Annex A. This information has been utilised to inform the assessment made within this preliminary FRA. Data collected for this assessment is described in Table 9A-1.

Table 9A-1: Sources of Data

PURPOSE	DATA SOURCE	COMMENT
Identification of hydrological features	1:25,000 Ordnance Survey (OS) mapping	Identifies the position of the Proposed Development Site and local hydrological features.
Identification of Ground Levels	1:25,000 Ordnance Survey (OS) mapping	Provides existing Proposed Development Site levels and spot level heights along local highways.
Identification of Existing Flood Risk	Environment Agency Indicative Flood Zone Map (presented as Figure 9-4: Environment Agency Flood Risk Zones (PEI Report Volume II).	Identifies fluvial/tidal inundation extents and historical flooding.

PURPOSE	DATA SOURCE	COMMENT
	Environment Agency Long-term Flood Information Mapping (Environment Agency, no date (n.d.)b)	Provides information on the risk of flooding from fluvial, tidal, surface water and reservoirs (artificial sources).
	Redcar and Cleveland Borough Council (RCBC) Level 1 Strategic Flood Risk Assessment (SFRA) (JBA Consulting, 2016)	Assesses flood risk across the Redcar and Cleveland Borough Council (RCBC) boundary area. Includes flood risk from fluvial/tidal, sewers, overland flow and groundwater. Provides details on historical flooding, flood risk at sites allocated in the Local Plan and provides mitigation measure requirements for developments located in areas of flood risk and surface water management requirements.
	RCBC Level 2 SFRA (JBA Consulting, 2016b)	
	RCBC Preliminary Flood Risk Assessment (PFRA) (Redcar and Cleveland Borough Council, 2011)	
	Redcar and Cleveland Local Flood Risk Management Strategy (Redcar and Cleveland Borough Council, 2017)	
	Stockton-On-Tees Borough Council (STBC) Level 1 SFRA (JBA Consulting, 2018)	Assesses flood risk across the Stockton-on-Tees Borough Council (STBC) boundary area. Includes flood risk from fluvial/tidal, sewers, Overland flow and groundwater. Provides details on historical flooding, flood risk at sites allocated in the Local Plan and provides mitigation measure requirements for developments located in areas of flood risk and surface water management requirements.
	STBC Local Plan Potential Sites Assessment Level 2 SFRA - Site Screening (JBA Consulting, 2018)	
	STBC PFRA (Stockton-On-Tees Borough Council, n.d.a)	
	Stockton-on-Tees Local Flood Risk Management Strategy (Stockton-On-Tees Borough Council, 2016)	

PURPOSE	DATA SOURCE	COMMENT
	Hartlepool Borough Council (HBC) Level 1 SFRA (JBA Consulting, 2017)	Assesses flood risk across the Hartlepool Borough Council (HBC) boundary area. Includes flood risk from fluvial/tidal, sewers, overland flow and groundwater. Provides details on historical flooding, flood risk at sites allocated in the Local Plan and provides mitigation measure requirements for developments located in areas of flood risk and surface water management requirements.
	PFRA Preliminary Assessment Report for Hartlepool Borough Council (Hartlepool Borough Council, 2011)	
	Hartlepool Local Flood Risk Management Strategy (JBA Consulting, 2016)	
Catchment identification and River Basin Management Plans	Environment Agency Catchment Data Explorer (Environment Agency, n.d.a)	Provides details of watercourses and operational management catchments.
Identification of Hydrogeological features	British Geological Survey's Geological Mapping Viewer, 'Geoindex' (British Geological Society, no date (n.d).)	Provides details of geology and hydrogeology in the vicinity of the Proposed Development Site.
Identification of Historical Flooding	Relevant LLFA SFRAs and PFRAs	Gives details of historical flooding.
Details of the Proposed Works	Design from Proposed Works as outlined within Chapter 4: Proposed Development (PEI Report Volume I)	Provides alternative locations and layouts of the Proposed Development.
Surface Water Drainage	Assumed based on SuDS Principles	Principles for the management of surface water run-off and foul drainage on the Proposed Development Site.

Consultation

9A.3.2 The Environment Agency has been contacted for pre-application planning advice and a response was received on 17 March 2023.

9A.3.3 A summary of the planning advice relevant to this discipline is outlined in Table 9A-2, along with a summary of how the various points will be addressed by the assessment.

9A.3.4 An EIA Scoping Opinion was requested from the Planning Inspectorate (the Inspectorate) in April 2023. A response was received on 17 May 2023. The opinions received from the Inspectorate , the Environment Agency and Natural England which are relevant to this chapter are also summarised in Table 9A-2.

Table 9A-2: Summary of Environment Agency pre-application advice and the Inspectorate Scoping Opinion that has Informed the Scope and Methodology of the FRA

CONSULTEE COMMENTS	RESPONSE
ENVIRONMENT AGENCY PRE-APPLICATION ADVICE (MARCH 2023)	
Flood Risk: The red line boundary for the full development is located within Flood Zones 3, 2 and 1. The majority of the development site for the Main Site is situated within Flood Zone 1. However, small portions of the Main Site are situated within Flood Zone 2 and 3. Parts of the Hydrogen Pipeline Corridor are also within Flood zone 2 and 3.	Noted. This assessment is for Main Site (The Foundry) which is located entirely within Flood Zone 1. Refer to Figure 9-3 (PEI Report, Volume II) for fluvial flood risk mapping.
Flood Risk Vulnerability Classification: No information has been provided on the flood risk vulnerability classification within the provided information. Therefore, we are unable to advise on our policy position in relation to flood risk until the vulnerability of the development has been confirmed by the applicant and/or the local planning authority. It should be noted that 'highly vulnerable' uses, requiring a Hazardous Substance Consent, would not be appropriate within flood zones 3. In accordance with Table 2 of the flood risk and coastal change section of the Planning Practice Guidance (PPG), 'highly vulnerable' developments are not appropriate in flood zone 3 and should not be permitted.	The Proposed Development comprises an approximately 1.2 GWth Carbon Capture Usage & Storage (CCUS) enabled Hydrogen Production Facility and supporting associated connections. According to NPPF Annex 3 Flood Risk Vulnerability Classification, the Proposed Development is classified as 'Essential Infrastructure'. Essential Infrastructure is defined as '*Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood'.*
Sources of Flooding: The main source of potential flooding in the area is from the tidal stretch of the River Tees, but there could be other local sources of flooding such as groundwater and surface water. We have published a suite of interactive maps that indicate where possible flooding from different sources could occur	Noted. These sources have been interrogated during the preparation of the preliminary FRA. Further flood risk data and information has also been requested from the Environment Agency. The modelling data has been received and matches the

CONSULTEE COMMENTS	RESPONSE
Check the long term flood risk for an area in England - GOV.UK (www.gov.uk). Our maps are not suitable for a detailed Flood Risk Assessment (FRA), but they can indicate where further assessment may be needed.	data used for the NZT assessment however the data will be used during the EIA for further assessment.
Flood Risk Assessment: We would expect an FRA to be submitted in support of your DCO application. The FRA must assess flood risk from all sources of flooding and recommend the mitigation measures that will be implemented to ensure a safe development in a 1 in 200-year (tidal) flood event, taking account of climate change. It must also demonstrate that flood risk will not be increased elsewhere. Flood risk mitigations will need to be included within the development to ensure it can remain safe for its' lifetime. This includes raising the finished floor levels to the 1 in 200 year plus climate change plus a freeboard of 600mm.	The preliminary FRA assesses flood risk from all sources using the data received to date and publicly available information. The preliminary FRA will be updated for the ES as more information and data is available from the Environment Agency, and these requirements will be accounted for. Further consultation with the Environment Agency will also be sought as the Proposed Development design progresses. The Proposed Development will be located on a development platform located above the 0.5% AEP plus climate change plus a freeboard of 600 mm.
Flood Risk Information the Environment Agency holds: We have an outline for a 1 in 200-year level undefended model that can be requested. The modelling we have for this location does not include climate change allowances and therefore this will need to be calculated in accordance with the 'Flood risk assessments: climate change allowances'. As the development location is at risk from tidal flooding, sea level allowances will need to be applied to the 1 in 200-year level for the lifetime of the development using both higher central and upper end allowances. This applies to both the temporary and permanent works. The extent, speed and depth of flooding shown in the assessment should be used to determine the flood level for flood risk mitigation measures. Where assessment shows flood risk increases steadily and to shallow depths, it is likely to be more appropriate to choose a flood level lower in the range. Where assessment shows	Noted. A freedom of information request was issued to the Environment Agency in March 2023 to receive the latest baseline information relating to flood risk. The data was received in May 2023 and has been incorporated into this chapter and its appendices where relevant.

CONSULTEE COMMENTS	RESPONSE
flood risk increases sharply due to a 'cliff edge' effect caused by, for example, sudden changes in topography or defences failing or overtopping, it is likely to be more appropriate to choose a flood level higher in the range.	
Flood Alleviation Schemes: The Environment Agency are currently in the process of developing flood alleviation schemes which may have an interface with the proposed development. Attached to this letter is the scheme overview for the Greatham North East Flood Alleviation scheme.	Noted. Interfaces with the Greatham North East Flood Alleviation scheme are being considered, including pre-planning consultation advice received from the Environment Agency pertaining to the flood alleviation scheme. This was further considered in the selection of the preferred hydrogen pipeline routing at the Greatham Creek Area. Further consultation with the Environment Agency will also be sought as the Proposed Development design progresses.
Flood Risk Consents and Permits: The River Tees is a designated 'main river' and under the Environmental Permitting Regulations certain works within 16m of a tidal main river, or within 16m of any flood defence structure on a tidal main river, require a Flood Risk Activity Permit from the Environment Agency. This includes works such as directional drilling under the River Tees. You can find more information on permit requirements using the following link: Flood risk activities: environmental permits – GOV.UK (www.gov.uk). If a permit is required, it must be obtained prior to beginning the works. You may also need a Marine Management Organisation license depending on if any works will be undertaken below the mean high water springs (MHWS).	Noted. Permits and consents that are expected to be required by the Proposed Development are outlined in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I).
Drainage Strategy: In order to determine the water quality impacts, the following information should be submitted as part of your drainage strategy: • How rainwater will be handled and discharged from the site; and • How foul water will be handled and discharged from the site. This should include	Noted. Drainage principles for the Proposed Development are outlined in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I) Section 9.5 A Drainage Strategy

CONSULTEE COMMENTS	RESPONSE
if the site will be connecting to Northumbrian water's public sewer network.	will accompany the DCO Application, and its suitability assessed during the EIA and reported in the ES.
Discharge of Clean Water: Clean surface water (i.e., clean, uncontaminated rainwater from hard standing areas such as roads and car parks) can be discharged to a watercourse without a permit if the discharge passes through a maintained oil interceptor or Sustainable Urban Drainage System. If a water attenuation system is proposed it would be beneficial to see the details, methods, and maintenance of the system to ensure longevity and effectiveness.	Noted. Drainage principles for the Proposed Development are outlined in Section 9.5. A Drainage Strategy will accompany the DCO Application, and its suitability assessed during the EIA and reported in the ES.
THE INSPECTORATE SCOPING OPINION (MAY 2023)	
Flood Zones. The Scoping Report identifies Flood Zones across the Study Area however does not include sub-categories, such as an area of high probability (Flood Zone 3a) or functional floodplain (Flood Zone 3b). The ES should provide an accurate and consistent description of the baseline flood risk for each element of the Proposed Development and the description should clearly distinguish between Flood Zones, including Flood Zones 3a and 3b where relevant. The Applicant's attention is drawn to the Environment Agency's comments in Appendix 2 regarding Flood Zones; the Inspectorate notes that there is a discrepancy between information in the Scoping Report, which identifies that Main Site B is entirely within Flood Zone 1, and the Environment Agency's information, which states it is primarily within Flood Zone 1 but partially within Flood Zones 2 and 3. The Flood Zone should be confirmed within the ES and mitigation identified as required.	Noted. This assessment is for Main Site (The Foundry) which is located entirely within Flood Zone 1. Refer to Figure 9-3: Fluvial Flood Risk (PEI Report Volume II)
Scope of assessment – FRA. The FRA underpinning the ES assessment should additionally cover matters including the effect that temporary mounds of soil in the floodplain could have on flood risk, the volumes of water displacement involved and mitigation measures where necessary. The Applicant's attention is	Noted. The preliminary FRA will be updated during the EIA as more information and data is available from the Environment Agency, and these requirements will be accounted for. Further consultation with the Environment Agency will also be sought as

CONSULTEE COMMENTS	RESPONSE
drawn to the Environment Agency's comments in Appendix 2 regarding scope of the FRA and climate change allowances.	the Proposed Development design progresses. Further flood risk data and information has been requested from the Environment Agency for the EIA.
Scope of assessment. The ES should assess the potential for an increase in offsite flood risk arising from any proposed ground raising within the development boundary, including the pipeline corridors. Effort should be made to agree the scope of the assessment, including the requirement for flood modelling, with the Environment Agency. The ES should identify any mitigation required to address likely significant effects.	The preliminary FRA will be updated during the EIA as more information and data is available from the Environment Agency, and these requirements will be accounted for. Further consultation with the Environment Agency will also be sought as the Proposed Development design progresses.
ENVIRONMENT AGENCY SCOPING OPINION (MAY 2023) (Only included where different or additional to the pre-planning responses outlined above)	
Offsite Flood Risk. If ground raising is occurring within part of the development boundary, and the existing ground levels are below the design flood event, then an assessment will be required to confirm no increase in offsite flood risk. Given current topographical levels of the Main Site and if ground raising is significant which is below the design flood event, then flood modelling should be undertaken. If the pipeline is causing any ground raising, or is above ground which could impact local flood mechanisms, an assessment will be required to understand any increase in offsite flood risk and provide mitigation measures, this assessment could include modelling.	The preliminary FRA will be updated during the EIA as more information is available from the Environment Agency, and these requirements will be accounted for. Continued consultation with the Environment Agency will be maintained should modelling be required.
Hydrogen Pipeline Corridor. The proposed hydrogen pipeline corridor heading north towards the Venator Plant, could affect our flood defence assets along Greatham Creek and the Environment Agency's land holding at Marsh House Farm. In addition, all three routes (labelled R1, R2 and R3 on a document previously supplied to the Environment Agency ('All Utility Connection Corridor, Figure 1')	Noted: Continued consultation with the Environment Agency will be maintained to ensure no impacts to flood defence assets.

CONSULTEE COMMENTS	RESPONSE
could have a significant impact on Greatham Creek and its associated saltmarsh habitat - the last remaining natural area of the original Tees Estuary. In particular, R2 and R3 in particular are of significant concern to the Environment Agency. R2 runs along the line of one of our major flood defences at Cowpen Marsh. The defence lies between the Cowpen Bewley Landfill (to the West) and the Teesmouth and Cleveland Coast Special Protection Area (SPA) (to the East). As such, any work along this corridor could impact one the three current land uses. To the north of Greatham Creek, R2 then runs through Saltern Wetlands (an area of saltmarsh owned by the Environment Agency) and under the Environment Agency's flood embankment to the south of the ConocoPhillips tank farm. The Environment Agency A has concerns that this route will have an impact on the wetland area, which lies with the SPA, and flood defences. R1 crosses the no. 4 brinefield (owned by Sabic and used for hydrocarbon storage), and under the flood embankment on the south bank of Greatham Creek (Sabic Embankment). It also lies under the flood embankment on the north bank of Greatham Creek, which is to be significantly repaired as part of Environment Agency's Greatham North East Flood Alleviation Scheme (FAS). This route also crosses the redundant no. 5 brinefield (owned by Inovyn Chlorvinyl Ltd) and the ConocoPhillips oil pipeline corridor and Seal Sands Emergency Access Road. R3 crosses our land at Marsh House Farm to be used for the extraction of clay in 2024-2026 for our Greatham NE FAS. The Environment Agency is also developing a scheme (Greatham North East FAS) to improve the defences to the south of the Venator Plant. We expect to submit an application for planning permission in Spring 2024, and hope to start construction of the scheme in summer 2024. We are currently seeking contributions from beneficiaries of the scheme. As the proposed pipeline could benefit from our works, we would welcome discussions	Potential impacts and effects to habitats are considered in Chapter 12: Ecology and Nature Conservation (including Aquatic Ecology) (PEI Report, Volume I). Impacts on surface waterbodies and groundwater bodies related to the pipelines are considered in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I).

CONSULTEE COMMENTS	RESPONSE
with the applicant on the potential for financial contributions from DCO, if R1 is chosen as the preferred route.	
Pipelines. The Environment Agency would require the existing flood standard of protection, provided by the defences to be maintained both during the construction of the pipeline, and after completion of the scheme, whichever route is chosen. In order minimise the impact of the DCO on our flood defences, consideration should be given to the following comments: Pipeline Design • Where the pipeline crosses a flood defence structure below ground, designs for the pipeline must include a load case for the top water level. This may be different at each location. The pipeline must also be at a suitable depth to ensure the stability of the flood defence structure, this is to be demonstrated in submitted designs; • The scoping report states the pipeline will not cross our flood defence structure above ground. If this is to change, loading to our asset will need to be considered and the design must not impede access for routine maintenance and inspections of the flood defence structure; • If the pipeline crosses a watercourse above ground, it must be appropriately designed and positioned to prevent accumulation of debris and localised increases in water levels; • Where the pipeline is to utilise existing pipework that crosses watercourses, it is expected that modifications to the structure will be made where possible for improved conveyance and reduce debris accumulation; and	Noted. These considerations will be taken into account during Proposed Development design development. Final details regarding pipeline design are not known at this stage, and so worst-case assumptions have been considered in this preliminary assessment, as described in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I).

CONSULTEE COMMENTS	RESPONSE
• Where ground levels near a flood defence are to be disturbed on either a permanent or temporary basis, designs must not allow additional water to pond at the toe of the flood defence.	
Pipeline Construction. • Open trench methodology is not permitted when crossing a flood defence. Excavations near the footprint of a flood defence must remain a safe distance away from the toe of the defence to ensure stability of the defence. This must be demonstrated in submitted designs; and • Directional drilling would be permitted when crossing a flood defence provided: - The drilling operation does not affect the stability of the flood defence structure by inducing a geotechnical failure, including when it is retaining flood water; and - The drilling or permanent works do not provide a conduit for water seepage underneath the flood defence structure, including when it is retaining flood water.	Noted. These considerations will be taken into account during the Proposed Development design development.
Pipeline Maintenance. • Repairs or future improvement works will be subject to an Environmental Permit from the EA if taking place within 16m of a flood defence; and • Routine maintenance activities on the pipeline should be detailed within the DCO application.	Noted. Maintenance activities pertaining to pipelines will be included in the ES.
Flood Defence Maintenance. In order to maintain the standard of protection, the Environment Agency requires continued access to continue routine maintenance of the existing and planned defences. Any permissions or legal agreements to allow these works to go ahead, must be agreed in advance of pipeline construction. It	Noted. Environment Agency access will be incorporated as necessary.

CONSULTEE COMMENTS	RESPONSE
should be noted that the Environment Agency have statutory powers to carry out works on our assets.	
Drainage. In terms of SUDs, we would recommend that there is no increase in infiltration within the development area. This is to avoid the risk of contaminant mobilisation given the industrial heritage of the area. This ties into section 6.4.88 where the scope of assessment includes 'disturbance of contaminated soils and perched groundwater, and the creation of new pathways to sensitive receptors (including construction workers and controlled waters) during construction.	Noted. The drainage strategy is under development and will be assessed during the EIA and reported in the ES.

9A.4 Site Information

Location, Land Use and Topography

9A.4.1 The Proposed Development Site is located on part of the former Sahaviriya Stell Industries (SSI) site to the east of Redcar Bulk Terminal (referred to as 'the Foundry') on the south bank of the River Tees, approximately 1.6 km east from the town of Redcar and 1.4 km north-east of Dormanstown.

9A.4.2 The indicative boundary for the Main Site currently encompasses an area of approximately 42.5 ha, whilst the Proposed Development Site encompasses an area of approximately 1,391 ha.

9A.4.3 The area is coastal, being located immediately south-west of Teesmouth, at approximately 4 - 8 m above ordnance datum (AOD). Coatham Sands is immediately to the north and Bran Sands is to the west (see Figure 9-1: Surface Water Features and their Attributes (PEI Report, Volume II)). The Proposed Development Site is currently industrial, comprising former steelworks structures.

9A.4.4 The Proposed Development Site boundary extends west across the Tees Estuary at the southern extent of Bran Sands and further south close to Teesport (see Figure 9-1: Surface Water Features and their Attributes (PEI Report, Volume II)). These crossings of the Tees Estuary are included to incorporate the Hydrogen Pipeline Corridor infrastructure required by the Proposed Development.

9A.4.5 South of the Tees Estuary, the Proposed Development Site boundary extends south to Grangetown to accommodate the Electrical Connection, Water Connection Corridor and Hydrogen Pipeline Corridor.

9A.4.6 The Proposed Development Site boundary to the north of the Tees Estuary generally follows existing pipeline routes on reclaimed land to the south of the Seal Sands inter-tidal mudflats. The Hydrogen Pipeline Corridor extends west as far as Cowpen Bewley Woodland Country Park, and south into the industrial area at the eastern edge of Billingham. This whole section of the Proposed Development Site is very flat, being between 0 and 10 m AOD. The immediate surroundings include heavy industry on the banks of the Tees, mudflats to the north, marshland at Saltholme and Cowpen Marsh, and the Tees Estuary itself. There are numerous large standing bodies of water in the marshland areas as well as small watercourses draining towards Seal Sands (which is included within local Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA) designations). The Main Site, together with the Electrical Connection Corridor, the Natural Gas Connection Corridor, the Nitrogen and Oxygen Connection Corridor, the Water Connections Corridor, and the CO_2 Export Corridor fall within the administrative boundary of Redcar and Cleveland Borough Council (RCBC) in the ward of South Bank. A part of the Hydrogen Pipeline Corridor crosses the River Tees and will be located in the administrative boundary of Stockton-on-Tees Borough Council (STBC) in the Billingham Ward and a small area will cross into the southern area in the administrative boundary of Hartlepool Borough Council (HBC).

Hydrology and Flood Risk Management Infrastructure

Surface Water Features

9A.4.7 For the purposes of the preliminary FRA a Study Area of 1 km from the Proposed Development Site boundary was adopted. As flood risk impact can also impact upstream and downstream, the preliminary FRA also considers a wider Study Area than 1 km outside of the Proposed Development Site boundary, where relevant. Professional judgement has been applied to identify the extent to which such features are considered.

9A.4.8 A site walkover was undertaken on 15th February 2023 in cold, dry but overcast conditions. Using observations taken on this visit, data from OS mapping and the Environment Agency Catchment Data Explorer website (Environment Agency, n.d.c), a summary list of the surface waterbodies and where relevant to the assessment, groundwater waterbodies, listed in Table 9A-3, were identified within the Study Area and are presented on Figure 9-1: Surface Water Features and Their Attributes (PEI Report, Volume II).

Table 9A-3: Surface Waterbodies

NAME	COASTAL/MAIN RIVER/ORDINARY WATERCOURSE	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
Tees Bay (North Sea)	Coastal (tidal)	N/A	Tees Bay stretches from approximately 20 km south-east of Redcar at Boulby, to approximately 13 km northwest of Redcar at Crimdon. It includes a total area of 88.31 km^2.	The Tees Coastal waterbody was observed from Coatham Sands between Redcar and Teesmouth. The waterbody is backed by a wide sandy beach and sand dunes and is popular for recreation. Coatham Sands has, in places along its length, been strongly influenced by historic deposition of slag from local ironworks. This means that large parts of the dunes are a mix of slag deposits and natural marine-deposited and subsequently wind-blown sand. Within the sand dune complex are a number of ponds and wetland areas. Discharge infrastructure was not apparent and is presumably buried or only observable at very low tide. One pipe was noted across the beach emanating from the direction of Cleveland Links golf course and the area of Warrenby Industrial Estate and is likely to be for discharges to the Tees.
Tees Estuary (River Tees)	Main River (tidal)	N/A	The Tees Estuary extends from the Tees Barrage, east of Stockton-on-Tees, to Teesmouth. This is approximately 16 km. It includes a total area of 11.44 km^2.	The River Tees is approximately 1.6 km to the west of the Main Site. The River Tees is tidal at this location, with the normal tidal limit approximately 14 km upstream, at the Tees Barrage. The Tees was observed from near the Dabholm Gut on the south bank. At this point the estuary is approximately 455 m wide. The estuary is also a busy route for navigation with docks and jetties on both banks. Land either side of the waterbody is

NAME	COASTAL/MAIN RIVER/ORDINARY WATERCOURSE	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
				flat, having been largely reclaimed in this area and is currently occupied by various heavy industries.
Belasis Beck	Ordinary Watercourse	Holme Fleet (Within Tees Transitional WFD Waterbody catchment)	Belasis Beck appears to rise from ponds in Belasis Hall Technology Park (NZ 47373 23267) and flows east for 2 km before its confluence with Holme Fleet within Saltholme Nature Reserve at NZ 49071 23577.	Belasis Beck was observed in the pastoral fields adjacent to Cowpen Bewley Road, where the main channel appeared to be shallow and wide (~6-7 m). Water levels were high during the site visit and overtopping slightly onto the floodplain. Here the channel flows roughly parallel with an adjacent pipeline, which cuts through the fields either side of the road. Flow was sluggish as a result of the shallow gradient and probable tidal locking. The road crossing appeared largely buried at this location, and flows appeared to be backing up upstream of the road leading to the spillage onto the floodplain.
Dabholm Beck	Ordinary Watercourse	Tees Estuary	Dabholm Beck is a drainage channel marked on mapping as flowing north-east above ground for 700 m between NZ 56161 23102 and NZ 56710 23730. It then flows north-west into the tidal Dabholm Gut.	The Dabholm Gut flows to the River Tees approximately 0.8 km south of the Proposed Development Site boundary. The Dabholm Gut is an artificial channel of around 1 km length, left following historic land reclamation. Upstream is Dabholm Beck, which is formed from the coalescence of numerous small watercourses and drains through an area of freshwater marshland to the north-west of the Wilton International Site (upstream of the tidal limit). Dabholm Beck has a single stem channel around 3-4 m wide, incised and straight being indicative of extensive past modification. There are several
Dabholm Gut	Ordinary Watercourse (tidal)	Tees Estuary	Dabholm Gut is a tidal channel on the east bank of the Tees, left when	

NAME	COASTAL/MAIN RIVER/ORDINARY WATERCOURSE	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
			the land on both sides was reclaimed from the Tees estuary.	large outfalls that discharge into the channel. At the tidal limit where it becomes Dabholm Gut, the channel widens to approximately 30 m and numerous other active outfalls were observed with relatively high rates of discharge. There are numerous consented discharges here from the adjacent industry. The channel width remains constant up to the confluence with the Tees. During especially high tides anecdotal evidence suggests the channel has been known to overtop onto the adjacent access road.
Greatham Creek	Main River	Tees Estuary	Greatham Creek is the estuarine section of Greatham Beck, which flows from the north of Elwick (NZ 45077 33468) to Seal Sands (NZ 51667 25568).	Greatham Creek was observed during the site visit at Greatham Creek Bridge (A178 road crossing). Here, historic modifications are evident, particularly downstream of the road crossing, with raised stone banks and embankments containing this tidal river maintaining a straightened length through to the Tees Estuary. There are three existing structures downstream of the A178 road crossing, comprising two other bridge crossings and a series of in-channel piers that formed part of a redundant crossing. The watercourse is sinuous upstream of the A178 and forms part of a dynamic system of intertidal channels and marsh. Bed and bank sediment comprised fine material which is likely reworked with each tide. The watercourse has an approximate Mean High Water width of 60 m, although width varies considerably through the more natural length upstream

NAME	COASTAL/MAIN RIVER/ORDINARY WATERCOURSE	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
				of the road crossing. There is a history of tidal flooding and breach of the defences at Greatham Creek.
Kettle Beck	Ordinary Watercourse	Tees Estuary	Kettle Beck rises at Lazenby Bank and flows approximately 4 km generally north along the edge of the Wilton International Site, beneath the A1085, beneath the Teesside Works (Lackenby), and beyond the A1053 before discharging to the Tees. The exact course of the watercourse is not clear from online mapping north of the A1085 as the watercourse is culverted.	Kettle Beck was observed at the western edge of the Wilton International Site. Here the channel was between 2 and 3 m wide, with an artificial, straightened character. The bed was dominated by fine sediment with some isolated very fine gravel accumulations. Flow was impeded by a road culvert at the observation site, which consisted of 6 small diameter (~0.5 m) pipes. The banks rose steeply from the channel bed and were incised meaning the channel is likely disconnected from the floodplain.
Holme Fleet	Main River	Tees Estuary	Holme Fleet is a marshland channel that meanders between Cowpen Marsh (NZ 50596 24732) and Port Clarence (NZ 50703 21620). It is around 5.6 km in length, and a large number of marshland channels join the Fleet, which also flows through several marshland open waterbodies and reedbeds.	Not visited during the site visit as it is outside of the Proposed Development Site boundary but still considered, where relevant, within the Study Area of the assessment.

NAME	COASTAL/MAIN RIVER/ORDINARY WATERCOURSE	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
Kinkerdale Beck	Ordinary Watercourse	Tees Estuary	This watercourse is mapped as a surface waterbody for 320 m at the north-western extent of the Wilton International Site (NZ 56071 20996) and is then in culvert. As such, the source and exact course of the watercourse is not known, although it is known to outfall to the Lackenby Channel.	Kinkerdale Beck is a 2-3 m wide ditch which appears to be fed from an overflow connection from Kettle Beck. It was observed just downstream of Kettle Beck where it has an artificial, straightened character with steep banks. The bed was dominated by fine sediment. Water in this section of the channel was largely ponded. Further downstream the watercourse is largely culverted beneath the Wilton International Site.
Castle Gill	Ordinary Watercourse	Tees Estuary	Castle Gill is a short watercourse, which flows for approximately 1.5 km in a south-westerly direction within the southern extent of the Wilton International Site, from NZ 57760 20577 to NZ 56121 20500.	This watercourse was not observed during the initial site visit as it would not be expected to be directly impacted by the Proposed Development. Aerial photography indicates it is partly in culvert, straightened and heavily modified with a width of approximately 2-3 m.
Knitting Wife Beck	Ordinary Watercourse	Tees Estuary	This watercourse rises just north of the A66 in Grangetown (NZ 55172 20910), before flowing north for approximately 300 m towards the Lackenby Steelworks. The watercourse is then culverted and so the course alignment is unclear	The watercourse was visited as it emerges from an approximately 1 m wide box culvert to the north of the A66. The channel was approximately 1-1.5 m wide, and artificial in nature being straight with steep incised banks rising 2-3 m from the channel bed. Fine sediment accumulations were abundant; the channel was largely overgrown.

NAME	COASTAL/MAIN RIVER/ORDINARY WATERCOURSE	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
			but is known to outfall at the Lackenby Channel.	
Lackenby Channel	Ordinary Watercourse	Tees Estuary	The Lackenby Channel is a drainage cut between the Lackenby steelworks (NZ 55305 22207) and the eastern bank of the Tees estuary (NZ 54145 23341). It is approximately 1.6 km in length and conveys flows from Knitting Wife Beck, Kinkerdale Beck and Kettle Beck to the Tees.	Lackenby Channel was not visited during the site visit, but aerial photography, available online, indicates that it is an artificial, straight channel varying between 10 and 15m in width.
Main's Dike	Ordinary Watercourse	Tees Estuary	Main's Dike watercourse rises from a spring in Wilton Wood to the south-east of the Proposed Development Site at NZ 59328 19741. The watercourse then flows north along the eastern boundary of the Wilton International Site, and into the Mill Race at NZ 57893 22824.	Main's Dike was observed along the eastern edge of the Wilton International Site where it was very straight, around 1 m in width and with steep incised banks rising around 4 m from the channel. Significant sediment accumulations were observed downstream of the Mains Dike Bridge culvert. There was also evidence of some lateral erosion of the banks and the formation of small, alternating fine gravel lateral bars, although the gradient was still shallow and the channel stable.
Mill Race	Ordinary Watercourse	The Fleet Tees Estuary	The course of the Mill Race is unclear as it is largely culverted but appears to emanate from	The Mill Race was observed within the Wilton International Site to the south of the A1085. Here the watercourse was overly wide (around 3.5-4 m wide) leading up to a circular culvert of

NAME	COASTAL/MAIN RIVER/ORDINARY WATERCOURSE	TRIBUTARY OF	WATERCOURSE DESCRIPTION	SITE OBSERVATIONS
		(S Bank WFD Waterbody)	coalescence of ditches and watercourses at NZ 57893 22824, then flows north of the Wilton International Site beneath the A1085. It remerges at NZ 57102 24152 and flows west into The Fleet.	around 2 m diameter, with artificial concrete banks in places. Banks were steep and incised. The bed was dominated by fine sediment. There are numerous service crossings of the watercourse at this location. The Mill Race was also observed downstream of the A1085 adjacent to the Trunk Road roundabout where it was 2-3 m wide, very straight, with a bed dominated by fine sediment. Road runoff appears to discharge into the channel.
Mucky Fleet / Swallow Fleet	Ordinary Watercourse	Tees Estuary	Mucky Fleet and Swallow Fleet are meandering channels draining Cowpen Marsh. A large number of marshland channels intersect these channels, which ultimately drain to the Tees Estuary.	Swallow Fleet was observed from the viewing platform on the A178. The watercourse was approximately 30 m wide at its widest point, although this varied. A network of interconnected marshland channels join Swallow fleet, along with several linear, artificial drainage channels. Fine sediment dominates in this intertidal habitat and is likely reworked with each tide.

9A.4.9 In addition to the watercourses described in Table 9A-3, there are numerous drains and ditches in the Study Area. These are predominantly related to drainage infrastructure in the industrial areas, and many are culverted beneath ground and so their exact course is unclear. In places, the drainage channels are visible above ground and are typically of the order of 0.5 to 1 m in width, ephemeral (i.e. flowing for only part of the year or only after storms), have artificial engineered and sometimes concrete channels.

9A.4.10 There is also a network of small watercourse channels throughout the saltmarsh and wetland area to the south and south-west of Seal Sands. Some of these channels were observed on site from the Saltholme RSPB Nature Reserve, and they are small (1-2 m wide) low gradient, single thread, meandering waterbodies that are closely connected to their floodplains.

9A.4.11 There are a large number of still waterbodies across the Proposed Development Site, the majority of which are small ponds or artificial standing waterbodies. The majority of these on the south-east bank of the Tees are small artificial waterbodies and ponds related to the surrounding industrial land use. To the north-east of the Tees there are further artificial and industrial waterbodies, such as the large brine reservoirs immediately north of the Proposed Development Site at Saltholme. The surrounding wetlands here also include several large, interconnecting waterbodies. The ponds within the Proposed Development Site boundary itself are predominantly very small and generally artificial, with the exception being several waterbodies within the South Gare and Coatham Dunes.

Flood Management Infrastructure

9A.4.12 The Environment Agency own and maintain a number of flood defence assets along the River Tees near the Proposed Development Site and in the wider Study Area. These include a series of embankments and walls upstream and downstream of the Tees Transporter Bridge and defences around the Greatham Creek delta flowing into Seaton on Tees Channel. (See maps provided by the Environment Agency in Annex A). There are also demountable defences that when erected create a wall with the same standard of protection as the surrounding defences. These are privately owned and maintained by Wilton International site.

9A.4.13 The tidal defences in proximity to the Main Site consist of a combination of high ground and raised defences, including floodwalls and flood banks. According to information provided by the Environment Agency they are in Very Good to Good condition and reduce the risk of flooding up to a 0.5% Annual Exceedance Probability (AEP) (1 in 200 chance in any year) event. The Environment Agency inspects these defences routinely to ensure potential defects are identified.

9A.4.14 Additional information on specific areas of flood defences has been provided by the Environment Agency and are detailed below.

Port Clarence

9A.4.15 In 2019, the Environment Agency completed a major flood defence scheme to protect Port Clarence and some of the surrounding industrial areas from tidal flooding. The works comprised the following phases:

- Phase 1 of the works involved improving the defences along the north bank of the River Tees both up and downstream of the Transporter Bridge. This involved a new flood wall through the Wilton International site, a road hump just before the access to the bridge and improvements to the flood bank downstream of the bridge. This work is now complete and is the main protection for Port Clarence.
- Phase 2 involved improving the defences along the south bank of Greatham Creek. This work has improved the protection of the industrial complexes near Seal Sands and also prevents Port Clarence flooding from the north during extreme tidal events.

9A.4.16 Flood defences along the frontage of Port Clarence comprise a combination of flood embankments and flood walls and provide a standard of protection up to and including the 0.5% AEP (1 in 200) flood event.

9A.4.17 The defence crest levels are between approximately 4.59 m – 5.2m AOD and according to the Environment Agency asset condition inspection are in Very Good to Fair condition.

Greatham South

9A.4.18 Flood defences at Greatham South are located between NGR NZ 50259 25412 and NZ 50934 25418, comprised of flood embankments. No information on the standard of protection or the defence crest levels is provided. According to the Environment Agency asset condition inspection the defences are in Good to Fair condition.

Greatham Creek

9A.4.19 Flood defences along Greatham Creek (including areas of Greatham, Greatham Marsh and Claxton Beck) comprise flood embankments and provide a standard of protection between a 20% AEP (1 in 5) and 0.65% AEP (1 in 153) flood event.

9A.4.20 The defence crest levels are between approximately 4.52 m – 6.66m AOD and according to the Environment Agency asset condition inspection are generally in Good to Fair condition.

Seal Sands (Hartlepool)

9A.4.21 Flood defences at Seal Sands comprise flood embankments and provide a standard of protection between 20% AEP (1 in 5) and 2% AEP (1 in 50) flood event.

9A.4.22 The defence crest levels are between approximately 3.44 m – 4.85m AOD and according to the Environment Agency asset condition inspection are generally in Fair condition.

Portrack (Stockton on Tees)

9A.4.23 Flood defences along the course of Lustrum Beck at Portrack comprise a combination of flood embankments and high ground. No information on the standard of protection, the defence crest levels or the condition of the defences is provided.

Greatham North East Flood Alleviation Scheme (Proposed)

9A.4.24 The Environment Agency are currently developing a flood alleviation scheme on the north bank of Greatham Creek and Seal Sands (see indicative plan presented in Annex

A). The Environment Agency are currently undertaking the detailed design of the scheme and hope to commence delivery on site in summer 2024. The flood alleviation scheme includes the following elements:

- the construction of a new flood embankment with a crest height of approximately 5.5m AOD to the north, west and south of Greenabella Marsh adjacent to the Venator Plant Site;
- breach of the existing Greenabella flood embankment in two locations. The remaining sections of the defence will be retained to act as a high tide roost. The managed realignment will see the creation of intertidal mud at Greenabella Marsh;
- the existing Greatham Creek embankment will be repaired, and a regulated tidal exchange (RTE) structure installed to enable tidal connectivity of the brinefield in future; and
- creation of habitat to the west of Marsh House Farm in a former arable field owned by the Environment Agency.

Anticipated Ground Conditions and Hydrogeology

Geology

9A.4.25 Full details on geology and groundwater are provided in Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I). In summary, the British Geological Survey (BGS) Geoindex viewer (BGS, 2020) indicates that the solid geology beneath the Main Site consists of strata of Triassic and Jurassic age.

9A.4.26 Immediately around the River Tees and to the south of Teesmouth the bedrock is Mercia Mudstone. To the south of the Tees, the northern section of the Proposed Development Site is also underlain by Mercia Mudstone, while the southern half of the Proposed Development Site consists of Redcar Mudstone which also stretches south to beyond the Wilton International site and includes the majority of the town of Redcar.

9A.4.27 To the north of the Tees, Mercia Mudstone underlies the Seal Sand Industrial Estate, but then gives way to Sherwood Sandstone Group which is widespread and underlies Seal Sands, Cowpen Marsh, Saltholme and the town of Billingham.

9A.4.28 The superficial deposits beneath the majority of the Proposed Development Site consist of Tidal Flat Deposits (sand, silt and clay). These are found beneath the Tees Estuary, Teesmouth, Seal Sands, Cowpen Marsh and Saltholme. To the north-east of the Proposed Development Site in the coastal area adjacent to Coatham Sands there are deposits of Beach and Tidal Flat Deposits and Blown Sand. The Lackenby Steelworks, Grangetown and Lazenby are underlain by glaciolacustrine deposits, Redcar is underlain by Devensian Till (diamicton). The north-west of the Study Area towards Cowpen Bewley is underlain by glaciolacustrine deposits. There are marine beach deposits on the coastline north of Teesmouth.

9A.4.29 Bedrock and superficial geology present beneath the Proposed Development Site is summarised in Table 9A-4.

Table 9A-4: Geology

SITE	FLOOD ZONE	ARTIFICIAL GEOLOGY	BEDROCK AND SUPERFICIAL GEOLOGY
Main Site	FZ1	Present – entire area	Tidal Flat Deposits (Estuarine Alluvium) Glaciolacustrine Deposits Till, Devensian (Glacial Till, Boulder Clay, Drift)
CO_2 Export Corridor	FZ1	Present – entire area	Blown Sand Tidal Flat Deposits (Estuarine Alluvium) Glaciolacustrine Deposits
Natural Gas Connection Corridor	FZ1	Present – entire area	Blown Sand Tidal Flat Deposits (Estuarine Alluvium) Glaciolacustrine Deposits
Water Connection Corridor	FZ1, FZ2, FZ3a	Present – north-western extent	Blown Sand Tidal Flat Deposits (Estuarine Alluvium) Glaciolacustrine Deposits Till, Devensian (Glacial Till, Boulder Clay, Drift)
Electrical Connection Corridor	FZ1, FZ2, FZ3a	Present – western extent	Blown Sand Tidal Flat Deposits (Estuarine Alluvium) Glaciolacustrine Deposits Till, Devensian (Glacial Till, Boulder Clay, Drift)
Hydrogen Pipeline Corridor	FZ1, FZ2, FZ3a	Present – central and western extent east of the River Tees and eastern extent and localised areas west of the River Tees	Blown Sand Tidal Flat Deposits (Estuarine Alluvium) Glaciolacustrine Deposits Till, Devensian (Glacial Till, Boulder Clay, Drift) Peat Alluvium
Other Gases Connection Corridor (Nitrogen and Oxygen)	FZ1, FZ2, FZ3a	Present – entire area	Blown Sand Tidal Flat Deposits (Estuarine Alluvium) Glaciolacustrine Deposits

Hydrogeology

9A.4.30 PEI Report Figures 10-13: Bedrock Aquifers and Figure 10-12: Superficial Aquifers (PEI Report, Volume II) present the designated superficial and bedrock aquifers below the Proposed Development Site, respectively. The designated aquifers have been defined by the Environment Agency below:

- Principal Aquifer: *"layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and / or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer*".
- Secondary Aquifer — A: "*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers*".
- Secondary Aquifer — B: "*predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers*".
- Secondary Aquifer — Undifferentiated: "*has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type*".
- Unproductive Strata: "*These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow*".

9A.4.31 Hydrogeological conditions for each area of the Proposed Development Site are summarised in Table 9A-5.

Table 9A-5: Hydrogeology

RELEVANT FEATURE	DESIGNATION	STRATA
Main Site		
Superficial Aquifer	• Secondary A • Unproductive • Secondary Undifferentiated	• Tidal Flat Deposits Sand and Silt - (eastern half of the Main Site) • Glaciolacustrine Deposits • Till and Tidal Flat Deposits – Sand, Silt and Clay (western half of the Main Site)
Bedrock Aquifer	• Secondary B • Secondary B	• Mercia Mudstone • Penarth Group • Redcar Mudstone

RELEVANT FEATURE	DESIGNATION	STRATA
	• Secondary Undifferentiated	
Groundwater Vulnerability	High (Secondary Superficial)	-
Source Protection Zone	None within 1km	-
CO_2 Export Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary Undifferentiated • Unproductive	• Tidal Flat Deposits – Sand and Silt • Blown Sand • Till • Glaciolacustrine Deposits
Bedrock Aquifer	• Secondary B • Secondary B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	High (Secondary Superficial)	-
Source Protection Zone	None within 1km	-
Natural Gas Connection Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary Undifferentiated • Unproductive	• Tidal Flat Deposits – Sand and Silt • Blown Sand • Till • Glaciolacustrine Deposits
Bedrock Aquifer	• Secondary B • Secondary B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	High (Secondary Superficial)	-
Source Protection Zone	None within 1km	-

RELEVANT FEATURE	DESIGNATION	STRATA
Water Connection Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary Undifferentiated • Unproductive	• Tidal Flat Deposits – Sand and Silt • Blown Sand • Till • Glaciolacustrine Deposits
Bedrock Aquifer	• Secondary B • Secondary B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	High (Secondary Superficial) Medium (Secondary Superficial) Low (Secondary Superficial) Medium (Secondary Bedrock) Low (Secondary Bedrock)	-
Source Protection Zone	None within 1km	-
Electrical Connection Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary Undifferentiated • Unproductive	• Tidal Flat Deposits – Sand and Silt (north-eastern extent of the Corridor) • Blown Sand • Till and Tidal Flat Deposits – Sand, Silt and Clay (for north-western and southern extend of the Corridor) • Glaciolacustrine Deposits
Bedrock Aquifer	• Secondary B • Secondary B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone

RELEVANT FEATURE	DESIGNATION	STRATA
Groundwater Vulnerability	High (Secondary Superficial) Medium (Secondary Superficial) Medium (Secondary Bedrock) Low (Secondary Bedrock)	-
Source Protection Zone	None within 1km	-
Hydrogen Pipeline Corridor		
Superficial Aquifer	• Secondary A • Secondary A • Secondary Undifferentiated • Unproductive	• Tidal Flat Deposits – Sand and Silt (north-eastern extent of the Corridor) • Blown Sand • Till and Tidal Flat Deposits – Sand, Silt and Clay (north-west and south-west extent of the Corridor) • Glaciolacustrine Deposits
Bedrock Aquifer	• Secondary B • Secondary B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	High (Secondary Superficial) Medium (Secondary Superficial) Medium (Secondary Bedrock) Low (Secondary Bedrock)	-
Source Protection Zone	None within 1km	-
Oxygen and Nitrogen Corridor		
Superficial Aquifer	• Secondary A • Secondary A	• Tidal Flat Deposits – Sand and Silt (most of the Corridor)

RELEVANT FEATURE	DESIGNATION	STRATA
		• Blown Sand • Tidal Flat Deposits – Sand, Silt and Clay (far western and southernmost extend)
Bedrock Aquifer	• Secondary B • Secondary B • Secondary Undifferentiated	• Mercia Mudstone • Penarth Group • Redcar Mudstone
Groundwater Vulnerability	High (Secondary Superficial)	-
Source Protection Zone	None within 1 km	-

9A.4.32 Cranfield University's Soilscapes website (Cranfield University, n.d.) indicates that the majority of the Study Area either side of the Tees Estuary is underlain by loamy and clayey soils of coastal flats with naturally high groundwater. Beyond this, the Lackenby Steelworks is underlain by slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soil. The latter is also found in the northern extent of the Study Area north of Haverton Hill and toward Billingham. However, due to past development, soil type and structure is likely to have been altered and large areas of Made Ground exist. Finally, sand dune soils are found along the coastal areas to the north of the Study Area.

9A.4.33 The Study Area is not within a drinking water safeguard zone for groundwater or surface water.

9A.5 The Proposed Development

Introduction

9A.5.1 The Proposed Development comprises the construction, operation, (including maintenance) and decommissioning of an approximately 1.2 GWth (Phase 1 600 MWth and Phase 2 600 MWth) Carbon Capture and Storage (CCS) enabled Hydrogen Production Facility located in the Teesside industrial cluster area along with the pipeline infrastructure required to supply hydrogen (H_2) to offtakers (customers) and the necessary utility connections. The Production Facility will be located within land owned by Teesworks known as 'The Foundry' (the Main Site) in Redcar and Cleveland, with the connection corridors extending further into Stockton-on-Tees and Hartlepool, all within the Tees Valley.

9A.5.2 The Production Facility at the Main Site will need a hydrogen pipeline to transport the H_2 produced to potential industrial off-takers around Teesside as well as a CO_2

export connection and other utility connections including natural gas, water and electricity.

9A.5.3 H2Teesside will have a mainly baseload production profile, with demand coming from multiple end users, including fuel switching within chemical and petrochemical industries, combined heat and power (CHP) generation and flexible power generation, amongst others. The capture technology is post-combustion amine-based absorption-regeneration with a design carbon capture rate in excess of 95%. H2Teesside will connect via a short CO_2 export connection to Northern Endurance Partnership (NEP) infrastructure to the east of the Main Site. Based on current projections, H2Teesside will have the capacity to continuously export 1.35 million tonnes (Mt) of dehydrated and compressed CO_2 per year per Phase, or 2.7 Mt/year once both phases are operational (100% utilisation) with no temporary CO_2 storage required on Main Site.

9A.5.4 At this stage in the design of the Proposed Development, there are still options being considered for various components. The design of the Proposed Development therefore incorporates a necessary degree of flexibility to allow for the future selection of the preferred layout at the Main Site, as well as routing of the hydrogen pipeline and other connections. This will evolve as the design and commercial agreements progress throughout the preparation of the DCO Application.

9A.5.5 The Rochdale Envelope approach has been adopted to ensure that a worst case in terms of design parameters, proposed development extents and options has been considered. It is expected that the current optionality will be reduced, and preferred options confirmed prior to submission of the DCO Application, and the Rochdale Envelope used and assessed will be narrowed accordingly.

9A.5.6 In addition, some of the design aspects and features of the Proposed Development cannot be confirmed until the Engineering, Procurement and Construction (EPC) Contractor has been appointed. For example, the building sizes may vary depending on the contactor selected and their specific configuration and selection of plant. However, an indicative construction programme is presented within Chapter 5: Construction Programme and Management (PEI Report, Volume I) on which the potential environmental effects of the Proposed Development have been assessed. Therefore, focused use of the Rochdale Envelope approach will continue to be adopted to define appropriate parameters for use in the environmental impact assessment (EIA).

Components of the Proposed Development

9A.5.7 This section provides a summary of the Proposed Development as described in detail in Chapter 4: Proposed Development (PEI Report, Volume I).

Main Site

9A.5.8 A new-build natural gas-fuelled blue hydrogen production facility (via auto-thermal reforming) with integrated carbon capture unit, low pressure compression, and associated utilities and buildings (Hydrogen Production Facility).

Hydrogen Pipeline Corridor

9A.5.9 A gaseous phase hydrogen pipeline network is required to connect various potential industrial off-takers across the Tees Valley to the Production Facility at the Main Site. The length of the Hydrogen Pipeline Corridor extends beyond 16 km and will require crossings of numerous watercourses.

9A.5.10 The Hydrogen Pipeline will be up to 24" in diameter and will cross the Tees Estuary and Greatham Creek (and adjacent waterbodies at Seal Sands) using trenchless technologies (Micro Bored Tunnelling (MBT) and Horizontal Directional Drilling (HDD) respectively). The Hydrogen Pipeline Corridor is shown in Figure 9-1 (PEI Report, Volume II), with a northern option and southern option for the crossing of the Tees still remaining at this PEI Report stage. The sections of the Hydrogen Pipeline that will be installed via trenchless approaches will require launch, reception, and jointing pits to be installed.

9A.5.11 Various route options and construction methodologies are being considered for the remainder of the Hydrogen Pipeline Corridor (aside from the trenchless crossings discussed above). These include an option for below ground open trench (buried), installation on existing above ground pipe racks, and repurposing and reuse of existing pipelines (where possible). However, this is subject to ongoing design work, discussions with landowners and statutory consultees, as well as being informed by environmental surveys.

9A.5.12 For the majority of the hydrogen pipeline corridor south of the River Tees, it is proposed to route along existing established pipeline corridors (generally above ground) where possible. There will be watercourse crossings of Knitting Wife Beck, the Mill Race, Mains Dike, and the Fleet. These are all assumed to be above ground crossings utilising existing pipe bridges. Belasis Beck to the south of the Tees off Cowpen Bewley Road will also be constructed above ground.

9A.5.13 The following watercourse pipeline crossings to the south of the Tees Estuary are assumed to require open cut methods for installation. These are Belasis Beck and three unnamed watercourses.

9A.5.14 The exact number of watercourse crossings and their methodology will be identified and assessed for the ES.

CO2 Export Corridor

9A.5.15 CO_2 captured and compressed at H2Teesside will be exported in a pipeline of up to 22" diameter to feed into the NEP CO_2 gathering system via a short CO_2 export connection pipeline between the H2Teesside Production Facility and the NEP development to the east, for high-pressure compression.

9A.5.16 At this stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the CO_2 Export options for the Main Site have been depicted as broad corridors and it is expected that the extents of these will be refined further as the preparation of the DCO Application progresses. At this stage in the design development, the CO_2 export connection may be entirely above or below ground or a combination of the two.

Natural Gas Connection Corridor

9A.5.17 Natural gas will need to be imported to the Production Facility for use in the reforming process. The exact routing of this connection is to be confirmed and subject to ongoing design, however, at this stage it is anticipated that a 24" pipeline will be constructed as part of the Proposed Development which will connect the proposed Production Facility at the Main Site to the wider gas supply network at a tie in point to infrastructure constructed by NEP.

9A.5.18 At this stage in the design development, the natural gas connection may be entirely above or below ground or a combination of the two. At this stage it is assumed that below ground construction of the Natural Gas Connection will use a combination of open-trench and trenchless technologies dependent upon engineering and environmental constraints.

9A.5.19 At this stage in the design and assessment process and in applying the Rochdale Envelope approach, the potential areas required for the gas connection options have been depicted as a broad corridor. It is expected that the extent of this will be refined further, and the routing options may be reduced as the Proposed Development design progresses.

Electrical Connection Corridor

9A.5.20 There is existing electrical infrastructure in the area which comprises a combination of overhead and lower voltage underground cables that serve the local area and other industrial users located in proximity to the Proposed Development Site. Although the Production Facility can supply a proportion of its energy requirements onsite via the steam turbine generator (STG), an alternative electricity supply will also be required, likely from a nearby sub-station. The final decision on substation choice will be subject to design development and further work based on constructability and electrical network resilience and capacity.

9A.5.21 At this stage in the design development, the electrical connection may be entirely above or below ground or a combination of the two. The Electrical Connection Corridor is currently depicted as broad corridors.

9A.5.22 There is potential for watercourse crossings within these corridors depending on the final arrangement of infrastructure. The locations are not known at this stage but affected watercourses may include the Fleet, Mains Dike, Dabholm Beck, Kinkerdale Beck, the Mill Race, Cross Beck and Knitting Wife Beck. At this stage it is assumed that all of these watercourses will be crossed using open-cut techniques as a worst-case scenario.

Other Gases Connections

9A.5.23 Other gas connection pipelines may be required for the transportation of compressed O_2 and N_2 for use at the Production Facility. At this stage in the design development, the connections for other gases may be entirely above or below ground or a combination of the two. There is potential for watercourse crossings relating to the Fleet, Mains Dike and Dabholm Beck. At this stage it is assumed that all of these watercourses will be crossed using open-cut techniques as a worst-case scenario.

Water Connections Corridor

9A.5.24 The Water Connections Corridor includes a pipeline route(s) between the Main Site and Bran Sands Wastewater Treatment Works (WwTW) as well as a potential connection to the Net Zero Teesside (NZT) project (for use of the discharge outfall) and a potential route for a Demineralised Water connection between the Main Site and Wilton International. At this stage in the design development, the water connections may be entirely above or below ground or a combination of the two.

9A.5.25 At this stage in the design and assessment process and in applying the Rochdale Envelope approach, the land required for the water connection options currently proposed for the Main Site has been depicted as a broad corridor. There is potential for watercourse crossings within the corridor depending on the final arrangement of infrastructure. The locations are not known at this stage but affected watercourses may include the Fleet, Mains Dike and Dabholm Beck. At this stage it is assumed that all these watercourses will be crossed using open-cut techniques as a worst-case scenario.

Chemical Storage on Site

9A.5.26 A number of chemicals will be required to be stored and used on Main Site. The inventory of materials to be stored on Main Site will be finalised through the detailed design. However, where storage of hazardous materials — individually or in-combination — exceeds the relevant thresholds, separate permissions will be sought from the Hazardous Substances Authority, Health and Safety Executive (HSE) and Local Planning Authority (LPA) as appropriate for their storage, under the Hazardous Substance Consent and Control of Major Accident Hazards (COMAH) and Hazardous Substance Consent regimes respectively. All chemical storage will be regulated by the Environment Agency through an environmental permit that will be required for the operation of the Proposed Development.

9A.5.27 On-site storage of hydrogen may be required for the Proposed Development. Should there be a requirement for hydrogen storage on-site, it is expected that this will be more than 5 and not exceeding 11 tonnes of pressurised storage. On-Site above ground storage of hydrogen, located at the main site, will be utilised to provide resilience to the hydrogen production network.

Access

9A.5.28 Access to the Main Site during the construction phase for Heavy Goods Vehicles (HGVs) construction traffic is likely to be via the existing access road from the A1085 via the former Teeswork Steel House Gate. This route will also be used during operation for staff and other site traffic. At this stage it is assumed that all construction HGVs associated with the Main Site would arrive/depart the site from Tees Dock Road via the A1053/A66/Tees Dock Road roundabout. At the junction with the A1053/A66/Tees Dock Road, it is assumed that 50% would head west on the A66 and 50% would head south on the A1053 then west on the A174. Alternatively, HGV traffic could access the A1085 Trunk Road from the Lackenby Steelworks entrance (accessed from the Main Site via the internal Teesworks road network) from where

traffic could route via the A66 or A1053 as above. For further detail regarding access, please refer to Chapter 15: Traffic and Transport (PEI Report, Volume I).

9A.5.29 Construction access routes for the hydrogen pipeline and connection corridors are yet to be defined, however, it is assumed that laydown areas will be identified at suitable locations along the pipeline routes located north of the River Tees to ensure disturbance is kept to a minimum.

9A.5.30 It is likely that the Main Site construction laydown areas will be utilised during the construction of the sections of the Hydrogen Pipeline Corridor and other connections in proximity e.g., Water Connections, Natural Gas Connection and Electricity Connection (south of the River Tees). Currently it is proposed that laydown areas for the Main Site construction will be located on land within, to the east and west of the Main Site, thereby minimising the distance to the Main Site. Other laydown areas for pipeline construction required will be located within the connection corridors and will be identified in the DCO Application.

Lifetime of the Development

9A.5.31 The Main Site is located on the site of the former SSI Steelworks which is brownfield land that currently contains some above and below ground structures and redundant services associated with the former steelworks. The removal of those structures, clearance and any necessary remediation of Main Site will be undertaken before the construction of the main structures of the Proposed Development. The removal of current structures is the responsibility of the landowner, i.e., Teesworks, and is therefore not assessed in this PEI Report. Construction of the Proposed Development will occur over the period of 2025 to 2027 for Phase 1 and from late 2027 to mid-2030 for Phase 2.

9A.5.32 The Production Facility will have a design life of 25 years for each phase. However, the operational life could be longer subject to market conditions and plant condition. At the end of the expected design life, these elements would be assessed for ongoing viability and, only if no longer viable, be decommissioned. The PEI Report has assumed that the Proposed Development could operate for longer than a 25-year design life, and in relevant chapters has considered and assessed the potential for operational impacts and effects to continue beyond this timeframe.

9A.5.33 Given that the Proposed Development Site may operate beyond the anticipated lifetime of the development, subject to market conditions and plant viability, and in line with the lifetime of non-residential uses in the NPPF and Flood Risk and Coastal Change PPG, the lifetime of the development is assumed to be 75 years for the purpose of the preliminary FRA.

9A.6 Planning Policy

9A.6.1 The Sections below consider the planning policies and guidance of relevance to the Proposed Development Site with regards to the flood risks from all sources and appropriate mitigation measures which should be considered.

National Policy Guidance

National Policy Statements

9A.6.2 The Overarching National Policy Statement (NPS) for Energy (EN-1), 2011 is relevant to this assessment with the main sections being Section 5.7 Flood Risk, Paragraph 5.7.4 states that:

"*Applications for energy projects of 1 hectare or greater in Flood Zone 1 in England or Zone A in Wales113 and all proposals for energy projects located in Flood Zones 2 and 3 in England or Zones B and C in Wales should be accompanied by a flood risk assessment (FRA). An FRA will also be required where an energy project less than 1 hectare may be subject to sources of flooding other than rivers and the sea (for example surface water), or where the EA, Internal Drainage Board or other body have indicated that there may be drainage problems. This should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed, taking climate change into account*."

9A.6.3 The minimum requirements for an FRA are also listed in Section 5.7 of EN-1, the minimum requirements for FRAs are that they should:

- be proportionate to the risk and appropriate to the scale, nature and location of the project;
- consider the risk of flooding arising from the project in addition to the risk of flooding to the project;
- take the impacts of climate change into account, clearly stating the development lifetime over which the assessment has been made;
- be undertaken by competent people, as early as possible in the process of preparing the proposal;
- consider both the potential adverse and beneficial effects of flood risk management infrastructure, including raised defences, flow channels, flood storage areas and other artificial features, together with the consequences of their failure;
- consider the vulnerability of those using the site, including arrangements for safe access;
- consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and identify flood risk reduction measures, so that assessments are fit for the purpose of the decisions being made;
- consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes;
- include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that these

risks can be safely managed, ensuring people will not be exposed to hazardous flooding;

- consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of the project may affect drainage systems;
- detail those measures that will be included to ensure the development will be safe and remain operational during a flooding event throughout the development's lifetime without increasing flood risk elsewhere;
- consider if there is a need to be safe and remain operational during a worst-case flood event over the development's lifetime; and
- be supported by appropriate data and information, including historical information on previous events.

Revised Draft National Policy Statements

9A.6.4 The UK Government is currently reviewing and updating the Energy NPSs. It is doing this to reflect its policies and strategic approach for the energy system that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions. As part of the NPS review process, the Government published a suite of revised draft of NPSs for new energy infrastructure on 6 September 2021. They are currently holding public re-consultation that support the decision on major energy infrastructure due to close on 25 May 2023. These include the following Draft NPSs:

- Draft Overarching National Policy Statement for Energy (EN-1) (Department of Energy Security and Net Zero (DESNZ), 2023b);
- Draft NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (DESNZ, 2023c), and
- Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (DESNZ, 2023d).

9A.6.5 The detail of these provisions are, however, subject to consultation and thereafter implementation. The timetable for adoption of the updated NPSs is not known, however it is expected that these will be finalised and shall replace the current NPSs by the time the DCO application is submitted.

9A.6.6 Given the importance of these NPSs, the assessment approach takes account of these new emerging documents and any subsequent formal adoption of new NSPs for energy infrastructure will be considered where relevant during the production of the ES. The following summary indicates where the relevant Draft NPS contain requirements that differ from the requirements of the existing NPSs (which otherwise apply):

- identifying and securing opportunities to reduce the causes and impacts of flooding overall during the construction period should be included as a minimum

requirement for FRA as stated in EN-1 Draft 2023 Section 5.8 Flood Risk, Paragraph 5.8.15; and

- inclusion of changes to the assessment of the existing status due to the impact of climate change on rainfall patterns and consequently water availability across the water environment in EN-1 Draft 2023 Section 5.16 Water Quality and Resources, Paragraph 5.16.13.

9A.6.7 The Draft NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (DESNZ, 2023c) also addresses flood risk in relation to climate change resilience in Chapter 2.3 Climate Change Adaptation.

9A.6.8 As climate change is likely to increase risks to some of this infrastructure, from flooding or rising sea levels for example, applicants should in particular set out how the proposal would be resilient to:

- increased risk of flooding;
- effects of rising sea levels and increased risk of storm surge;
- higher temperatures;
- increased risk of earth movement, coastal erosion, or subsidence from increased risk of flooding and drought; and
- any other increased risks identified in the applicant's assessment.

9A.6.9 The resilience of a project to climate change should be assessed in an Environmental Statement (ES) accompanying an application. For example, future increased risk of flooding should be covered in the flood risk assessment.

UK Marine Policy Statement

9A.6.10 The Marine Policy Statement (MPS) (Department for Environment, Food & Rural Affairs (DEFRA), 2011a) is the framework for preparing Marine Plans and taking decisions affecting the marine environment. It establishes a vision for the marine environment, which is for '*clean, healthy, safe, productive, and biologically diverse oceans and seas*'. The MPS underpins the process of marine planning, which establishes a framework of economic, social, and environmental considerations in that will deliver these high-level objectives and ensure the sustainable development of the UK marine area.

9A.6.11 Section 2.6.8 of the MPS is relevant to the flood risk and drainage. In particular, paragraph 2.6.8.4 states, amongst other things, that "*Marine plan authorities should be satisfied that activities and developments will themselves be resilient to risks of coastal change and flooding and will not have an unacceptable impact on coastal change...*". In addition, paragraph 2.6.8.6 notes that *"the impacts of climate change throughout the operational life of a development should be taken into account in assessments".*

9A.6.12 The North East Inshore and North East Offshore Marine Plans (DEFRA, 2021) establishes the plan led system for the marine area in which the riverine parts of the Proposed Development Site are located. It provides a framework that will shape and

inform decisions over how the areas' waters are developed, protected and improved over the next 20 years.

9A.6.13 Section 3.5 states *"The East marine plan areas have a role to play in realising national ambitions with regard to climate change. Adaptation involves modifying infrastructure to better deal with climate change conditions and helping people to determine how to adjust their behaviour/ decisions to enable them to adapt to the challenges of a changing climate."* (Paragraph 230)

9A.6.14 Policy CC1 states that *"Proposals should take account of:*

- *How they may be impacted upon by, and respond to, climate change over their lifetime; and*
- *How they may impact upon any climate change adaptation measures elsewhere during their lifetime.*

  Where detrimental impacts on climate change adaptation measures are identified, evidence should be provided as to how the proposal will reduce such impacts."

9A.6.15 Policy CC1 is consistent with, and adds marine planning context to, the NPPF (see below) in seeking that new development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. The combination of a low-lying topography, isostatic change, a rise in sea levels and the possibility of an increase in tidal surges in the North Sea are particularly significant for the East Coast.

National Planning Policy Framework

9A.6.16 Published by the Ministry of Housing, Communities and Local Government, the NPPF (Ministry of Housing, Communities and Local Government, 2021) was updated in July 2021. The NPPF has three overarching objectives to contribute to the achievement of sustainable development, one of which is the `environmental objective'. This objective includes the requirement of *"improving biodiversity, using natural resources prudently, and minimising waste and pollution"* (Paragraph 8c).

9A.6.17 The NPPF contains several statements which are relevant to flood risk. These include:

- Strategic policies should set out an overall strategy for the pattern, scale, and quality of development, and make provision for:
  - housing, employment, retail, leisure, and other commercial development (paragraph 20a);
  - infrastructure for transport, telecommunications, security, waste management, water supply, wastewater, flood risk and coastal change management, and the provision of minerals and energy (including heat) (paragraph 20b); and
  - conservation and enhancement of the natural, built and historic environment. This includes landscapes and green infrastructure and

planning measures to address climate change mitigation and adaptation (paragraph 20d).

- Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure (paragraph 153).
- New development should be planned for in ways that: (a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure (paragraph 154).
- Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere (paragraph 159).
- Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards (paragraph 160).
- All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property (paragraph 161). And
- When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific FRA. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:
  - within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
  - the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;

- it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- any residual risk can be safely managed; and
- safe access and escape routes are included where appropriate, as part of an agreed emergency plan (paragraph 167); and

- Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:
  - take account of advice from the lead local flood authority;
  - have appropriate proposed minimum operational standards;
  - have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
  - where possible, provide multifunctional benefits (paragraph 169).

9A.6.18 The requirements of the NPPF with regards flood risk have been taken into account in the assessment.

National Planning Policy Guidance

9A.6.19 The PPG (Department for Communities and Local Government, 2022) provides guidance for local planning authorities on assessing the significance of water environment effects of proposed developments. The guidance highlights that adequate water and wastewater infrastructure is needed to support sustainable development.

9A.6.20 The NPPF (Ministry of Housing, Communities and Local Government, 2021) and the Flood Risk and Coastal Change NPPG (Department for Communities and Local Government, 2022) recommend that Local Plans should be supported by a SFRA and develop policies to manage flood risk from all sources, taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as LLFAs and Internal Drainage Boards (IDBs). Local Plans should apply a sequential, risk-based approach to the location of development to avoid, where possible, flood risk to people and property and manage any residual risk, taking account of the impacts of climate change, by:

- applying the Sequential Test;
- applying the Exception Test, if necessary;
- safeguarding land from development that is required for current and future flood management;
- using opportunities offered by new development to reduce the causes and impacts of flooding; and
- where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to

facilitate the relocation of development, including housing, to more sustainable locations.

9A.6.21 All sources of flooding should be considered in order to steer development at the planning stage to areas at the lowest risk of flooding in order to satisfy the Sequential Test. This includes assessing the risk of flooding from Main Rivers and the Sea. The predicted flood risk from these sources is shown on the Environment Agency's Fluvial and Coastal Map, also known as the Flood Map for Planning (FMfP), which outlines three main zones of risk.

9A.6.22 The Flood Zone definitions used in both the NPS and NPPF, as presented in Table 1 of the PPG, are defined in Table 9A-6.

Table 9A-6: Flood Zone Definitions

FLOOD ZONE	DEFINITION	PROBABILITY OF FLOODING
Flood Zone 1	Land that has a low probability of flooding (less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)).	Low
Flood Zone 2	Land that has a medium probability of flooding (between 1 in 100 and 1 in 1,000 annual probability of river flooding (0.1-1%), or between 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.1-0.5%).	Medium
Flood Zone 3a	Land that has a high probability of flooding (1 in 100 year or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%).	High
Flood Zone 3b (Functional Floodplain)	This zone comprises land where water has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).	Very High

FLOOD ZONE	DEFINITION	PROBABILITY OF FLOODING
	Please note, this zone is not usually included within the FMfP and is calculated where necessary during detailed hydraulic modelling.	

9A.6.23 As discussed in Section 9.2, the Environment Agency's FMfP identifies that the Proposed Development Site is located predominantly within Flood Zone 1 with some sections of the Connection Corridors located in Flood Zones 2 and 3.

Vulnerability of the Proposed Development

9A.6.24 According to NPPF Annex 3 Flood Risk Vulnerability Classification, the Proposed Development is classified as 'Essential Infrastructure'. Essential Infrastructure is defined as *"Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood".*

Sequential Test

9A.6.25 The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account. Where it is not possible to locate development in low-risk areas (i.e. Flood Zone 1), the Sequential Test should go on to compare reasonably available sites:

- within medium risk areas (i.e. Flood Zone 2); and
- then, only where there are no reasonably available sites in low and medium risk areas, within high-risk areas (i.e. Flood Zone 3).

9A.6.26 The Proposed Development is a Nationally Significant Infrastructure Project (NSIP). Requirements and restrictions in relation to the location of an NSIP within Flood Zone 3 are set out in pars 5.8.15 of NPS EN-1. which states: "*Preference should be given to locating projects in areas of lowest flood risk. The Secretary of State should not consent development in flood risk areas (Flood Zone 2 and Flood Zone 3 in England), accounting for all sources of flooding and the predicted impacts of climate change unless they are satisfied that the sequential test requirements have been met. However, when seeking development consent on a site allocated in a development plan through the application of the Sequential Test, informed by a strategic flood risk assessment, applicants need not apply the Sequential Test, provided the proposed development is consistent with the use for which the site was allocated and there is no new flood risk information that would have affected the outcome of the test. Consideration of alternative sites should take account of the policy on alternatives set out in Section 4.2 of the NP S EN-1. All projects should apply the sequential approach to locating development within the site".*

9A.6.27 The Main Site is entirely located within Flood Zone 1, the flood zone of lowest risk. The location of the Main Site within the former SSI Steelworks utilises previously developed land and specifically avoids the need for new built development in Flood Zone 2 or 3 therefore meets the requirements of the sequential test.

9A.6.28 The site selection process for the location of the Proposed Development Site is set out in Chapter 6: Alternatives and Design Evolution (PEI Report, Volume I). In summary, the analysis of potential sites focussed on identifying a site that supports the development that facilitates local regeneration industrial connectivity and the path to decarbonisation.

9A.6.29 Some of the criteria that were considered as part of the site selection process are outlined below:

- proximity to the east coast and NEP infrastructure – to enable high pressure CO_2 export to be quickly directed offshore and specifically to the Endurance storage facility and to separate high pressure systems from residential areas;
- dimensionality – ensuring there is sufficient space for the Proposed Development and its constructability and expansion potential;
- utilising brownfield land where possible;
- proximity to industrial offtakers that could connect into the H_2 Network;
- proximity to necessary connections including gas network, electricity transmission network, water supply; and
- minimising environmental/social effects or risks.

9A.6.30 As part of the site selection process, the Main Site is deemed the most appropriate site for the hydrogen production facility, given its location on brownfield land, being relatively distant from residential areas, of sufficient area to enable construction, having proximity to the necessary connections, and of being accessible for construction including from port and jetty facilities.

9A.6.31 In addition, the Main Site is directly adjacent to the NEP onshore facilities at NZT, thereby simplifying the CO_2 connection corridor routing. The Main Site also presents an opportunity to consider locating other proposed bp projects in Teesside (such as HyGreen, a proposed green hydrogen project), adjacent to the Proposed Development Site, allowing synergies between the projects to be explored.

9A.6.32 In the STBC Local Plan (STBC, 2019) Policy SD4 - Economic Growth Strategy states *"The Seal Sands, North Tees and Billingham Chemical Complex areas are the main growth locations for hazardous installations including [...] carbon capture and storage"*. Much of the land within the Site connection corridors that lies in Flood Zone 3 is within the boundary of STBC.

9A.6.33 Any construction works within Flood Zones 2 and 3 will be temporary in nature in terms of construction activities, and any permanent fixtures (required for the life of the Proposed Development) will only comprise a potential above ground installation (AGI) at the eastern end of the Dabholm Gut and include buried pipelines or pipelines fixed to existing pipe-rack infrastructure.

Given the evidence provided above it is, therefore, considered that the Sequential Test is satisfied. Information supporting the Sequential Test will be provided in the ES.

Exception Test

9A.6.34 Table 2 of the PPG provides a Flood Risk Vulnerability and Flood Zone Compatibility matrix (replicated in Table 9A-7) identifying which vulnerability classifications are appropriate within each Flood Zone.

9A.6.35 As shown in Table 9A-7, whilst essential infrastructure is appropriate in Flood Zones 1 and 2, application of the Exception Test is required for the elements of the Proposed Development located in Flood Zone 3. As illustrated on Figure 9-3: Fluvial Flood Risk (PEI Report, Volume II), some of the Connection Corridors are partially located within Flood Zones 2 and 3. The available detailed maps presented within the LLFAs SFRAs (see Annex B) for STBC (Map 10,11,16,17 and 18) and RCBC (Map 1,2,14,15,16 and 17) show the differentiation of Flood Zone 3 to Flood Zone 3a and Flood Zone 3b. This mapping confirms that the parts of the Proposed Development located within Flood 3, as shown on Figure 9-3, are all within Flood Zone 3a.

Table 9A-7: Flood Risk Vulnerability and Flood Zone Compatibility

FLOOD RISK VULNERABILITY CLASSIFICATION	ESSENTIAL INFRASTRUCTURE	WATER COMPATIBLE	HIGHLY VULNERABLE	MORE VULNERABLE	LESS VULNERABLE
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception test required	✓	✓
Zone 3a	Exception test required	✓	×	Exception test required	✓
Zone 3b (Functional Floodplain)	Exception test required	✓	×	×	×

Key
✓ *Development is appropriate.*
× *Development should not be permitted.*

9A.6.36 The detail of the Exception Test required for a NSIP is set at Paragraph 5.7.16 of the NPS EN-1 which states: *"Both elements of the test will have to be passed for development to be consented. For the Exception Test to be passed:*

- *the project provides wider sustainability benefits to the community that outweigh flood risk; and*
- *the project reduces flood risk overall, where possible."*

9A.6.37 Further information regarding the Exception Test will be provided in the ES.

9A.6.38 The Proposed Development will bring sustainability benefits, such as contributing to the UK's greenhouse gas (GHG) emissions reduction targets, supporting the decarbonisation of natural gas in Teesside for use in industrial applications and thus helping to achieve national targets in relation to carbon net zero. It will also be a key contributor to restoring manufacturing jobs in the Tees Valley.

Environment Agency Climate Change Guidance (2022)

9A.6.39 The Environment Agency published updated climate change allowances in May 2022 (Environment Agency, 2022) to support the NPPF, which supersede all previous allowances written in the PPG: Flood Risk & Coastal Change and EA Climate Change Guidance 2019 (EA, 2019) and are predictions of anticipated change for:

- peak river flow by River Basin District;
- peak rainfall intensity;
- sea level rise; and
- offshore wind speed and extreme wave height.

9A.6.40 There are allowances for different climate scenarios over different epochs, or periods of time, over the coming century. They include figures for extreme climate change scenarios, known as High++ (H++) allowances.

9A.6.41 To increase resilience to flooding these should be considered within an FRA in regard to future impacts from climate change on site specific planning applications. The Environment Agency's guidance outlines how and when allowances should be applied for FRAs.

Tidal Climate Change Allowances

9A.6.42 Table 9A-8 is an extract replicated from Table 3 of the Environment Agency guidance detailing the revised anticipated rise in sea levels up to 2125.

Table 9A-8: Sea Level Allowance for Each Epoch in Millimetres (mm) per year with Total Sea Level Rise for Each Epoch in Brackets (use 1981 to 2000 baseline)

RIVER BASIN DISTRICT	ALLOWANCE	2000 TO 2035	2036 TO 2065	2066 TO 2095	2096 TO 2125	CUMULATIVE RISE 2000 TO 2125 (M)
Northumbria	Higher central	4.6 (161 mm)	7.5 (225 mm)	10.1 (303 mm)	11.2 (336 mm)	1.03 m
	Upper end	5.8 (203 mm)	10.0 (300 mm)	14.3 (429 mm)	16.5 (495 mm)	1.43 m

9A.6.43 As the Proposed Developments is defined as Essential Infrastructure and a NSIP it is appropriate to apply the single H++ allowance. Table 9A-9 replicated from Table 4 of the Environment Agency guidance shows the H++ allowance total sea level rise to 2100.

Table 9A-9: H++ Sea Level Rise Allowance

CHANGE TO RELATIVE MEAN SEA LEVEL	TOTAL SEA LEVEL RISE TO 2100*
H++	1.9 m

**There is no H++ value beyond 2100*

Fluvial Climate Change Allowance

9A.6.44 For proposed developments in areas of fluvial flood risk, the flood risk vulnerability classification, flood zone and lifetime of development are of particular importance to determine the correct climate change allowance as detailed in Table 9A-10.

Table 9A-10: Climate Change Allowances to apply based upon the Flood Zone and Development Land Use Vulnerability

	WATER COMPATIBLE	LESS VULNERABLE	MORE VULNERABLE	HIGHLY VULNERABLE	ESSENTIAL INFRASTRUCTURE
Flood Zone 2	CA	CA	CA	CA	HCA
Flood Zone 3a	CA	CA	CA	X	HCA
Flood Zone 3b	CA	X	X	X	HCA
CA = Central Allowance, HCA = High Central Allowance; X = Development not permitted					

9A.6.45 As the Proposed Development is classified as 'Essential Infrastructure' from the vulnerability classifications in Annex 3 of the NPPF, the corresponding percentages that should be assessed at sites within the Tees Management Catchment are listed in Table 9A-11. The guidance states that for *"Essential Infrastructure located in Flood Zone 2 or Flood Zone 3 the Higher Central Allowance should be assessed".* Therefore a +40% allowance for climate change is applicable to the Proposed Development based on the lifetime of the development, assessed in line with the NPPF (i.e., 75 years).

Table 9A-11: Environment Agency Peak River Flow Climate Change Allowances for the Tees Management Catchment

	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE '2020S'	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE '2050S'	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE `2080S'
Upper End Allowance	32%	41%	61%
Higher Central Allowance	23%	27%	40%
Central Allowance	19%	21%	32%

Pluvial Climate Change Allowance

9A.6.46 To account for the anticipated changes in rainfall intensity, the Environment Agency's guidance (as shown in Tables 9A-12 and 9A-13) states that *"a FRA for an expected development with a lifetime up to 2100 assess the upper end allowances. You must do this for both the 1% and 3.3% annual exceedance probability events for the 2070s epoch (2061 to 2125)".*

Table 9A-12: Environment Agency Peak Rainfall Intensity Climate Change Allowances for Tees Catchment Management (3.3% annual exceedance rainfall event)

	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE '2050S' (UP TO 2060)	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE '2070S' (2061 TO 2125)
Upper End Allowance	35%	40%
Central Allowance	20%	30%

Table 9A-13: Environment Agency Peak Rainfall Intensity Climate Change Allowances across England for Tees Catchment Management (1% annual exceedance rainfall event)

	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE '2050S' (UP TO 2060)	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE '2070S' (2061 TO 2125)
Upper End Allowance	40%	45%
Central Allowance	25%	30%

9A.6.47 Therefore, a +45% allowance for climate change is applicable to the Proposed Development Site. This will be taken into account in the calculations of surface water runoff rates and volumes in the Drainage Strategy for the Proposed Development Site.

9A.6.48 When assessing a range of allowances for peak tidal, river flow or rainfall intensity, the following must be considered:

- likely depth, speed and extent of flooding for each of the assessed climate change allowances;
- vulnerability of the proposed development types or land use allocations to flooding;
- 'built in' resilience measures used, for example, raised floor levels; and

- capacity or space in the development to include additional resilience measures in the future, using a 'managed adaptive' approach.

National Design Guide

9A.6.49 The NPPF makes clear that creating high quality buildings and places is fundamental to what the planning and development process should achieve. The National Design Guide (Ministry of Housing, Communities and Local Government, 2019b), published on 1st October 2019, illustrates how well-designed places that are beautiful, enduring and successful can be achieved in practice. It forms part of the Government's collection of planning practice guidance and should be read alongside the separate planning practice guidance.

9A.6.50 Sections of the guidance relevant to the Proposed Development include:

- N2 Improve and enhance water management which states, *''Well designed places integrate existing, and incorporate new natural features into a multifunctional network that supports quality of place, biodiversity and water management, and addresses climate change mitigation and resilience"*; and
- R3 Maximise resilience which states "*Well designed places contribute to community resilience and climate adaptation by addressing the potential effects of temperature extremes in summer and winter, increased flood risk, and more intense weather events such as rainstorms."* R3 also states *"Well designed places have sustainable drainage systems to manage surface water, flood risk and significant changes in rainfall. Urban environments make use of green sustainable drainage systems and natural flood resilience wherever possible. Homes and buildings also incorporate flood resistance and resilience measures where necessary and conserve water by harnessing rainfall or grey water for re-use on-site."*

Non-Statutory Sustainable Drainage Systems (SuDS) Guidance

9A.6.51 Defra published their Sustainable Drainage Systems: Non-Statutory Technical Standards (NSTS) in March 2015 (DEFRA, 2015) setting the requirements for the design, construction, maintenance and operation of SuDS. The NSTS are intended to be used alongside the NPPF and PPG.

9A.6.52 The NSTS of relevance in relation to the consideration of surface water flood risk to and from development relate to runoff destinations, peak flow control and volume control. Additional guidance is provided for structural integrity, designing for maintenance considerations and construction.

Regional Policy

Northumbria River Basin District Flood Risk Management Plan

9A.6.53 Flood Risk Management Plans (FRMPs) are prepared by the Environment Agency for six-year cycles and set out how organisations, stakeholders and communities will work together to achieve the objectives and measures (actions) needed to manage flood risk at a national and local level. The most recent plans were published in 2022 and will remain in place until after 2027. The Study Area is located within the

Northumbria River Basin District Flood Risk Management Plan (Environment Agency, 2022).

9A.6.54 The Northumbria River Basin District FRMP (Environment Agency, 2016) has been published by the Environment Agency and sets out objectives to manage flood risk for the region for the period 2015 to 2021. The Proposed Development is located within the Tees Management Catchment. The following relevant objectives are to be met in the Tees Catchment:

- Social Objectives
  - reduce the number of people exposed to each category of flood hazard particularly high and extreme hazard;
  - ensure that critical infrastructure remains operational during flood events; and
  - reduce the social impact of flooding on communities at risk, especially in areas where there are high proportions of properties and social assets at risk.
- Economic Objectives
  - reduce the direct economic damages to property and agriculture from flooding; and
  - ensure that FRM expenditure follows the level of flood risk in the catchment.
- Environmental
  - protect heritage sites from the effects of flooding and where possible use FRM activities to enhance the landscape;
  - maintain and where possible improve the ecological function of designated sites through FRM activities;
  - allow river channel processes to operate naturally within the catchment; and
  - no adverse impact on water quality as a result of flooding.

Tees Catchment Flood Management Plan

9A.6.55 The role of Catchment Flood Management Plans (CFMP) is to identify flood risk management policies which will assist all key decision makers in the catchment to deliver sustainable flood risk management for the long term. The Tees CFMP (EA. 2009) considers all types of inland flooding, from rivers, ground water, surface water and tidal flooding, but not flooding directly from the sea (coastal flooding).

9A.6.56 The CFMP splits the Tees catchment into eight sub-areas which have similar physical characteristics, sources of flooding and level of risk. The most appropriate approach

to managing flood risk for each of the sub-areas is identified and one of six generic flood risk management policies is allocated to the area.

9A.6.57 The Proposed Development is located in Sub-area 4 — Eastern and identifies that flooding from rivers and surface water flooding problems from the drainage systems are the main sources of flood risk in the sub-area.

9A.6.58 The key factors affecting Sub-area 4, which contains Stockton-On-Tees, include future coastal flood risk as a result of sea level rise, high urban flood risk due to increasing use of culverts and channel straightening, and increasing development pressure in the sub-area. Because of this, the CFMP policy is to take further action to reduce flood risk there by actions such as investigating flood storage options, developing a Surface Water Maintenance and Management Plan (SWMP) and developing an asset management plan for flood defences and channel maintenance.

River Tyne to Flamborough Head Shoreline Management Plan

9A.6.59 The purpose of a Shoreline Management Plan is to identify the most sustainable approach to managing the flood and coastal erosion risks to the coastline in the short-term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years).

9A.6.60 In the River Tyne to Flamborough Head SMP (Royal Haskoning, 2007), the Proposed Development Site location falls into 'Policy Development Zone 5 - Hartlepool Headland to Saltburn Scar and Management Area 13 (MA13) - Little Scar to Coatham Sands.

9A.6.61 The report identifies MA13 to be an area of low to high flood risk where the LLFA and the Environment Agency are already working towards managing the risk (the Proposed Development Site itself is located in an area shown to be at low risk of flooding from tidal sources). However, it is also an area that will be affected by climate change due to the low-lying land and its coastal location, and so will need ongoing maintenance and defence improvements. Overall, the policy for MA13 is to *"hold the line/ maintain the structure - maintain or change the level of protection provided by defences. This would include work or operations carried out in front of the existing defences or where, while maintaining existing defences, policies involve operations to the back of defences (such as secondary flood defences) as an essential part of maintaining the current defence system"*. To the south and east of the Estuary, where the Site is located), the policy is for *"no active intervention allowing natural development of the Coatham Sands and potential enhancement of habitat behind"*.

Local Policy

Redcar and Cleveland Local Plan (May 2018)

9A.6.62 The Proposed Development is predominantly within the administrative area of RCBC. RCBC has published a Local Plan which was adopted in 2018 and which outlines the Council strategy up to the year 2032.

9A.6.63 Policies specific to flood risk are highlighted in Table 9A-14.

Table 9A-14: Relevant RCBC Local Planning Policies

DOCUMENT	POLICY
Redcar & Cleveland Local Plan	Policy SD1 — Sustainable Development When considering development proposals, the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the NPPF.
	Policy SD2 - Locational Policy Development will be directed to the most sustainable locations in the borough. The majority of development will be focused in the urban and coastal areas. The location of new development will avoid areas at risk of flooding in line with the requirements set out in PPG25. (NB. PPG25 is now superseded by the PPG).
	Policy SD4 — General Development Principles In assessing the suitability of a site or location. development will be permitted where it; f. will not increase flood risk either on site or downstream of the development; and I. be sustainable in design and construction, incorporating best practice in resource management_ energy efficiency and climate change adaptation.
	Policy SD7 — Flood and Water Management Flood risk will be taken into account at all stages in the planning process to avoid inappropriate development in areas at current or future risk. Development in areas at risk of flooding, as identified by the EA flood risk maps, will only be granted where all the following criteria are met: a) the proposal meets the sequential and exception tests (where required) in relation to the NPPF; b) a site-specific flood risk assessment demonstrates that the development will be safe, including the access and egress, without increasing flood risk elsewhere. and, where possible, will reduce flood risk overall: and c) new site drainage systems are well designed. taking account of events that exceed normal design standard (e.g. consideration of flood flow routing and utilising temporary storage areas). All development proposals will be expected to be designed to mitigate and adapt to climate change, taking account of flood risk by: d) ensuring opportunities to contribute to the mitigation of flooding elsewhere are taken; e) prioritising the use of sustainable drainage systems (SuDS)

DOCUMENT	POLICY
	f) ensuring the full separation of foul and surface water flows; and g) ensuring development is in accordance with the Redcar and Cleveland SFRA. A site-specific flood risk assessment will be required to be carried out to demonstrate that the development is not at risk from flooding and that it does not increase flood risk downstream in the following circumstances: h) proposals of 1 ha in size or greater in Flood Zone 1; or i) proposals for new development (including minor development and change of use) in Flood Zones 3a or Flood Zone 2; or j) proposals for new development in areas susceptible to surface water flooding; or k) proposals situated in an area currently benefitting from defences; or I) proposals within 20 m of a bank top of a main river; or m) proposals over a culverted watercourse or where development will be required to control or influence the flow of any watercourse; or n) where the Proposed Development may be subject to other sources of flooding. Surface water runoff not collected.

Stockton-on-Tees Borough Council Local Plan (January 2019)

9A.6.64 The elements of the Proposed Development to the north of the Tees Estuary (i.e. the Natural Gas Connection and CO_2 Gathering Network) are located within the STBC administrative area. STBC published a Local Plan in 2019 which outlines the Council's strategy up to the year 2032.

9A.6.65 Policies specific to flood risk are highlighted in Table 9A-15.

Table 9A-15: Relevant STBC Planning Policies

DOCUMENT	POLICY
Stockton on Tees Local Development Plan (2019)	Strategic Development Policy SD5 — Natural, Built and Historic Environment To ensure the conservation and enhancement of the environment alongside meeting the challenge of climate change the Council will 2). Meet the challenge of climate change, flooding and coastal change through a variety of methods including:

DOCUMENT	POLICY
	• Supporting sustainable water management within development proposals; • Directing new development towards areas of low flood risk (Flood Zone 1) ensuring flood risk is not increased elsewhere. and working with developers and partners to reduce flood risk; • Ensuring development takes into account the risks and opportunities associated with future changes to climate and are adaptable to changing social, technological and economic conditions such as incorporating suitable and effective climate change adaptation principle; and • Ensuring development minimises the effects of climate change and encourage new development to meet the highest feasible environmental standards.
	Policy EG4 – Seal Sands, North Tees, and Billingham Development proposals in the North Tees and Seal Sands are required, as appropriate, to be supported by a site-specific FRA which considers, amongst other matters, emergency access/egress in the event of tidal flooding.
	Policy SD2 - Locational Policy will be directed to the most sustainable locations in the borough. The majority of development will be focused in the urban and coastal areas. The location of new development will avoid areas at risk of flooding in line with the requirements set out in PPG25. (NB. PPS 25 as referenced in objective 1 is now superseded as discussed in Section 15.2).
	Policy ENV4 — Reducing and Mitigating Flood Risk All new development will be directed towards areas of the lowest risk to minimise the risk of flooding from all sources and will mitigate any such risk through design and implementing sustainable drainage (SuDS) principles. Development on land in Flood Zones 2 or 3 will only be permitted following: a) The successful completion of the Sequential and Exception Tests (where required); and b) A site-specific flood risk assessment, demonstrating development will be safe over the lifetime of the development, including access and egress, without increasing flood risk elsewhere and where possible reducing flood risk overall. Site specific flood risk assessments will be required in accordance with national policy.

DOCUMENT	POLICY
	All development proposals will be designed to ensure that: a) Opportunities are taken to mitigate the risk of flooding elsewhere; Foul and surface water flows are separated; b) Appropriate surface water drainage mitigation measures are incorporated, and Sustainable Drainage Systems are prioritised; and c) SuDs have regards to Tees Valley Authorities Local Standards for Sustainable drainage (2015) or successor document. Surface water runoff should be managed at source wherever possible and disposed of in the following hierarchy of preference sequence: a) To an infiltration or soak away system; then b) To a watercourse open or closed: then c) To a sewer. For developments which were previously developed. the peak runoff rate from the development to any drain, sewer or surface water body for the 1-in-1 rainfall event and the 1-in-100 year rainfall event should be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event. Within critical drainage areas or other areas identified as having particular flood risk issues the Council may: a) Support reduced runoff rates; and b) Seek contributions, where appropriate, towards off-site enhancements directly related to flow paths from the development, to provide increased flood risk benefits to the site and surrounding areas. SuDS should be provided on major development unless demonstrated to be inappropriate. The incorporation of SuDS should be integral to the design process and be integrated with green infrastructure. Where SuDS are provided, arrangements must be put in place for their whole life management and maintenance. Through partnership working the Council will work to achieve the goals of the Stockton on Tees Local Flood Risk Management Strategy and the Northumbria Catchment Flood Management Plan.

DOCUMENT	POLICY
	To reduce the risk of flooding the Council is working in partnership with the Environment Agency to deliver a Flood Alleviation Scheme on Lustrum Beck.

Hartlepool Local Plan (May 2018)

9A.6.66 A small section of the Proposed Development Site extends into HBC administrative area. HBC published a Local Plan in 2018 which outlines the Council's strategy up to the year 2032.

9A.6.67 Policies specific to flood risk are highlighted in Table 9A-16.

Table 9A-16: Relevant HBC Planning Policies

DOCUMENT	POLICY
Hartlepool Local Plan (2018)	Policy SUS1: The Presumption in Favour of Sustainable Development When considering development proposals, the Borough Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. It will always work proactively with applicants jointly to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social, and environmental conditions in the area. Planning applications that accord with the policies in this Local Plan (and, where relevant, with policies in neighbourhood plans) will be approved without delay, unless material considerations indicate otherwise. Where there are no policies relevant to the application or relevant policies are out of date at the time of making the decision then the Borough Council will grant permission unless material considerations indicate otherwise – taking into account whether: a) Any adverse impacts of granting permission would significantly and demonstrably outweigh the benefits, when assessed against the policies in the National Planning Policy Framework taken as a whole; or b) Specific policies in that Framework indicate that development should be restricted.
	Policy LS1: Locational Strategy Development will be focused in areas of lower flood risk where possible and must comply with policy CC2.

DOCUMENT	POLICY
	Policy CC1: Minimising and adapting to climate change The Borough Council will work with partner organisations, developers and the community to help minimise and adapt to climate change by: 1) Locating development in areas of low flood risk wherever possible and incorporating appropriate measures to minimise flood risk, such as sustainable drainage systems and the use of porous materials along with water retention and recycling.
	Policy CC2: Reducing and mitigating flood risk All new development proposals will be required to demonstrate how they will minimise flood risk to people, property and infrastructure from all potential sources by: 1) Avoiding inappropriate development in areas at risk of flooding and directing the development away from areas at highest risk, applying the Sequential Test and if necessary, the Exceptions Test, in accordance with national policy and the Hartlepool Strategic Flood Risk Assessment; 2) Site Specific Flood Risk Assessments will be required in accordance with national policy; 3) Ensuring that the development will be safe over its lifetime, taking account of climate change, will not increase flood risk in vulnerable locations elsewhere and where possible, will reduce flood risk overall; 4) Assessing the impact of the development proposal on existing sewerage infrastructure and flood risk management infrastructure, including whether there is a need to reinforce such infrastructure or provide new infrastructure; 5) Ensuring that development proposals are resilient to flood risk, in accordance with national policy and the findings and recommendations of the Hartlepool Strategic Flood Risk Assessment; 6) Requiring that all development proposals include provision for the full separation of foul and surface water flows; 7) Ensuring that development proposals separate, minimise and control surface water run-off, with Sustainable Drainage Systems being the preferred approach. 8) Surface water should be managed at source wherever possible, ensuring that there is no net increase in surface

DOCUMENT	POLICY
	water runoff for the lifetime of the development. Surface water should be disposed of in accordance with the following hierarchy for surface water run-off: a) to a soak away system, unless it can be demonstrated that this is not feasible due to poor infiltration with the underlying ground conditions; b) to a watercourse, unless there is no alternative or suitable receiving watercourse available; c) to a surface water sewer; d) disposal to combined sewers should be the last resort once all other methods have been explored. 9) Where Greenfield sites are to be developed, the surface water run-off rates should not exceed, and where possible, should reduce the existing run-off rates. Where previously developed (brownfield) sites are to be developed, surface water run-off rates should seek to achieve greenfield equivalent run off rates or be reduced by a minimum of 50% of the existing site run-off rate.

Other Relevant Policy and Guidance

Local Flood Risk Management Strategies

9A.6.68 The vision of the Stockton-on-Tees Local Flood Risk Management Strategy (FRMS) (STBC, 2015), the Redcar and Cleveland FRMS (RCBC, 2017) and the Hartlepool FRMS (HBC, 2016) is "*To work with our partners in the Borough of Stockton-On-Tees to reduce the risk of flooding to residents and businesses and ensure that flood risk is managed in the most effective and sustainable way*".

9A.6.69 The strategies assess local flood risk (from surface water, groundwater and ordinary watercourses) within the boroughs and set objectives for managing this risk. The strategies detail mechanisms for achieving the objectives and seeks to reduce the risk of flooding to residents in both boroughs.

Strategic Flood Risk Assessments

9A.6.70 A Strategic Flood Risk Assessment (SFRA) provides the central source of all relevant flood risk information. An SFRA is required to initiate the sequential risk-based approach to the allocation of land for development in the Councils Local Plans and to identify whether the application of the Exception Test is likely to be necessary.

9A.6.71 The STBC Level 1 SFRA (JBA Consulting, 2018) indicates that the majority of fluvial flood risk comes from the River Tees. The tidal flood risk is particularly extensive, placing large parts of the industrial area on the north bank of the Tees Estuary and other, more central parts of the borough, at risk. Tide locking (prevention of fluvial flow discharging due to high tide levels) is also a contributing flood risk factor on many watercourses that flow into the tidal Tees.

9A.6.72 The available detailed maps presented within the STBC SFRA (Map 10,11,16,17 and 18, see Annex B) confirm that the parts of the Proposed Development Site located within Flood 3 are all located within Flood Zone 3a.

9A.6.73 In the Level 2 SFRA (JBA Consulting, 2018) three allocation sites have been taken forward from the Level 1 SFRA for a more detailed Level 2 screening assessment.

9A.6.74 The RCBC Level 1 SFRA (Redcar and Cleveland Borough Council, 2016) notes that fluvial flood risk in the borough is low and tidal risk mainly comes from the Tees Estuary in the west of the borough though is confined to the Docklands area. The Level 2 SFRA (JBA Consulting, 2016) provides a detailed assessment of flood hazards for the area at risk of tidal flooding and how this risk impacts on allocated development sites and available employment land. The study has identified three areas in the Borough which have critical drainage problems. These are Redcar, Eston and Guisborough.

9A.6.75 The available detailed maps presented within the RCBC SFRA (Map 1, 2, 14, 15, 16 and 17 - see Annex B) confirm that the parts of the Proposed Development Site located within Flood 3 are all located within Flood Zone 3a.

9A.6.76 The HBC Level 1 SFRA (JBA Consulting, 2017) notes that fluvial flood risk in the borough is low in the area around Greatham Beck, and tidal risk mainly comes from two coastal areas, currently protected by flood defences. The SFRA (JBA Consulting, 2017) provides a detailed assessment of flood hazards for the area at risk of tidal flooding and how this risk impacts on allocated development sites and available employment land. The study has identified three areas in the Borough which have critical drainage problems. These are the Stell, Middle Warren and Valley Drive.

Preliminary Flood Risk Assessments

9A.6.77 In their roles as LLFAs, STBC, RCBC, and HBC have produced Preliminary Flood Risk Assessment (PFRA) reports to meet their statutory duties to manage local flood risk and deliver the requirements of the Flood Risk Regulations 2009. The Regulations require LLFAs, through the PFRA process, to determine whether there is a significant risk in their area based on local flooding (surface water, groundwater, ordinary watercourses and canals) and to identify the part of the area affected by these risks.

9A.6.78 The purpose of a PFRA report is to provide a strategic assessment of flood risk from local sources including surface water, groundwater, ordinary watercourses and canals. The reports are high-level screening exercises using readily available data held by the Councils and partnering organisations. The reports look at historical flood events and consider the potential future flood events that may have a significant consequence on human health, economic activity and the environment including cultural heritage.

9A.6.79 The STBC PFRA (STBC, 2011) identifies six locations which have been subject to historical flooding. Of these locations Port Clarence and Lustrum Beck, although located outside the proposed Site boundary, fall within the Study Area.

9A.6.80 The RCBC PFRA (RCBC, 2011) notes that there are a number of locations across Redcar and Cleveland that are subject to frequent flooding from local sources, particularly from surface water.

9A.6.81 The HBC PFRA (HBC, 2011) identifies three locations which have been subject to historical flooding, which were then further investigated within a Level 2 SFRA.

Tees Valley Authorities Local Standards for Sustainable Drainage

9A.6.82 The Tees Valley Authorities (i.e., the local authorities of Hartlepool, Middlesbrough, Redcar and Cleveland, Stockton-on-Tees, and Darlington Borough Councils) produced a supplementary planning guidance (SPG) document entitled 'Sustainable Drainage Systems (SuDS) Guidance: Design Guide and Local Standards' in 2019 (The Tees Valley Authorities, 2019). Volume 1 provides an overview into SuDS techniques and policy requirements. Volume 2 highlights the Tees Valley specific local standards intended to provide clarity to the national standards.

9A.6.83 The document strongly promotes the use of sustainable drainage systems to help manage increased surface water runoff from new developments and help mitigate flood risk. It outlines the minimum standards to ensure a satisfactory scheme is constructed but are not intended to preclude any requirement for a higher standard that may be deemed necessary.

9A.6.84 It is stated that when designing and using SuDS, consideration should be given to ensuring that they: reduce damage from flooding, improve water quality, protect, and improve the environment, protect health and safety and ensure stability and durability of drainage.

9A.7 Flood Risk Sources

9A.7.1 Both the NPS and NPPF require the effects of all forms of flood risk, both to and from the Proposed Development, to be considered within an FRA. There should be demonstration of how these should be managed so that the development remains safe throughout its lifetime, taking into account current climate change predictions.

9A.7.2 This section discusses these potential risks in relation to tidal, fluvial, surface water runoff, groundwater and man-made/artificial sources.

Historical Flooding Incidents

9A.7.3 The history of tidal flooding from the Tees Estuary dates back as far as 1836, according to the online BHS Chronology of British Hydrological Events (University of Dundee, 2020). There was severe tidal flooding of Stockton on Tees in this year and then again in Middlesbrough in 1903.

9A.7.4 STBC hold no records of historical flooding for Ordinary Watercourses in the vicinity of the Proposed Development Site.

9A.7.5 The main source of historic flooding in RCBC is from the other local sources e.g. surface water sewers, water authority combined sewers, smaller (ordinary) watercourses and drains. All the main urban areas in RCBC have been subject to this type of local flooding at different times. In total, nearly 800 flooding incidents have been recorded by the different data holders, affecting around 10 main locations. The main local flood risk locations, identified in the SFRA are Eston, Guisborough and Redcar. These have been classed as Critical Drainage Areas (CDAs) within the SFRA.

9A.7.6 Records of historical flooding taken from the BHS Chronology of British Hydrological Events and LLFAs SFRAs are summarised in Table 9A-17.

Table 9A-17: Records of Historical Flooding

DATE	FLOODING SOURCE	OVERVIEW
1953	Tidal	An area of low pressure, in conjunction with North Westerly winds and a high spring tide, caused a large tidal surge and flooding of Port Clarence to a depth of 1.2 m. the peak water level was 4.01m AOD at the Tees Estuary. There were two breaches of the embankments at Greatham Creek on both the North and South embankment, in the vicinity of the A178. Other areas affected include Billingham Reach Industrial Estate, Tees Marshalling Yard, along with many of the lower reaches of the tidal River Tees.
January 1978	Tidal	A breach of the Greatham Creek defences where both the North and South banks were breached downstream of the A178.
1983	Tidal	A breach of the Greatham Creek Southern flood defence embankment both upstream and downstream of the A178, with a peak tide level of 3.65 m AOD.
March 1999	Fluvial	Substantial flooding occurred due to heavy rain and peak flows unable to pass through Holme Fleet culvert, which is located to the north of Port Clarence. It was reported that the culvert was blocked at the time by material which had entered the access chambers.
8th November 2000	Fluvial	Between 2 - 4am an intense storm hit the area of Port Clarence. approximately 16 properties suffered from internal flooding with flood water reaching ground floor level. It was reported that the flooding occurred due to Holme Fleet Beck overtopping due to heavy rainfall.
Unknown	Groundwater	Flooding to the south of Marske, directly below Errington Wood.

DATE	FLOODING SOURCE	OVERVIEW
25th/26th September 2012	Fluvial and Surface Water	24 hours of persistent heavy rain followed the wettest summer on record, resulting in fluvial and surface water flooding of several communities. The most severely affected were those along Lustrum Beck, and those in Norton near Billingham Beck. Traffic disruption also occurred following flooding of the A19/A66 trunk road. The report estimates that 150 properties and businesses were flooded internally.
5th December 2013	Tidal	Tidal flooding occurred within the Stockton borough due to a combination of a high spring tide and a low-pressure system causing a positive tidal surge. The total tide height was 4.09 m AOD. which surpassed the recorded historic events in the area. 32 residential properties were internally flooded at Port Clarence, as well as 20 businesses across Port Clarence. Billingham Reach Industrial Estate and Seal Sands. There was significant infrastructure damage, including the closure of the A19 Portrack interchange and partial closure of the A66 trunk road at Teesside Park. Breach of the flood defences at Greatham Creek flooded a large area of land.
1st April 2017	Fluvial/Surface Water/Drainage Infrastructure	Cross Beck catchment in Eston and Spencer Beck catchment in Teesville affected. Met Office confirmed that 1 weeks' worth of rain fell in 1 hour and Northumbrian Water Limited confirmed the event was a 1 in 197-year storm. Ground conditions were very dry prior to the event which exacerbated the speed of run off from land to watercourses. Intensity of rainfall resulted in all drainage systems being inundated and overwhelmed.

Tidal Sources

9A.7.7 The Main Site is situated in a coastal location, with the North Sea approximately 0.6 km to the north.

9A.7.8 The River Tees is classified as an Environment Agency Main River on the Digital Mapping Network and is located approximately 1.6 km to the west of the Proposed

Development Site. The River Tees is tidal at this location, with the normal tidal limit approximately 14 km upstream (at the Tees Barrage).

9A.7.9 Greatham Creek, an Environment Agency Main River, is a tidal watercourse which flows in a westerly direction, following the STBC boundary, and discharges into the Tees at Seal Sands. Its tidal limit extends to a weir, which is 300 m upstream of the confluence with Cowbridge Beck, outside of Stockton Borough. The Creek is crossed by bridges which carry the A178 trunk road and the emergency access road to Seal Sands. There is a history of tidal flooding and breach of the defences at Greatham Creek.

9A.7.10 The STBC SFRA states *"The tidal flood risk is particularly extensive, placing large parts of the industrial area on the north bank of the Tees Estuary and other, more central parts of the Borough, at risk. In addition, tide locking (prevention of fluvial flow discharging due to high tide levels) is also a contributing flood risk factor on many watercourses that flow into the tidal Tees".*

9A.7.11 Flood defence and artificial ground raising protect much of STBC from tidal flooding. There is the potential for some defences to be outflanked, notably those at Port Clarence, Old River Tees and at Greatham Creek.

Flood Map for Planning

9A.7.12 The Environment Agency's FMfP (available to view on their website and Figure 9-3: Fluvial Flood Risk, PEI Report, Volume II) identifies areas subject to fluvial/tidal flood risk for the present day but does not include the benefits or impacts of any existing flood defences or climate change respectively.

9A.7.13 In addition to the FMfP, the available detailed maps presented within the SFRAs for STBC (Map 10, 11, 16, 17 and 18) and RCBC (Map 1, 2, 14, 15, 16 and 17) presented in Annex B, confirm that the parts of the Proposed Development Site located within Flood Zone 3 are all within Flood Zone 3a. There is no land within the Proposed Development Site boundary located in Flood Zone 3b (Functional Floodplain) in relation to tidal flood sources.

9A.7.14 Flood zone definitions are summarised in Table 9A-6 and the supporting flood risk mapping is presented on Figure 9-3: Fluvial Flood Risk (PEI Report, Volume II).

Main Site

9A.7.15 The FMfP illustrates that the entirety of the Main Site is located within Flood Zone 1 (low risk of flooding from fluvial and/or tidal sources).

Pipeline Corridors

9A.7.16 The FMfP indicates that to the south of the River Tees the Pipeline Corridor is predominantly located in Flood Zone 1 (low risk of flooding from fluvial and/or tidal sources). The exceptions to this are small sections of the Electrical Pipeline, Water Connection, Hydrogen Pipeline and Other Gases connection corridors which extend into Flood Zone 2 (medium risk of flooding from fluvial and/or tidal sources) and Flood Zone 3a (high risk of flooding from fluvial and/or tidal sources) as they cross or are in proximity to Dabholm Gut.

9A.7.17 Flooding is more extensive to the north bank of the River Tees with flooding predominantly associated with Greatham Creek, Mucky Fleet and Swallow Fleet. The section of the Hydrogen Pipeline Corridor that extends out towards Billingham is located in Flood Zone 1 (low risk), Flood Zone 2 (medium risk) and Flood Zone 3a (high risk) with the main area at risk located to the north of Port Clarence.

Flood Defences

9A.7.18 In accordance with the NPPF, the requirements are to ensure any proposed developments are designed to manage tidal flooding up to a 0.5% AEP (1 in 200 chance) event, taking into account the potential impacts of climate change.

9A.7.19 It is noted in the STBC SFRA that *"flood defence and artificial ground raising protect much of STBC from tidal flooding".*

9A.7.20 Consultation with the Environment Agency (see Annex A) identifies that the Environment Agency own and maintain a number of flood defence assets along the River Tees near the Proposed Development Site. The tidal defences protecting this Site consist of a combination of high ground and raised defences, including floodwalls and flood banks and reduce the risk of flooding up to a 0.5% AEP (1 in 200 chance in any year) event. The Environment Agency inspects these defences routinely to ensure potential defects are identified. Further details on flood management infrastructure is provided in Section 9.4.

Modelled Tidal Water Levels

9A.7.21 The Environment Agency provided modelled tidal peak water levels for the tidal Tees area for the NZT development for the 0.5% AEP (1 in 200 year), 0.1% AEP (1 in 1000 year) and 0.1% AEP with climate change scenario flood events to inform the NZT FRA (see Annex A).

9A.7.22 The outputs are from the 2020 Greatham and Port Clarence model update report, the 2011 Tidal Tees Integrated Flood Risk Modelling Study and the 1,000-year plus climate change levels are from the 2015 Tidal Tees Integrated Flood Risk Modelling Study.

9A.7.23 The 1,000-year plus climate change events were not provided in the 2020 updated modelling, however, for the NZT assessment, the 2015 results were deemed appropriate as climate change uplifts have not changed in the assessment time period and current day levels had slightly decreased in the new modelling. This means that the 2015 estimates still accurately represent flood risk in the area. Running the 1,000 year plus climate change scenario, the maximum water levels along the reach are presented in Table 9A-18. These are the current best estimate for extreme tidal water levels in the vicinity of the Proposed Development Site.

9A.7.24 The Environment Agency's model demonstrated that during a 0.1% AEP (1 in 1000 chance) event based upon the existing (2019) scenario, tidal levels in the Tees Estuary could rise up to 4.33m AOD at the mouth of the estuary and up to 4.40m AOD where the A19 crosses the Tees near Portrack.

Table 9A-18: Modelled Water Levels for the Tidal River Tees

LOCATION	RETURN PERIOD UNDEFENDED SCENARIO WATER LEVELS (M AOD)			RETURN PERIOD DEFENDED SCENARIO WATER LEVELS (M AOD)		
	0.5%	0.1%	0.1% + CC	0.5%	0.1%	0.1% + CC
NZ 55096 28427 (Teesmouth)	4.0810	4.33	5.25	4.08-	4.33-	
NZ 54455 26362 (opp. RBT)	4.0811	4.33	5.26	4.0811	4.33	5.26
NZ 54745 24769 (app. Dabholm Gut)	4.0911	4.33	5.27	4.0912	4.34	5.26
NZ 51605 20997 (app. Clarence Wharf)	4.12	4.36	5.29	4.12	4.37	5.27
NZ 50618 21103 (app. Port Clarence)	4.13	4.36	5.30	4.13	4.37	5.26
NZ 47863 19935 (Newport Bridge)	4.15	4.40	5.32	4.15	4.40	5.29
NZ 47539 19485 (Portrack)	4.16	4.40	5.33	4.15	4.40	5.29

Source: 2011 Tidal Tees Integrated Flood Risk Modelling Study and 2015 Tidal Tees Integrated Flood Risk Modelling Study: Running the 1,000-year + climate change 2020 Greatham and Port Clarence model update report. (Environment Agency Consultation - Annex A)

9A.7.25 The 0.1% AEP (1 in 1000 chance) including climate change modelled water levels taken from the 2015 Tidal Tees Integrated Flood Risk Modelling Study demonstrate that during a 0.1% AEP event based upon the future 2115 scenario, tidal levels in the Tees Estuary could rise up to 5.25m AOD at the mouth of the estuary and up to 5.33m AOD where the A19 crosses the Tees near Portrack.

9A.7.26 The Environment Agency climate change guidance was recently updated with revised sea level allowances (see Table 9A-8) up to the year 2125. Applying these sea level allowances to the existing (2019) scenarios indicates water levels along the estuary could increase by 0.94 m using the Higher Central allowance and 1.32 m using the Upper End allowance.

9A.7.27 Table 9A-19 shows the water levels for a 0.5% AEP and 0.1 % AEP flood event when the Higher Central Upper End and H++ allowances are applied. The table also shows the potential sea level rise for the lifetime of the development, taken to be 75 years, in line with NPPF/PPG recommendations.

Table 9A-19: Tidal Water Levels for the Tidal River Tees with Climate Change Allowances (m AOD)

LOCATION	HIGHER CENTRAL				UPPER END				H++ (1.9M INCREASE TO 2100)	
	TOTAL INCREASE 0.94M TO 2125		TOTAL INCREASE 0.66M TO 2105 (75 YR LIFETIME)		TOTAL INCREASE 1.32M TO 2125		TOTAL INCREASE 0.904 M TO 2105 (75 YR LIFETIME)			
	0.5% AEP	0.1% AEP	0.5% AEP	0.1% AEP	0.5% AEP	0.1% AEP	0.5% AEP	0.1% AEP	0.5% AEP	0.1% AEP
NZ 55096 28427 (Teesmouth)	5.02	5.27	4.74	4.99	5.40	5.65	4.99	5.23	5.98	6.23
NZ 47539 19485 (Portrack)	5.10	5.34	4.82	5.06	5.48	5.72	5.06	5.30	6.06	6.30

9A.7.28 For coastal flooding, the Environment Agency climate guidance states to use:

- Higher Central Allowance: as a design allowance;
- Upper End Allowance: to test sensitivity to severe climate change and any required mitigation;
- H++/Credible Maximum: to test the project under more extreme climate change and exceedance events – but does not have to be used to inform mitigation.

9A.7.29 In reality, based on an expected lifetime of 25 years for each phase of the development, the maximum flood water levels would be significantly less than those shown in Table 9A-19.

Residual Flood Risk- Overtopping and/ or breach of Flood Defences
Overtopping of Flood Defences

9A.7.30 Existing flood defences along both banks of the River Tees generally comprise high ground and provide protection against flooding up to and including the 0.5% AEP (1 in 200) flood event.

9A.7.31 Historically, flood defences comprising flood walls and flood banks have been known to overtop in the Port Clarence area flooding land to the north of the River Tees, however, a new flood defence scheme has recently been constructed to a minimum standard of 0.5% AEP to protect against the risk of flooding in this area.

9A.7.32 There is no overtopping scenario hazard mapping data available from the Environment Agency to inform this assessment, therefore it is assumed that overtopping of the flood defences. as a worst-case scenario, would result in a similar

flood extent to the undefended Flood Zone 2 and Flood Zone 3a flood extents provided by the Environment Agency.

9A.7.33 In accordance with the NPPF, the assessment of overtopping should be undertaken using the 0.5% AEP (1 in 200 year event) plus climate change design tidal event. Based on Table 9A-19, maximum flood water levels for a 0.5% AEP Upper End climate change flood event are between 4.99 – 5.06m AOD for the lifetime of the development (assessed as 75 years).

9A.7.34 The Main Site is located in Flood Zone 1 and the Proposed Development will be sited at a level no lower than a minimum ground level of 6.83m AOD, a level derived from the 0.1% AEP H++ flood level of 6.23m AOD (as presented in Table 9A-19) with an additional freeboard of 600mm added. The current site is relatively flat with ground levels at 7m AOD, ±0.4m. The level of 6.83m AOD would be the minimum ground level once site clearance and remediation has been undertaken. In addition, the topography across the Proposed Development Site, extending south and southwest of the Main Site in the areas of the Hydrogen Pipeline Corridor rises slightly to the south and west, reaching 25m AOD at Lazenby and 30m AOD in Grangetown.

9A.7.35 The 0.5% AEP climate change water level (adjusted using the Upper End allowance) is calculated as 5.40m AOD at the mouth of the Tees Estuary and therefore significantly below the site levels in this area. Even if the assessment were to be undertaken using the H++ water level of 5.98m AOD (for a 0.5% AEP tidal event) and 6.23m AOD (for a 0.1% AEP tidal event) the risk of tidal flooding to the Main Site would remain at low (i.e. within Flood Zone 1) should overtopping of the high ground occur.

9A.7.36 The Proposed Development located to the south and south-west of the Main Site (the Hydrogen Pipeline Corridor, Water Connections Corridor, CO_2 Export Corridor, Natural Gas Connection Corridor, and the Electrical Connection Corridor) will, wherever possible, use existing above ground pipe racking networks, existing culverts and overbridges, will remain at low risk of flooding, with the exception of watercourse crossings.

9A.7.37 In the Port Clarence area, should overtopping occur for the present day scenario along the River Tees or Greatham Brook, the Hydrogen Pipeline Corridor, to the east of Billingham, which will use an existing above ground pipe racking network, existing culverts and overbridges, will be flooded and assuming a worst case scenario, the area flooded will be similar to the Flood Zone 3a extent shown on the current Environment Agency flood map.

9A.7.38 Overtopping of the flood defences in this area for the Upper End and H++ scenarios result in an increase in flood depth and an increase in flood extents meaning a greater area of the Hydrogen Pipeline Corridor i.e. the area currently located within Flood Zone 1 to the east of Billingham, would be at risk of flooding.

Breach/Failure of Flood Defences

9A.7.39 Existing flood defences along both banks of the River Tees generally comprise high ground and raised defences, including floodwalls and flood banks, and provide protection against flooding up to and including the 0.5% AEP (1 in 200) flood event.

High ground is generally not susceptible to breach and/or failure therefore the main residual tidal flood risk along the Tees Estuary is from overtopping, as outlined above. According to information provided by the Environment Agency they are in 'very good to good' condition. The Environment Agency inspects these defences routinely to ensure potential defects are identified.

9A.7.40 Historically, flood defences at Port Clarence (flood walls and flood banks) and flood embankments along Greatham Creek have breached, flooding land between the two watercourses where ground levels are between 0 to 10 m AOD. In 2019 a major flood defence scheme to protect Port Clarence and some of the surrounding industrial areas from tidal flooding was completed. This included improving defences along the north bank of the River Tees and along the south bank of Greatham Creek, providing a 0.5% AEP standard of protection.

9A.7.41 There is no breach scenario hazard mapping data available from the Environment Agency to inform this assessment. It is assumed that a breach or failure of the flood defences, (present day scenario) as a worst-case, would result in a similar flood extent to the undefended Flood Zone 2 and Flood Zone 3a flood extents provided by the Environment Agency. The Hydrogen Pipeline Corridor, to the east of Billingham, which will use an existing above ground pipe racking network, existing culverts and overbridges, would be flooded under this scenario. A breach in the flood defences for the Upper End and H++ scenarios would result in an increase in flood depth and an increase in flood extents meaning a greater area of the Hydrogen Pipeline Corridor i.e. the area currently located within Flood Zone 1 to the east and south of Billingham, would potentially be at risk of flooding.

Risk of Flooding

9A.7.42 Based on the information provided by the Environment Agency, it has been determined that the Main Site and the majority of the connection corridors (the Water Connections Corridor, the Electrical Connection Corridor, the Natural Gas Connection Corridor, CO_2 Export Corridor and the Hydrogen Pipeline Corridor are located within Flood Zone 1 on the north and south banks of the River Tees) are at a 'low' risk of flooding from tidal sources.

9A.7.43 Both options for the section of the Hydrogen Pipeline Corridor crossing the River Tees and the section to the east of Billingham (located in Flood Zone 3a on the north bank of the River Tees) is at 'high' risk of tidal flooding.

9A.7.44 The Main Site, with ground elevations no lower than 6.83m AOD (see Paragraph 9A.1.200), will remain at low risk of flooding from overtopping of the high ground (informal flood defences) during events that exceed a 0.5% AEP (1 in 200 chance) of flooding, during a 0.1% AEP (1 in 1000 chance) event taking into account climate change, including the H++ climate change scenario.

9A.7.45 If the defences adjacent to Port Clarence and along the southern bank of Greatham Creek were to overtop or fail/breach the Hydrogen Pipeline Corridor, located between the two watercourses, would be at 'high' residual risk of flooding from both the existing scenario 0.5% and 0.1% AEP (1 in 1000 chance) events and future climate change scenarios, including the H++ scenario.

Fluvial Sources

9A.7.46 A review of OS mapping identified that the nearest watercourse to the Main Site is The Fleet, located approximately 273 m to the south-east of the Main Site and Dabholm Gut, located approximately 1.1 km to the south.

9A.7.47 Numerous ordinary watercourses intersect the connection corridor routes including Mains Dike, The Mill Race, Kinkerdale Beck and Knitting Wife Beck to the south of the River Tees and Belasis Beck, Mucky Fleet and Swallow Fleet to the north of the River Tees near Billingham. These watercourses all pose a potential risk of fluvial flooding to the connection corridors.

Flood Map for Planning

9A.7.48 The online Environment Agency FMfP illustrates that the Main Site is located entirely in Flood Zone 1 (low risk of flooding from fluvial sources). Small areas of the Electrical Connection Corridor and the Water Connection Corridor are also located within Flood Zones 2 and 3 to the south of the River Tees.

9A.7.49 Flooding is more extensive to the north bank of the River Tees and a significant amount of the Hydrogen Pipeline Corridor is located within Flood Zones 2 (medium risk of flooding) and 3 (high risk of fluvial flooding), however, flooding in this area is predominantly from tidal sources. There are, however, ordinary watercourses, such as the Mucky Fleet, Swallow Fleet and Belasis Beck that could pose a risk to small sections of the Hydrogen Pipeline Corridor, predominantly where the connection corridor passes over a watercourse/drain.

9A.7.50 Flood zone definitions are summarised in Section 9.6, Table 9A-6 and the supporting flood risk mapping is presented on Figure 9-3: Fluvial Flood Risk (PEI Report, Volume II).

Flood Defences

9A.7.51 The Environment Agency FMfP indicates that the Proposed Development Site is not located in an area benefitting from flood defences. The FMfP shows small sections of raised tidal flood defences located along the River Tees to the west and south west of the Main Site, however; there is no information regarding fluvial flood defences along the smaller watercourses in the area. Further information on flood management infrastructure is presented in Section 9.4.

Modelled Fluvial Water Levels

9A.7.52 No modelled fluvial flood level data is available for the smaller watercourses in the Study Area.

9A.7.53 It is known that tide locking (prevention of fluvial flow discharging due to high tide levels) is a contributing flood risk factor on many watercourses that flow into the tidal Tees.

9A.7.54 Smaller watercourses have no associated hydraulic model or modelled flood water data available to inform the assessment. As a proxy, for catchment areas less than 3 km^2, the Environment Agency Risk of Flooding from Surface Water (RoFSW) maps, primarily used to represent surface runoff; can also be used to identify flooding from

Ordinary Watercourses. Analysis of the mapped flood extents associated with ordinary watercourses indicates that for the present -day flooding is not significant, and should a flood occur the area of inundation remains local to the watercourse.

Risk of Flooding

9A.7.55 It considered that during the existing scenario the Main Site and the majority of the connection corridors to the north and south of the River Tees are at `low' risk of flooding from fluvial sources.

9A.7.56 Climate change is assessed using the +40% higher central allowance for areas of the Site located in Flood Zone 1, as required by the Environment Agency climate change guidance. The Main Site, with levels no lower than 6.83m AOD will remain at low risk of flooding from the 1% AEP with a 40% allowance for climate change flood event.

9A.7.57 For areas of the Proposed Development Site located in Flood Zones 2 and 3a, where connection corridor routes cross watercourses, the Environment Agency guidance is that for essential infrastructure the upper end climate change allowance (61%) is used to assess climate change from fluvial sources as the H++ scenario.

9A.7.58 Taking the climate change scenarios into account, the risk of flooding to the Main Site itself will remain low as high ground levels ensure that the site remains in Flood Zone 1.

9A.7.59 For the H++ climate change scenario the risk of flooding from The Fleet and Dabholm Gut will increase with the depth and extent of flooding increasing across a larger area. The Connection Corridors will, wherever possible, use existing above ground pipe racking networks, existing culverts and overbridges and therefore these elements of the Proposed Development will be at increased risk of fluvial flooding over the lifetime of the development.

9A.7.60 On the north bank of the River Tees, both climate change scenario will have a similar impact on flooding from the Mucky Fleet, Swallow Fleet and Belasis Beck. An increase in the extent and depth of flooding is likely to increase the flood risk to the sections of the Hydrogen Pipeline Corridor located in proximity to these ordinary watercourses.

9A.7.61 Given the short-term nature of the construction period it is not expected that fluvial flooding associated with climate change will affect this phase of the development.

Groundwater Sources

9A.7.62 Groundwater flooding can occur when groundwater levels rise above ground surface levels. The underlying geology has a major influence on where this type of flooding takes place: it is most likely to occur in low-lying areas underlain by permeable rocks (aquifers).

9A.7.63 Both the RCBC SFRA and the PFRA state that the overall risk of groundwater flooding in Redcar and Cleveland is low. It is noted, however, that the majority of the borough may be subject to very wet ground conditions as a result of winter waterlogging.

9A.7.64 The Tees CFMP states that there is little documented evidence of groundwater flooding in the Tees catchment and groundwater flooding is not known to be a major

problem due to the geology of the catchment. This is particularly true for STBC as the main geology is of sandstone and mudstone. There are no sources of groundwater flooding as the aquifers within these sandstones are not artesian, even in very wet conditions.

9A.7.65 STBC hold no records of groundwater flooding problems in the area.

9A.7.66 The Environment Agency's 'Areas Susceptible to Groundwater Flooding' map is illustrated in the RCBC and STBC PFRA reports. The Areas Susceptible to Groundwater Flooding map is divided into 1 km^2 grid-squares in which a percentage is given for what proportion of the 1 km^2 is considered to be susceptible to groundwater emergence.

9A.7.67 Within the RCBC, STBC, and HBC areas, the map shows the Main Site lies predominantly in an area with a 75% or greater chance of groundwater emergence.

9A.7.68 The Environment Agency have no groundwater level monitoring sites either inside the search area or within 2 km of the search area (the closest groundwater level data held is from a site approximately 8.2 km north-north-west of the Proposed Development Site boundary) however, the Environment Agency have indicated that the bedrock groundwater level is expected to be around Ordnance Datum given the proximity to the coast.

9A.7.69 Based on the above available information, the risk of flooding from groundwater sources is assessed as a medium risk. The Parties also agree that an assessment of groundwater flooding risk will be undertaken in advance of any intrusive works in Saltholme and secured by requirement.

Surface Water Runoff

Overland Flow of Rainfall Runoff

9A.7.70 Overland flow results from rainfall that fails to infiltrate the surface and travels over the ground surface; this is exacerbated where the permeability of the ground is low due to the type of soil and geology (such as clayey soils) or urban development with impermeable surfaces.

9A.7.71 Surface water flooding is the main source of flood risk in RCBC with regular flooding in Eston, Redcar and Guisborough. This flooding is due to insufficient surface water, combined sewer and culverted watercourse capacity. The RCBC PFRA states *''In general, this local flooding occurs regularly but it is not particularly hazardous and individual incidents do not affect a large number of properties''.*

9A.7.72 STBC have confirmed that flooding did affect parts of the Proposed Development Site following the September 2012 rainfall event, however, there are no official recorded locations.

9A.7.73 The Environment Agency 'Risk of Flooding from Surface Water' maps available on the Environment Agency website and presented on Figure 9-4: Surface Water Flood Risk (PEI Report, Volume II) indicate areas at risk from surface water flooding, when rainwater does not drain away through the normal drainage systems or soak into the ground, but instead lies on or flows over the ground.

9A.7.74 The maps delineate risk into the four following categories:

- Very Low - each year, this area has a chance of flooding of less than 1 in 1,000 (<0.1 %);
- Low - each year, this area has a chance of flooding of between 1 in 1,000 (0.1 %) and 1 in 100 (1 %);
- Medium - each year, this area has a chance of flooding of between 1 in 100 (1 %) and 1 in 30 (3.3 %): and
- High - each year, this area has a chalice of flooding of greater than 1 in 30 (3.3 %).

9A.7.75 Environment Agency mapping indicates that the Main Site and the associated connection corridors within STBC, RCBC, and HBC are generally at very low risk (<0.1% AEP event) of flooding from surface water. There are isolated areas of high, medium and low flood risk where water is seen to pond during more significant rainfall events, however, these areas are constrained to low spots in the local topography within the Proposed Development Site boundary.

9A.7.76 The main locations of identified surface water flooding are:

- approximately 275 m to the south east of the Main Site where water is seen to flood around the A1085/Broadway East roundabout junction. Land in this area is identified at low to high risk of surface water flooding; and
- land located to the west between the A1085 and Cowpen Bewley Road, approximately 8 km to the west of the Main Site. Land in this area is identified at low to medium risk of surface water flooding.

9A.7.77 There are no surface water flow routes identified on the 'Risk of Flooding from Surface Water' maps therefore the risk of surface water flooding both to and from the Main Site area and the Connection Corridors is therefore considered to be ‘low' to 'very low'.

9A.7.78 Climate change must be taken into account when considering surface water runoff generated by development sites. This is usually represented by increasing the peak rainfall intensities. An increase in intensity will increase surface water rates and volumes. Additional surface water drainage will be required to allow increased surface water to be contained and managed.

9A.7.79 Drainage principles for the Proposed Development are outlined in Section 9.8. A Drainage Strategy will accompany the DCO Application, and its suitability assessed during the EIA and reported in the ES.

9A.7.80 The conceptual drainage strategy for surface water management will include an increase in peak rainfall intensity, in line with Environment Agency climate change guidance, summarised in Section 9.8. As a result, surface water runoff increasing over the lifetime of the development as a result of climate change is expected to be managed and not increase flood risk to the Proposed Development Site or elsewhere.

Existing Drainage Infrastructure

9A.7.81 No information was available regarding the private drainage within the Main Site boundary at the time of preparing the PEI Report. It is assumed the existing surface

water drainage system collects runoff from the buildings, hardstanding areas and gullies, which then discharge into the surrounding sewer network and/ or watercourses.

9A.7.82 The Northumbrian Water Bran Sands wastewater treatment works (to the immediate south of the Redcar Steelworks site) discharges into the Dabholm Gut.

9A.7.83 In total, there are 234 records of historic sewer flooding incidents in RCBC. Information provided in the RCBC SFRA indicates that no historical sewer flooding has occurred in close proximity to the Main Site and connection corridors to the south of the River Tees. Flooding from drainage infrastructure within RCBC tends to occur in predominantly residential areas with Eston, located to the southwest of the Main Site, and is identified as a critical drainage area.

9A.7.84 Based on the available records and information, the Proposed Development Site is considered to be at low risk of flooding from drainage infrastructure.

Artificial Waterbodies

9A.7.85 Artificial flood sources include raised channels such as canals or storage features such as ponds and reservoirs.

Flood Risk from Canals

9A.7.86 There are no canal systems within close proximity to the Main Site and connection corridors.

Flood Risk from Reservoirs

9A.7.87 The risk of flooding associated with reservoirs is residual and is associated with failure of reservoir outfalls or dam breaching. This risk is reduced through regular inspections and maintenance by the operating authority. Reservoirs in the UK have an extremely good safety record with no incidents resulting in the loss of life since 1925.

9A.7.88 The Environment Agency is the enforcement authority for the Reservoirs Act 1975 in England and Wales. All large reservoirs must be regularly inspected and supervised by reservoir panel engineers. Local Authorities are responsible for coordinating emergency plans for reservoir flooding and ensuring communities are well prepared.

9A.7.89 The Environment Agency's Long-term Flood Risk Mapping shows the largest area that might be flooded if a reservoir were to fail and release the water it holds but do not give any information about the depth or speed of the flood waters.

9A.7.90 The mapping shows that the Hydrogen Pipeline Corridor, located to the north of the River Tees, crosses an area at residual risk of reservoir flooding when river levels are normal and when there is also flooding from rivers. This area includes Cowpen Marshes in proximity to the Holme Fleet, Swallow Fleet and Belasis Beck (to the east of Billingham), and to a lesser extent along the course of Greatham and Claxton Becks to the north.

9A.7.91 To the south and south-east of the Main Site, the Hydrogen Pipeline Corridor, Water Connections Corridor, and the Electrical Connection Corridor all pass over areas at residual risk of reservoir flooding. This area includes the Wilton International Site and

land off the A1053/Tees Dock Road (at residual risk when river water levels are normal) and areas adjacent to the Mill Race, The Fleet and Dabholm Gut (at residual risk when river levels are normal and when there is also flooding from rivers).

9A.7.92 The RCBC Level 1 SFRA states that *"the reservoirs within the borough do not receive flow from river catchments and would therefore not be subject to large inflows of water during storm conditions. The risk is therefore perceived to be low and further assessment not required".*

9A.7.93 Based on the information above the current risk of flooding from artificial sources is low.

Summary of Flood Risks to the Site

9A.7.94 Table 9A-20 presents a summary of key flood risks to the Proposed Development.

Table 9A-20: Summary of Key Flood Risks

FLOOD RISK	RISKS TO THE SITE	NOTES	MITIGATION REQUIRED
Tidal	Main Site — Low Connection Corridors —Low with areas of medium to high risk identified to the north of the River Tees	The Proposed Development Site is predominantly located in Flood Zone 1 and the Main Site and the majority of the connection corridor routes also remain in Flood Zone 1 when relevant climate change allowances are applied for tidal and fluvial flooding. Localised areas of the Connection Corridors are located within Flood Zone 2 and 3 and the application of climate change allowances will increase the risk of flooding from tidal and fluvial sources in these areas. There is also a high residual risk of flooding should overtopping or breach of flood defences occur, predominantly to the north of the River Tees.	Yes
Fluvial	Main Site — Low Connection Corridors —Low with areas of high risk identified to the north and south of the River Tees		Yes
Surface Water	Low/Very low across the Proposed Development Site	Areas of surface water flooding are associated with low topographical areas where surface water pools rather than draining away. Very few flood flow routes are	Yes

FLOOD RISK	RISKS TO THE SITE	NOTES	MITIGATION REQUIRED
		present within the Proposed Development Site boundary. When climate change is considered surface water runoff both to and from the Proposed Development Site will increase over the lifetime of the development.	
Groundwater	Medium	There is limited information on ground levels in the area, however it is expected that given the proximity to the coast, groundwater levels will be at OS datum. Excavations during the construction phase and the below ground development associated with the Connection Corridors may be at risk.	Yes
Drainage Infrastructure	Low to Medium	Historical flood records in the SFRAs suggest the risk of flooding is low to medium.	No
Artificial Sources	South Bank of the Tees – Low residual risk North Bank of the Tees - High residual risk	No canals are located in close proximity to the Proposed Development Site. The Main Site is not located in an area at residual risk of reservoir flooding, however the Hydrogen Pipeline Corridor to the north of the River Tees and the Connection Corridors to the south/south east of the Main Site pass through areas at risk of reservoir flooding should a failure or breach of a reservoir occur. However. the probability of a failure/ breach occurring is very low.	No

9A.8 Management of Surface Water from the Site

9A.8.1 A new surface water drainage network and management system will be provided for the Main Site that will provide adequate interception, conveyance and treatment of surface water runoff from buildings and hard standing. This will be separate to foul systems for welfare facilities and process wastewater generated by the operation of the Site. The connection corridors will not require additional drainage as they will be using existing pipe racks, pipe bridges or, culverts or otherwise installed underground.

9A.8.2 The drainage strategy will be defined in consultation with the LLFA (RCBC and STBC) and the Environment Agency. The principles of the drainage strategy are as follows:

- segregate hazardous and non-hazardous effluent;
- contain leaks and accidental spills via carefully designed collection system;
- establish requirement to segregate collection and to eliminate cross contamination prior to recovery and disposal;
- identify recovery and recycle interfaces for the drained fluids;
- ensure safe design with access for maintenance and inspection; and
- account for normal operations, maintenance draining and drainage during an emergency.

9A.8.3 The proposed drainage system once developed is assumed to include the use of SuDS where possible, to enable attenuation of surface water flows due to increases in the impermeable area as a result of the Proposed Development. SuDS will also provide treatment of runoff to ensure potential adverse effects on water quality are avoided. SuDS and the treatment train will be selected with reference to the Simple Index Approach of the SuDS Manual (CIRIA, 2016), although a more precautionary approach may be taken due to the industrial land use, which may increase the risk.

9A.8.4 Water discharged from the Main Site will be limited to the greenfield runoff rate when discharged into a Main River or an Ordinary Watercourse, and water storage (e.g., within an attenuation pond) will be appropriately sized to accommodate the 1% AEP event with 45% allowance for climate change. Water discharged into the Tees Bay via the NZT outfall will be discharged freely and without limitations.

9A.8.5 The key objectives of the site drainage system are to provide a drainage system which is inherently safe and protects the local environment and the anticipated outfall in Tees Bay from accidental discharges of oil, chemicals or run-off from firefighting effluent. Clean water, storm water and firewater drainage would be segregated from contaminated water through the minimisation of paved areas and use of rain shelters. Gravity drainage will be used wherever practicable.

9A.9 Mitigation of Residual Flood Risks and Off-Site Impacts

9A.9.1 Consideration should be given to measures that protect the Proposed Development from the residual risk of flooding in the event that the existing tidal defences overtop or fail in the vicinity of the Proposed Development Site, or in the event of heavy

rainfall that could result in surface water flooding at the Main Site if the design capacity of the drainage network is exceeded.

9A.9.2 This Section therefore provides recommendations for the construction and operation phases of the Proposed Development in accordance with the guidance provided in the NPS, SFRAs and by Environment Agency guidance on how the Proposed Development can be designed to withstand predicted flood risks and mitigate the impact.

Construction

Construction Environmental Management Plan

9A.9.3 Prior to construction starting on Site, a Final Construction Environmental Management Plan (CEMP) will be prepared The Final CEMP will be standard procedure for the Proposed Development and will describe the principles for the protection of the water environment during construction. Within the Final CEMP as a technical appendix will be a Water Management Plan (WMP). The WMP will outline the mitigation measures necessary to avoid, prevent and reduce adverse effects where possible upon the local surface water (and groundwater) environment during construction. A Framework CEMP will be prepared as part of the ES.

9A.9.4 The Framework CEMP will need to be reviewed, revised and updated as the project progresses towards construction to ensure all potential impacts and residual effects are considered and addressed as far as practicable, in keeping with available good practice at that point in time. The principles of the mitigation measures set out below are the minimum standards that the contractor will implement. However, it is acknowledged that for some issues, there are multiple ways in which they may be addressed.

- topsoil and other construction materials will be stored outside of the 0.5% AEP (1 in 200-year) floodplain extent and only moved to the temporary works area immediately prior to use;
- connectivity will be maintained between the floodplain, the River Tees and Greatham Creek, with no changes in ground levels within the floodplain;
- the construction laydown areas, site office, and supervisor will be notified of any potential flood occurring by use of the Environment Agency 'Floodline Warnings Direct' service;
- the Contractor will be required to produce a Flood Risk Management Action Plan/ Method Statement which will provide details of the response to an impending flood and include:
  - a 24-hour availability and ability to mobilise staff in the event of a flood warning;
  - the removal of all plant, machinery and material capable of being mobilised in a flood for the duration of any holiday close down period;
  - details of the evacuation and site closedown procedures; and

- arrangements for removing any potentially hazardous material and anything capable of becoming entrained in floodwaters, from the temporary works area.

9A.9.5 Finally, where not disapplied through the DCO (albeit it is the Applicant's intention to disapply where agreed), there may be the need for a number of secondary permissions for temporary and potentially some permanent works affecting watercourses or groundwater (e.g., flood risk activity permits, water activity permits, land drainage consents, and abstraction/impoundment licences). At this stage it is reasonable to assume that all temporary works will be carried out under the necessary consents/permits and that the contractor will comply with any conditions imposed by any relevant permission, or otherwise the matters covered by these secondary consents will be dealt with pursuant to the DCO.

Good Practice Guidance

9A.9.6 The following relevant Guidance for Pollution Prevention (GPPs) have been released to date on the NetRegs website (NetRegs, n.d.) and are listed below. While these are not regulatory guidance in England, it remains a useful resource for best practice. The best practice approaches will be secured through the Framework CEMP:

- GPP 1: Understanding your environmental responsibilities – good environmental practices;
- GPP 2: Above ground oil storage;
- GPP 3: Use and design of oil separators in surface water drainage systems;
- GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer;
- GPP 5: Works and maintenance in or near water;
- GPP 8: Safe storage and disposal of used oils;
- GPP 13: Vehicle washing and cleaning;
- GPP 19: Vehicles: Service and Repair;
- GPP 20: Dewatering underground ducts and chambers;
- GPP 21: Pollution Incident Response Plans;
- GPP22: Dealing with spills;
- GPP26: Safe storage – drums and intermediate bulk containers; and
- GPP 27: Installation, decommissioning and removal of underground storage tanks.

9A.9.7 Where new GPPs are yet to be published, previous Environment Agency Pollution Prevention Guidance (PPGs) still provide useful advice on the management of construction to avoid, minimise and reduce environmental impacts, although they should not be relied upon to provide accurate details of the current legal and regulatory requirements and processes. Construction phase operations would be carried out in accordance with guidance contained within the following PPG:

- PPG6: Working at construction and demolition sites (Environment Agency, 2012);
- PPG7: Safe storage – the safe operation of refuelling facilities (Environment Agency, 2011); and
- PPG18: Managing fire water and major spillages (Environment Agency, 2000).

9A.9.8 Additional good practice guidance for mitigation to protect the water environment can be found in the following key CIRIA documents and British Standards Institute documents:

- British Standards Institute (2009) BS6031:2009 Code of Practice for Earth Works (British Standards Institute, 2009).
- British Standards Institute (2013) BS8582 Code of Practice for Surface Water Management of Development Sites (British Standards Institute, 2013a);
- C753 (2015) The SuDS Manual (second edition) (CIRIA, 2015a);
- C744 (2015) Coastal and marine environmental site guide (second edition) (CIRIA, 2015b);
- C741 (2015) Environmental good practice on site guide (fourth edition) (CIRIA, 2015c);
- C648 (2006) Control of water pollution from linear construction projects, technical guidance (CIRIA, 2006);
- C609 (2004) Sustainable Drainage Systems, hydraulic, structural and water quality advice (CIRIA, 2004);
- C532 (2001) Control of water pollution from construction sites – Guidance for consultants and contractors (CIRIA, 2001); and
- C736F Containment systems for prevention of pollution (CIRIA, 2014).

Construction of Hydrogen Pipeline Corridor – Trenchless Crossings

9A.9.9 A gaseous phase hydrogen pipeline network is required to connect various potential industrial off-takers across the Tees Valley to the Production Facility at the Main Site. This will require crossings of numerous watercourses.

9A.9.10 The Hydrogen Pipeline will be up to 24” in diameter and will cross the Tees Estuary and Greatham Creek (and adjacent water features at Seal Sands) using trenchless technologies (e.g. HDD or MBT). The Hydrogen Pipeline Corridor is shown in Figure 9-1 (PEI Report, Volume II), with a northern option (approximate NGR NZ 54687 24776) and southern option (approximate NGR NZ 53789 23211) for the crossing of the Tees Estuary still under consideration at this PEI Report stage. The Greatham Creek crossing would be at an approximate NGR of NZ 51436 25546.

9A.9.11 The use of trenchless technologies will minimise direct impact to the estuary bed and any flood defences present. Drilling will be a sufficient depth beneath the estuary bed to ensure that there is no risk of exposure, and this buffer distance will be agreed with the Marine Management Organisation (MMO). For the purposes of assessment this is assumed to be 10 - 15 m below the bed level.

9A.9.12 The sections of the Hydrogen Pipeline that will be installed via trenchless approaches will require launch, reception and jointing pits to be installed. It is assumed for the purposes of the assessment that the pit excavations for drilling/boring will be located at least 10 m from the watercourse edge, as measured from the top of bank, under which they will be directional drilled.

Construction of Hydrogen Pipeline Corridor – Above Ground and Open-Cut Crossings

9A.9.13 Various route options and construction methodologies are being considered for the remainder of the Hydrogen Pipeline Corridor (aside from the trenchless crossings discussed above). These include an option for below ground open trench (buried), installation on existing above ground pipe racks, and repurposing and reuse of existing pipelines (where possible). However, this is subject to ongoing design work, discussions with landowners and statutory consultees as well as being informed by environmental surveys.

9A.9.14 For the majority of the hydrogen pipeline corridor south of the River Tees, it is proposed to route along existing established pipeline corridors (generally above ground) where possible. There will be watercourse crossings of:

- Knitting Wife Beck (approximate NGR NZ 54580 23003);
- The Mill Race (approximate NGR NZ 57329 23682);
- Mains Dike (approximate NGR NZ 58121 22905); and
- The Fleet (approximate NGR NZ 56765 23730).

9A.9.15 These are all assumed to be above ground crossings utilising existing pipe bridges.

9A.9.16 Belasis Beck (approximate NGR NZ 48313 23194) to the south of the Tees off Cowpen Bewley Road will also be constructed above ground (NZ 48313 23194).

9A.9.17 The following watercourse pipeline crossings to the south of the Tees Estuary are assumed to require open cut methods for installation:

- Belasis Beck (at approximate NGR NZ 49397 23941); and
- Unnamed watercourses at NZ 51111 24826, NZ 49147 24367 and NZ 51221 26296.

9A.9.18 The exact number of watercourse crossings and their methodology will be known, and assessed fully, during the EIA and reported in the ES. Where open-cut installation of pipelines is required, the following mitigation will be in place:

- a pre-works morphology survey of the channel of each watercourse to be crossed will be undertaken prior to construction. The pre-works survey is to ensure that there is a formal record of the condition of each watercourse prior to commencement of works to install cables beneath the channel. The survey is a precautionary measure so that should there be any unforeseen adverse impacts there is a record against which any remedial action can be determined;
- at this stage it is assumed that where open-cut crossings are required that water flow would be maintained by damming and over pumping or fluming. Works will be carried out in the drier months where possible as this would reduce the

probability of a flood event occurring. It will be a requirement that the watercourses are reinstated as found. Regular observations of the watercourses will also be required post-works during vegetation re-establishment of the banks, especially following wet weather, to ensure that no adverse impacts have occurred. These requirements will be secured in the WMP, that will form a technical appendix of the Final CEMP.

Construction of Water Connection Corridor.

9A.9.19 Raw water will be supplied via the existing NWL raw water supply to the Teesworks site. There would also be a connection to NZT for use of the discharge outfall (for Case 2A and Case 2B) and a potential route for a Demineralised Water connection between the Main Site and Wilton International. At this stage in the development design, the water connections may be entirely above or below ground or a combination of the two. Agreements with NWL and the NZT project will be sought through the ongoing DCO process where required.

9A.9.20 Applying the Rochdale Envelope approach, the land required for the water connection options currently proposed for the Main Site has been depicted as a broad corridor. There is potential for watercourse crossings within the corridor depending on the final arrangement of infrastructure.

9A.9.21 For the majority of the Hydrogen Pipeline Corridor south of the River Tees, it is proposed to route along existing established pipeline corridors (generally above ground) where possible. There may be a need to cross the following watercourses:

- The Mill Race (approximate NGR NZ 57329 23682);
- Mains Dike (approximate NGR NZ 58121 22905 and NZ 57448 23552); and
- The Fleet (Tees Estuary S Bank WFD waterbody) (approximate NGR NZ 56765 23730).

9A.9.22 These are all assumed to be above ground crossings utilising existing pipe bridges. Belasis Beck (approximate NGR NZ 48313 23194) to the north of the Tees off Cowpen Bewley Road will also be constructed above ground (NZ 48313 23194).

9A.9.23 The following watercourse pipeline crossings to the north of the Tees Estuary are assumed to require open cut methods for installation:

- Belasis Beck (at approximate NGR NZ 49397 23941); and
- Unnamed watercourses at NZ 51111 24826, NZ 49147 24367 and NZ 51221 26296.

9A.9.24 The exact number of watercourse crossings and their methodology will be fully assessed during the EIA and reported in the ES. Where open-cut installation of pipelines is required, the following mitigation will be implemented.

Construction of Other Gases Connections

9A.9.25 Other gas connection pipelines may be required for the transportation of compressed O_2 and N_2 for use at the Production Facility. At this stage in the design development, the connections for other gases may be entirely above or below

ground or a combination of the two. There is potential for watercourse crossings relating to the Fleet (Tees Estuary S Bank), Mains Dike and Dabholm Beck. At this stage, and applying a precautionary worst-case scenario, it is assumed that all these watercourses will be crossed using open-cut techniques, following the mitigation outlined above with regard to the Hydrogen Pipeline Corridor.

Construction of Electrical Connection Corridor

9A.9.26 There is existing electrical infrastructure in the area which comprises a combination of overhead and lower voltage underground cables that serve the local area and other industrial users located in proximity to the Proposed Development Site. The final decision on substation choice will be subject to design development and further work based on constructability and electrical network resilience and capacity.

9A.9.27 At this stage in the design development, the electrical connection may be entirely above or below ground or a combination of the two. The Electrical Connection Corridor is currently depicted as broad corridors.

9A.9.28 There is potential for watercourse crossings within these corridors depending on the final arrangement of infrastructure. The locations are not known at this stage but affected watercourses may include:

- The Fleet (Tees Estuary S Bank);
- Mains Dike;
- Dabholm Beck;
- Kinkerdale Beck;
- The Mill Race;
- Cross Beck; and
- Knitting Wife Beck.

9A.9.29 At this stage, and applying a precautionary worst-case scenario, it is assumed that all these watercourses will be crossed using open-cut techniques, following the mitigation outlined above with regard to the Hydrogen Pipeline Corridor.

Management of Flood Risk

9A.9.30 All construction materials and temporary compounds associated with the construction of the Proposed Development will be located in Flood Zone 1 where possible. During the construction phase, the contractor will monitor weather forecasts and plan works accordingly. In addition, the Contractor will sign up to Environment Agency flood warning alerts and describe in the Emergency Response Plan the actions it will take in the event of a possible flood event. These actions will be hierarchal meaning that as the risk increases the contractor will implement more stringent protection measures. This is important to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding during the construction phase.

9A.9.31 The contractor will be required to produce a Flood Risk Management Action Plan/ Method Statement which will provide details of the response to an impending flood and include:

- a 24-hour availability and ability to mobilise staff in the event of a flood warning;
- the removal of all plant, machinery and material capable of being mobilised in a flood for the duration of any holiday close down period;
- details of the evacuation and site closedown procedures; and
- arrangements for removing any potentially hazardous material and anything capable of becoming entrained in floodwaters, from the temporary works area.

9A.9.32 If water is encountered during below ground construction, suitable de-watering methods will be used with reference to a Construction Dewatering Strategy. Any significant groundwater dewatering that is required (i.e. more than 20 m^3 per day) will be undertaken in line with the requirements of the Environment Agency (under Water Resources Act 1991 as amended) and Environmental Permitting Regulations (2016).

9A.9.33 Safe egress and exits are to be maintained at all times when working in excavations. When working in excavations a banksman is to be present at all times.

Works in Proximity to Flood Defences

9A.9.34 The Hydrogen Pipeline Corridor will cross the Tees Estuary and Greatham Creek (and adjacent water features at Seal Sands) using trenchless technologies (e.g. HDD or MBT). Dependent on the final corridor route, construction of the corridor would include sections in proximity to the following Environment Agency flood defences:

- defences along Greatham Creek (running north towards the Venator Plant);
- a flood embankment on the north bank of Greatham Creek, which is to be significantly repaired as part of Environment Agency's Greatham North East Flood Alleviation Scheme (FAS);
- Cowpen Marsh (between the Cowpen Bewley Landfill (to the west) and the Teesmouth and Cleveland Coast Special Protection Area (SPA) (to the east);
- a flood embankment to the south of the ConocoPhillips tank farm (north of Greatham Creek); and
- a flood embankment on the south bank of Greatham Creek (Sabic Embankment).

9A.9.35 The Environment Agency require the existing flood standard of protection, provided by the defences to be maintained both during the construction of the pipeline, and after completion of the scheme, whichever route is chosen.

9A.9.36 Continued consultation with the Environment Agency will be maintained to ensure no impacts to flood defence assets. In order minimise the impact of the Proposed Development Site on the flood defences, consideration will be given to the following (with details able to be agreed pursuant to Protective Provisions for the EA within the DCO):

- where the pipeline crosses a flood defence structure below ground, designs for the pipeline must include a load case for the top water level. This may be different at each location. The pipeline must also be at a suitable depth to ensure the stability of the flood defence structure, this is to be demonstrated in submitted designs;
- should the pipeline cross a flood defence structure above ground loading to flood defence asset will need to be considered and the design must not impede access for routine maintenance and inspections of the flood defence structure;
- if the pipeline crosses a watercourse above ground, it must be appropriately designed and positioned to prevent accumulation of debris and localised increases in water levels;
- where the pipeline is to utilise existing pipework that crosses watercourses, it is expected that modifications to the structure will be made where possible for improved conveyance and reduce debris accumulation;
- where ground levels near a flood defence are to be disturbed on either a permanent or temporary basis, designs must not allow additional water to pond at the toe of the flood defence, and
- excavations near the footprint of a flood defence must remain a safe distance away from the toe of the defence to ensure stability of the defence. This must be demonstrated in submitted designs.

9A.9.37 Directional drilling is permitted when crossing a flood defence provided:

- the drilling operation does not affect the stability of the flood defence structure by inducing a geotechnical failure, including when it is retaining flood water; and
- the drilling or permanent works do not provide a conduit for water seepage underneath the flood defence structure, including when it is retaining flood water.

9A.9.38 In order to maintain the standard of protection, the Environment Agency requires continued access to continue routine maintenance of the existing and planned defences. Any permissions or legal agreements to allow these works to go ahead, would be agreed in advance of pipeline construction.

Operation

9A.9.39 A number of mitigation features will be incorporated into the design of the Proposed Development design in order to avoid, minimise and reduce potential adverse impacts on flood risk, and these are described in the following sections.

9A.9.40 The following mitigation measures are considered to protect the Proposed Development at the Main Site in accordance with the legislative and regulatory authority requirements:

- flood resistance and resilience measures;
- flood Emergency Response Plans
- Flood Warnings and Alerts;

- emergency access and egress; and
- design capacity exceedance.

Flood Resistance and Resilience Measures

9A.9.41 The following flood resilience and resistance mitigation measures were considered to ensure the operation of the development is maintained during inundation, and to ensure the safety of people:

- raising external ground levels; and
- elevating critical plant equipment and/or internal finished floor levels above the peak flood inundation level.
- flood resistant/resilient design.

Raising External Ground Levels

9A.9.42 The predicted (undefended) peak flood level for the Main Site during a 0.1% AEP (1 in 1,000 chance) H++ climate change flood scenario up to 2105 is calculated to be 6.23m AOD. This estimation is based on the updated Environment Agency climate change sea level allowances (UKCIP18) and the 2019 existing baseline water level information. To protect all critical equipment assets on site ground levels at the Main Site a +600mm freeboard is added to the flood level resulting in the development platform for the Production Facility being no lower than 6.83m AOD following site clearance and remediation. Not only does this ensure the Proposed Development will remain elevated above the estimated H++ peak flood level, the raised ground levels, will also allow sufficient depth for installation of the drainage system with gravity discharge and connection to NEP.

9A.9.43 Although the elevation of the Main Site will be at a minimum level of 6.83m AOD following site clearance and remediation, there are no proposals to raise land in Flood Zones 2 and 3a for the purposes of protecting the Proposed Development. Therefore, flood water will not be displaced, and this will not pose an increased risk of flooding off-site to adjacent land uses. No flood volume compensation is therefore required.

Critical Plant Equipment

9A.9.44 Relevant pieces of critical equipment include:

- electrical equipment, switchboards and control panels;
- transformers;
- main boiler feed pumps;
- condensate extraction pumps; and
- primary air fan and induced draught fan.

9A.9.45 As the Main Site will be located on a development platform above the H++ climate change scenarios water level, critical equipment will remain in Flood Zone 1, at low risk of flooding.

9A.9.46 If required, identification will also be undertaken of items of critical plant along the Pipeline Corridors for which spares can be kept on the Main Site, and storage of those items on the

Main Site will be implemented to reduce the potential recovery time in the event of a major flood event.

Flood Resistant and Resilient Design

9A.9.47 CIRIA Report C688 'Flood Resilience and Resistance for Critical Infrastructure' (CIRIA, 2010), states that *"Flood resilience involves designing an infrastructure asset or adapting an existing infrastructure asset so that although it comes into contact with floodwater during floods, no permanent damage is caused, structural integrity is maintained and, if operational disruption does occur, normal operation can resume rapidly after a flood has receded. Flood resistance involves designing an infrastructure asset or adapting an existing infrastructure asset so that floodwater is excluded during flood events and normal operation can continue with no disruption occurring to the essential services the asset provides".*

9A.9.48 The following measures are also considered appropriate and have been included within the design and layout of the Proposed Development:

- pipelines and storage tanks designed to withstand the water pressures associated with high return period event flooding;
- tanks (if required) securely tethered in such a way to ensure the infrastructure remains secure should flooding occur;
- protecting wiring for operational control of the Proposed Development, telephone, internet and other services by suitable insulation in the distribution ducts to prevent damage;
- materials with low permeability up to 0.3 m and accept water passage through building at higher water depths;
- flood proofing including the use of flood resistant building materials, use of water-resistant coatings, use of galvanised and stainless-steel fixings and raising electrical sockets and switches;
- utilising floor materials that are able to withstand exposure to floodwater without significant deterioration and that can be easily cleaned e.g. concrete-based or stone;
- incorporating water resistant services within the buildings i.e. avoid services using ferrous materials;
- design development to drain water away after flooding;
- provide access to all spaces to permit drying and cleaning;
- carefully considering the type of usage and layout of ground floor areas to minimise the potential impact on business operations following a flood; and
- suitable waterproofing measures to development located below ground i.e. tanking below ground storage areas etc.;
- pollution control will be implemented to prevent/ reduce the chance of any fuel/ material stored on site leaking;

- landscaping of the Site or building curtilage will be designed to direct or divert floodwater away from buildings; and
- SuDS will be designed to manage surface water flood risk and water quality.

Flood Warnings and Alerts

9A.9.49 The Environment Agency operates a Flood Warning Service for many areas at risk of fluvial and tidal flooding. The service currently consists of three stages:

- Flood Alert - flooding is possible and that you need to be prepared;
- Flood Warning - flooding is expected and that you should take immediate action. Action should be taken when a flood warning is issued and not wait for a severe flood warning; and
- Severe Flood Warning - there is severe flooding and danger to life. These are issued when flooding is posing significant risk to life or disruption to communities.

9A.9.50 Each code gives an indication of the expected level of danger. Although some members of the public find Flood Watches useful, they are predominantly targeted towards professional partners, alerting them to expected flooding of low-lying land and roads.

9A.9.51 All stages of warning are disseminated via the 'Floodline Warnings Direct', which is a free service that provides warnings to registered customers by telephone, mobile, email, SMS text message and fax. Local radio, TV, loudhailers, sirens and Floodline are also used to deliver flood warning messages. The Floodline number is 0845 988 1188, and it is always kept up to date with the Environment Agency's latest flooding information.

9A.9.52 More detailed information on the likely extent and time scale of these warnings can be obtained by request from the Environment Agency, by their 'Quick dial' recorded information service, or via their website.

9A.9.53 For any proposed commercial or industrial developments within a designated floodplain (as in the case of some areas of the Proposed Development Site), a system for monitoring flood warnings should be developed with designated responsible persons (site managers) able to monitor and disseminate the warnings. This will provide more time to enable emergency access and egress of staff occupants away from the local area which may become flooded during a flood event (including routes for egress) prior to inundation. They should also enable sufficient time to implement protection measures for any equipment on site. This is particularly relevant to the construction phase.

9A.9.54 The Proposed Development Site is located within a designated Environment Agency Flood Alert Area (short code 121WAT926 covering low lying land surrounding Tidal River Tees, downstream of the Tees Barrage, including areas of Middlesbrough and Billingham).

9A.9.55 The connection corridors at Seal Sands and Saltholme are located within a designated Environment Agency Flood Warning Area (FWA) (short code name 121FWT565 covering industrial properties on Seal Sands, Southern Graythorp and Billingham Fire Station). Due to the 24 hour a day nature of the operations at the Proposed Development Site, the Proposed Development Site will be registered with the Environment Agency's Flood Warnings Direct service and monitoring of the warnings is adopted at the Site to mitigate

the residual risk of tidal/fluvial flooding in the event of overtopping or defence failure in the vicinity.

Flood Emergency Response Plan

9A.9.56 It is recommended that a Flood Emergency Response Plan be developed for the Proposed Development to ensure the residual risk to the site over the lifetime of the development is sufficiently managed and mitigated. A management system will be implemented to respond to a variety of emergency situations both during normal hours (24/7) and over holiday periods.

9A.9.57 A Flood Emergency Response Plan will be prepared in consultation with the Environment Agency and LLFAs. This will define access and egress routes from the Main Site, which will include recommendations on the best route, signage strategy in and around the area and congregation points. It will ensure that the development is registered to receive flood warnings from the Environment Agency's 'Floodline Warnings Direct' service to inform if there is a risk of flooding from a tidal storm surge type event which could result in overtopping or breach of defences. This will include the recommendation of at least one Flood Warden for the plant.

9A.9.58 As the Flood Emergency Response Plan will be set up to manage the residual risk of flooding, careful consideration will be undertaken as to what action will be taken at each level of warning. The plan will define how occupants of the Site will be evacuated to an appropriate safe place of refuge should there be a real risk of flooding, as the safety of all occupants is essential. However, it is also important to ensure that the site is only evacuated when necessary.

Emergency Access and Egress to/from the Proposed Development Site

9A.9.59 An emergency access and egress route is a route that is 'safe' for use by occupiers without the intervention of the emergency services or others. A route can only be completely (safe' in flood risk terms if it is dry at all times.

9A.9.60 For developments located in areas at flood risk, the Environment Agency consider 'safe' access and egress to be in accordance with paragraph 039 of the NPPF PPG, and FRA Guidance for new Developments FD2320 (DEFRA and Environment Agency, 2005), where the requirements for safe access and egress from new developments are as follows in order of preference:

- safe, dry route for people and vehicles;
- safe, dry route for people;
- if a dry route for people is not possible, a route for people where the flood hazard in terms of depth and velocity of flooding) is low and should not cause risk to people; and
- if a dry route for vehicles is not possible, a route for vehicles where the flood hazard (in terms of depth and velocity of flooding) is low to permit access for emergency vehicles.

9A.9.61 For 'essential infrastructure' development, it is considered that dry access and egress from the site will be desirable during times of extreme floods.

9A.9.62 Surface water flood maps indicate the access road to and from the Main Site is affected by surface water flooding during higher return period events. Mapping shows flooding to a depth of 300 to 900mm at the A1085/West Coatham Lane roundabout junction. Should flooding occur in this location appropriate access/egress will be required on the access road to and from the Main Site in case flooding occurs. Alternatively, staff could be evacuated from the Site, via the northern gate from the PCC Site onto South Gare Road and then east to Redcar via Warrenby.

Place of Safe Refuge

9A.9.63 Safe places of refuge are generally considered an acceptable approach to flood risk management in areas adjacent to sea defences as in the event of a defence breach, inundation is likely to be rapid and therefore evacuation from the Main Site and local area can sometimes be an unsafe option.

9A.9.64 The Main Site is located within Flood Zone 1 for both the current flood risk and all climate change scenarios, including the H++ allowance for the 0.5% AEP and 0.1% AEP flood events therefore a place of safe refuge is unlikely to be required.

Exceedance Flows

9A.9.65 Following the completion of the Proposed Development, an additional residual risk relates to maintenance of the on-site drainage infrastructure. Failure, blockage and capacity exceedance above that of the design events for the drainage system are a potential risk to the Main Site and the surrounding area.

9A.9.66 To reduce the risks, maintenance of the system will be incorporated in general site management and remains the responsibility of the operator. A manual will be prepared detailing each drainage feature on site, the maintenance required, timescales for maintenance and who is responsible for undertaking the maintenance. It is expected the Site owners will ultimately be responsible for maintenance of the site drainage system including all pipes, discharge structures and any SUDS implemented on site in accordance with the recommendations in the SuDS Manual.

9A.9.67 CIRIA 0635 (CIRIA, 2005) provides guidance on measures that can be incorporated into the detailed design of developments to steer surface water that has exceeded the capacity of the drainage system away from buildings and route it towards the intended point of discharge (for example along swales and roads using raised kerbing and through parking areas).

Decommissioning

9A.9.68 At the end of its design life decommissioning of the Proposed Development will see the removal of all above ground equipment down to ground level and the ground remediated to enable future re-use.

9A.9.69 It is assumed that all underground infrastructure will remain in-situ; however, all connection and access points will be sealed or grouted to ensure disconnection. At this stage it is assumed that decommissioning impacts are expected to be limited and will be the same/similar to the construction impacts, as discussed above.

9A.9.70 A Decommissioning Environmental Management Plan (DEMP) will be produced and agreed pursuant to a DCO Requirement. The DEMP will consider in detail all potential

environmental risks and contain guidance on how risks can be removed, mitigated or managed. This will include details of how flood risk and surface water drainage should be managed at the Proposed Development Site during decommissioning and demolition.

Permits and Consents

9A.9.71 Various water-related permissions may be required where it is not agreed with the relevant regulating authority to disapply them through the DCO. These permissions may include:

- Land drainage consent(s) under section 23 of the Land Drainage Act 1991for works affecting the flow in ordinary watercourses;
- Flood risk activity permit(s) from the Environment Agency under the Environmental Permitting Regulations (England and Wales) 2016 in connection with works to main rivers (e.g. Greatham Creek, River Tees);
- Water activity permit(s) from the Environment Agency under the Environmental Permitting Regulations (England and Wales) 2016 for temporary construction and permanent operational discharges;
- Full or temporary water abstraction licence(s) under section 24 of the Water Resources Act 1991 (if more than 20 m3/d is to be dewatered/over-pumped and exemptions do not apply); and
- Temporary water impoundment licence under section 25 of the Water Resources Act 1991 in connection with the laying of cables.

9A.10 Summary and Conclusions

Flood Risk Summary

Tidal Sources

9A.10.1 Flooding from tidal sources is the predominant flood risk to the Proposed Development.

9A.10.2 Based on the Environment Agency FMfP, it has been determined that during the existing scenario the Main Site and the majority of the connection corridor routes are at a 'low' risk of flooding from tidal sources (River Tees and Greatham Creek) during events that exceed a 0.5% AEP (1 in 200 chance) flood event.

9A.10.3 During a future scenario resulting from climate change up to 2125 and a H++ scenario to 2100, the Main Site remains at 'low' risk of flooding during events that exceed a 0.5% AEP (1 in 200 chance) of flooding and the 0.1% AEP (1 in 1000 chance) event when mitigation comprising a minimum site elevation of 6.83m AOD is included.

9A.10.4 To the north of the River Tees, the Hydrogen Pipeline corridor located between the tidal River Tees and Greatham Creek is at high risk of flooding from tidal sources during events that exceed a 0.5% AEP (1 in 200 chance) flood event and the climate change flooding scenarios. This section of the Proposed Development Site is also at high residual risk of flooding should a failure or breach of the flood defences occur. However, works in this area comprise either underground pipework or installation of

pipelines on existing pipe racking. The need to develop the pipelines in this location is essential to connect to existing industrial sources seeking to decarbonise through the proposed CO_2 Export Corridor and export infrastructure.

9A.10.5 Elements of the Proposed Development Site that are located within Flood Zone 3a will not result in a loss of floodplain storage volume and will not result in a change in flood routes, therefore, flood risk to third parties will not increase.

9A.10.6 Appropriate mitigation measures are proposed for the construction phase in this area of higher flood risk. These measures will be secured through the CEMP (to be discharged by DCO requirement), best practice and in consultation with the Environment Agency with regards maintaining the integrity of the flood defences.

Fluvial Sources

9A.10.7 The information provided by the Environment Agency FMfP identifies the Main Site to be at 'low' risk of fluvial flooding from Ordinary watercourses located in proximity to the Proposed Development Site boundary.

9A.10.8 During a future scenario resulting from climate change up to the year 2125 the Main Site remains at 'low' risk of fluvial flooding therefore appropriate mitigation measures are not required to be implemented at the Proposed Development Site to mitigate this risk.

9A.10.9 Where the risk of flooding from fluvial sources is currently assessed as high, the risk category of flooding to the Proposed Development Site is not likely to increase due to climate change. If a flood event did occur, the impact of climate change would result in an increase in the depth and extent of floodwater across the areas of the site affected by flooding from this source during a 1% (1 in 100 chance) event.

9A.10.10 The connection corridors to the south and south-west of the Main Site will generally be located above ground and will remain at low risk of flooding from fluvial sources, including all climate change scenarios. The only exception is the proposed open-trench channels for the Hydrogen Pipeline Corridor, running to the east and alongside of the Seaton Carew Road.

9A.10.11 Flood risk from fluvial sources (ordinary watercourses) on the north bank of the River Tees, between Billingham and Seal Sands, will increase for all climate change scenarios. Therefore, the Hydrogen Pipeline Corridor will be at risk of flooding over the lifetime of the development. However, most of it will be located underground and in an existing unattended service corridor and is therefore considered acceptable development within Flood Zone 3a. Any maintenance work (e.g., pigging) will be undertaken in accordance with the Flood Emergency Response Plan.

9A.10.12 Appropriate mitigation measures are proposed for the construction phase in this area of higher flood risk. These measures will be secured through the CEMP (to be discharged by DCO requirement), best practice and in consultation with the Environment Agency with regards maintaining the integrity of the flood defences.

9A.10.13 The Main Site will be constructed at a level no lower than 6.83m AOD (derived from the 6.23m AOD flood level for a 0.1% AEP H++- plus 600mm freeboard). The

operational development remains above the maximum flood level and no further mitigation is required.

Surface Water Runoff to the Site

9A.10.14 The risk of surface water flooding within the Proposed Development Site from elsewhere or generated within the Site is considered to be 'low to very low'.

Groundwater

9A.10.15 The risk of groundwater flooding within the Proposed Development Site is considered to be 'medium'. However, should the Proposed Development comprise below ground development within strata where groundwater is recorded as present, mitigation measures, including those outlined in British Standard 8102 (BS8102) will be required to reduce the risk of groundwater flooding to underground structures.

Drainage Infrastructure

9A.10.16 The Proposed Development Site is not located in an area defined as a CDA and there are no historic records of flooding from drainage infrastructure sources for the Study Area in the LLFA SFRAs. Areas associated with flooding from sewerage infrastructure are concentrated in residential areas such as Eston. The risk of flooding from drainage infrastructure is therefore assessed as low.

Artificial Sources

9A.10.17 There are no canals located in close proximity to the Proposed Development Site, however, land between the north bank of the River Tees and the south bank of Greatham Creek is located in an area at residual risk of flooding should a failure or breach of a reservoir occur.

Management of Surface Water Runoff from the Site

9A.10.18 A new surface water drainage network and management system will be provided for the Main Site that will provide adequate interception, conveyance and treatment of surface water runoff from buildings and hard standing. This will be separate to foul systems for welfare facilities and process wastewater generated by the operation of the Proposed Development Site. The connection corridors will not require additional drainage as they will be using existing pipe racks, pipe bridges or, culverts or otherwise installed underground.

Residual Risk Mitigation Measures

9A.10.19 A number of mitigation measures are proposed in areas of the Proposed Development Site where construction will take place in Flood Zone 3a as set out in this assessment. These measures will be secured through the Final CEMP to be discharged by requirement of the draft DCO and will be considered during the design process for the Proposed Development to ensure the operation of the Main Site is maintained in the event of an extreme flood.

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ANNEX A – CONSULTATION RESPONSES

creating a better place
for people and wildlife

Environment Agency

[redacted]
AECOM
1 New York Street
Manchester
Lancashire
M1 4HD

Our ref: NA/2023/116167/01-L01
Your ref: H2 Teesside

Date: 17 March 2023

Dear [redacted]

CHARGED PLANNING ADVICE (ENVPAC/1/NEA/00127): REQUEST FOR ADVICE FOR A 1.2GW BLUE HYDROGEN PRODUCTION FACILITY WHICH DERIVES HYDROGEN (H2) FROM NATURAL GAS, WITH THE CARBON DIOXIDE (CO2) RELEASED FROM THE PROCESS BEING CAPTURED, TRANSPORTED AND STORED OFFSHORE. THE PROPOSED DEVELOPMENT WILL BE BUILT OVER 2 PHASES WITH PHASE 1 BEING OPERATIONAL BY 2027 AND PHASE 2 BY 2029/30. FLOOD RISK, WASTE, WFD, AND WQ ADVICE REQUESTED. FOUNDARY, SOUTH GARE ROAD, REDCAR, TS10 5NX

We are pleased to provide planning advice on the above development to proposal.

Environment Agency Comments
We have reviewed the information submitted below and have the following comments/advice to offer:

- All utility connection corridor map; and.
- Charged request form

Reuse of Made Ground
Use of made ground in development projects is often undertaken using the CL:AIRE Definition of Waste Code of Practice (DoWCoP). This allows waste materials to be used outside of waste legislation, providing four key factors are met relating to certainty of use, quantity used, suitability for use and the environment and human health is protected.

Reuse of the made ground on this development site is unlikely to be suitable for use under the DoWCoP. This is because the material is likely to consist of blast furnace slag and other historic contaminants. As such, reuse of the material would not be considered low risk for use under the DoWCoP as it presents a risk of causing pollution to the environment. We would therefore recommend that an Environmental Permit is sought to authorise and condition any proposed reuse of the made ground. We would also encourage the developer to request pre-application advice to discuss permitting options.

Further information is available at: Get advice before you apply for an environmental permit - GOV.UK (www.gov.uk)

Landfill Sites

The proposed Development Consent Order (DCO) boundary includes interaction with several areas of historic landfill. Historic landfill sites are sites where an environmental permit or waste management licence is no longer in place. They generally operated prior to the onset of key pieces of legislation such as the Control of Pollution Act (1974) or the Waste Management Licencing Regulations (1994). They operated under regimes which required less assessment around waste acceptance and little or no engineering or monitoring requirements. As such, known reliable information relating to these sites is not available.

Specifically, the DCO boundary will interact with the following sites:

- West of Wolviston to Seal Sands Link Road (NGR: NZ 49303 23674). The site operated in 1981 and 1982 and is believed to contain incinerator residues and construction wastes.
- South of Seal Sands Road (NGR: NZ 52147 23893). The site operated between 1973 and 1978 and is believed to contain incinerator residues and construction wastes.
- Seal Sands (NGR: NZ 52332 24719). The period of operation for this site is unknown but is believed to have begun in the late 1970s. It is believed to have accepted medical wastes.
- Seal Sands, North Bank (NGR: NZ 52034 25149). This site operated between 1978 and 1989 and is understood to have accepted construction and industrial wastes, including blast furnace slag.
- Sea Banks Lagoon No.4 (NGR: NZ 51552 25447). This site operated between 1978 and 1979 and is understood to have accepted industrial wastes.
- Billingham Process Pack Site A (NGR: NZ 48145 22199). This site operated in 1992 and is believed to have accepted construction wastes.
- Haverton Hill Landfill (NGR: NZ 48621 22583). This site began operating in 1990 and consisted of serval screening mounds, formed of construction wastes. In situ gas monitoring was undertaken at this site with no appreciable landfill gas recorded. This licence (reference EAWML 60225) was deemed suitable for licence surrender in 2012 following an assessment of environmental risk.
- Teesport Eston Tip (NGR: NZ 56334 23873). This site operated between 1977 and 1993 and is understood to have accepted construction wastes and blast furnace slag.
- Redcar Trunk Road Landscaping (NGR: NZ 56890 23000). This site operated between 1977 and 1979 and is believed to contain general industrial wastes, soils and blast furnace slag.

The DCO boundary also includes some overlap with the currently permitted Warrenby landfill (NGR: NZ 57723 24753). This site is currently licensed under a Waste Management Licence (reference; EAWML 60138) and contains blast furnace slag. The site is closed to waste acceptance.

Caution must be exercised when looking to excavate in and around these areas of historic landfill. A risk assessment should be undertaken which adequately addresses the risks posed to the wider environment from disturbing these waste masses. Leachate or gas present within the waste mass could become mobile if disturbed. Should any excavated material from these sites be reused within the development plot, this must be done so as a waste material and Environmental Permitting requirements will be

Cont/d..

required.

The DCO boundary also runs alongside several currently operation landfill sites – Port Clarence landfills, Cowpen Bewley landfill, Teesport No 2 and No 3 landfills and Bran Sands landfill (this site is closed to waste acceptance). These sites will contain a network of perimeter boreholes around their boundary which are used to monitor gases and groundwaters. The DCO must ensure these boreholes are not disturbed during construction.

Flood Risk
The red line boundary for the full development is located within flood 3, 2 and 1. The majority of the development site for the Main Site is situated within flood zone 1. However, small portions of the Main Site are situated within flood zone 2 and 3. Parts of the Hydrogen Pipeline Corridor are also within flood zone 2 and 3.

Flood Risk Vulnerability Classification
No information has been provided on the flood risk vulnerability classification within the provided information. Therefore, we are unable to advise on our policy position in relation to flood risk until the vulnerability of the development has been confirmed by the applicant and/or the local planning authority.

It should be noted that 'highly vulnerable' uses, requiring a Hazardous Substance Consent, would not be appropriate within flood zones 3. In accordance with Table 2 of the flood risk and coastal change section of the Planning Practice Guidance (PPG), 'highly vulnerable' developments are not appropriate in flood zone 3 and should not be permitted.

Sources of Flooding
The main source of potential flooding in the area is from the tidal stretch of the River Tees, but there could be other local sources of flooding such as groundwater and surface water. We have published a suite of interactive maps that indicate where possible flooding from different sources could occur Check the long term flood risk for an area in England - GOV.UK (www.gov.uk). Our maps are not suitable for a detailed Flood Risk Assessment **(**FRA), but they can indicate where further assessment may be needed.

Flood Risk Assessment
We would expect a FRA to be submitted in support of your DCO application. The FRA must assess flood risk from all sources of flooding and recommend the mitigation measures that will be implemented to ensure a safe development in a 1 in 200-year (tidal) flood event, taking account of climate change. It must also demonstrate that flood risk will not be increased elsewhere.

Flood risk mitigations will need to be included within the development to ensure it can remain safe for its' lifetime. This includes raising the finished floor levels to the 1 in 200 year plus climate change plus a freeboard of 600mm.

Flood Risk Information the Environment Agency (EA) holds
We have an outline for a 1 in 200-year level undefended model that can be requested. The modelling we have for this location does not include climate change allowances and therefore this will need to be calculated in accordance with the 'Flood risk assessments: climate change allowances'. As the development location is at risk from tidal flooding, sea level allowances will need to be applied to the 1 in 200-year level for the lifetime of the development using both higher central and upper end allowances.

Cont/d..

This applies to both the temporary and permanent works.

The extent, speed and depth of flooding shown in the assessment should be used to determine the flood level for flood risk mitigation measures. Where assessment shows flood risk increases steadily and to shallow depths, it is likely to be more appropriate to choose a flood level lower in the range. Where assessment shows flood risk increases sharply due to a 'cliff edge' effect caused by, for example, sudden changes in topography or defences failing or overtopping, it is likely to be more appropriate to choose a flood level higher in the range.

Requests for data should be sent to northeast-newcastle@environment-agency.gov.uk. Please note that requests for data can take up to 20 working days to process. Your local planning authority should have undertaken a Strategic Flood Risk Assessment (SFRA) which will also include local flood risk information to inform your FRA.

Flood Alleviation Schemes
The Environment Agency are currently in the process of developing flood alleviation schemes which may have an interface with the proposed development. Attached to this letter is the scheme overview for the Greatham North East Flood Alleviation scheme.

Flood Risk Consents and Permits
The River Tees is a designated ‘main river’ and under the Environmental Permitting Regulations certain works within 16m of a tidal main river, or within 16m of any flood defence structure on a tidal main river, require a Flood Risk Activity Permit from the Environment Agency. This includes works such as directional drilling under the River Tees. You can find more information on permit requirements using the following link: Flood risk activities: environmental permits - GOV.UK (www.gov.uk). If a permit is required, it must be obtained prior to beginning the works.

You may also need a Marine Management Organisation license depending on if any works will be undertaken below the mean high water springs (MHWS).

Water Framework Directive (WFD) Assessment
Your development proposal should have regard to the objectives the Water Environment (Water Framework Directive) Regulations 2017, and the Northumbria River Basin Management Plan, which requires the restoration and enhancement of water bodies to prevent deterioration and promote recovery of water bodies.

We would expect a WFD assessment to be submitted in support of your DCO application. Your WFD assessment should consider the impact of the proposed development on the WFD status of the receiving waterbody Tees estuary (GB510302509900) and ensure that there is no deterioration resulting from their activities. Information about the status of the waterbody is available at TEES | Catchment Data Explorer | Catchment Data Explorer

As well as water quality impacts, your WFD assessment consider impacts to fisheries, ecology and the marine environment, both from the proposed activity once operational and during the construction phase. Any impacts identified need to be minimised and/or mitigated against. These mitigation measures should go above and beyond simply preventing deterioration and should work to create a better environment.

Applicants may not need to proceed to all stages of the WFD assessment process depending on the circumstances of the project. Guidance on how to assess the impact to WFD is available at: Water Framework Directive assessment: estuarine and coastal

Cont/d..

waters - GOV.UK (www.gov.uk)

Construction Environmental Management Plan
A Construction Environmental Management Plan (CEMP) should be submitted in support of your DCO application. With respect to water quality, the CEMP should address the following points:

- Treatment and removal of suspended solids from surface water run-off during construction works;
- Management of fuel and chemical spills during construction and operation, including the process in place to ensure the environment is not detrimentally impacted in the event of a spill; and
- Construction runoff could contain hazardous chemicals and elements due to the site's location. Contaminated land is likely to be present on site, and a scheme would be required to manage the associated risks, and minimise mobilisation of hydrocarbons, heavy metals, and any other hazardous pollutants into the water environment during construction and site operation.

Drainage Strategy
In order to determine the water quality impacts, the following information should be submitted as part of your drainage strategy:

- How rainwater will be handled and discharged from the site; and
- How foul water will be handled and discharged from the site. This should include if the site will be connecting to Northumbrian water's public sewer network.

Reclaimed Water Supply
The applicant seeks to utilise reclaimed water to supply water for the proposed development. However, limited information has been provided on this matter. We recognise that reusing water will provide a substitute for either a new abstraction or increase the utilisation of existing abstractions. This will limit the environmental impact of the proposal and protect the flow regime of sources of supply. We are unable to provide further comments on the opportunities or constraints that could be associated with effluent reuse, as it is assumed that these sources of water are regulated discharges and are therefore controlled under a separate regulatory regime.

Discharge of Trade Effluent
Effluent discharged from any premises carrying on a trade or industry, and effluent generated by a commercial enterprise where the effluent is different to that which would arise from domestic activities in a normal home is considered to be trade effluent. If you are not able to discharge effluent, it will be classed as waste, and you must then comply with your duty of care responsibilities.

Any effluent discharging into the Tees estuary or the adjacent coastal waterbody will need to be assessed as part of the DCO application. This may involve a standalone water quality assessment along with hydrodynamic modelling. Depending on the nature of the discharge, additional chemical or thermal plume modelling may be required.

If proposing to discharge to non-mains:
If you wish to discharge effluent, after appropriately treating it, to groundwater or surface water a permit under the Environmental Permit Regulations will be required. Full characterisation of the effluent will be required, and modelling may be required at the planning stage to determine the impact of the effluent on the receiving watercourse.

If proposing to discharge to mains:

Cont/d..

A trade effluent consent or a trade effluent agreement with your water and sewerage company (in this case likely to be Northumbrian Water) must be obtained before you discharge trade effluent to a public foul sewer or a private sewer that connects to a public foul sewer. Further guidance is available at Pollution prevention for businesses - GOV.UK (www.gov.uk).

The below timescales apply if a discharge permit is needed:

Application Type	**Current estimated time to produce water quality permit (Allocation and determination time)**
Simple Bespoke	286 working days
Complex Bespoke	365 working days

Some applications may be considered for prioritisation if it meets the Environment Agency's National Permitting Service's prioritisation criteria.

Discharge of Clean Water
Clean surface water (i.e., clean, uncontaminated rainwater from hard standing areas such as roads and car parks) can be discharged to a watercourse without a permit if the discharge passes through a maintained oil interceptor or Sustainable Urban Drainage System. If a water attenuation system is proposed it would be beneficial to see the details, methods, and maintenance of the system to ensure longevity and effectiveness.

Guidance about discharges to surface water and groundwater, including when you do and do not need a permit to discharge water can be found at https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits).

Construction Dewatering (Discharge)
Discharge from temporary excavations can occur if the discharge can meet all of the conditions of the Regulator Position Statement "Temporary dewatering from excavations to surface water". This is available at https://www.gov.uk/government/publications/temporary-dewatering-from-excavations-to-surface-water/temporary-dewatering-from-excavations-to-surface-water). If any discharge cannot meet all the conditions, a Bespoke Environmental Permit would be required, this would follow the same timeline as other water quality permits stated under the discharge of trade effluent section of this response.

Water Resources (Abstraction and Impoundment)
The proposals may require Water Resource Licences in respect of the construction activities required and the eventual operation of the site. Water Resource (Impoundment and Abstraction) Licences are issued by the Environment Agency under the terms of the Water Resources Act 1991, and the provisions of the Water Resources (Abstraction and Impounding) Regulations 2006. The current estimated time to receive a water resources licence permit is between 6 and 9 months. Therefore, applications should be made at the earliest opportunity.

Abstraction Licence
If you intend to abstract more than 20 cubic metres of water per day from a surface water source e.g. a stream or from underground strata (via borehole or well) for any particular purpose then you will need an abstraction licence from the Environment Agency. There is no guarantee that a licence will be granted as this is dependent on available water resources and existing protected rights.

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Impounding licence
If you intend to impound a watercourse then you are likely to need an impounding licence from the Environment Agency. An impoundment is any dam, weir or other structure that can raise the water level of a water body above its natural level. ‘On-line’ impoundments hold back water in rivers, stream, wetlands and estuaries, and consequently affect downstream flows, sediment transport and migration of fish. Impoundments could be created through works to modify or change existing watercourses. An Impoundment Licence could also be required if you amend, modify or remove existing in channel structures.

Construction Dewatering (Abstraction)
Dewatering is the removal/abstraction of water (predominantly, but not confined to, groundwater) in order to locally lower water levels near the excavation. This can allow operations to take place, such as mining, quarrying, building, engineering works or other operations, whether underground or on the surface.

The dewatering activities on-site could have an impact upon local wells, water supplies and/or nearby watercourses and environmental interests. This activity was previously exempt from requiring an abstraction licence. Since 1 January 2018, most cases of new planned dewatering operations above 20 cubic metres a day will require a water abstraction licence from us prior to the commencement of dewatering activities at the site.

Nutrient Neutrality
Nutrient Neutrality applies to developments and discharges in this area. Please ensure liaison with Natural England is undertaken as this issue may have implications on your WFD assessment and technical assessments.

Please do not hesitate to contact me if you have any questions regarding this letter.

Yours sincerely

[redacted]
Planning Technical Specialist - Sustainable Places

Direct dial [redacted]
Direct e-mail [redacted]@environment-agency.gov.uk

End

creating a better place
for people and wildlife

Environment Agency

Mr Tim Jones
Sent via email: [redacted]@aecom.com

Our ref: 307252
Your ref: 60689030 H2Teesside
Date: 19 May 2023

Dear Mr Jones

RE: Request for information under the Freedom of Information Act 2000 (FOIA)/ Environmental Information Regulations 2004 (EIR)

Thank you for your request dated 19 April 2023 for information/data to assist with the completion of the Environmental Impact Assessment for H2Teesside.

We respond to requests for information that we hold under the Freedom of Information Act 2000 (FOIA) and Environmental Information Regulations 2004 (EIR).

For ease of reference, we have structured our response below in a similar lay out to your request.

Please download the information found in the share file links before they expire in 20 days.

Flood Risk Assessment Data

P5-8 Port Clarence 2020 FM-TUFLOW Model and Report
FRA Data: https://ea.sharefile.com/d-sc736b792890a4e2d85cf4b04c571d67b
Report: https://ea.sharefile.com/d-s4d9cfed5d667446d8298bd466ed8c2dc
Model: Share file to be provided shortly.

Areas susceptible to Surface Water – extent maps for 1/30, 1/100 and 1/1000 and the SW suitability map:
https://data.gov.uk/data/search?sort=&q=Risk+of+Flooding+from+Surface+Water+Extent
FZ2: https://data.gov.uk/dataset/flood-map-for-planning-rivers-and-sea-flood-zone-2
FZ3: https://data.gov.uk/dataset/flood-map-for-planning-rivers-and-sea-flood-zone-3

Critical drainage areas:
https://data.gov.uk/dataset/areas-with-critical-drainage-problems

LiDAR data is open data available to download from the website:
https://data.gov.uk/data/search?q=lidar+data

You will be aware that we are developing a flood alleviation scheme on the north bank of Greatham Creek and Seal[redacted]icative plan attached. We are currently undertaking the detailed design of the scheme and hope to commence delivery on site in summer 2024.

Following examination of our records of historic flooding, we have no record of flooding in the area. This does not necessarily mean that the area of the property / site has never flooded, only that we do not currently have records of flooding in this area.

The Environment Agency is the relevant risk management authority for flood risk on 'main rivers'. Local Authorities now take the lead for local flood risk, including 'ordinary watercourses', surface water and ground water flooding. We recommend that you contact the Lead Local Flood Authority for further information. Regarding flood risk from sewers please contact Northumbrian Water Group.

For general advice about assessing flood risk when completing planning applications, and in particular how to complete a flood risk assessment (FRA) as part of a planning application go to https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications

If your request is in relation to a planning application, the supplied data may not assess climate change using the most recent allowances. To find out which allowances to use go to www.gov.uk/guidance/flood-risk-assessments-climate-change-allowance

Our Sustainable Places Team can give more detailed advice although there is a charge for this. Here is the link to the standard terms and conditions that apply to our charged planning advice service https://www.gov.uk/government/publications/planning-advice-environment-agency-standard-terms-and-conditions. The standard charge is £100 per hour.

Any works near a main river may require approval from the Environment Agency. You may need to apply for a Flood Risk Activity Permit if:
- the works are within 8 metres(m) from a non-tidal Main river and from any flood defence structure or culvert.
- the works are within 16m from a tidal Main river and from any flood defence structure or culvert.
- the works are within 16m from a sea defence structure.

To determine whether you actually need a permit please visit https://www.gov.uk/guidance/flood-risk-activities-environmental-permits Or you can send a brief explanation of what works you plan to do (and where) so we can confirm.

Water Quality, Resources, Water Framework Directive and Biological Data

[redacted]

WFD investigations & mitigation measures: https://ea.sharefile.com/d-s376bb07bb2224ff182d79f85469fd58b

Water quality data/WFD classification information can be found using the below links:

- Water Quality data: Open WIMS data
- WFD Classification information: England | Catchment Data Explorer

Abstraction Licences: https://ea.sharefile.com/d-s99dffa6c886d445bb40567ab622990cf

Please find the above link containing the licences within a 10km radius from NGR NZ5066723691. We only regulate abstractions over 20 cubic meters per day, so if information is required for abstractions under this volume, please contact the Local Authority about the private water supplies in the area. Please note there are some duplicate licence numbers which represents that there are multiple purposes/uses.

We are unable to comment on third party intentions for water resource licences and would recommend that licence holders are contacted directly if you are interested in information about the licence holders plans for a specific licence. We can confirm that the Environment agency is not seeking to review any licence in the study area beyond the routine catchment review which will be undertaken in 2027.

We can confirm that we do not hold any groundwater level data for within the site area.

Information on management issues regarding water resources is available within the Abstraction Licence Strategy for the Tees Management Catchment. This is available on gov.uk at Tees abstraction licensing strategy - GOV.UK (www.gov.uk). Further information on specific proposals would be available through the Environment Agency's Water Resources Pre-Application service. We would also recommended that any significant developments in the Tees Estuary seek to engage with Water Resources North East (Water Resources North) in respect of ongoing catchment based water resource planning.

Discharge Consents: Defra Data Services Platform

Category 3 water pollutions incidents: Data is still being collated and will follow shortly.

Climate/Weather Data:
https://www.data.gov.uk/search?q=weather&filters%5Bpublisher%5D=&filters%5Btopic%5D=&filters%5Bformat%5D=&sort=best

River Flow Data: https://ea.sharefile.com/d-s89c562a32b4b4b78b6e6cfaa17db0f20

We have provided daily mean stage data from level gauges at Tees Barrage (NGR: NZ46200 19000) and Stockton (NGR:44775 18809). Unfortunately, there is no flow data available within the study area, however, we have supplied daily mean flow data from the nearest flow gauge upstream at Low

Moor (NGR:NZ 36442 10549). We have also provided hourly tidal data and monthly tidal max data from the tidal g[redacted]ock (NGR: NZ 43112 23508).

Ecological/Estuarine Habitat Data:

Although the below information has not specifically been requested, it has been included in the hopes that it is useful for your needs.

Ecology and fish data explorer: https://environment.data.gov.uk/ecology/explorer/
The new **Saltmarsh Change** and **Saltmarsh Extent and Zonation** data layers are available to download
The new **Seagrass Extent** data layer is available to download
The **Restoration Potential Maps** are available to download
The **Habitat Restoration Handbook series** are available to download
The **Infographics** developed for the habitat restoration handbook series are available to download
Restoring Meadow, Marsh and Reef (ReMeMaRe) | Estuarine & Coastal Sciences Association (ecsa.international)

Abstracts

FRA products 5-8

Name	Products 5, 6 and 7
Description	P5-8 Port Clarence 2020 FM-TUFLOW Model and Report
Licence	The information provided is not available under the Open Government Licence but we may be able to license it to you under the Environment Agency Conditional Licence: Environment Agency Conditional Licence However, you MUST first check the supporting information below and the above link to determine if the conditions on use are suitable for your purposes. If they aren't, this information is not provided with a licence for use, and the data is provided for read right only. Environment Agency Conditional Licence
Conditions [redacted]	1.0 You may use the Information for your internal or personal purposes and may only sublicense others to use it if you do so under a written licence which includes the terms of these conditions and the agreement and in particular may not allow any period of use longer than the period licensed to you. 2.0 Notwithstanding the fact that the standard wording of the Environment Agency Conditional Licence indicates that it is perpetual, this Licence has a

	limited duration of 5 years at the end of which it will terminate [redacted]atically without notice. 3.0 We have restricted use of the Information as a result of legal restrictions placed upon us to protect the rights or confidentialities of others. In this instance it is because of third party data. If you contact us in writing (this includes email) we will, as far as confidentiality rules allow, provide you with details including, if available, how you might seek permission from a third party to extend your use rights. 4.1 The Information may contain some data that we believe is within the definition of "personal data" under the Data Protection Act 1998 but we consider that we will not be in breach of the Act if we disclose it to you with conditions set out in this condition and the conditions above. This personal data comprises names of individuals or commentary relating to property that may be owned by an individual or commentary relating to the activities of an individual. 4.2 Under the Act a person who holds and uses or passes to others personal data is responsible for any compliance with the Act and so we have no option but to warn you that this means you have responsibility to check that you are compliant with the Act in respect of this personal data. 5.0 The location of public water supply abstraction sources must not be published to a resolution more detailed than 1km2. Information about the operation of flood assets should not be published. 6.1 Where we have supplied model data which may include model inputs or outputs you agree to supply to the Environment Agency copies of any assessments/studies and related outputs, modifications or derivatives created pursuant to the supply to you of the Information, all of which are hereinafter referred to as "the Data". 6.2 You agree, in the public interest to grant to the Environment Agency a perpetual royalty free non-exclusive licence to use the Data or any part thereof for its internal purposes or to use it in any way as part of Environment Agency derivative products which it supplies free of charge to others such as incorporation into the Environment Agency's Open Data mapping products.
[redacted]	

Information Warnings	Please be aware that model data is not raw, factual or measured but [redacted]ises of estimations or modelled results based on the data available to us.
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. May contain Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198.
Name	Product 8
Description	P5-8 Port Clarence 2020 FM-TUFLOW Model and Report
Licence	Open Government Licence
Information Warnings	1.0 This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped. 2.0 The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results. 3.0 The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains. 4.0 Please contact the Environment Agency for further information on emergency planning associated with flood risk in this area.
Information Warning - OS background mapping [redacted]	*The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.*

Attribution	Contains Ordnance Survey data © Crown copyright 2017 Ordnance Survey [redacted]4198. Contains Environment Agency information © Environment Agency and/or database rights.

In respect of water abstraction information:

This information is not available with the Open Government Licence but we may be able to license to you under the Environment Agency Conditional Licence:

- **Water Abstractions (AfA135)** – detailed information about this dataset including conditions can be found on the Register Licence Abstract (you will need to download this spreadsheet to access the information about AfA135 – see below).

You MUST first check the supporting information available online to determine if the conditions on use are suitable for your purposes. If they aren't, this information is not provided with a licence for use, and the data is provided for read right only.

In respect of all other information:

Where we have provided links to data already available online, full details of supporting information and licensing are available when you access the data online. For all other information please refer to the Open Government Licence which explains the permitted use of this information. **Information Warnings**: **(i)** Personal Data in the Information is exempt from the Open Government Licence. **(ii)** It is the responsibility of the licensee to ensure that data they hold is accurate and up to date.

Information not held

EIR Regulation 3(2) states that information is held if it is in our possession and has been produced or received by us, or it is held by another person on our behalf at the time the request is received.

Some information/data is not held by the Environment Agency, and we are therefore refusing these parts of your request on the grounds that there is no information we can provide.

[redacted]Where a request is for environmental information, the Regulations allow us to refuse to disclose it if the exception at EIR Regulation 12(4)(a) applies. The regulation states that a public authority may refuse to disclose environmental information to the extent that it does not hold that information when an applicant's request is received.

It is not possible for us to conduct a public interest balancing test because the reason for non-disclosure is that the information is not held.

creating a better place
for people and wildlife

Environment Agency

Personal Data

[redacted]

We have redacted personal data from any non-public register data/reports. The reason for this refusal is explained below.

Relevant exceptions

The Environment Agency is not able to disclose the names of individuals as this is personal data under the Data Protection Act 2018 (DPA 2018) and to disclose it would breach the First Data Protection Principle of the DPA 2018.

The information requested is therefore exempt due to Regulation 13(1) of the Environmental Information Regulations 2004, which explains that:

"To the extent that the information requested includes personal data of which the applicant is not the data subject, a public authority must not disclose the personal data if—

(a) the first condition is satisfied…"

The 'first condition' referred to above is further explained in Regulation 13(2A):
"The first condition is that the disclosure of the information to a member of the public otherwise than under these Regulations—

(a) would contravene any of the data protection principles…"

The First Data Protection Principle requires that we are fair to individuals when we collect and use their personal data. In this case it would be unfair to disclose information relating to an identifiable individual as such individuals have a reasonable expectation that any information held about them by the Environment Agency would remain confidential.

The Public Interest Test

There is no requirement to conduct a public interest test when withholding personal data.

Rights of appeal

If you are not satisfied you can contact us within 2 calendar months to ask for our decision to be reviewed.

Yours sincerely,

[redacted]

Customers and Engagement Officer

Environment Agency | Tyneside House, Skinnerburn Road, Newcastle Business Park, Newcastle upon Tyne, NE4 7AR

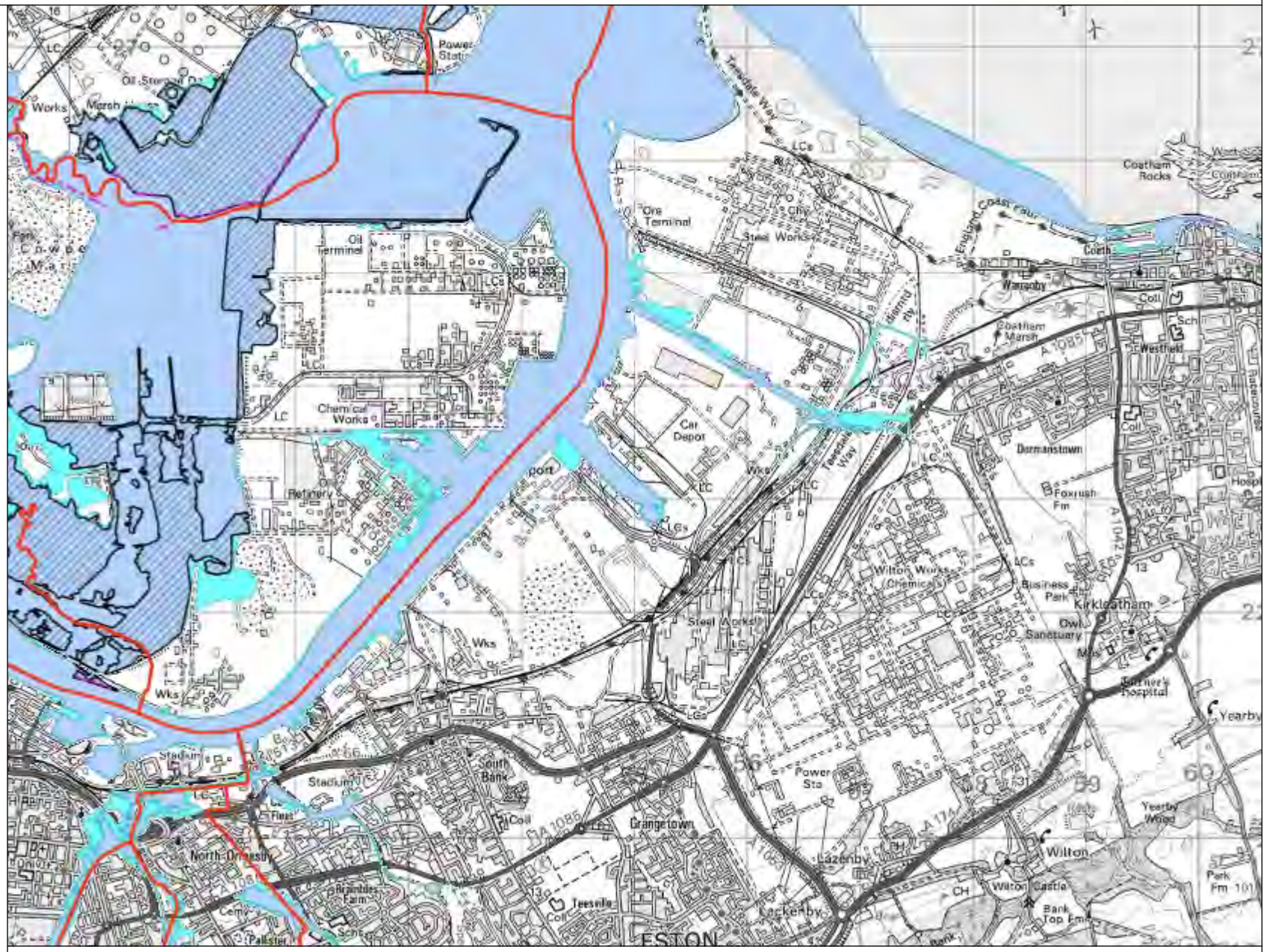
northeast-newcastle@environment-agency.gov.uk

Flood Map for Planning

Environment Agency

Legend

- Statutory Main Rivers
- Defences
- Flood Storage Areas
- Areas benefiting from flood defence
- Flood Zone 3
- Flood Zone 2



1: 50,000

0 1,250

Metres

N W E S

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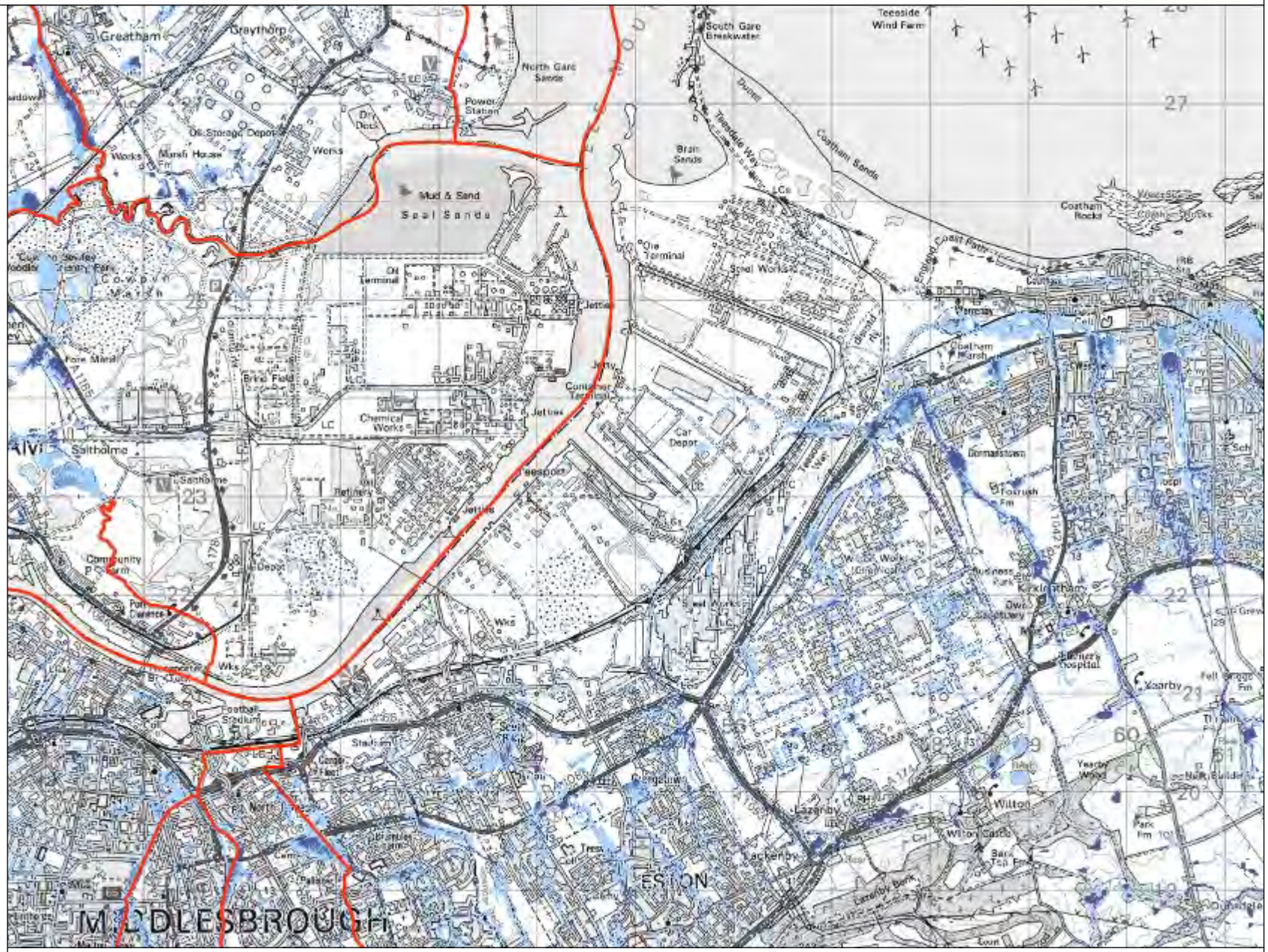
Surface Water Flood Risk

Environment Agency

Legend

- Statutory Main Rivers
- Flood Extent 1 in 30
- Flood Extent 1 in 100
- Flood Extent 1 in 1000



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0 1,439

Metres

N W E S

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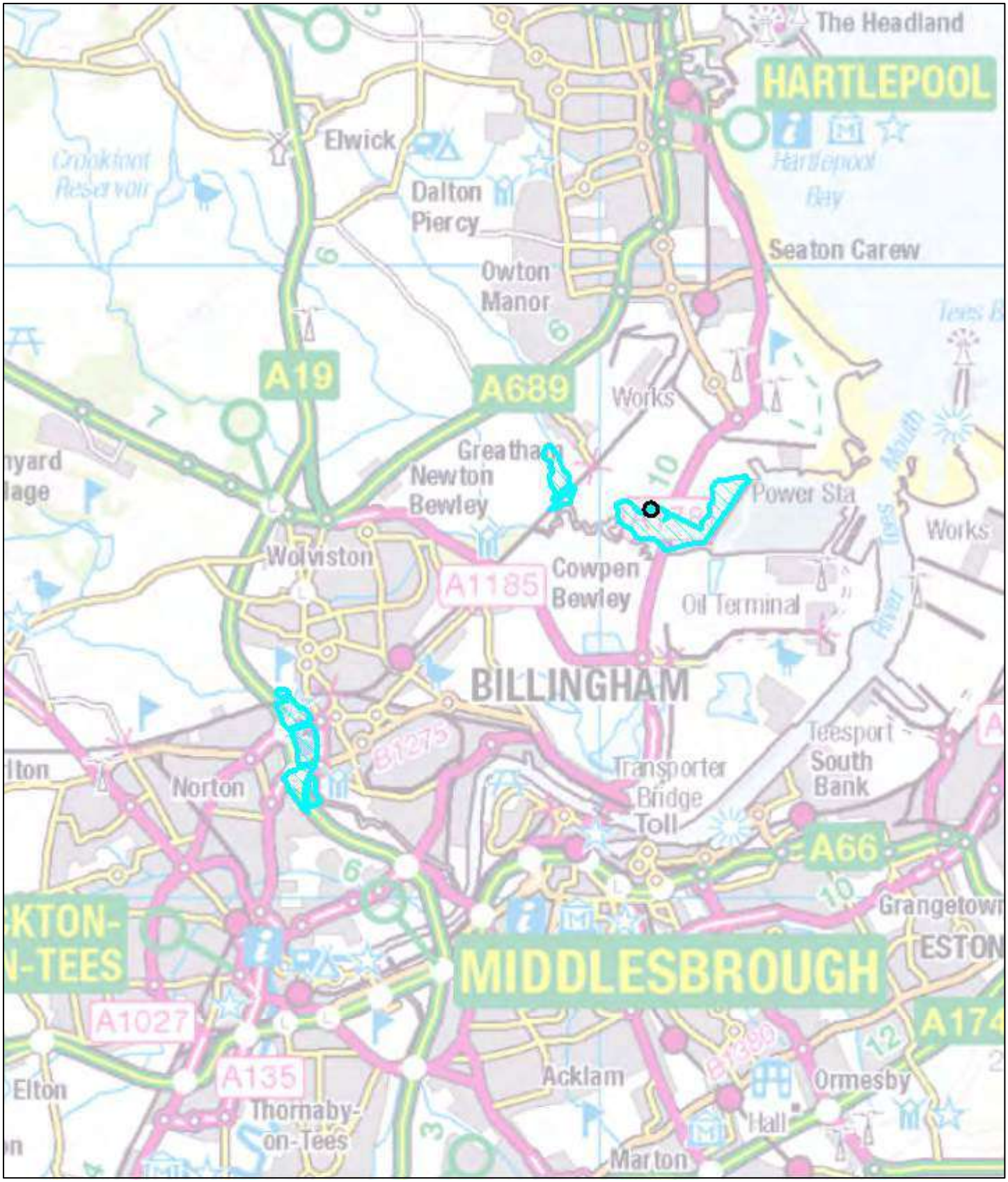
11/01/1978 Flood Event



April 26, 2023

1:83,368

0 0.5 1 2 mi

0 1 2 4 km

FLOOD INFORMATION LOCATIONS

RECORDED FLOOD OUTLINES

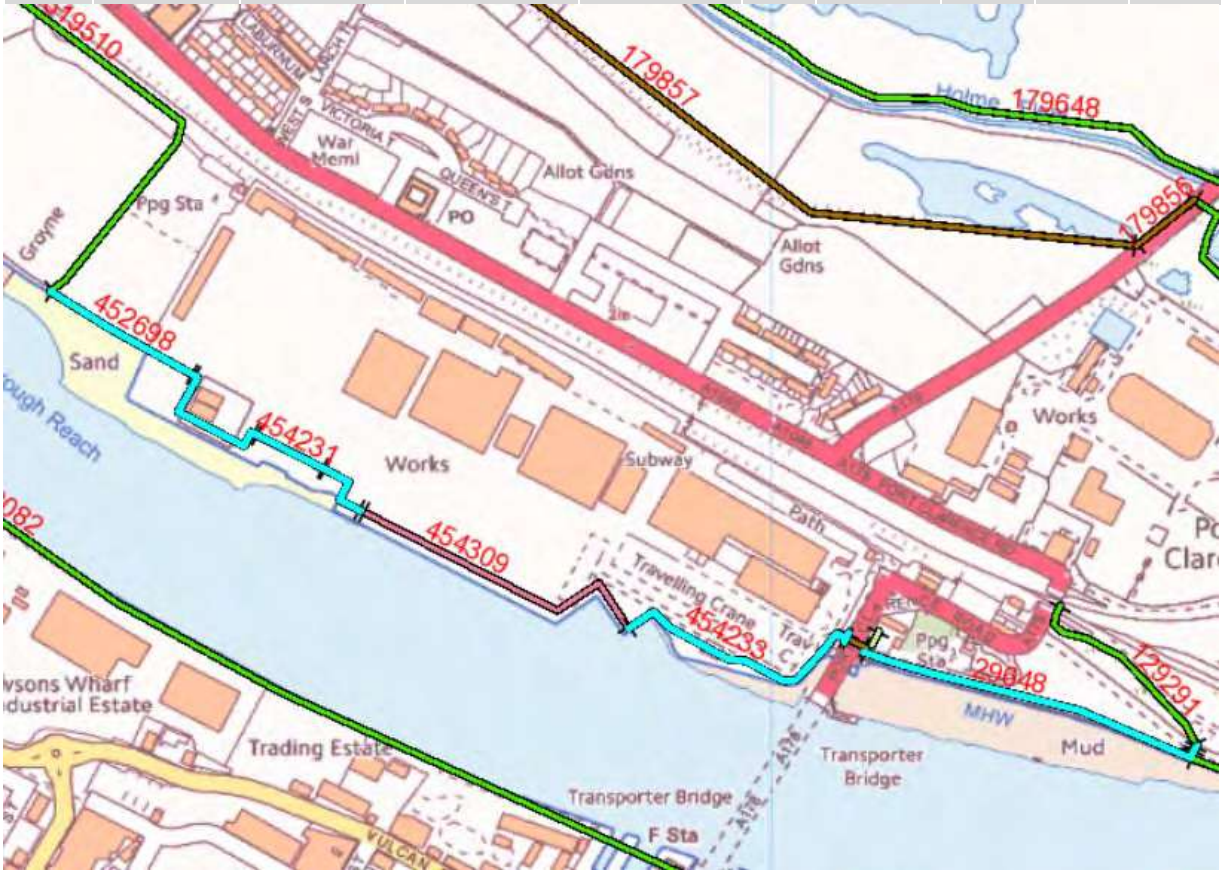
OS Traditional Maps

FCRM/DDTS/Data & Systems 2019

Environment Agency Flood Defence Information

Port Clarence

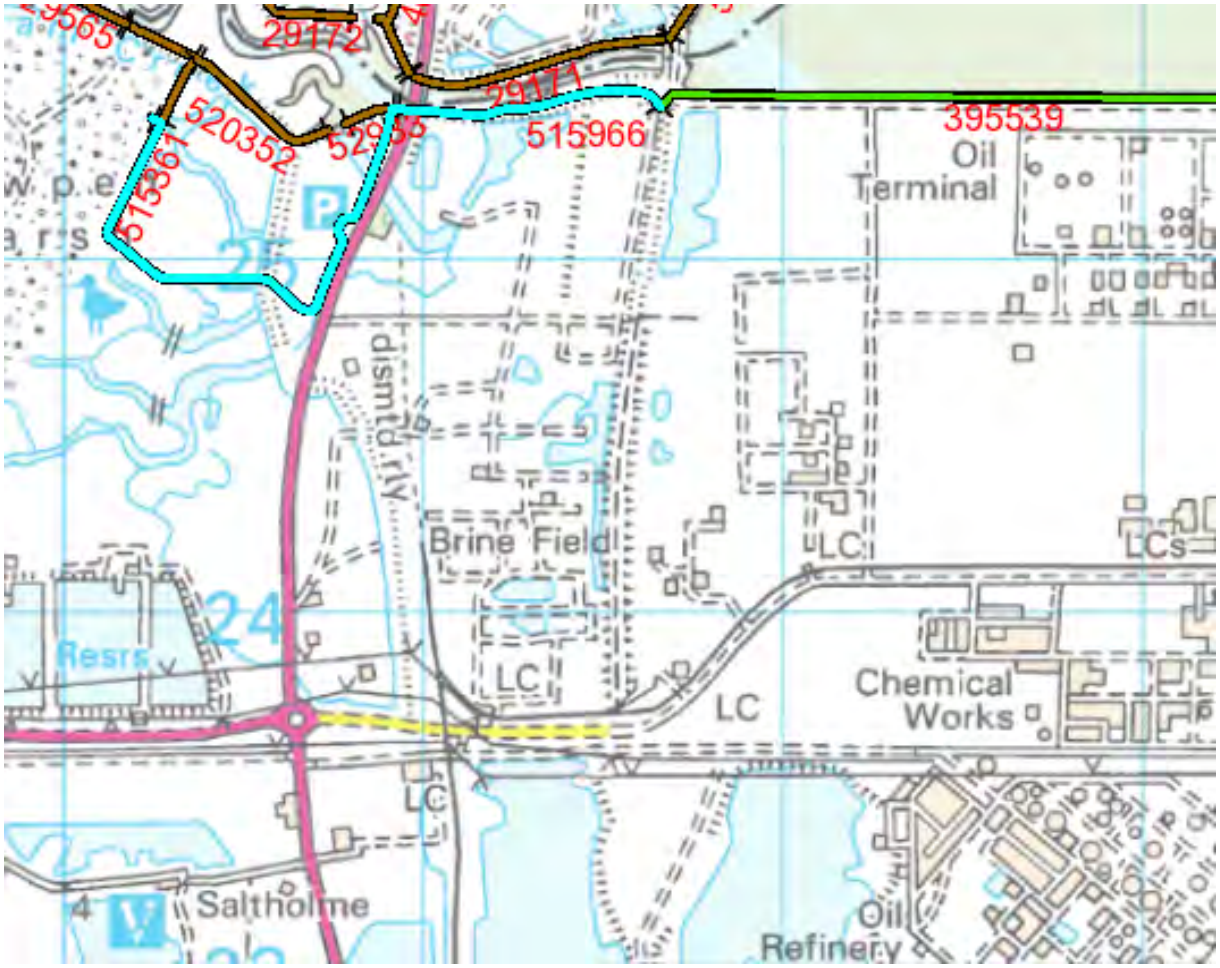
Asset Ref	Asset Type	Description	Location	Upstream National Grid Ref.	Condition*	Standard of Protection (Return period, 1 in x Years)	Upstream Crest Level (m)**	Downstream Crest Level (m)**	Length (m)
29648	Flood Defence	Embankment	Port Clarence	NZ 50078 21419	3	200	4.59	4.59	301.60
416350	Flood Defence	Embankment	Port Clarence	NZ 50360 21331	1	200	4.60	4.59	6.90
452698	Flood Defence	Embankment	Port Clarence	NZ 49379 21733	3	200	5.20	5.20	143.40
454231	Flood Defence	Embankment	Port Clarence	NZ 49554 21607	2	200	5.10	5.10	65.80
454219	Flood Defence	Flood Wall	Port Clarence	NZ 49503 21661	2	200	5.05	5.00	120.30
454233	Flood Defence	Flood Wall	Port Clarence	NZ 49875 21440	2	200	4.95	4.91	228.70
454290	Flood Defence	Flood Wall	Port Clarence	NZ 49614 21580	1	200	4.93	4.90	62.50
454311	Flood Defence	Flood Wall	Port Clarence	NZ 50060 21427	1	200	TBC	TBC	9.10



*The condition grades provided are from a visual inspection only based on the Environment Agency's Condition Assessment Manual.
Descriptions are as follows:
1 Very Good – Cosmetic defects that will have no effect on performance.
2 Good – Minor defects that will not reduce the overall performance of the asset
3 Fair – Defects that could reduce performance of the asset
4 Poor – Defects that would significantly reduce the performance of the asset. Further investigation needed
5 Very Poor – Severe defects resulting in complete performance failure.
**The Crest Levels are metres Above Ordnance Datum (Newlyn).

Environment Agency Flood Defence Information

Asset Ref	Asset Type	Description	Location	Upstream National Grid Ref.	Condition*	Standard of Protection (Return period, 1 in x Years)	Upstream Crest Level (m)**	Downstream Crest Level (m)**	Length (m)
515361	Flood Defence	Floodbank	Greatham South	NZ 50259 25412	2	tbc	tbc	tbc	1671.40
515966	Flood Defence	Floodbank	Greatham South	NZ 50934 25418	3	tbc	tbc	tbc	760.40



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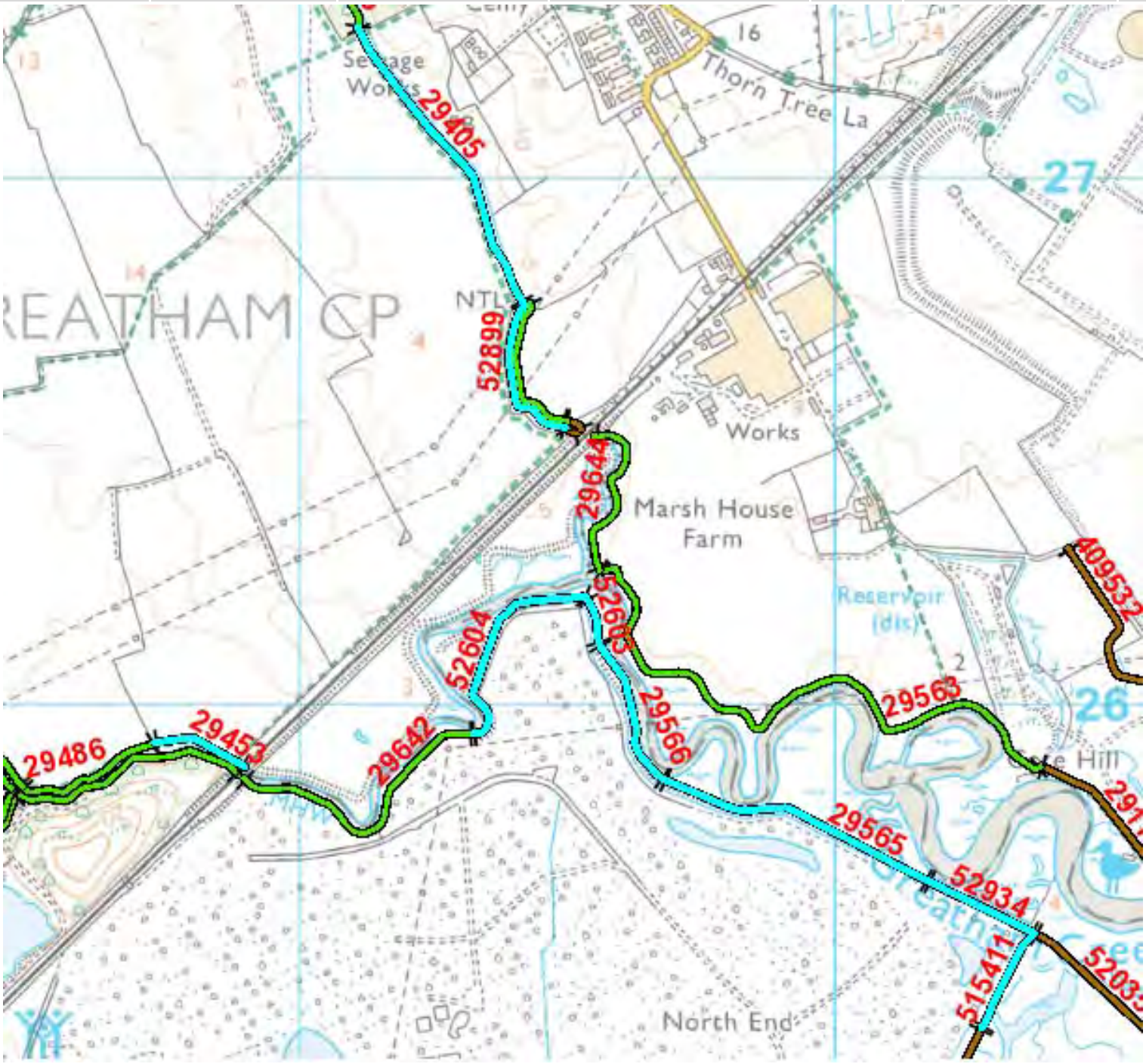
4 Poor – Defects that would significantly reduce the performance of the asset. Further investigation needed
5 Very Poor – Severe defects resulting in complete performance failure.
**The Crest Levels are metres Above Ordnance Datum (Newlyn).

Environment Agency Flood Defence Information

Asset Ref	Asset Type	Description	Location	Upstream National Grid Ref.	Condition*	Standard of Protection (Return period, 1 in x Years)	Upstream Crest Level (m)**	Downstream Crest Level (m)**	Length (m)
29405	Flood Defence	Floodbank	Greatham	NZ 49107 27288	4	5	3.970	3.690	616.67
52899	Flood Defence	Floodbank	Greatham Marsh	NZ 49414 26762	5	5	4.260	4.520	304.49
29453	Flood Defence	Floodbank	Claxton Beck	NZ 48727 25929	3	50	3.900	3.480	183.58
52604	Flood Defence	Floodbank	Greatham Creek	NZ 49324 25942	3	5	4.850	3.900	431.27
52603	Flood Defence	Floodbank	Greatham Creek	NZ 49538 26209	3	5	3.890	4.720	92.56
29566	Flood Defence	Floodbank	Greatham Creek	NZ 49558 26114	3	5	4.720	3.850	295.31
29565	Flood Defence	Floodbank	Greatham Creek	NZ 49680 25860	3	10	3.440	3.610	540.18
52934	Flood Defence	Floodbank	Greatham Creek	NZ 50170 25664	3	50	3.790	4.130	222.37
515411	Flood Defence	Floodbank	Greatham Creek	NZ 50279 25388	2	tbc	tbc	tbc	205.96



*Descriptions are as follows:
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5 Very Poor – Severe defects resulting in complete performance failure.
**The Crest Levels are metres Above Ordnance Datum (Newlyn).

Environment Agency Flood Defence Information

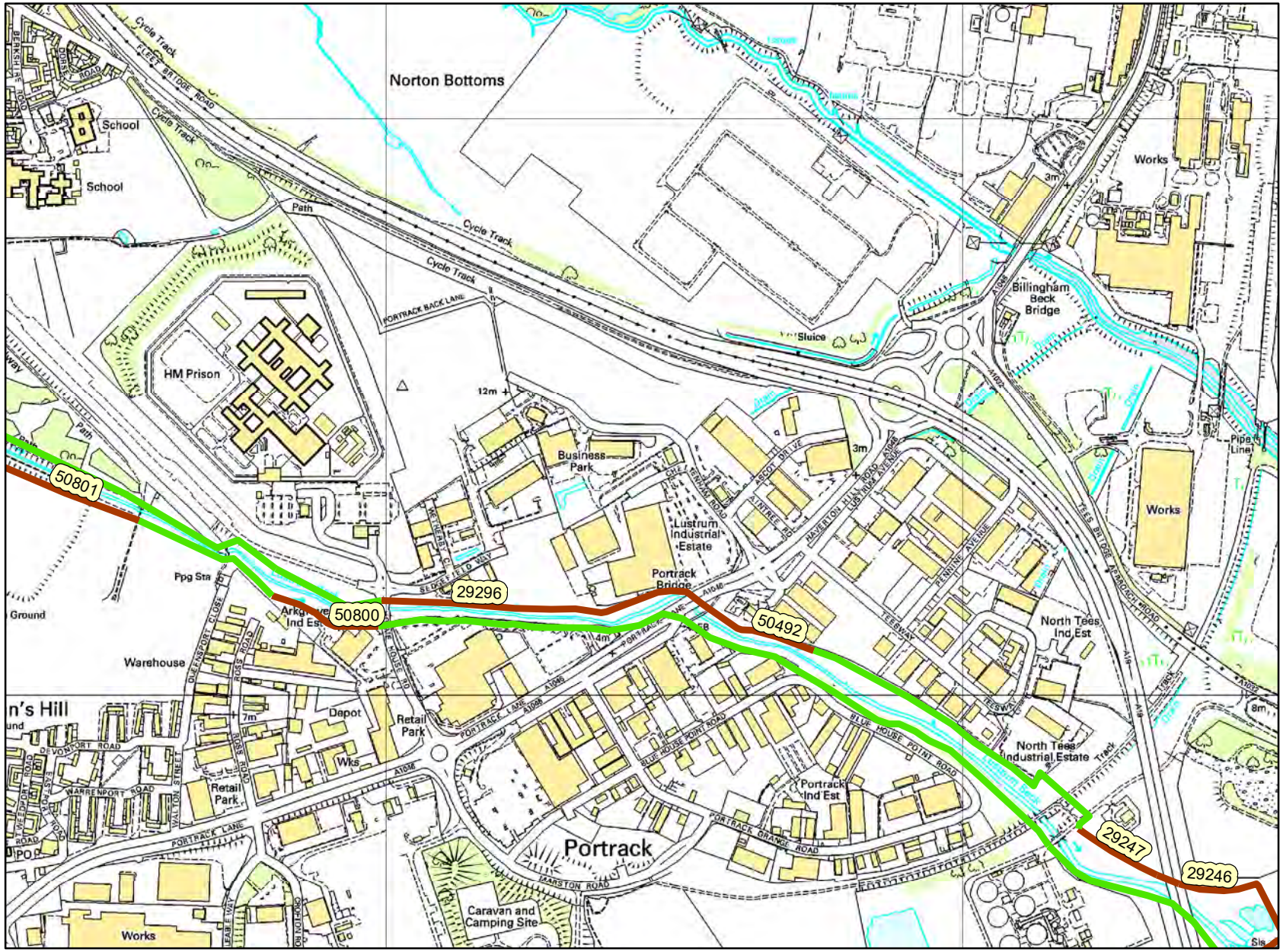
Hartlepool

Asset Ref	Asset Type	Description	Location	Upstream National Grid Ref.	Condition*	Standard of Protection (Return period, 1 in x Years)	Upstream Crest Level (m)**	Downstream Crest Level (m)**	Length (m)
52943	Flood Defence	Floodbank	Seal Sands	NZ 51685 25651	4	153	5.560	4.678	1006.41
409532	Flood Defence	Floodbank	Seal Sands	NZ 50346 26426	3	TBC	4.519	4.727	1617.19
29171	Flood Defence	Floodbank	Seal Sands	NZ 50964 25515	3	25	6.663	5.560	751.89



*The condition grades provided are from a visual inspection only based on the Environment Agency's Condition Assessment Manual.
Descriptions are as follows:
1 Very Good – Cosmetic defects that will have no effect on performance.
2 Good – Minor defects that will not reduce the overall performance of the asset
3 Fair – Defects that could reduce performance of the asset
4 Poor – Defects that would significantly reduce the performance of the asset. Further investigation needed
5 Very Poor – Severe defects resulting in complete performance failure.
**The Crest Levels are metres Above Ordnance Datum (Newlyn).

Environment Agency Owned and Maintained Flood Defences - Portrack, Stockton-on-Tees



Legend

- High Ground
- Embankment

0 0.1 0.2 0.3 km

N

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Greatham North East Flood Alleviation Scheme
(Indicative plan for illustrative purposes only)

Extraction of class 2 clay for new flood embankment from borrow pits within the area edged in blue. Estimated volume needed 129,000 m³.

Haulage route for class 2 clay from borrow pits. A stone haul road will be constructed. Plant crossing of A178 using traffic management.

Creation of habitat in former arable field owned by EA.

Emergency access road

Construction of new flood embankment. Crest height 5.5 mOD.

Breach existing Greenabella embankment in 2 locations. Retain remaining section to act as a high tide roost. The managed realignment will see the creation of intertidal mud at Greenabella Marsh.

Repair existing Greatham Creek embankment. Install RTE structure to enable tidal connectivity of the brinefield in future.

Greenabella Marsh

Inovyn Brinefield

Venator Plant

Tofts Farm West Industrial Estate

Graythorp

Graythorp Industrial Estate

Sewage Works

Playing Field

Tees Road

B1277

Oil Storage Depot

Basin

Reservoir (dis)

Marsh House Farm

Cote Hill

Brine Field

Greatham Creek

North End

Mucky Fleet

Rough Marsh

Cowpen Marsh

Swallow Fleet

Holme Crook

Greatham Creek Bridge

A178

Dismantled Railway

Flare Stacks

Flare Stack

Thorn Tree La

Greatham

Mean High Water

UA & CP Bdy

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N W E S

1: 10,000

0 250

Metres

Somerton, Jo

From: Stuart Edwards <[redacted]@hartlepool.gov.uk>
Sent: 16 March 2023 12:55
To: Somerton, Jo
Subject: RE: Flood Risk Information Request:H2 Teesside
Attachments: Hartlepool Local plan_Library_16_April_2018.pdf

This Message Is From an External Sender

This message came from outside your organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Report Suspicious

Hello Jo,

In response to your request for information:

• Details of Ordinary Watercourses in the area, including flood level/ model information where available;
We would refer to publicly available mapping for watercourse location and we do not hold flood level/model information for watercourses in the area.
• Any detailed maps of historical flood extents at the Proposed Development Site and details of any other flood level or flood extent data related to the Proposed Development Site that may be relevant, including any photographs, other anecdotal information and climate change scenarios;
We don't have any detailed maps of historical flood events in the area.
• Details of any existing or planned flood defences/flood alleviation schemes in the area, their condition, anticipated lifetime and statutory flood defence levels;
We don't have works planned in the area. However, Greatham Creek that runs through the area you have highlighted is Main River and as such is regulated by the Environment Agency (EA) who will be able to provide details of that asset. Furthermore, The EA are proposing to implement a flood alleviation scheme at the Greatham North East flood cell. Please see map extract below:



This may overlap with the area you have highlighted in your enquiry. Please contact [redacted]@environment-agency.gov.uk I understand that AECOM have already been in touch with the EA.

• Details of any known surface water flooding problems in the area and confirmation of any designated Critical Drainage Areas (CDAs);

Please see attached Local Plan Examination Library that mainly on page 4 lists our Strategic Flood Risk Assessment documents for your information.

• Mapping showing the Areas Susceptible to Surface Water Flooding (AStSWF) and the Updated Flood Mapping for Surface Water (uFMfSW);

Please refer to Environment Agency flood risk mapping.

• Confirmation of the assessment approach for the above ground elements of the pipeline corridors (entry and exit points) and preferred construction methodology for pipeline watercourse crossings; and

These matters will need to be assessed on a case by case basis with a focus on no increased flood risk. Underground watercourse crossings will likely be preferable.

• Surface water drainage requirements for the Main Site and the above ground elements of the pipelines, including Sustainable Drainage Systems (SuDS).

Surface water drainage requirements can be found in the Tees Valley SuDS Design Guide and Local Standards which is available via the internet. This will provide consistency in requirements across local authority boundaries in the Tees Valley.

Regards
Stuart

Stuart Edwards **BEng(Hons) PGCert MCIWEM** Flood Risk Officer
Hartlepool Borough Council
Tel: [redacted]
Email: [redacted]@hartlepool.gov.uk

Web: www.hartlepool.gov.uk
Facebook: /hartlepoolcouncil
Twitter: @HpoolCouncil

HARTLEPOOL BOROUGH COUNCIL



From: [redacted] [mailto:[redacted]@aecom.com]
Sent: 14 March 2023 08:59
To: Jim Ferguson <[redacted]@hartlepool.gov.uk>
Cc: H2 Teesside Correspondence <H2TeessideCorrespondence@aecom.com>; Kearns, Laura [redacted]@aecom.com>; Stevenson, Katherine [redacted]@aecom.com>; Sperlova, Zuzana <[redacted]@aecom.com>
Subject: Flood Risk Information Request:H2 Teesside

Jim,

AECOM has been commissioned to prepare an Environmental Impact Assessment (EIA), including a Flood Risk Assessment (FRA) and Water Framework Directive (WFD) Assessment , to support a Development Consent Order (DCO) application for the construction, operation (including maintenance where relevant) and decommissioning of a 1.2 Gigawatt thermal (GWth) Hydrogen Production Facility with associated Carbon Capture and Storage (CCS) and hydrogen transport pipeline network and other connections on land in Redcar and Cleveland, Stockton-on-Tees, and Hartlepool on Teesside.

To support development of these assessments we would like to request data from Hartlepool Council in relation to flood risk. Please see attached our full information request which includes all details including a map of the study area.

If there are any queries regarding the information request then please do let me know.

Many thanks for your help.

Kind regards,

[redacted] MSc

Principal Flood Risk Consultant, Water: EUR - UK & Ireland
M [redacted]
[redacted]@aecom.com

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2 City Walk
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T +44 (0)113 3018400
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ANNEX B – SFRA FLOOD ZONES

North

528000

527000

526000

455000

456000

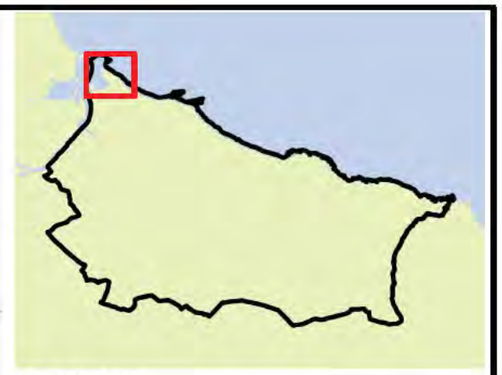
457000

ELD14

I3

ELD64

Scale 1:10,000



LEGEND

Choose Option Flood Zones

Show Labels

Council boundary

Detailed River Network

Potential Development Sites

Residential (SHLAA 2015)

Employment Land Available (ELA)

Employment Land Developed (ELD)

Industrial estate

Mixed use

Traveller

Flood Zones

Flood Zone 3b

Flood Zone 3a

Flood Zone 2

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JBA consulting

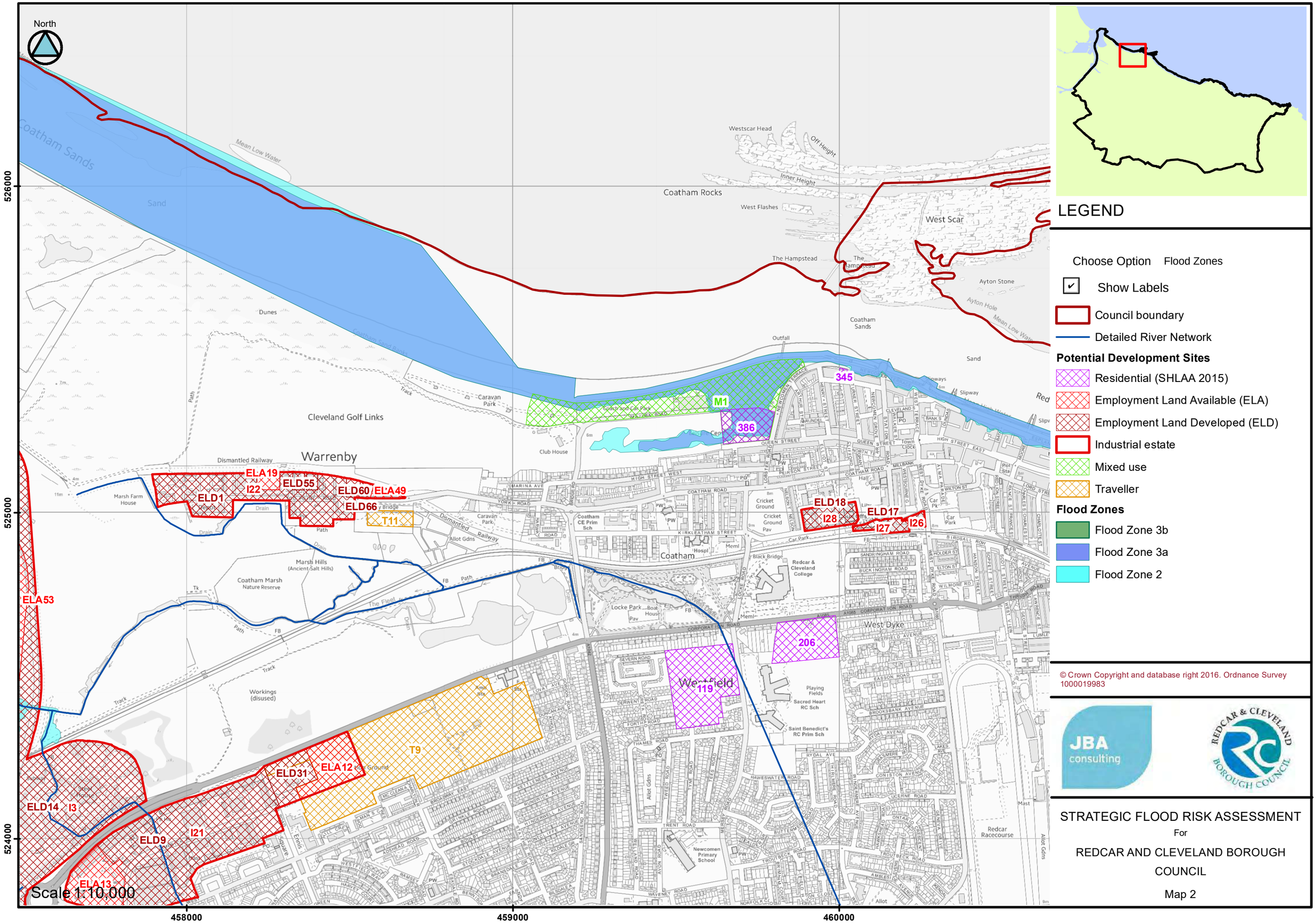
REDCAR & CLEVELAND BOROUGH COUNCIL

STRATEGIC FLOOD RISK ASSESSMENT

For

REDCAR AND CLEVELAND BOROUGH COUNCIL

Map 1



LEGEND

Choose Option — Flood Zones

☑ Show Labels

Council boundary

Detailed River Network

Potential Development Sites

- Residential (SHLAA 2015)
- Employment Land Available (ELA)
- Employment Land Developed (ELD)
- Industrial estate
- Mixed use
- Traveller

Flood Zones

- Flood Zone 3b
- Flood Zone 3a
- Flood Zone 2

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JBA consulting

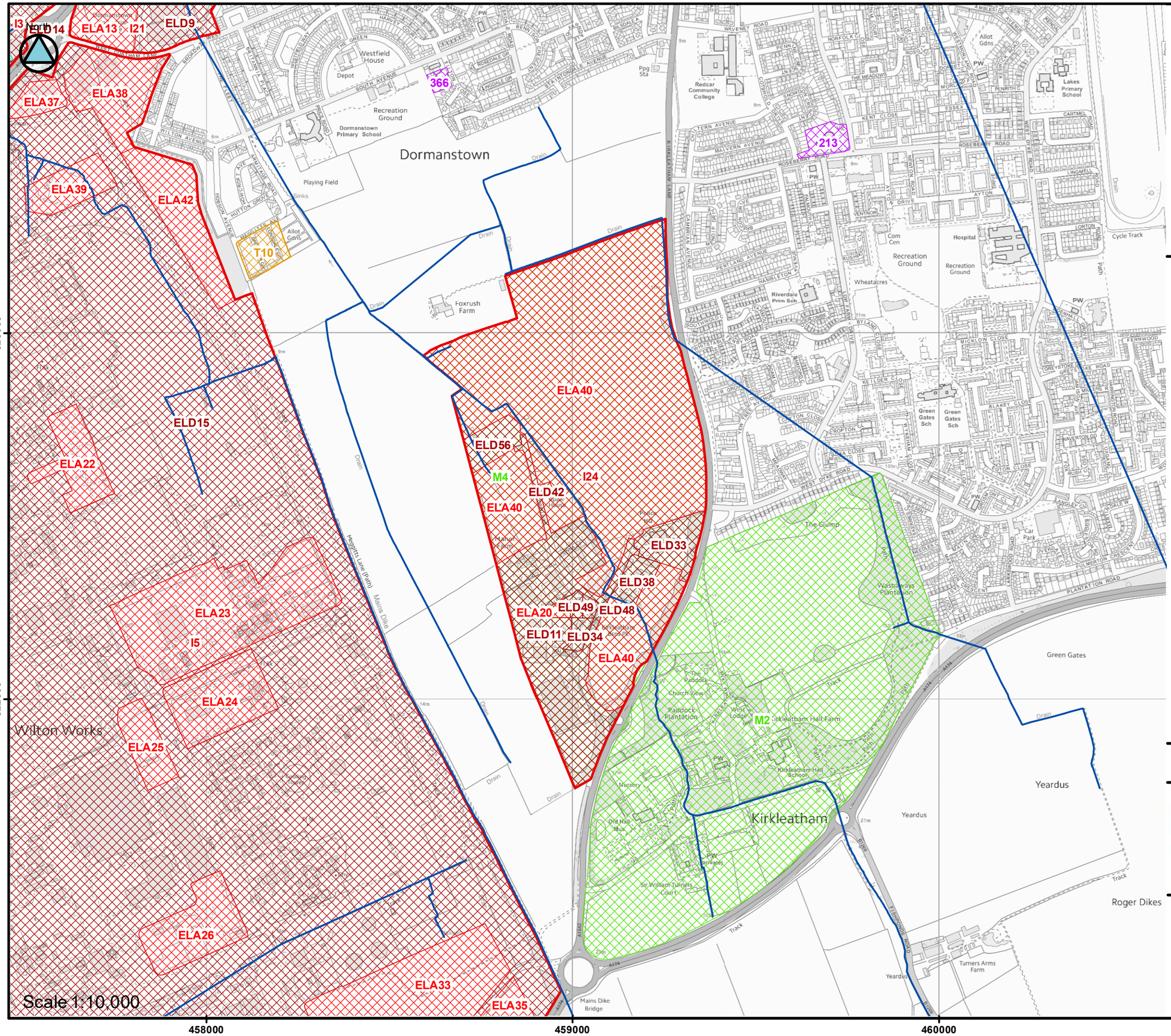
REDCAR & CLEVELAND BOROUGH COUNCIL

STRATEGIC FLOOD RISK ASSESSMENT

For

REDCAR AND CLEVELAND BOROUGH COUNCIL

Map 2



LEGEND

Choose Option Flood Zones

Show Labels

Council boundary

Detailed River Network

Potential Development Sites

Residential (SHLAA 2015)

Employment Land Available (ELA)

Employment Land Developed (ELD)

Industrial estate

Mixed use

Traveller

Flood Zones

Flood Zone 3b

Flood Zone 3a

Flood Zone 2

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JBA consulting

REDCAR & CLEVELAND BOROUGH COUNCIL

STRATEGIC FLOOD RISK ASSESSMENT

For

REDCAR AND CLEVELAND BOROUGH COUNCIL

Map 14

North

525000

524000

455000

456000

457000

Scale 1:10,000

Teesside Works, Redcar

ELD64

ELD14

I3

I4

ELA53

Teesside Works Redcar

I6

ELD13

I2

ELA45

ELA37

ELA39

ELD15

I5

Dabholm Gut

Mean High Water

Container Terminal

Potash Terminal

Depot

Sewage Works

Landing Stage

Pipe Lines

Trav C

BOULBY ROAD

DABHOLM ROAD

KIRKLEATAM ROAD

Tees Dock

LEGEND

Choose Option Flood Zones

Show Labels

Council boundary

Detailed River Network

Potential Development Sites

Residential (SHLAA 2015)

Employment Land Available (ELA)

Employment Land Developed (ELD)

Industrial estate

Mixed use

Traveller

Flood Zones

Flood Zone 3b

Flood Zone 3a

Flood Zone 2

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JBA consulting

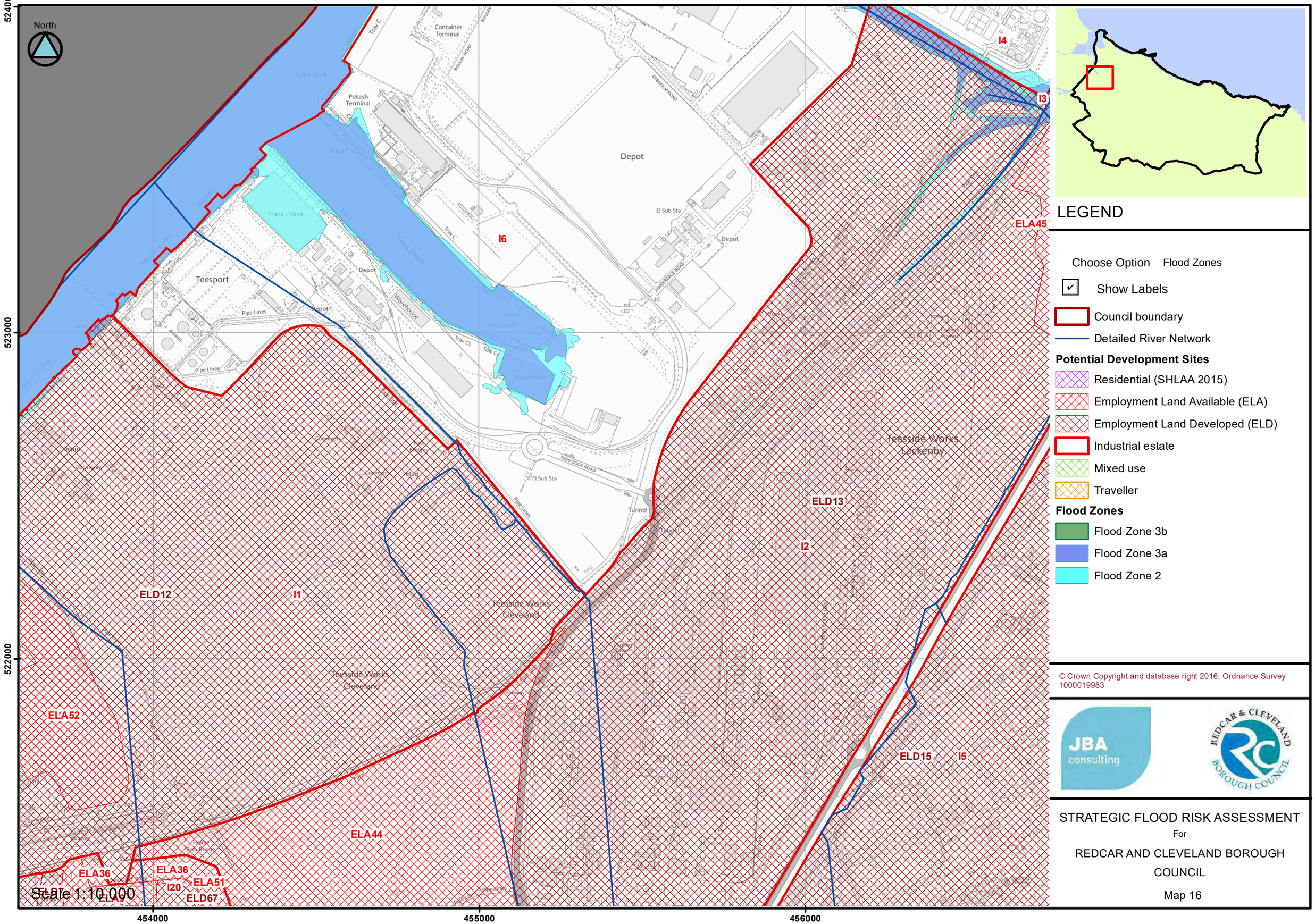
REDCAR & CLEVELAND BOROUGH COUNCIL

STRATEGIC FLOOD RISK ASSESSMENT

For

REDCAR AND CLEVELAND BOROUGH COUNCIL

Map 15



LEGEND

Choose Option Flood Zones

Show Labels

Council boundary

Detailed River Network

Potential Development Sites

Residential (SHLAA 2015)

Employment Land Available (ELA)

Employment Land Developed (ELD)

Industrial estate

Mixed use

Traveller

Flood Zones

Flood Zone 3b

Flood Zone 3a

Flood Zone 2

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STRATEGIC FLOOD RISK ASSESSMENT

For

REDCAR AND CLEVELAND BOROUGH COUNCIL

Map 16

North

523000

522000

521000

456000

457000

458000

459000

Scale 1:10,000

ELA45
ELA42
T10
ELA40
ELA22
ELD56
M4
I24
ELD42
ELA40
ELD13
I2
Teesside Works
Lackenby
ELA23
ELD49
ELD11
ELD15
ELA24
Wilton Works
ELA25
I5
ELA27
ELA26
ELA28
ELA33
ELA35
ELA29
ELA34
ELA30
ELA31

Foxrush Farm
Meggitts Lane (Drain)
Maine Dike
Drain
Manor Farm
Cooling Tower
Freightliner Terminal
The Vulcan Centre

LEGEND

Choose Option Flood Zones

Show Labels

Council boundary

Detailed River Network

Potential Development Sites

Residential (SHLAA 2015)

Employment Land Available (ELA)

Employment Land Developed (ELD)

Industrial estate

Mixed use

Traveller

Flood Zones

Flood Zone 3b

Flood Zone 3a

Flood Zone 2

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REDCAR & CLEVELAND BOROUGH COUNCIL

STRATEGIC FLOOD RISK ASSESSMENT

For

REDCAR AND CLEVELAND BOROUGH COUNCIL

Map 17

North

525000

524000

523000

451000

452000

453000

Ground Flares

Ground Flare

SS

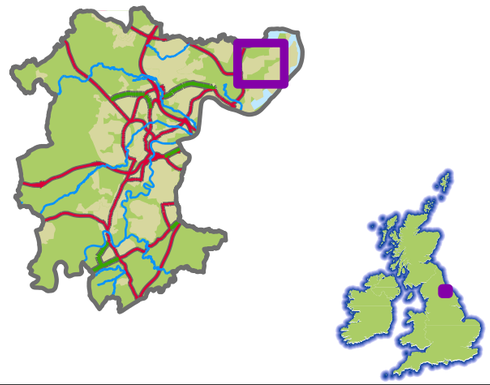
NT

Brine Field

Fire Station

0 0.25 0.5 0.75 1 Kilometres

Detailed Map 10



LEVEL 1
STRATEGIC FLOOD RISK ASSESSMENT

For

STOCKTON ON TEES BOROUGH COUNCIL

Please select a data type from the dropdown menu below that you wish to view:

Flood Zones

Development Sites

Proposed Use

- Residential
- Employment
- Mixed Use

- SBC Boundary
- Detailed River Network

Flood Zones

- Flood Zone 3b
- Flood Zone 3
- Flood Zone 2

☑ Show Site Reference Labels

JBA consulting

Stockton-on-Tees BOROUGH COUNCIL

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North

526000

525000

524000

452000

453000

454000

Seal Sands

Ground Flare

Ground Flares

EMERGENCY ACCESS ROAD

SS

0 0.25 0.5 0.75 1 Kilometres



LEVEL 1
STRATEGIC FLOOD RISK ASSESSMENT

For

STOCKTON ON TEES BOROUGH COUNCIL

Please select a data type from the dropdown menu below that you wish to view:

Flood Zones

Development Sites

Proposed Use

- Residential
- Employment
- Mixed Use

SBC Boundary

Detailed River Network

Flood Zones

- Flood Zone 3b
- Flood Zone 3
- Flood Zone 2

☑ Show Site Reference Labels

Detailed Map 11

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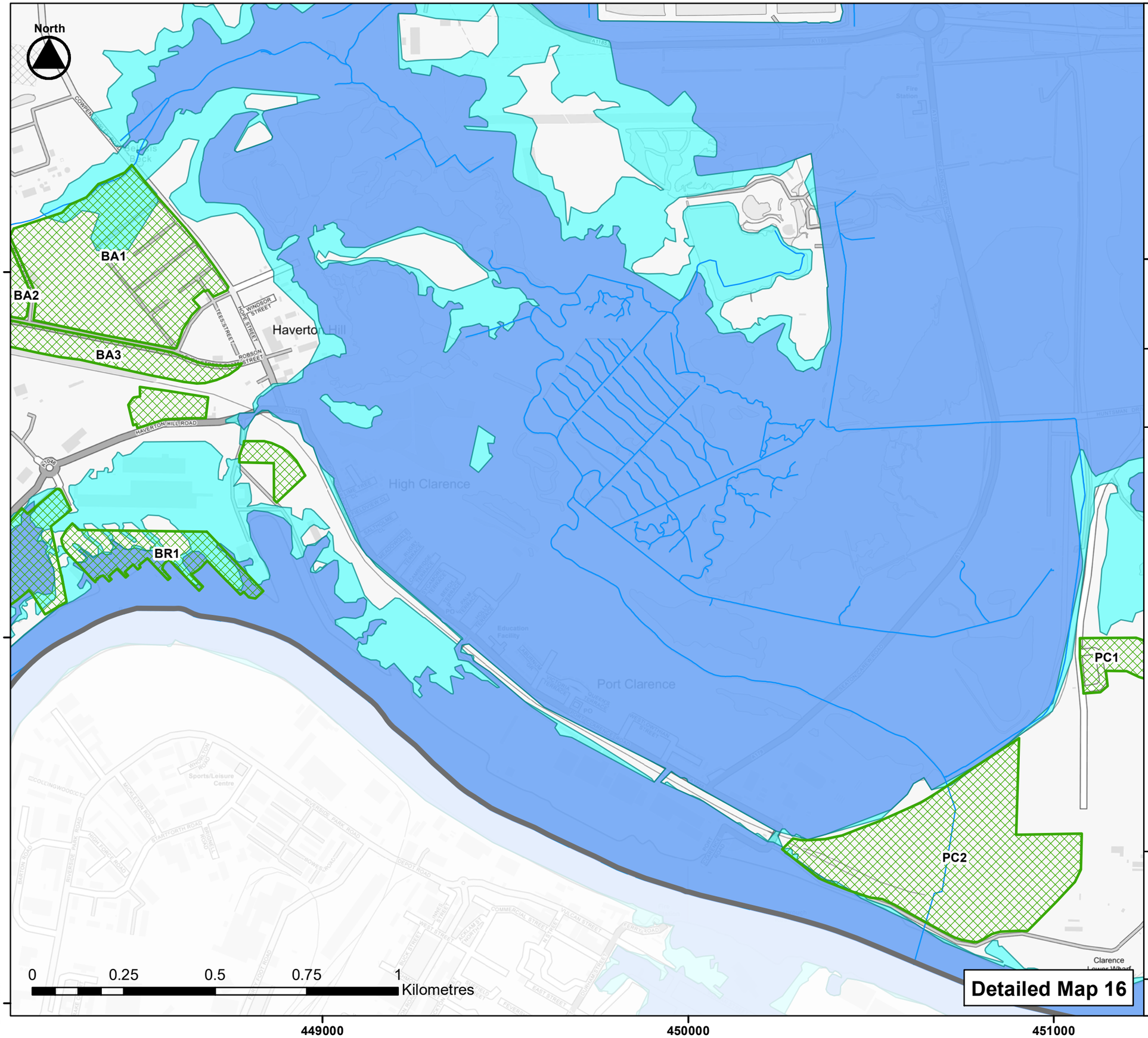

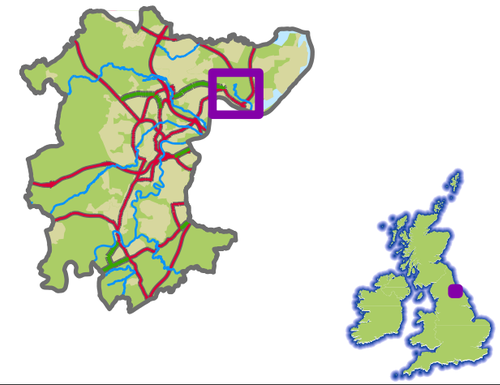

LEVEL 1
STRATEGIC FLOOD RISK ASSESSMENT
For
STOCKTON ON TEES BOROUGH COUNCIL

Please select a data type from the dropdown menu below that you wish to view:

Flood Zones

Development Sites

Proposed Use

- Residential
- Employment
- Mixed Use

- SBC Boundary
- Detailed River Network

Flood Zones

- Flood Zone 3b
- Flood Zone 3
- Flood Zone 2

☑ Show Site Reference Labels

JBA consulting

Stockton-on-Tees BOROUGH COUNCIL

Detailed Map 16

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H2Teesside Project

Nutrient Neutrality Screening Report

Volume III – Appendices

Appendix 9B: Nutrient Neutrality Screening Report

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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1.0 INTRODUCTION

1.1 Overview

1.1.1 On 16 March 2022, Natural England published advice to a number of Local Planning Authorities (LPAs), including Redcar and Cleveland Borough Council (RCBC), Stockton-on-Tees Borough Council (STBC) and Hartlepool Borough Council (HBC) and the Planning Inspectorate ('the Inspectorate'), to indicate that as a Competent Authority under the Habitats Regulations the LPA (or Secretary of State (SoS) in the case of a Development Consent Order (DCO)), must carefully consider the nutrient impacts of any new plans and projects on habitats sites and whether those impacts may have an adverse effect on the integrity of a habitats site that requires mitigation, including through nutrient neutrality (Natural England, 2022a). In the case of RCBC, STBC and HBC, the affected habitats site is the Teesmouth & Cleveland Coast Special Protection Area (SPA)/Ramsar site, for which excessive nitrogen is contributing to unfavourable status.

1.1.2 The H2Teesside project (hereafter 'The Proposed Development') is located within the catchment of the Teesmouth and Cleveland Coast SPA/Ramsar site. Therefore, this screening report considers the potential nutrient impacts of the Proposed Development, whether the issue of nutrient neutrality is invoked, and assesses whether (or not) a detailed nutrient neutrality assessment may be required, and if so, what the next steps for addressing the issue would be within the DCO process.

1.1.3 The catchment of the Teesmouth and Cleveland Coast SPA/Ramsar site as defined by Natural England is shown in Annex A.

1.1.4 The Habitats Regulation Assessment (HRA) that is to be prepared for the Proposed Development, in line with the Inspectorate's Advice Note 10 (Planning Inspectorate, 2022), will take into account the outcomes of the nutrient screening and any further nutrient assessment and will be submitted with the DCO Application.

1.2 The Issue of Nutrient Neutrality

1.2.1 In many designated estuarine and freshwater habitats sites, poor water quality due to nutrient enrichment is one of the main reasons for sites being in an unfavourable condition. Excessive levels of nutrients can cause the rapid growth of certain plants and excessive oxygen consumption (this process is called eutrophication). This in turn can lead to reduced biodiversity, and the condition of a site being considered 'unfavourable'. To improve the water quality in these sites, reductions in nutrients are required.

1.2.2 Nutrient neutrality has become an issue in many areas of the country, such as the Solent, Somerset Levels, the Wye catchment in Herefordshire, the Camel catchment in Cornwall, the Stour catchment in Kent, and the Poole Harbour and Chesil and The Fleet catchments in Dorset, amongst others. The issue has reached legislative control by virtue of the ruling of the European Court of Justice (ECJ) in combined cases C-293/17 and C-294/17 (the Dutch Nitrogen case). That judgment was about atmospheric nitrogen but in the process of making their ruling the judgment refined the definition of plans and projects to include operations such as agriculture,

confirming that agricultural inputs of nutrients (either from atmosphere or runoff) need to be covered in the 'in combination' requirements of the Habitats Regulations Assessment (HRA) process.

1.2.3 In addition, the ruling reaffirmed that if a European protected nature conservation site is in a deteriorating condition (such as due to excess nutrient levels that may also be forecast to increase) there are very limited circumstances under which further discharges of nutrients to a site can legally be permitted. This is covered in paragraph 79 of Advocate-General Kokott's opinion, written to inform the court: 'Where total damage is reduced, but the integrity of the protected site concerned is nevertheless adversely affected [by which she means where the total nitrogen deposition still exceeds the critical load], Article 6(3) of the Habitats Directive does not in any case permit any additional damage of this kind'.

1.2.4 As a result, in the absence of any empirically derived threshold by which additional aquatic inputs of nitrogen and phosphorus can be deemed nugatory or de minimis, it must be concluded that all new development within the affected habitats site catchment has the potential to increase nitrogen and phosphate deposition into the protected sites above consented levels and thus interfere with the ability of a site to achieve its conservation objectives and thus the integrity of the European protected nature conservation site, and that therefore all development proposals should consider whether this will be the case. This is relevant because under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended) an LPA or the SoS (competent authority) cannot legally consent a plan or project that will have an adverse effect on the integrity of any European protected nature conservation site without imperative reasons of overriding public interest being proved and sufficient compensatory measures being provided.

1.2.5 One way that the potential impact of new development can be determined is by using nutrient neutrality calculations to create a nutrient budget. A calculation methodology covering both nitrogen and phosphorus (where applicable) has been developed by Natural England, originally in 2020, using the most up-to-date scientific evidence base at the time of publication. This methodology has since been updated and published as the 'Nutrient Neutrality Generic Methodology' (latest version November 2022) (Natural England, 2022b).

1.2.6 In March 2022, Natural England identified further habitats sites that are in unfavourable status due to excess nutrients and to which the nutrient neutrality process will now apply. This now includes over 70 local authority areas including RCBC, STBC and HBC (where only nitrogen is affected). Natural England also published locally amended nutrient calculators alongside their guidance.

1.2.7 Should a derived nutrient budget for a development demonstrate that there will be a nutrient surplus (i.e., is not nutrient neutral) then in the absence of any strategic solution or local credit scheme, the Applicant must identify suitable mitigation that allows neutrality to be achieved. There are a range of nutrient mitigation approaches that can be adopted.

1.2.8 Improvements to wastewater treatment works (WwTWs) are one such area, for instance by incorporating tertiary treatment phosphate stripping. However, this approach is largely outside of developer control and can take years to implement and so does not generally enable nutrient neutrality to be demonstrated in the short term. However, the draft Levelling-Up and Regeneration Bill that is progressing through the House of Lords at the time of writing (August 2023) does outline new nutrient effluent targets to be achieved by WwTWs by 2030 based on Technically Achievable Limits (TAL), and this is expected to reduce the future burden that developers need to mitigate. However, amendments to the draft Bill that are currently being debated would restrict TAL upgrades to only WwTWs serving 2000 or more people and in areas currently affected by nutrient neutrality requirements. For WwTWs that serve between 250 and 2000 people, upgrades may be needed at the discretion or direction of the SoS. There will also be improvements to WwTWs relating to Water Company PR24 Business Plans.

1.2.9 Strategic scale mitigation solutions, such as large wetlands, are under development by various LPAs and Natural England to enable developers to buy nutrient credits to offset development. Such solutions can have multiple benefits including Natural Flood Management (NFM), biodiversity improvements and potential for recreation. They can also be located to minimize the loss of farmland needed for food production. A notable example of a strategic solution is the Solent Nutrient Market Pilot scheme (Partnership for South Hampshire, 2023). However, for most LPA areas, strategic solutions are not yet in place and mitigation approaches often involve changing land use, for instance from agricultural land to woodland or greenspace (that is not treated with fertilisers) to reduce nutrient uptake, although this may be unfeasible for developments with a substantial nutrient load. Wetland creation for nutrient treatment of foul water or abstracted river water and use of sustainable drainage systems (SuDS) to treat surface water runoff is another commonly applied mitigation approach. Overall, a key consideration with regard to mitigation is that it must be in place from the point of operation of a development and must be maintained for the lifetime of that development.

1.2.10 In the UK Government's Spring 2023 budget (March 2023) it was announced that the Department for Levelling Up, Housing and Communities would launch "*a call for evidence for locally led nutrient neutrality credit schemes*" and provide "*funding to support clearer routes for housing developers to deliver 'nutrient neutral' sites, in line with their environmental obligations"*.

1.2.11 In a further development in August 2023, the UK Government announced proposed amendments to the draft Levelling-Up and Regeneration Bill to the effect that urban wastewater developments would no longer need to consider nutrient flows as part of HRA for planning decision making and plan-making in nutrient neutrality catchments. However, HRA considerations for developments which generate nutrient loads outside of urban wastewater, such as agricultural and certain industrial developments, are unchanged and neutrality requirements will remain. As such, it is understood that the Proposed Development would still require a nutrient neutrality assessment.

1.3 Teesmouth & Cleveland Coast SPA/Ramsar Site

1.3.1 The Teesmouth and Cleveland Coast SPA / Ramsar (Joint Nature Conservation Committee, 1995) is a 12,211 ha estuarine and coastal site located on the north-eastern coast of England as shown in the Annex B.

1.3.2 The designated sites comprise a range of coastal habitats, such as sand- and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes. The SPA / Ramsar lies along a stretch of coast that has been significantly modified by human activity. The site provides feeding and roosting opportunities for a significant number of waterfowl in winter and the passage period.

SPA Qualifying Features

1.3.3 The site qualifies as a SPA under Article 4.1 of the Birds Directive (79/409/EEC) by supporting populations of the following features, as per the conservation objectives for the SPA updated in May 2020:

- *Recurvirostra avosetta*; Pied avocet (Breeding);
- *Calidris canutus*; Red knot (Non-breeding);
- *Calidris pugnax*; Ruff (Non-breeding);
- *Tringa 7etanus*; Common redshank (Non-breeding);
- *Sterna sandvicensis*; Sandwich tern (Non-breeding);
- *Sterna hirundo*; Common tern (Breeding);
- *Sterna albifrons*; Little tern (Breeding); and
- Waterbird assemblage.

1.3.4 An extension to the Teesmouth and Cleveland Coast SPA / Ramsar was made in 2020 to improve seabird protection within the SPA network.

Ramsar Qualifying Features (Ramsar Sites Information Service 2020):

- Criterion 5 – Assemblages of international importance; species with peak counts in winter are 26,786 waterfowl (5-year peak mean 2011/12-2015/16); and
- Criterion 6 – Species/populations occurring at levels of international importance; qualifying species/populations (as identified at designation); species with peak counts in spring / autumn – common redshank *Tringa 7etanus*; 1,648 individuals representing an average of 1.1% of the East Atlantic population (1987-91); Species with peak counts in winter – red knot Calidris *Canutus islandica*; 5,509 individuals representing an average of 1.6% of the Canada/Greenland/Iceland/ UK population (5 year peak mean 1991/92-1995/96), and Sandwich tern *Thalasseus sandvicensis* – 1,900 individuals representing an average of 4.3% of the GB population (1988-1992).

1.3.5 The following threats / pressures to the site integrity of the Teesmouth and Cleveland Coast SPA have been identified in Natural England's Site Improvement Plan (Natural England, 2014):

- physical modification;
- public access / disturbance;
- direct land take from development;
- water pollution;
- fisheries: commercial marine and estuarine;
- fisheries: recreational marine and estuarine;
- undergrazing;
- inappropriate water levels;
- predation;
- coastal squeeze;
- change to site conditions; and
- air pollution: impact of atmospheric nitrogen deposition.

2.0 ENGAGEMENT

2.1.1 A pre-application consultation meeting was held on nutrient neutrality screening and Water Framework Directive (WFD) Screening with Natural England and the Environment Agency on 12th June 2023. At this meeting an overview of the Proposed Development was provided, with preliminary details presented regarding possible raw water supply, management principles for surface water runoff, options for foul discharge and process water discharge rates and nitrogen concentration.

2.1.2 Natural England will be further consulted on the outcomes of this screening report, the scope of proposed dispersion modelling and next steps agreed for ensuring suitability of the proposed nutrient neutrality assessment.

3.0 THE PROPOSED DEVELOPMENT

3.1 Overview

3.1.1 The Proposed Development comprises the construction, operation (including maintenance where relevant) and decommissioning of an approximately 1.2-Gigawatt Thermal (GWth) Lower Heating Value (LHV) Carbon Capture and Storage (CCS) enabled Hydrogen Production Facility ('the Production Facility') located in the Teesside industrial cluster area.

3.1.2 The Hydrogen Production Facility elements of the Proposed Development are comprised of two 'phases' of plant, each comprising a single autothermal reform (ATR) unit and associated CCS and utilities. The first phase would be constructed, commissioned, and operated initially, with the second phase developed once the first unit is operational and when required by demand. It is anticipated that Phase 2 would be identical to Phase 1. The Production Facility and associated infrastructure to that

facility which form part of the Proposed Development will be located on the 'Main Site'.

3.1.3 To operate, the Hydrogen Production Facility requires the following elements:

- hydrogen distribution pipelines to supply hydrogen to various offtakers on Teesside and within the surrounding area, such pipelines to be utilised in association with the H2 production plant;
- an Air Separation Unit (ASU) to supply oxygen for the hydrogen production process;
- oxygen and nitrogen supply pipelines (as an alternative to the ASU) to supply oxygen and nitrogen for the hydrogen production process;
- carbon dioxide capture and compression facilities and a connection to the Northern Endurance Partnership (NEP) pipeline on the adjacent Net Zero Teesside (NZT) site for onward transport to the Endurance storage facility beneath the North Sea.
- a natural gas supply connection for the supply of gas to the hydrogen production plant;
- an electricity grid connection to provide power to the Proposed Development;
- water supply and treatment infrastructure;
- wastewater treatment and disposal infrastructure;
- other utilities connections, telecommunications, and other associated and ancillary infrastructure; and
- temporary construction and laydown areas.

3.1.4 H2Teesside demand will come from multiple end users, including fuel switching within process heat, steam raising and power generation applications.

3.1.5 The proposed capture technology is pre-combustion amine-based absorption-regeneration with an anticipated design carbon capture rate in excess of 95%. The capture rate is anticipated to be secured through the Environmental Permit. H2Teesside will connect via a short carbon dioxide export connection to NEP infrastructure on the Net Zero Teesside site. Based on current projections, H2Teesside will have the capacity to continuously export 1.42 Mt of dehydrated and compressed carbon dioxide per year per phase, or 2.84 Mt/year once both phases are operational (100% utilisation) with no temporary carbon dioxide storage required on Site.

3.1.6 At this stage in the design of the Proposed Development, there are still options being considered for various components. The design incorporates a necessary degree of flexibility to allow for the future selection of the preferred layout at the Main Site, as well as routing of the hydrogen pipeline and other connections. This will evolve as the design and commercial agreements progress throughout the preparation of the Application.

3.1.7 In order to ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the Environmental Impact Assessment (EIA) is being undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate. This involves assessing the maximum (or where relevant, minimum) parameters for the elements where flexibility needs to be retained. Refer to Chapter 4: Proposed Development (PEI Report, Volume I), for a full list of Rochdale Envelope parameters relating to the water environment.

3.1.8 The following sections provide further information regarding water supply and discharge for the Proposed Development as well as the Rochdale Envelope parameters, where they are relevant to the nutrient neutrality screening. Further details regarding the Proposed Development are outlined in Chapter 4: Proposed Development (PEI Report, Volume I).

3.2 Water Cycle Overview

3.2.1 The initial source of water to supply the Proposed Development will be the existing Northumbrian Water Limited (NWL) raw water pipeline feed, which is an existing licensed abstraction from the River Tees.

3.2.2 The effluent streams from the Proposed Development will include process water (e.g., process condensate from the reforming process, cooling tower blowdown water and demineralisation plant rejects), foul water and surface water runoff. Plates 1a-1d below show flow diagrams summarising the Proposed Development's water balance for both Case A and Case B of the Proposed Development (for process and foul water, but not including surface water runoff which is described further below). As set out in Chapter 4: Proposed Development (PEI Report, Volume I), the two 'cases' reflect different technology options for blue hydrogen production, autothermal reforming technology (ATR) and low carbon hydrogen (LCH) technology, respectively. Each of the approaches have different water demands and produce different qualities of process returns.

3.2.3 In addition, two further 'cases' are under consideration in terms of process effluent management. Case 1 is based on Minimalised Liquid Discharge (MLD) from the Proposed Development's Effluent Treatment Plant. In this scenario treated wastewater from the Effluent Treatment Plant will be reused as makeup water in the Proposed Development's Water Treatment Plant. A low-volume liquid waste stream containing salts and nutrients would be taken offsite for disposal. Case 2 is an alternative to MLD and requires discharge of process effluent to the Net Zero Teeside (NZT) project outfall at Tees Bay.

3.2.4 Surface water runoff from the Proposed Development will be partially used to feed the process but will have an alternative disposal route to Dabholm Gut. This is described further later.

3.2.5 The various 'cases' for the Proposed Development are summarised in Table 1.

Table 1: Summary of the four Cases being considered by the Proposed Development

	CASE 1A	CASE 1B	CASE 2A	CASE 2B
Technology	Autothermal reforming technology	Low carbon hydrogen - Gas Heated Reformer - ATR combination process	Autothermal reforming technology	Low carbon hydrogen - Gas Heated Reformer - ATR combination process
Process Wastewater Disposal	Minimalised Liquid Discharge – treated wastewater from the Effluent Treatment Plant will be reused as makeup water in the Proposed Development's Water Treatment Plant. A low-volume liquid waste stream containing salts and nutrients would be taken offsite for disposal	Minimalised Liquid Discharge – treated wastewater from the Effluent Treatment Plant will be reused as makeup water in the Proposed Development's Water Treatment Plant. A low-volume liquid waste stream containing salts and nutrients would be taken offsite for disposal	NZT Outfall to Tees Bay	NZT Outfall to Tees Bay

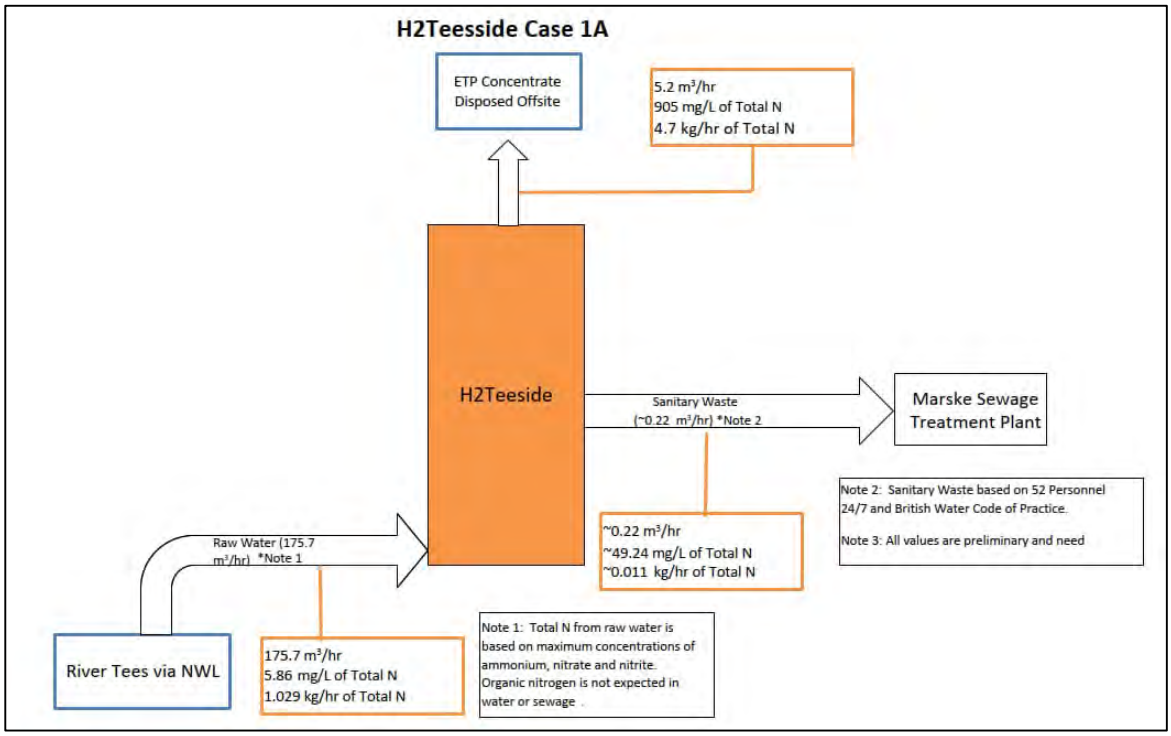

Plate 1a: Flow diagram to summarise the water cycle for the Proposed Development for Case 1A[1]

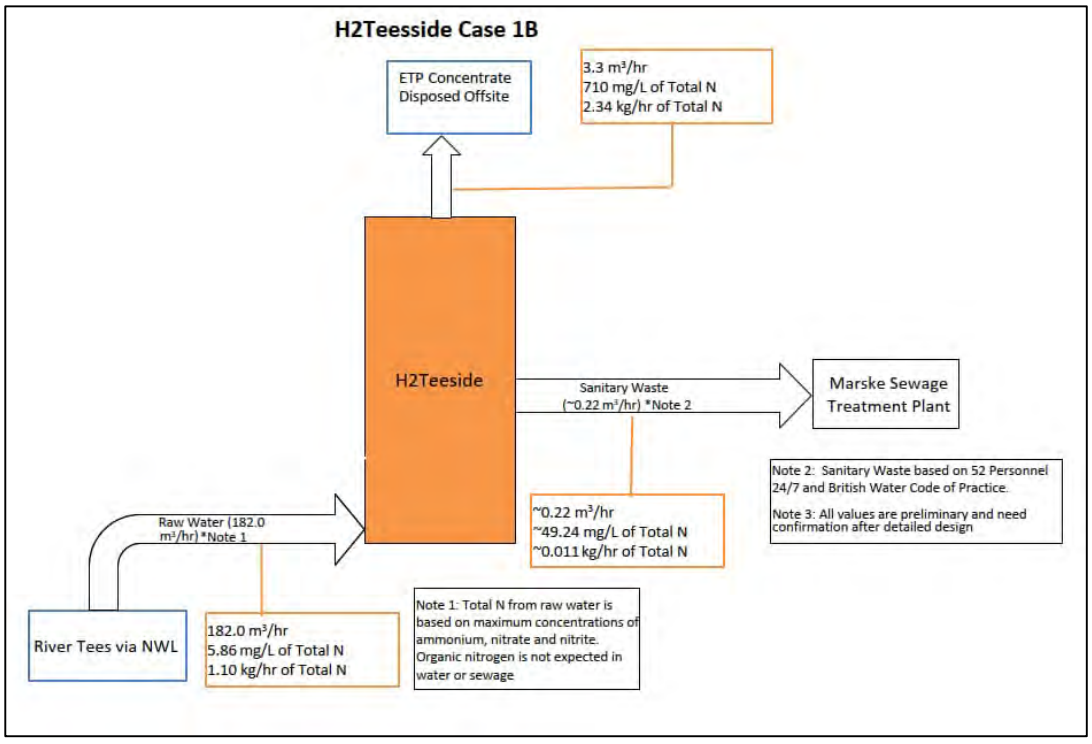

Plate 1b: Flow Diagram to Summarise the Water Cycle for the Proposed Development for Case 1B

[1] Sanitary wastewater volume presented in Plate 1a to 1d is based on a 52 personnel peak during weekday shifts. However, it should be noted that operations staffing will be on a shift basis to be spread over a 24-hour period and so personnel numbers will vary.

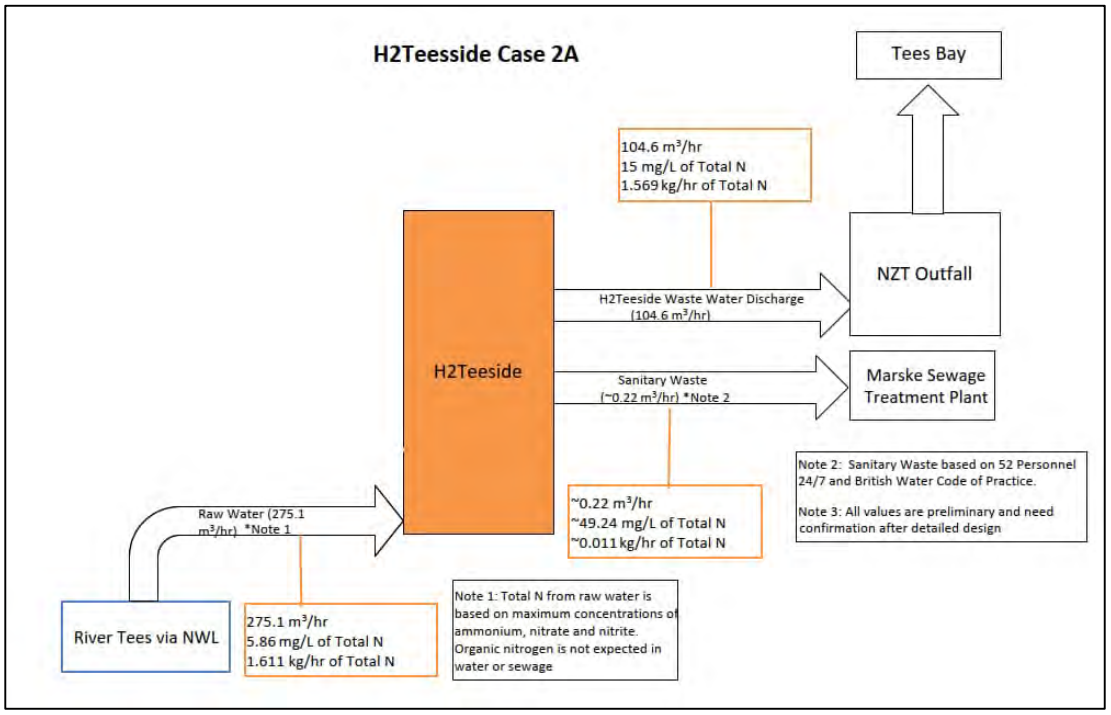

Plate 1c: Flow Diagram to Summarise the Water Cycle for the Proposed Development for Case 2A

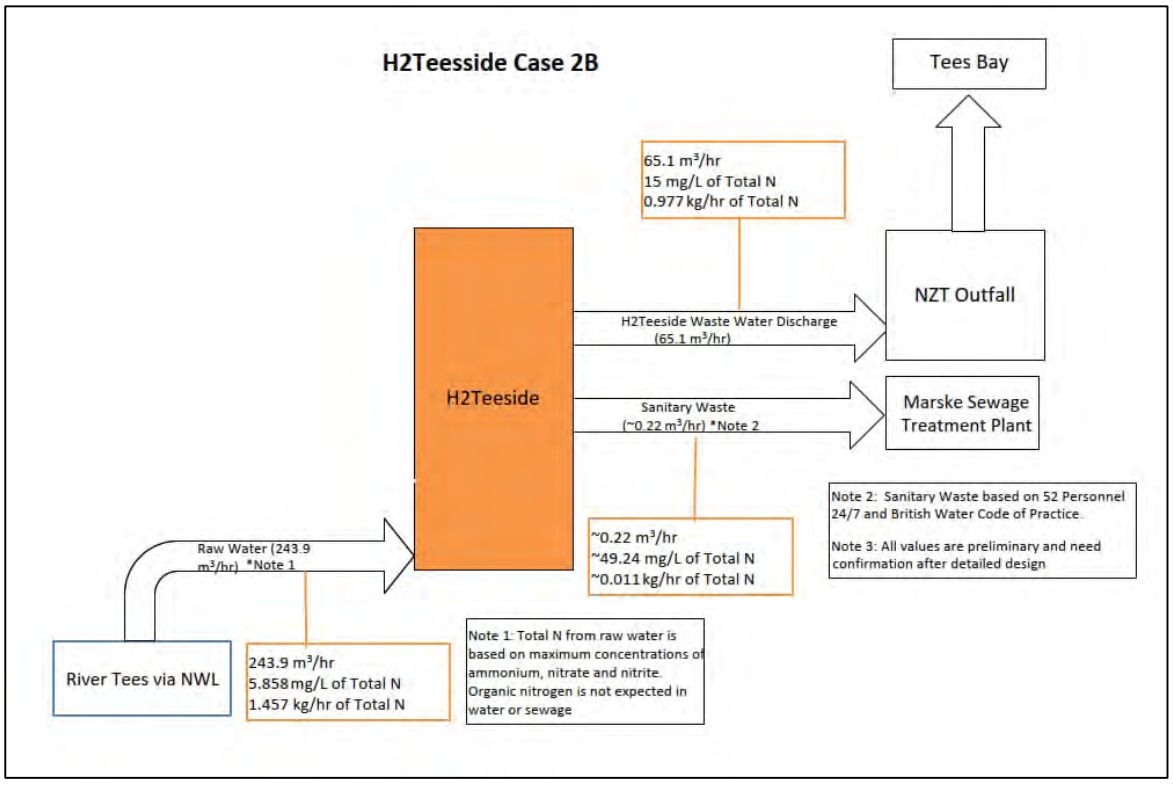

Plate 1d: Flow Diagram to Summarise the Water Cycle for the Proposed Development for Case 2B

3.3 Water Demand

3.3.1 The raw water requirement for the Proposed Development comprises the elements listed in Table 2.

Table 2: Raw water requirement for the Proposed Development

WATER REQUIREMENT	CASE 1A & 2A (M^3/HR) (PHASE 1&2)	CASE 1B & 2B (M^3/HR) (PHASE 1&2)
Cooling water make-up	144	114
Utility water	10	10
Firewater make up	Normally no flow	
Demineralised water for boiler feed water make-up, chemicals, carbon dioxide absorber and hydrochloric acid scrubber	220	104

3.3.2 Water is to be supplied via the existing NWL raw water pipeline feed from the River Tees. Treatment is required to the supplied water to produce the desired water quality for utility water/cooling water make-up, firewater and for producing demineralised water.

3.3.3 The abstraction of water from the Tees would remove a certain amount of nitrogen from the estuary, and so when returned 'downstream' does not add an additional nitrogen load, except where there is any additional load generated in the hydrogen production process.

3.4 Surface Water Drainage

3.4.1 A new surface water drainage network and management system will be provided for the Main Site that will provide adequate interception, conveyance, and treatment of surface water runoff from buildings and hard standing. This will be separate to foul systems for welfare facilities and process effluent generated by the operation of the Proposed Development. The Connection Corridors will not require additional drainage as they will be using existing pipe racks, pipe bridges, culverts or otherwise installed underground.

3.4.2 Surface water drainage will discharge to Tees Estuary via Dabholm Gut or Tees Bay. There are three options for this route: 1) direct feed to Dabholm Gut (with any new pipework and outfall to be consented under a subsequent planning application); 2) discharge to Dabholm Gut via the existing Brans Sands discharge pipeline (but not requiring treatment at Brans Sands WwTW as this is surface water runoff); or 3) discharge via the NZT pipeline to Tees Bay.

3.4.3 Due to the nature of the Proposed Development, it is likely that a range of different diffuse pollutant types (including nutrients) may be present in surface water runoff, with concentrations varying depending on many factors. However, this risk will be

offset by the fact that the Proposed Development Site is a brownfield site that is currently not operating (i.e., surface water from the Proposed Development Site may already contain diffuse chemical pollutants).

3.4.4 A Surface Water Drainage Strategy will be defined in consultation with the Environment Agency, the Lead Local Flood Authorities (RCBC, STBC and HBC) and other statutory agencies. The drainage principles adopted at this stage are as follows:

- segregate hazardous and non-hazardous effluent, and also contaminated and un-contaminated water;
- contain leaks and accidental spills via carefully designed collection system (including bunding of controlled areas with a volume of 110% of storage capacity);
- establish requirement to segregate collection and to eliminate cross contamination prior to recovery and disposal;
- identify recovery and recycle interfaces for the drained fluids;
- ensure safe design with access for maintenance and inspection; and
- account for normal operations, maintenance draining and drainage during an emergency.

3.4.5 The proposed surface drainage system will include the use of sustainable drainage systems (SuDS) where possible, to enable attenuation of surface water flows due to increases in the impermeable area as a result of the Proposed Development. SuDS will provide a degree of treatment of surface water runoff to reduce potential adverse effects on water quality in receiving watercourses. This would include some treatment for nutrients depending on the approach adopted, and a Construction Industry Research and Information Association (CIRIA) guide providing detail on treatment efficiencies of SuDS specifically for nitrogen is expected to be published in 2023. The SuDS treatment train will be selected with reference to the Simple Index Approach of the SuDS Manual (CIRIA, 2016), although a more precautionary approach may be taken due to the industrial land use, which may increase the risk. It should also be noted that SuDS are not formal treatment measures and therefore contaminated water formal treatment and/or proprietary measures are likely to be needed.

3.4.6 The key objectives of the site surface water drainage system are to provide a drainage system which is inherently safe and protects the local environment and the anticipated outfall in Dabholm Gut or Tees Bay from accidental discharges of oil, chemicals, or run-off from firefighting effluent. Clean, uncontaminated storm water will be segregated from potentially contaminated water. Gravity drainage will be used wherever practicable. Spillage containment measures such as penstocks will also be included in the drainage design.

3.4.7 Process operations on site will require the storage and use of a range of potentially polluting chemicals. These may be associated with washdown water, tank water draw-offs, pump equipment drips and drains, draw-offs from sample connections,

instruments, drain cocks and similar equipment fittings and other routinely contaminated wastewater streams. The surface water drainage system for areas of site drainage that may contain chemical pollutants from minor leaks and spills (i.e., surface water drainage near chemical storage tanks or overlying pipework etc.) will therefore need to be separated from the main 'clean' surface water drainage system using appropriate methods such as kerbs, bunds and sumps. It is assumed that some areas may also be covered with rain shelters to reduce the ingress from rainfall to minimise the volume of potentially contaminated runoff that needs to be managed on the site. Bunded areas may contain valves that can remain closed until the water stored in the bunded area has been tested. Where water is contaminated, this will be directed to the on-site package treatment plant and will be subject to a requirement of an Environmental Permit.

3.4.8 In addition to the above sources of surface water, under exceptional circumstances firewater may be generated. Fire-fighting water may contain chemicals that can be harmful to the water environment. Therefore, the surface water drainage system will include a retention basin to intercept fire-fighting water and divert it away from the existing surface water SuDS system. The contaminated fire water would then be stored prior to being pumped out for appropriate off-site disposal at a licensed waste facility. The storage requirements and the method by which fire-fighting water is diverted (i.e. an automatic or manual operated system) will be further determined in consultation with the EA, LLFAs and the Fire Service post-DCO consent during detailed design.

3.4.9 A Surface Water Drainage Strategy will be developed which will outline the consequences for the drainage system should the Proposed Development close or be decommissioned. At this stage it is also envisaged that a Surface Water Maintenance and Management Plan will also be provided by the future site operator. This will detail the requirements of access and frequency for maintaining all drainage systems proposed on the Proposed Development Site. The maintenance regime must be properly implemented to ensure all treatment measures and processes operate as intended for the lifetime of the Proposed Development. It is anticipated that this will be prepared during the detailed design stage.

3.5 Process Wastewater

3.5.1 Process wastewater will be generated on the Proposed Development Site as follows:

- boiler blowdown (Case 1A, 1B and 2A, 2B) – this will generally be of good quality with some residual Total Dissolved Solids (TDS) that will need removal for use as demineralisation water;
- process condensate (Case 1A and 2A) - this has residual methanol and ammonia that requires removal to prevent a source of organics and nutrients that can lead to biological growth and biofouling;
- process condensate (Case 1B and 2B) - this has high ammonia, methanol, carbon dioxide, methane and hydrogen that need removal before it can be discharged; and

- hazardous liquid wastes – to be taken off-site (e.g., amine).

Biotreatment Plant

3.5.2 Process condensate will be treated by a dedicated on-site Water Treatment Plant. It has been confirmed that the plant will be designed for a total nitrogen (TN) of 15 mg/l annual average from both Case A and Case B from all process water sources. The treated process condensate will be reused as makeup water in the Water Treatment Plant and so will not be discharged.

Effluent Treatment Plant

3.5.3 Other wastewater streams (cooling tower blowdown and demineralisation plant rejects) will be treated in an Effluent Treatment Plant (ETP). Case 1A and 1B is based on Minimalised Liquid Discharge from the ETP. The treatment configuration in the ETP will be ultrafiltration followed by reverse osmosis (close circuit or staged) to provide > 95% recovery of the wastewater (including chemical rejects during the membrane cleaning process). The non-chemical rejects from the ultrafiltration will flow to a clarifier and the settled solids dewatered and disposed offsite as a wet cake. The reverse osmosis rejects/concentrate will produce a liquid waste stream containing salts and a quantity of nutrients (4.7 kg/hr TN for Case 1A and 2.34 kg/hr TN for Case 1B). This will be transported off-site (and outside of the designated habitats site catchment) for further treatment. The treated wastewater from the ETP will be reused as make-up water in the Water Treatment Plant.

3.5.4 Case 2A and 2B represents an alternative to Minimalised Liquid Discharge. In this case, wastewater would be discharged via the NZT outfall to Tees Bay, with a maximum TN concentration of 15 mg/l annual average (1.569 kg/hr TN for Case 2A and 0.977 kg/hr TN for Case 2B).

3.5.5 Further details on the effluent quality are given in Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I), but the design remains under development and will be considered further during the ongoing EIA process.

3.5.6 The continuous flows of effluent that would contain nitrogen are summarised in Plate 1a-d. In Case 1A and 1B there would be an overall continuous flow of liquid waste from the ETP for offsite disposal of 5.2 m^3/hr or 3.3 m^3/hr, respectively. For Case 2A and 2B there would be an overall continuous flow of process water effluent to be discharged to Tees Bay via the NZT outfall (or alternatively to Brans Sands WwTW) of 104.6 m^3/hr or 65.1 m^3/hr, respectively.

3.5.7 As outlined above, at this stage two options remain for disposal of treated process water and liquid waste depending on which of the four ‘cases’ is taken forward. The first option is transport of liquid waste (concentrate sludge/waste) off-site for further treatment based on Minimalised Liquid Discharge from the ETP. The second is discharge of treated process water to the Tees Bay outfall that will be constructed as part of the NZT project, where it will have to meet the standards required by the discharge permit (including an assessment of any cumulative impacts and ensuring compliance with WFD objectives including those for the designated sites). If there is discharge of process wastewater to the outfall at Tees Bay, then it is assumed that

the wastewater discharge will meet the requirements of the Best Available Techniques (BAT) Reference Document (BREF) for Common Wastewater and Waste Gas Treatment/Management Systems in the Chemical Sector 2016 (EC JRC, 2016). In both cases the permitting process will also consider the requirements of the HRA.

3.5.8 Amine contaminated water will be contained and where possible should be recovered and recycled for use within the process, or otherwise will be taken off-site by tanker to a specialist treatment plant, located outside of the habitats site catchment. Surface water runoff from uncovered external paved areas of the Proposed Development site containing amine equipment, which during normal operation is expected to result in chemical drips, leaks and minor spill and which could be contaminated, will be located within minimised local kerbed areas and be routed to the amine drain vessel for offsite disposal.

3.5.9 Water sampling facilities are to be provided for manual sampling of water prior any required discharge (dependent of which 'case' is progressed). The frequency of testing and parameters to be tested will be agreed with the permitting authority.

3.6 Foul Wastewater

3.6.1 Sanitary wastewater from welfare facilities will be at Northumbrian Water Marske-by-the-Sea WwTW. It is assumed given the relatively low volumes of foul effluent anticipated from the Proposed Development that NWL will treat this within their consent limits and in accordance with requirements to not cause deterioration or prevent improvement under the WFD. The flow diagrams in Plate 1 indicate an expected concentration of 49.24 mg/l TN in this foul effluent discharge (0.011 kg/hr) based on an indicative weekday shift of 52 personnel.

3.6.2 Given that the direction of prevailing current at Tees Bay from the Marske outfall is typically to the south, there is likely to be no pathway to the Teesmouth and Cleveland Coast SPA/Ramsar site (particularly Seal Sands) from Markse-by-the-Sea WwTW. This was agreed in discussions with Natural England and the Environment Agency on the water quality modelling undertaken for the NZT project.

3.7 Atmospheric Deposition of Nitrogen

3.7.1 There is potential for atmospheric deposition of nitrogen from emissions from the Proposed Development and modelling of this potential impact has been undertaken, and appropriate assessment through the Habitats Regulations Assessment will continue as part of the EIA process.

3.7.2 An estimation of TN load across Tees Bay has been made. Initial analysis suggests that this will have a negligible impact on ambient dissolved inorganic nitrogen (DIN) concentrations. Annual loads of between 0.001 and 0.32 kg N/ha/yr have been modelled, with the highest values found in the immediate vicinity of the Proposed Development. Values at Teesmouth are less than 0.05 kg N/ha/yr, with Seal Sands receiving <0.03 kg N/ha/yr.

3.7.3 Given the very small deposition rates in the Tees estuary, nitrogen contributions from this source are considered insignificant. It is also noteworthy that in other areas of

England where nutrient neutrality for effluent and surface runoff is a requirement, this has not been extended to include atmospheric sources of nitrogen.

4.0 SCREENING ASSESSMENT

4.1.1 The Proposed Development has the potential to release nitrogen via:

- surface water runoff;
- process water effluent discharge;
- foul water discharge; and
- atmospheric deposition.

4.1.2 Table 3 provides a screening table summarising the current understanding of the nutrient output from these various streams and whether (or not) the potential nitrogen source should be screened in for further assessment during the EIA.

Table 3: Nutrient Neutrality Screening

NITROGEN SOURCE	DEVELOPMENT DETAILS FOR NITROGEN SOURCE	SCREEN IN?
Surface Water Runoff	An Outline Surface Water Drainage Strategy will be prepared for the Proposed Development, with surface water runoff intended to be discharged to Tees Bay following attenuation. The Natural England nutrient budget calculator for Teesmouth suggests a nutrient loading of 5.78 kgTN/ha/yr for commercial and industrial land uses in the catchment (Darlington Borough Council, 2023). In the absence of specific nutrient loading data from schemes of this type, then this is the current best estimate of nutrient loading from surface water runoff in the absence of mitigation. Nonetheless, it is considered that there will be no significant change in land use between the current site and the Proposed Development Site that would be distinguishable in the budget calculator (i.e., still industrial / commercial under the Natural England land use classifications as there are no more appropriate land use categories) and thus no potential for the development to alter the nutrient load from existing site runoff. There may also potentially be betterment in terms of nutrient load reduction	No – the Proposed Development does not constitute a significant change in land use and thus there is no potential for the development to alter the nutrient load from existing site runoff.

NITROGEN SOURCE	DEVELOPMENT DETAILS FOR NITROGEN SOURCE	SCREEN IN?
	given proposed use of SuDS within the drainage philosophy.	
Process Water	There are two options for discharge of process water effluent: 1. Off-site transport of Minimalised Liquid Discharge waste from the ETP. This would contain 905 mg/l TN (Case 1A) and 710 mg/l TN (Case 1B). It has been confirmed that this would be taken for further treatment at a WwTW located outside of the catchment of the Teesmouth & Cleveland Coast Special Protection Area (SPA)/Ramsar site. 2. Discharge to Tees Bay via NZT outfall at 15 mg/l TN and at a discharge flow rate of 106.4m^3/hr (Case 2A) or 65.1 m^3/hr (Case 2B). This equates to a load of 1.596 kg/hr TN (Case 2A) and 0.977 kg/hr TN (Case 2B)[2]. Hydrodynamic modelling is required to determine the extent to which this would be dispersed into Tees Estuary and sensitive locations such as Seal Sands. The outcomes of this modelling will be reported in the ES.	Case 1A and Case 1B – No - liquid waste taken outside of the habitats site catchment for disposal. Case 2A and Case 2B - Yes – wastewater discharge from the NZT outfall would be to the SPA/Ramsar site, with modelling required to determine extent of impact should the NZT outfall be used.
Foul Wastewater	Foul wastewater will be discharged to Marske-by-the-Sea WwTW – whereby hydrodynamic modelling undertaken by NZTS indicates that the prevailing current would ensure movement of nutrients to the south and away from the designated site (Net Zero Teeside, 2022). Furthermore, the nutrient neutrality assessment method from Natural England is intended to estimate the nutrient budget from all types of development that would result in a net increase in population served by a wastewater system. This is indicated by development that would include overnight accommodation. It states that "*other types of business or commercial development, not involving overnight accommodation, will generally not need to be*	No – Natural England guidance assumes that staff will also live in the catchment and thus foul water generated is already part of the baseline. Furthermore, as Marske-by-the-Sea WwTW is to be used the prevailing currents would be away from the SPA / Ramsar.

[2] For context, the NZT project reported a base case of effluent flow through the outfall to Tees Bay of 36-640 m^3/hr effluent with 0.015 kgN/hr additional nitrogen discharged, and for their Option A had an effluent flow of 1,340 m^3/hr with 24.7 kgN/hr additional nitrogen discharged (Net Zero Teeside Project, Document Reference 9.36 Nutrient Nitrogen Briefing Paper).

NITROGEN SOURCE	DEVELOPMENT DETAILS FOR NITROGEN SOURCE	SCREEN IN?
	included in the assessment unless they have other (non-sewerage) water quality implications."	
Atmospheric Deposition	Air quality modelling indicates that TN loads would be very small from this source and given its distribution and dilution across a wide area of Tees Bay would likely be insignificant.	No – given small TN load, particularly in Tees estuary, and degree of dilution this source is not significant.

4.1.3 Natural England confirmed via consultation undertaken on 12th June 2023 that their concern with regard to nutrients (and their impact to the integrity of the site) for the Teesmouth and Cleveland Coast SPA/Ramsar site is primarily within the terrestrial and inter-tidal sections of the site, particularly the Seal Sands area. Where any discharge from the Proposed Development might occur to the sea and dispersion modelling can indicate no pathway to the terrestrial and inter-tidal sections of the site then there would likely be no issue with regard to nutrient neutrality and no further assessment or mitigation is likely to be required, all subject to agreement with Natural England. As such, the provisional screening outcome presented here will be reviewed during the EIA when further information is available to confirm whether certain potential nitrogen sources or pathways can be screened out of the detailed nutrient neutrality assessment in that context.

5.0 NEXT STEPS: NUTRIENT NEUTRALITY ASSESSMENT

5.1 Nutrient Neutrality Assessment

5.1.1 Nutrient neutrality is an approach which enables decision makers to assess and quantify mitigation requirements as a result of the effects of nutrient loading from new developments on habitats sites. Natural England considers nutrient neutrality as an acceptable means of counterbalancing nutrient impacts from development to demonstrate no adverse effects on the integrity of habitats sites.

5.1.2 A generic nutrient neutrality calculation methodology and a catchment specific nutrient budget calculator have been developed by Natural England and these were issued alongside the guidance to the LPAs in March 2022 (Planning House, 2023). Although primarily directed at residential developments, the guidance states that "other types of business or commercial development, not involving overnight accommodation, will generally not need to be included in the assessment unless they have other (non-sewerage) water quality implications". Given the potential of the Proposed Development to impact on water quality in the Tees Estuary and/or Tees Bay a bespoke assessment is therefore required within the relevant areas of the designated site.

5.1.3 The main function of the nutrient budget calculators is to estimate the annual nutrient load from foul water and from changes in land use via surface water runoff.

However, for the Proposed Development there are no overnight stays and so foul wastewater is not considered relevant, and for the purposes of this assessment the land use will effectively remain the same. It is the potential addition of nitrogen to process water effluent that is considered to trigger the need for a nutrient assessment (but which is not part of Natural England's existing calculator tool). Nonetheless, the principles of Natural England's method decision tree presented in the March 2022 letter (see Annex C) hold true and will be applied, and a similar approach for the determination of a nutrient budget for the Proposed Development will be undertaken (i.e., to estimate the annual nitrogen load from each new source to provide a total development nitrogen budget per year plus a buffer of 20%). Assumptions may be required for how the nitrogen load from various sources is estimated and this will be detailed in the final assessment. Once the annual nitrogen load plus buffer has been estimated, options for mitigation may be considered. Table 4 provides a summary of the main assessment stages and steps of the Natural England Nutrient Neutrality Generic Guidance with the final column setting out the bespoke approach for determining the budget for the Proposed Development.

Table 4: Comparison of Natural England Nutrient Neutrality Generic Methodology Stages and Steps and Bespoke Approach from NZT

NATURAL ENGLAND NUTRIENT NEUTRALITY GENERIC METHODOLOGY STAGES AND STEPS		PROPOSED METHOD FOR H2TEESIDE
Stage 1 The increase in nutrient loading to a Habitats Site that results from the increase in wastewater from a new development	Step 1 Calculate increase in population due to development	Estimate annual load of nitrogen from process water discharges to the Tees Estuary in kg N/ yr.
	Step 2 Calculate the increase in wastewater production (from population increase) due to development	
	Step 3 Determine the concentration of nutrients in wastewater and calculate additional wastewater nutrient load	
Stage 2 The nutrient loading from the past/present land use of the development site	Step 1 Obtain nutrient export values from current land use	N/A as land use is not changing. This will be reviewed and if there is a change of land use, the catchment specific nutrient neutrality calculator will be used to measure each land use and to estimate nutrient loading from past/existing and future land uses.
	Step 2 Calculate the annual nutrient export from current land use(s)	
Stage 3 The nutrient loading from the future mix of land use on the development site	Step 1 Calculate the annual nutrient export from future land use(s)	

NATURAL ENGLAND NUTRIENT NEUTRALITY GENERIC METHODOLOGY STAGES AND STEPS		PROPOSED METHOD FOR H2TEESIDE
Stage 4 Calculate the net change in nutrient loading to a Habitats Site with the addition of a buffer (the net change in the nutrient loading + the buffer is the nutrient budget)	Step 1 Calculate the nutrient budget	If it is confirmed that there is no change in land use, then the annual nitrogen load from process water discharges to the Tees Estuary equates to the nutrient budget.
	Step 2 Add the buffer to the nutrient budget	A precautionary buffer of 20% will be added to the Proposed Development Nutrient Budget as recommended by Natural England's methodology to account for uncertainty in the process and to provide reasonable certainty that there will no adverse effect on the integrity of the site.

5.2 Dispersion Modelling of Effluent

5.2.1 Modelling of process water effluent discharges to Tees Bay will support an assessment of potential impacts on the qualifying features of the Teesmouth and Cleveland Coast SPA/Ramsar and the potential for effluent to disperse into the Tees Estuary (e.g., by tidal incursion). It is important to determine whether any such pathway exists to determine whether any nutrient mitigation is required. If no pathway from the NZT outfall to Tees estuary / Seals Sands exists, then there would be no need for nutrient neutrality mitigation.

5.2.2 A modelling scope is to be agreed with the Environment Agency and Natural England for the relevant 'cases' and will include for cumulative assessment in combination with nitrogen outputs from the NZT development and where relevant other cumulative development sites (for determining potential for impacts against WFD requirements). The modelling and associated nutrient assessment will be presented in the Environmental Statement.

5.2.3 A separate water quality modelling report will be produced for inclusion in the DCO application and used to inform the nutrient neutrality assessment. This report will confirm whether (or not) process water effluent will enter the estuary and contribute to the loading on the designated sites, particularly Seal Sands.

5.3 Determine Mitigation Requirements

5.3.1 Once a nutrient budget has been determined for the Proposed Development following the above process (see Table 4), appropriate mitigation can be determined. If the Proposed Development does contribute to the load of nutrients released to the estuary via Bran Sands WwTW and Dabholm Gut, or if hydrodynamic modelling indicates a pathway from the Tees Bay outfall, then further mitigation to offset this nutrient load is likely to be required.

5.3.2 If nutrient neutrality cannot be proven beyond reasonable scientific doubt using mitigation measures for the Teesmouth and Cleveland Coast SPA/Ramsar, then the Proposed Development could not be consented without demonstrating 'imperative reasons of overriding public interest', that there are no alternatives and by delivering compensation. Similar considerations will also be required to ensure compliance with the Water Environment (Water Framework Directive) (England & Wales) Regulations 2017, as the conservation status of designated sites is a material consideration for WFD status of the Tees (transitional) and Tees Coastal WFD water bodies. In doing so various tests will need to be considered, such as consideration of all alternatives and identification of all possible mitigation.

5.3.3 Natural England guidance published to date suggests several potential ways of providing mitigation. These include direct measures, such as interceptor wetlands to prevent nutrients entering the habitats site, or indirect methods (i.e., off-setting) such as taking land out of nitrogen intensive uses (e.g. cropping of intensive livestock farming). However, where the new loads are large the need for, and space required for mitigation can also be significant, which can present challenges for deliver and thus early consideration of these issues is essential.

5.3.4 In areas where nutrient neutrality issues have become established, strategic solutions have begun to be developed. At Teesside, Natural England has launched a Nutrient Mitigation Scheme for housing developers. It is now possible to apply for credits to offset the small impact of development and create new wildlife habitats, such as wetlands. Natural England has already invested in land which will provide the first credits in the Tees catchment to unlock up to 1,600 homes this year (DEFRA, 2023). This is not expected to be applicable to larger scale industrial / commercial development, but this will be confirmed with Natural England.

5.3.5 On-site treatment options (denitrification) for the Proposed Development may be explored depending on the scale of mitigation required. Furthermore, there may be opportunities through ongoing consultation with Natural England and the Environment Agency to develop strategic solutions.

6.0 SUMMARY

6.1.1 On 16th March 2022, Natural England informed the Inspectorate, RCBC, STBC and HBC that as a Competent Authority under the Habitats Regulations, the LPAs (and the SoS for DCO applications) must carefully consider the nutrients impacts of any new plans and projects on the Teesmouth & Cleveland Coast SPA/Ramsar site and whether

those impacts may have an adverse effect on the site that requires mitigation, including through nutrient neutrality.

6.1.2 The Proposed Development has the potential to release nutrients via i) process water effluent discharge (where it introduces a new nitrogen load rather than just concentrating nitrogen already present in raw water and being returned to the habitats site); ii) surface water runoff; iii) foul water discharge; and iv) atmospheric deposition of nitrogen.

6.1.3 Following a screening exercise, it is proposed that process water effluent discharge is screened in only for those cases where it may enter the habitats site catchment (i.e., Cases 2A, 2B). Surface water runoff is considered to be 'no change' from the existing situation given it is currently an industrial site and so it is proposed that this can be screened out. The potential impact from foul effluent is also proposed to be screened out on the basis that operational workers are assumed to already live in the habitats site catchment and no 'new' overnight stays are created. Furthermore, if as Marske-by-the-Sea WwTW is to be used the prevailing currents would typically be away from the SPA / Ramsar sites. Impact from atmospheric deposition has also been screened out given the minimal deposition that has been modelled over Tees estuary which will be insignificant given the dilution and dispersal potential of the waterbody. Natural England will be consulted on the outcomes of this screening report to confirm their agreement.

6.1.4 For discharges to Tees Bay via the NZT project outfall (Case 2A and Case 2B), and considering the scope of assessment for the recent NZT project, hydrodynamic dispersion modelling is proposed to determine whether there is potential for nutrients to enter the Tees Estuary, particularly Seal Sands as the area of most concern in terms of eutrophication (as confirmed by Natural England). Natural England will expect mitigation approaches to be adopted to achieve nutrient neutrality if any discharges from the Proposed Development may contribute new nitrogen loads to the Teesmouth and Cleveland Coast SPA/Ramsar site. Similarly, these assessments would also need to consider WFD compliance including how the new discharge may impact achievement of conservation objectives for the designated sites. WFD compliance would also need to consider cumulative nitrogen loads (e.g., in combination with the NZT outfall).

6.1.5 If required, mitigation measures will be determined during the EIA once the nutrient budget has been determined with options likely to include on-site denitrification or working with Northumbrian Water to upgrade treatment works. Other approaches, which may be more appropriate to smaller developments, include use of the local nutrient credit scheme, conversion of agricultural land for community / wildlife benefit in the catchment of the Teesmouth and Cleveland Coast SPA/Ramsar site, woodland planting in the catchment of the habitats site, and use of wetlands (on site to treat runoff or offsite at a WwTW or elsewhere in the catchment).

6.1.6 As mentioned previously, under the WFD the Proposed Development must not cause deterioration or prevent improvement to good ecological potential of Tees transitional water body, taking into account the conservation objectives for the SPA/Ramsar sites. This includes long term aspirations to lower the nutrient load in

the estuary to reduce the extent of algal matts that are believed to hinder access to benthic fauna for bird species that are qualifying features. It remains unclear whether achieving nutrient neutrality alone is consistent with the target to reduce nutrient levels. Nonetheless, based on consultation undertaken to date, a requirement to go beyond achieving nutrient neutrality for the Proposed Development has not been stated to be required. However, this will be confirmed through further engagement with Natural England and the Environment Agency.

6.1.7 If it is not possible to deliver sufficient mitigation to demonstrate nutrient neutrality, then the competent authority (i.e. the SoS for this DCO application) cannot legally grant consent unless the Proposed Development can justify the impact by meeting the requirements of the Imperative Reasons of Overriding Public Interest (IROPI) tests (i.e. it must proceed despite the harm it will cause and that there are no feasible alternative solutions to meeting the objectives of the Proposed Development).

6.1.8 Importantly, even if the IROPI tests are passed it would be necessary to agree this position with Natural England, and if appropriate, deliver compensation for the harm caused to the SPA/Ramsar site.

6.1.9 Such compensation or mitigation could be in the form of habitat creation that would ensure the coherence of the National Site Network of internationally important wildlife sites was not compromised, and the Environment Agency have previously identified various local schemes with the NZT project already committed to exploring opportunities. However, in this case, delivering an area of compensation that served the needs of the SPA birds while not also being subject to nutrient neutrality issues would be extremely difficult, if not impossible, given that such issues affect the entire SPA/Ramsar site.

6.1.10 To conclude, on the basis of this screening exercise, it is proposed that a full nutrient neutrality assessment is undertaken during the EIA for inclusion in the DCO application focusing on Case 2A and 2B should they be retained as options for the Proposed Development. This will require a bespoke approach to assessment given that the existing nutrient calculator is not applicable this type of development. The bespoke methodology would be agreed with the Environment Agency and Natural England. For Case 1A and 1B, process water discharge, surface water runoff, foul drainage and atmospheric deposition are proposed to be screened out of further assessment on the basis of being unchanged from existing or not draining to the catchment of the designated.

7.0 REFERENCES

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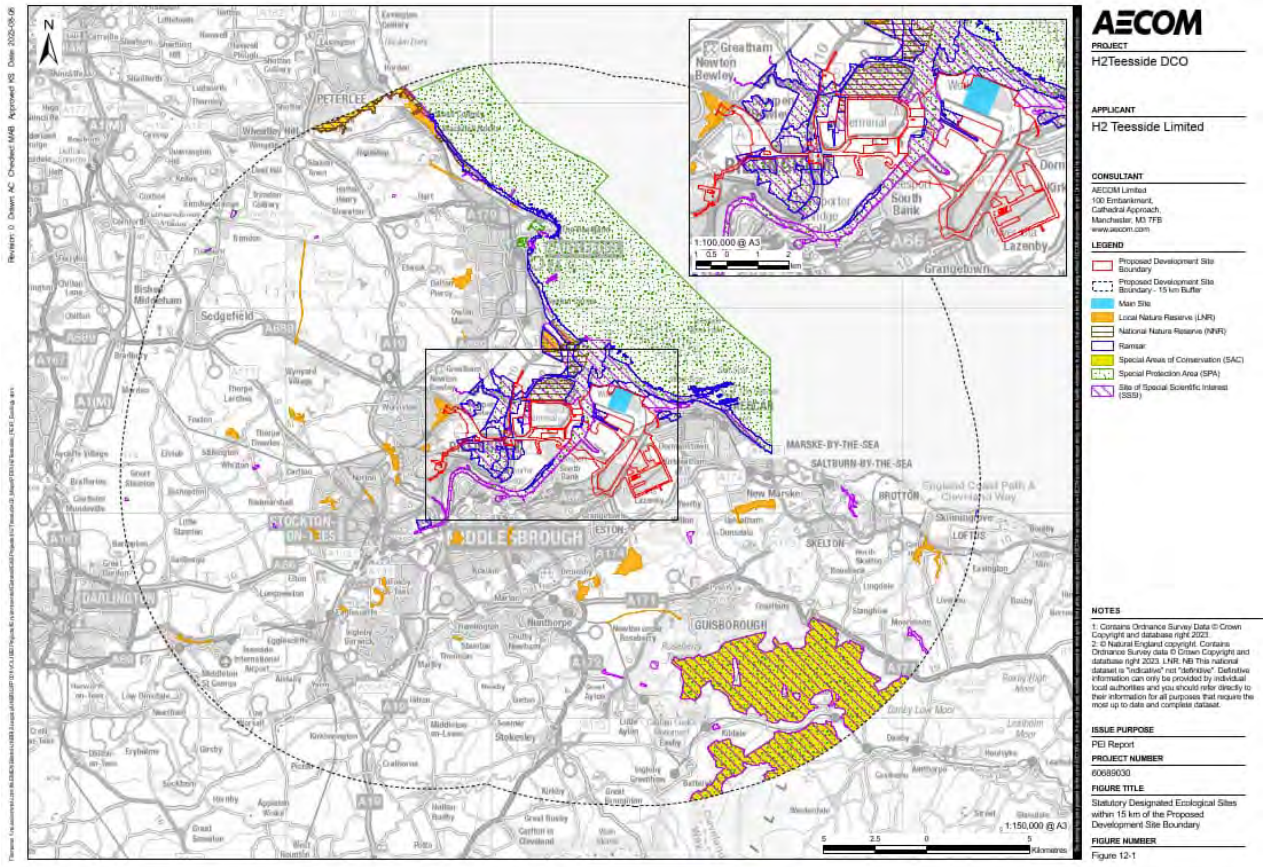
ANNEX A TEESMOUTH AND CLEVELAND COAST SPA/RAMSAR CATCHMENT AS DEFINED BY NATURAL ENGLAND



ANNEX B ECOLOGICAL DESIGNATIONS SURROUNDING THE PROPOSED DEVELOPMENT



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LEGEND
- Proposed Development Site Boundary
- Proposed Development Site Boundary - 15 km Buffer
- Main Site
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Ramsar
- Special Areas of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)

NOTES
1: Contains Ordnance Survey Data © Crown Copyright and database right 2023.
2: © Natural England copyright. Contains Ordnance Survey data © Crown Copyright and database right 2023. LNR, NB This national dataset is "indicative" not "definitive". Definitive information can only be provided by individual local authorities and you should refer directly to their information for all purposes that require the most up to date and complete dataset.

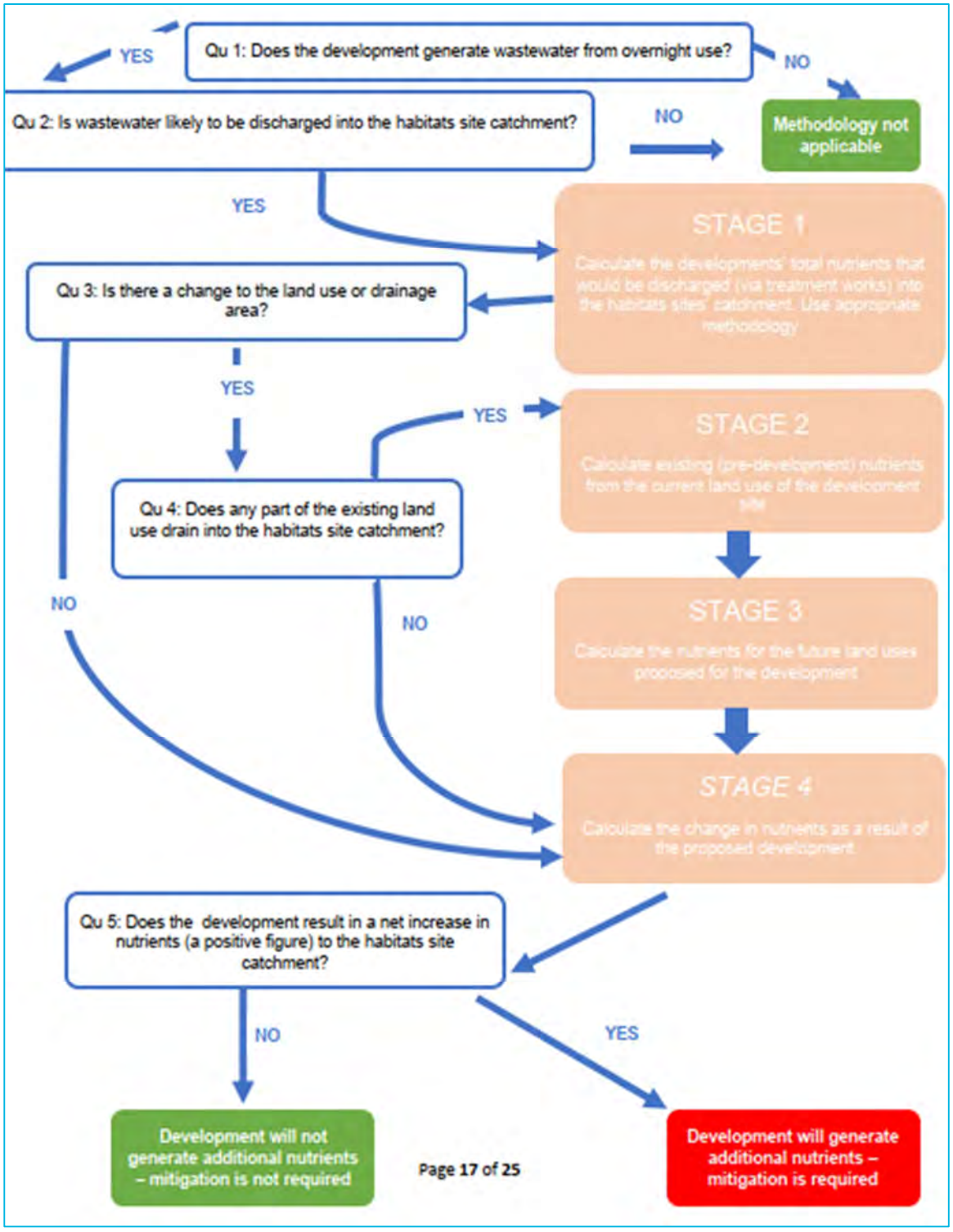
ISSUE PURPOSE
PEI Report

PROJECT NUMBER
60689030

FIGURE TITLE
Statutory Designated Ecological Sites within 15 km of the Proposed Development Site Boundary

FIGURE NUMBER
Figure 12-1

ANNEX C NATURAL ENGLAND NUTRIENT NEUTRALITY ASSESSMENT DECISION TREE (MARCH 2022)



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Appendix 11A: Construction Noise Levels and Assumptions

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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11A.0 CONSTRUCTION NOISE LEVELS AND ASSUMPTIONS

11A.1 Introduction

11A.1.2 The indicative construction and demolition (associated with decommissioning) noise levels were calculated using the procedures for prediction of construction noise set out in BS5228- 1:2009+A1:2014.

11A.1.1 Free field construction noise levels have been predicted at six receptor locations (H1, H2, H3, H4, H5 and H6) for the following construction activities:

- Construction of the Main Site:
  - piling and foundation works;
  - building and general site activity;
  - fit out;
  - layout areas;
  - decommissioning.
- Construction of the Pipeline Corridors:
  - Hydrogen Pipeline Corridor, Water Connection Corridor, CO_2 Export Corridor, Natural Gas Connection Corridor, Other Gas Connection Corridors- Open Cut and trenchless (HDD);
  - Electrical Connection- top soil strip.

11A.1.2 A full list of plant associated with construction activities and associated sound power data from BS5228 and % on time is presented in Tables 11A-1 to 11A-3. The list of plant was sourced from data from the client for pipeline construction and from other similar projects.

Table 11A-1: Plant and Equipment Associated with Construction of the Main Site

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
Piling and foundation Works			
Compressors	80	100	6
Dump Truck (tipping fill)	79	100	2
Dump Truck (pass-by)	87	100	3

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
Lorry (delivery and collection)	80	100	10
Large rotary bored piling rig	83	100	4
Hand-Held Welder (welding piles)	73	100	1
Generator for Welding	73	100	1
Tracked Excavator	71	100	5
Concrete Mixer Truck	80	100	25
Truck Mounted Concrete Pump and Boom Arm	80	100	3
Wheeled Mobile Telescopic Crane	78	100	4
Tower Crane	77	100	2
Diesel Generator for Site Cabins	66	100	4
Diesel Generator for Site Lighting	65	100	2
Road Sweeper	68	100	1
Angle Grinder	80	100	1
Electric Water Pump	68	100	2
Building and General Site Activities			
Compressors	80	100	6
Wheeled Loader	80	100	2
Lorry (delivery and collection)	80	100	10
Water Pump (20 kW)	65	100	1
Dumper (idling)	63	100	1
Wheeled Backhoe Loader	67	100	2
Tracked Excavator	71	100	5

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
Concrete Mixer Truck	80	100	25
Truck Mounted Concrete Pump and Boom Arm	80	100	3
Poker Vibrator	78	100	1
Wheeled Mobile Telescopic Crane	78	100	4
Tower Crane	77	100	2
Fork Lift Truck	75	100	4
Electric Core Drill (Drilling Concrete)	85	100	1
Concrete Floor Cutter	91	100	1
Diesel Generator for Site Cabins	66	100	4
Diesel Generator for Site Lighting	65	100	2
Road Sweeper	68	100	1
Angle Grinder	80	100	1
Road Planer (road construction)	82	100	1
Vibratory Compactor (asphalt)	82	100	1
Asphalt Paver + Tipper Lorry	77	100	1
Electric Water Pump	68	100	2
Fit Out			
Compressors	80	100	6
Lorry (delivery and collection)	80	100	10
Wheeled Mobile Telescopic Crane	78	100	4
Tower Crane	77	100	2

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
Lorry with Lifting Boom	77	100	1
Lifting Platform	67	100	1
Fork Lift Truck	75	100	1
Mini Tracked Excavator	74	100	1
Electric Core Drill (Drilling Concrete)	85	100	1
Concrete Floor Cutter	91	100	1
Hand-Held Circular Saw (Cutting Paving Slabs)	84	100	1
Diesel Generator for Site Cabins	66	100	4
Diesel Generator for Site Lighting	65	100	2
Road Sweeper	68	100	1
Angle Grinder	80	100	1
Hand-Held Cordless Nail Gun	73	100	1
Electric Water Pump	68	100	2
Decommissioning			
Compressors	80	100	3
Hand Held Pneumatic Breaker	83	100	3
Dump Truck (tipping fill)	79	100	2
Dump Truck (pass-by)	87	100	3
Lorry (delivery and collection)	80	100	4
Tracked Excavator	71	100	5
Concrete Mixer Truck	80	100	6

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
Wheeled Mobile Telescopic Crane	78	100	2
Tower Crane	77	100	1
Lorry with Lifting Boom	77	100	1
Diesel Generator for Site Cabins	66	100	2
Diesel Generator for Site Lighting	65	100	1
Road Sweeper	68	100	1
Angle Grinder	80	100	1
Electric Water Pump	68	100	2
screen stockpiler	87	100	1
concrete breaker mounted on wheeled backhoe	92	100	6
tracked crusher	84	100	1

Table 11A-2: Plant and Equipment Associated with Construction of Pipeline Corridors- Open Cut Trenches

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
Open Cut Trenches			
Dozer/loader	79	100	1
Hiab, Tracked excavator	77	100	1
Welding, grinding, etc.	80	100	1
Tracked excavator up to 40T	77	100	1

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
Dump truck up to 29T	79	100	1
Tracked excavator up to 40T	77	100	1
Tracked excavator up to 40T	77	100	1

Table 11A-3: Plant and Equipment Associated with Construction of Pipeline Corridors- Trenchless- HDD

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
HDD			
Vibratory sheet piling rig	88	100	1
Tracked excavator	77	100	1
Directional drill (generator)	77	100	1
Tracked drilling rig	86	100	1
Water Pump	78	100	1

Table 11A-4: Plant and Equipment Associated with Construction of Electrical Connection Corridor

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
Top Soil Strip			
30T Backhoe	80	100	1
CAT D5	78	100	1
CAT D6	81	100	1

PLANT/EQUIPMENT	SOUND POWER LEVEL (dB) REFERENCE FROM BS 5228	% ON TIME (BASED ON 12HR DAY) USED IN CALCULATIONS	NUMBER OF PLANT IN OPERATION BY CONSTRUCTION ACTIVITY
CAT D8	86	100	1

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Appendix 11B: OPERATIONAL NOISE INFORMATION

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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11B.0 OPERATIONAL NOISE INFORMATION

11B.1 Noise Model Settings

11B.1.1 The Proposed Development was characterised in CadnaA (version 2022) acoustic modelling software. This software implements the sound propagation calculation methodology set out in ISO 9613-2.

Data Sources

11B.1.2 The following data sources were used:

- surrounding area ground heights – downloaded from Open Survey Data (www.environment.data.gov.uk/DefraDataDownload);
- Ordnance Survey mapping of the Site and surrounding areas;
- sound power level data from similar projects; and
- proposed Development layout plans (as per Figure 4-1 – 4-8, PEI Report, Volume II).

Modelling Assumptions

11B.1.3 The model has been prepared with the following configurations and assumptions:

- Building dimensions as provided by design team;
- receptor buildings heights – all 2 storey houses (6.5 m), all 1 storey houses (4 m);
- receptor heights 1.5 m ground floor, 4 m first floor;
- ground absorption – industrial areas and hardstanding 0.0, vegetation 1.0, road surfaces 0.0, water bodies 0.0. The locations of each area have been determined from the OS Topography Layer;
- sound levels have been provided by designers as A-weighted values at 1 m from the source, these have been supplemented with octave band spectra from other comparable projects including the Khazzan central processing facility, this has been confirmed by designers to contain similar sound sources to the proposed development;
- the sound emitted by each building façade has been calculated based on the total sound power level for the building, distributed according to the surface area of the façade;
- all pumps have been modelled as point sources;
- where sound pressure level data for plant items has been provided inside an enclosure it is not yet been confirmed what material these enclosures will be constructed from. As a conservative assumption it has been assumed this will be 0.6 mm thick steel cladding.

Table 11B-1: Sound Power Levels of Operational Equipment

DETAILS	LINEAR SOUND POWER LEVEL EACH FREQUENCY BAND dB									NUMBER OPERATIONAL IN PROPOSED DEVELOPMENT	L_{WA} dB
	31	63	125	250	500	1K	2K	4K	8K		
NH3 Feed Pumps	36	50	71	78	78	78	75	68	57	2	81
Demineralised Water Pumps	46	60	81	88	88	88	85	78	67	4	91
Contaminated Water Sump Pump	36	50	71	78	78	78	75	68	57	2	81
Neutralisation Sump Effluent Pumps	36	50	71	78	78	78	75	68	57	4	81
Storm Water Sump Pumps	36	50	71	78	78	78	75	68	57	4	81
Oily Water Separator	36	50	71	78	78	78	75	68	57	2	81
Natural Gas Compressor	78	72	87	84	90	90	96	95	85	2	114
Lean Solution Cooler	127	119	113	112	119	108	103	97	89	2	117
CO_2 Cooler	126	118	112	111	118	107	102	96	88	2	116
Process Condensate Cooler	123	115	109	108	115	104	99	93	85	2	113
Syngas Cooler	127	119	113	112	119	108	103	97	89	2	117

DETAILS	LINEAR SOUND POWER LEVEL EACH FREQUENCY BAND dB									NUMBER OPERATIONAL IN PROPOSED DEVELOPMENT	L_{WA} dB
	31	63	125	250	500	1K	2K	4K	8K		
HP Flash Reflux Pumps	36	50	71	78	78	78	75	68	57	2	81
Semilean Solution Pumps	51	65	86	93	93	93	90	83	72	6	96
Hydraulic Turbine	123	115	108	91	86	89	82	83	81	2	96
Lean Solution Pumps	51	65	86	93	93	93	90	83	72	2	96
Stripper Feed Pumps	51	65	86	93	93	93	90	83	72	2	96
Reflux Pumps	36	50	71	78	78	78	75	68	57	2	81
First Fill Pumps	51	65	86	93	93	93	90	83	72	2	96
Make-up Pump	36	50	71	78	78	78	75	68	57	2	81
Process Condensate Pumps	36	50	71	78	78	78	75	68	57	2	81
CO2 Compressor	78	72	87	84	90	90	96	95	85	2	114
Fired Heater	68	78	86	95	104	111	102	106	90	6	113
Fired Heater stack exhaust	114	105	104	97	103	95	91	79	81	2	102
Process Condensate Circulation Pumps	46	60	81	88	88	88	85	78	67	2	91

DETAILS	LINEAR SOUND POWER LEVEL EACH FREQUENCY BAND dB									NUMBER OPERATIONAL IN PROPOSED DEVELOPMENT	L_{WA} dB
	31	63	125	250	500	1K	2K	4K	8K		
Process Condensate Stripper Feed Pumps	41	55	76	83	83	83	80	73	62	2	86
Process Condensate Feed Pumps	46	60	81	88	88	88	85	78	67	2	91
STG	60	76	86	84	83	79	79	69	67	2	85
Demineralised Water Plant Package	62	75	80	84	85	83	73	68	58	2	87
Flare KO Drum Pump	36	50	71	78	78	78	75	68	57	2	81
Fire Water Pumps	51	65	86	93	93	93	90	83	72	4	96
Fire Water E-Pumps	51	65	86	93	93	93	90	83	72	4	96
Fire Water Jockey Pumps	51	65	86	93	93	93	90	83	72	4	96
LP Flare Package	51	65	86	93	93	93	90	83	72	2	96
Dump Condenser	51	65	86	93	93	93	90	83	72	2	96
MP BFW Pumps	51	65	86	93	93	93	90	83	72	4	96
H2 Dryer Condensate Pumps	36	50	71	78	78	78	75	68	57	2	81
H2 Dryer	68	80	85	87	86	85	88	95	90	2	98

DETAILS	LINEAR SOUND POWER LEVEL EACH FREQUENCY BAND dB									NUMBER OPERATIONAL IN PROPOSED DEVELOPMENT	L_{WA} dB
	31	63	125	250	500	1K	2K	4K	8K		
H2 Fiscal Meter	106	114	104	99	98	101	95	96	87	2	105
H2 Recycle Compressor	44	57	74	82	90	93	90	86	88	4	96
H2 Compressor	-	110	111	112	108	106	103	88	91	2	111
Cooling Water Pumps	51	65	86	93	93	93	90	83	72	6	96
Cooling Water Tower	132	127	130	125	112	104	109	109	105	2	120
Cooling Water Dosing Package	63	76	83	91	97	100	95	94	85	2	103
Emergency Diesel Generator	-	115	109	92	89	88	83	80	72	2	96

11B.2 Uncertainty

11B.2.1 It should be noted than any sound level predictions have an associated degree of uncertainty. Modelling and measurement processes have been carried out in such a way to reduce such uncertainty. In particular, the following sources of uncertainty have been noted:

- sound levels for each noise sources have been provided by designers based on preliminary worst-case data and will be further updated during detailed design;
- the octave band spectra have not been available for each source so have been taken from other similar projects including other operational BP facilities;
- predictions of sound pressure levels according to ISO 9613 are assumed based on moderate downwind propagation, and hence could be considered as a worst-case calculation. However, the standard also indicates an estimated accuracy of ±3 dB(A) in predicted levels.

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Appendix 11C: BASELINE SOUND MONITORING AND SURVEY INFORMATION

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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11C.0 H2 TEESSIDE BASELINE SOUND MONITORING SURVEY INFORMATION

11C.1 Unattended Monitoring Location (H1) Manor House Farm, Cowpen Bewley

11C.1.1 Table 11C-1 provides information on the survey location and conditions recorded on site.

Table 11C-1: H1 Survey Location Details

LOCATION H1	DESCRIPTION
	DAY AND NIGHT UNATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Manor House Farm, Cowpen Bewley, Billingham ///cost.weep.voices NZ 48302 24880
Monitoring date and time	26/06/2023 15:17 to 04/07/2023 13:20
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Sound Level Meter and Serial No.	Rion NL-52 s/n 00620870
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 2217877
Weather station used	See location H6
Description of the sound climate	Road traffic from A1185 (NE), wind

Figure 11C-1: Location H1 Manor House Farm, Cowpen Bewley



11C.2 Attended Monitoring Location (H2) Cresswell Road, Grangetown

11C.2.1 Table 11C-2 provides information on the survey location and conditions recorded on site.

Table 11C-2: H2 Survey Location Details

LOCATION H2	DESCRIPTION
	DAY TIME ATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Cresswell Road, Grangetown ///feel.unique.swan NZ 55447 20705
Monitoring date and time	26/06/2023 17:28 to 26/06/2023 18:28
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Average wind speeds (m/s)	2.5
Wind direction	From the southeast
Cloud coverage	2/8
Sound Level Meter and Serial No.	Rion NL-52 s/n 00710387
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 3005464
Description of the sound climate	Road traffic from local roads and Broadway/Trunk Road and Greystone Road (A1053), light aircraft

Figure 11C-2: Location H2 Cresswell Road, Grangetown



11C.3 Unattended Monitoring Location (H3) Kirkleatham Village

11C.3.1 Table 11C-3 provides information on the survey location and conditions recorded on site.

Table 11C-3: H3 Survey Location Details

LOCATION H3	DESCRIPTION
	DAY AND NIGHT UNATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Kirkleatham Village ///phones.strain.jams NZ 59330 21711
Monitoring date and time	26/06/2023 16:43 to 04/07/2023 10:13
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Sound Level Meter and Serial No.	Rion NL-52 s/n 00386763
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 2217877
Weather Station used	See location H6
Description of the sound climate	Road traffic from A1042, A174 and other local roads, birdsong, wind in trees, industrial noise likely from Wilton International site.

Figure 11C-3: Location H3 Kirkleatham Village



11C.4 Attended Monitoring Location (H4) Seal Sands Office

11C.4.1 Table 11C-4 provides information on the survey location and conditions recorded on site.

Table 11C-4: H4 Survey Location Details

LOCATION H4	DESCRIPTION
	DAY TIME ATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Seal Sands Office, Billingham ///recall.shark.legend NZ 53979 24812
Monitoring date and time	27/06/2023 13:54 to 27/06/2023 14:54
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Average wind speeds (m/s)	2.2
Wind direction	From the south
Cloud coverage	3/8
Sound Level Meter and Serial No.	Rion NA-28 s/n 00570400
Field Calibrator and Serial No.	Rion NC-74 34973231
Description of the sound climate	Industrial sounds from Semcorp site as well as other nearby industrial facilities. Road traffic from unnamed site road.

Figure 11C-4: Location H4 Seal Sands Office



11C.5 Unattended and Attended Monitoring Location (H5) Marsh House Farm

11C.5.1 Table 11C-5 provides information on the unattended survey location and conditions recorded on site.

Table 11C-5: H5 Unattended Survey Location Details

LOCATION H5 (UNATTENDED)	DESCRIPTION
	DAY AND NIGHT UNATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Marsh House Farm, Warrenby /// jazz.shadow.trial NZ 57984 25035
Unattended monitoring date and time	21/07/2023 12:15 to 31/07/2023 11:45
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Average wind speeds (m/s)	0 to 8.9 m/s (weather station left at this location)
Wind direction	Most often S/SE
Sound Level Meter and Serial No.	Rion NL-52 s/n 00710387
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 3005464 and Brüel & Kjær Model 4231 s/n 2217876
Weather Station and Serial No.	RS Hydro OP46548
Description of the sound climate	Day: industrial sounds from east along Tod Point Road as well as distant industrial sound from west, road traffic along Tod Point Road, birdsong. Night: distant industrial sources to west (clanging and horns were noted), occasional cars on Tod Point Road

Figure 11C-5: Location H5 Unattended Marsh House Farm



11C.5.2 Table 11C-6 provides information on the unattended survey location and conditions recorded on site.

Table 11C-6: H5 Attended Survey Location Details

LOCATION H5 (ATTENDED)	DESCRIPTION	
	DAY AND NIGHT ATTENDED MONITORING	
Location description, what 3 words location and OS grid reference (Easting/Northing)	Near Marsh House Farm, Warrenby /// dined.tape.tone NZ 57890 25142	
Attended monitoring date and time	Day: 26/06/2023 15:53 until 16:53 Night: 26/06/2023 23:17 - 27/06/2023 00:17	
Monitoring height above ground	1.5 m	
Distance to nearest building façade	Greater than 3.5m	
Average wind speeds (m/s)	Day: 0.0	Night: 0.0
Wind direction	Day: SE	Night: E
Cloud Cover	Day: 3/8	Night:6/8
Sound Level Meter and Serial No.	Rion NL-52 s/n 00710387	
Field Calibrator and Serial No.	Day: Brüel & Kjær Model 4231 s/n 3005464 Night: Brüel & Kjær Model 4231 s/n 2217877	
Weather Station and Serial No.	RS Hydro OP46548	
Description of the sound climate	Day: industrial sounds from east along Tod Point Road as well as distant industrial sound from west, road traffic along Tod Point Road, birdsong. Night: distant industrial sources to west (clanging and horns were noted), occasional cars on Tod Point Road	

Figure 11C-6: Location H5 Attended Marsh House Farm



11C.6 Unattended Monitoring Location (H6) 58 Broadway West

11C.6.1 Table 11C-7 provides information on the survey location and conditions recorded on site.

Table 11C-7: H6 Survey Location Details

LOCATION H6	DESCRIPTION
	DAY AND NIGHT UNATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	58 Broadway West, Dormanstown /// manliness.chest.oath NZ 58089 23908
Unattended monitoring date and time	27/06/2023 10:51 to 04/07/2023 12:11
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Average wind speeds (m/s)	Between 0 and 4.6 m/s (weather station set up at this location)
Wind direction	From the south
Sound Level Meter and Serial No.	Rion NL-52 s/n 01021280
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 2217877
Weather Station and Serial No.	RS Hydro OP46548
Description of the sound climate	Road traffic on Broadway West and other nearby roads, industrial estate to north, birdsong.

Figure 11C-7: Location H6 58 Broadway West



11C.7 Attended Monitoring Location (Eb1) Greatham Railway

11C.7.1 Table 11C-8 provides information on the survey location and conditions recorded on site.

Table 11C-8: Eb1 Survey Location Details

LOCATION EB1	DESCRIPTION	
	DAY ATTENDED MONITORING	DAY ATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Greatham Railway /// deflection.silks.slows NZ 50194 27117	Thorn Tree Lane /// Noon.hogs.bigger NZ 50159 27149
Monitoring date and time	27/06/2023 13:50 to 27/06/2023 14:20	26/06/2023 13:23 to 13:53
Monitoring height above ground	1.5 m	1.5
Distance to nearest building façade	Greater than 3.5m	Greater than 3.5m
Average wind speeds (m/s)	0.0	4.0
Wind direction	Indeterminable	West
Cloud Cover	8/8	3/8
Sound Level Meter and Serial No.	JL: Rion NL-52 s/n 00710387	Rion NA-28 s/n 00570400
Field Calibrator and Serial No.	JL: Brüel & Kjær Model 4231 s/n 3005464	Rion NC-74 34973231
Description of the sound climate	Leaves rustling, trains, aircraft	Leaves rustling, trains, aircraft

Figure 11C-8: Location Eb1 58 Greatham Railway



11C.8 Unattended Monitoring Location (Eb2) Venator, Tees Road, Hartlepool

11C.8.1 Table 11C-9 provides information on the survey location and conditions recorded on site.

Table 11C-9: Eb2 Survey Location Details

LOCATION EB2	DESCRIPTION
	DAY AND NIGHT UNATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Venator, Tees Road, Hartlepool /// beans.lakes.frame NZ 51191 26237
Monitoring date and time	26/06/2023 13:45 to 04/07/2023 12:17
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Sound Level Meter and Serial No.	Rion NL-52 s/n 01581
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 3005464
Weather Station used	See location H6
Description of the sound climate	Road traffic onA178 was dominant with additional contributions from birdsong.

Figure 11C-9: Location Eb2 Venator



11C.9 Unattended Monitoring Location (Eb3) Seal Sands

11C.9.1 Table 11C-10 provides information on the survey location and conditions recorded on site.

Table 11C-10: Eb3 Survey Location Details

LOCATION EB3	DESCRIPTION
	DAY AND NIGHT UNATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Seal Sands, unnamed access road /// dices.feed.coherent NZ 52364 25451
Monitoring date and time	27/06/2023 13:01 to 04/07/2023 14:25
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Sound Level Meter and Serial No.	Rion NL-52 s/n 00654034
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 2217877
Weather Station used	See location H6
Description of the sound climate	Wind and industrial sound mainly from the nearby Conoco Phillips site were the main sources.

Figure 11C-10: Location Eb3 Seal Sands



11C.10 Unattended Monitoring Location (Eb4) Hospital of God, Greatham

11C.10.1 Table 11C-11 provides information on the survey location and conditions recorded on site.

Table 11C-11: Eb4 Survey Location Details

LOCATION EB4	DESCRIPTION
	DAY AND NIGHT UNATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	To the rear of Hospital of God, Greatham /// diner.trash.crowned NZ 449032 527493
Monitoring date and time	27/06/2023 13:05to 06/07/2023 13:20
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Sound Level Meter and Serial No.	Rion NL-52 s/n 02041
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 3005464
Weather Station used	See location H6
Description of the sound climate	Birdsong was identified as the dominant sound source at this location

Figure 11C-11: Location Eb4 Hospital of God, Greatham



11C.11 Attended Monitoring Location (Eb5) Cowpen Marsh

11C.11.1 Table 11C-12 provides information on the survey location and conditions recorded on site.

Table 11C-12: Eb5 Survey Location Details

LOCATION EB5	DESCRIPTION
	DAY ATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Cowpen Marsh /// orbit.into.bound NZ 45063 524710
Monitoring date and time	26/06/2023 14:10 to 15:10
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Average wind speeds (m/s)	3 m/s
Wind direction	From the north east
Sound Level Meter and Serial No.	Rion NL-52 s/n 00710387
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 3005464
Description of the sound climate	Birdsong and road traffic were identified as sources at this location.

Figure 11C-12: Location Eb5 Cowpen Marsh



11C.12 Unattended Monitoring Location (Eb6) Seal Sands

11C.12.1 Table 11C-13 provides information on the survey location and conditions recorded on site.

Table 11C-13: Eb6 Survey Location Details

LOCATION EB6	DESCRIPTION
	DAY AND NIGHT UNATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Seal Sands /// film.Mondays.skips NZ 53547 25477
Monitoring date and time	27/06/2023 13:30 to 04/07/2023 14:45
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Sound Level Meter and Serial No.	Rion NL-52 s/n 01021284
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 2217877
Weather Station used	See location H6
Description of the sound climate	Industrial sound mainly from the nearby Conoco Phillips site was dominant with additional contributions from wind and birds.

Figure 11C-13: Location Eb6 Seal Sands



11C.13 Unattended Monitoring Location (Eb7) Highfield Environmental

11C.13.1 Table 11C-14 provides information on the survey location and conditions recorded on site.

Table 11C-14: Eb7 Survey Location Details

LOCATION EB7	DESCRIPTION
	DAY AND NIGHT UNATTENDED MONITORING
Location description, what 3 words location and OS grid reference (Easting/Northing)	Highfield Environmental, Cowpen Bewley /// pasta.last.major NZ 49718 24447
Monitoring date and time	27/06/2023 13:00 to 06/07/2023 14:00
Monitoring height above ground	1.5 m
Distance to nearest building façade	Greater than 3.5m
Sound Level Meter and Serial No.	Rion NL-52 s/n 00386762
Field Calibrator and Serial No.	Brüel & Kjær Model 4231 s/n 3005464
Weather Station used	See location H6
Description of the sound climate	Operational noise from the Highfield Environmental site was dominant with additional noise form HGV movements on the site

Figure 11C-14: Location Eb7 Highfield Environmental



11C.14 Summary of H2 Teesside Baseline Noise Data

Table 11C-15: Sound Survey Results

MONITORING LOCATION	TIME PERIOD	$L_{Aeq,T}$ dB	Highest L_{AFmax} dB	$L_{AF90,T}$ dB
H1	Daytime	50	98	43
	Night-time	44	90	36
H2	Daytime	51	73	48
	Night-time*	-	-	-
H3	Daytime	51	92	47
	Night-time	49	78	42
H4	Daytime	57	84	53
	Night-time*	-	-	-
H5	Daytime	51	96	39
	Night-time	44	80	36
H6	Daytime	56	102	46
	Night-time	45	77	42
Eb1	Daytime	51	78	43
	Night-time*	-	-	-

MONITORING LOCATION	TIME PERIOD	$L_{Aeq,T}$ dB	Highest L_{AFmax} dB	$L_{AF90,T}$ dB
Eb2	Daytime	67	95	50
	Night-time	62	90	47
Eb3	Daytime	48	92	42
	Night-time	46	79	42
Eb4	Daytime	51	101	45
	Night-time	49	85	36
Eb5	Daytime	57	79	45
	Night-time*	-	-	-
Eb6	Daytime	53	76	51
	Night-time	53	88	51
Eb7	Daytime	47	88	41
	Night-time	42	82	37
*Only attended daytime measurements made at H2, H4, Eb1 and Eb5				

H2Teesside Project

Preliminary Environmental Information Report

Volume III – Appendices

Appendix 12A: Report to inform Habitats Regulations Assessment Screening

Conservation of Habitats and Species Regulations 2017 (as amended)

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(g)



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1.0 INTRODUCTION

1.1 Overview

1.1.1 This report to inform Habitats Regulations Assessment (HRA) Screening has been prepared on behalf of bp (the Applicant). It will ultimately form part of the application (the 'Application') for a Development Consent Order ('DCO'), that will be submitted to the Secretary of State for Energy Security and Net Zero, under Section 37 of the Planning Act 2008.

1.1.2 The applicant is seeking development consent for the construction, operation and decommissioning of an approximately 1.2-Gigawatt Thermal (GWth) Hydrogen Production Facility with associated Carbon Capture and Storage (CCS) and hydrogen transport pipeline network on land in Redcar and Cleveland, Stockton-on-Tees, and Hartlepool on Teesside (hereafter referred to as the 'Proposed Development Site') (see Figure 1-1: Proposed Development Site).

1.1.3 A DCO is required for the Proposed Development as the Proposed Development has been brought into the Planning Act 2008 regime through a Section 35 Direction.

1.2 The Proposed Development

1.2.1 The Main Site, which comprises the Production Facility together with the associated carbon capture and compression facilities and ancillary infrastructure, will be located at 'The Foundry', within the Teesworks development site. Carbon dioxide (CO_2) captured from the process will be compressed at the Main Site and will be transported for geological storage offsite using Northern Endurance Partnership (NEP) infrastructure.

1.2.2 The Hydrogen Pipeline Corridor will connect the Main Site to off-takers at various industrial installations across the Tees Valley. A Natural Gas Connection Corridor will connect the Production Facility to gas transmission infrastructure and an electrical connection corridor will connect the Production Facility to the National Grid Network.

1.2.3 Connections are required for water supply and discharge at the Production Facility. The preferred option for effluent discharge at this stage is a connection to Bran Sands, Wastewater Treatment Works (WwTW), for the provision of water (either raw water or treated effluent) for the use in the operation of the Production Facility and discharge of effluent from the Main Site back to Bran Sands WwTW for treatment. Other options being considered within the Water Connections Corridor include onsite water treatment (at the Main Site) prior to return of treated effluent back to Bran Sands WwTW as well as a demineralised water (DMW) connection between the Main Site and Wilton International.

1.2.4 Further information regarding the Project is provided in Chapter 4: Proposed Development (PEIR Report, Volume I).

1.3 Legislative Context

1.3.1 The Conservation of Habitats and Species Regulations 2017, hereafter referred to as the 'Habitats Regulations' provide for the designation of sites for the protection of certain species and habitats. These are collectively termed 'European sites' and form part of a network of protected sites across the UK known as the 'national site network' (NSN). For ease of expression, this report uses the term 'European site' for both European sites and European offshore marine sites. European sites protected by the Habitats Regulations include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Additionally, it is a matter of UK Government policy and guidance that the following sites should also be subject to a HRA, where affected by a plan or project: proposed SACs; potential SPAs; and Ramsar sites (both proposed and listed); and areas secured as sites compensating for damage to a European site.

1.3.2 Under the Habitats Regulations, a Competent Authority must consider whether a development will have a likely significant effect (LSE) on a European site, either alone or in combination with other plans or projects. Where LSE are likely and a project is not directly connected with or necessary to the management of that site(s), an appropriate assessment (AA) is required of the implications of the plan or project for that site(s) in view of its conservation objectives.

1.3.3 Further to this, where an AA has been carried out and results in a negative assessment (i.e. where Adverse Effects on Integrity (AEoI) of European site(s) cannot be ruled out, despite any proposed avoidance or reduction (mitigation) measures), consent can only be granted if: there are no alternative solutions; there are Imperative Reasons of Overriding Public Interest (IROPI); and Compensatory Measures have been secured. These latter stages are known as the 'derogations.'

1.3.4 HRA is a multi-stage process which identifies LSE, assesses any AEoI of a European site, and considers the derogations (as appropriate). The joint Defra, Welsh Government, Natural England and Natural Resources Wales guidance (2021) 'Habitats regulations assessments: protecting a European site' (hereafter referred to as the 'joint guidance') identifies a three-stage process, as set out below. It may not be necessary to complete all stages, depending on what conclusion is reached at each stage. The stages are:

- Stage 1. Screening – check if the proposal is likely to have a significant effect on the European site(s)'s conservation objectives, both alone or in combination with other plans or projects. At this stage, and in accordance with case law (People Over Wind and Sweetman v Coillte Teoranta (Case C-323/17)), mitigation measures proposed for the purpose of avoiding or minimising risk to a European site should not be taken into account. If a conclusion of no LSE is reached for all European sites and their qualifying features considered, it is not necessary to proceed to the next stages of HRA.
- Stage 2. Appropriate assessment (AA) – assess the implications of the proposal for the qualifying features of the European site(s), in view of the site(s)' conservation objectives and identify ways to avoid or minimise any effects.

- Stage 3. Derogation – consider if proposals that would have an AEoI of a European site(s) qualify for an exemption. There are three tests to this stage to be followed in order: consider alternative solutions; consider IROPI; and secure compensatory measures. Each test must be passed in sequence for a derogation to be granted.

1.3.5 When submitted with the DCO application, this will be a technical report to inform and support the competent authority (the Secretary of State) in its decision making.

1.3.6 The United Kingdom (UK) left the European Union (EU) on 31 January 2020 under the terms set out in the EU (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). The Withdrawal Act retains the body of existing EU-derived law within our domestic law, and this include the provisions of the Habitats Directive from which the requirement for HRA arises. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 maintains the existing protections for habitats and species.

2.0 METHOD

2.1 Introduction

2.1.1 This report has been prepared with reference to the general European Commission guidance on HRA (European Commission, 2001), general guidance on HRA published by the UK government in 2021 (Ministry of Housing, Communities & Local Government, 2021) and Planning Inspectorate (the Inspectorate) Advice Note 10 (The Planning Inspectorate, 2022).

2.1.2 The assessment of LSEs takes account of relevant EU case law (for instance, the Holohan and People over Wind cases, discussed below).

2.1.3 Figure 2-1 below outlines the stages of HRA. **Note that while Figure 2-1 shows all the stages of the HRA process, this document only discusses Stage 1 in detail (see below). The Stage 2 Report to Inform Appropriate Assessment will be documented and submitted with the Environmental Statement. The DCO application may also be accompanied by a revised version of this report if further evidence emerges which enables any of the conclusions over Likely Significant Effects to be revised.**

2.1.4 Whilst the HRA decisions must be taken by the competent authority (The Inspectorate as Examining Authority advising the Secretary of State as competent authority), the information needed to undertake the necessary assessments must be provided by the Applicant. The information needed for the competent authority to establish whether there are any LSEs from the Proposed Development is therefore provided in this Report.

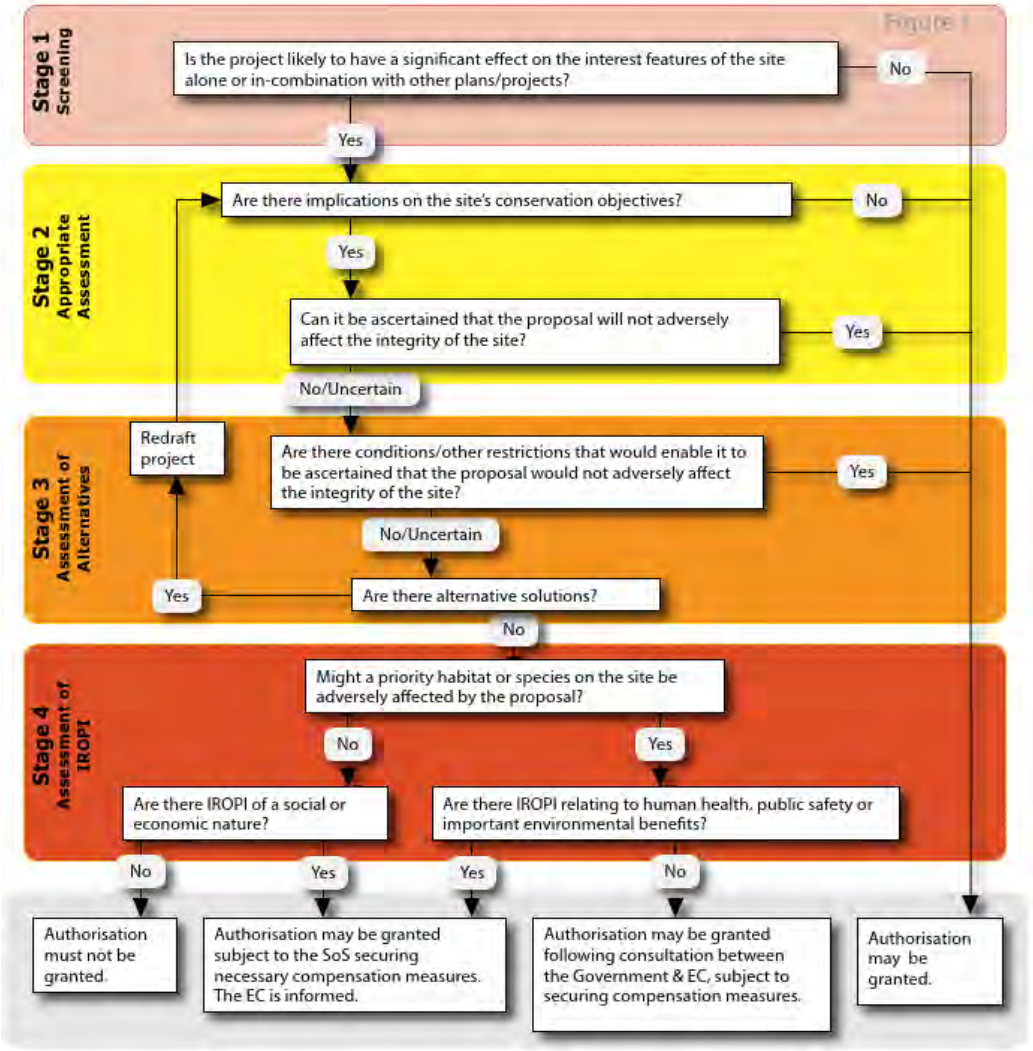

Figure 2-1: Four stage approach to Habitats Regulations Assessment of Projects

HRA Stage 1 – Screening for LSEs

2.1.5 The objective of the LSE test is to 'screen out' those aspects of a project and / or the European sites that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction (i.e., a pathway) with European sites. The remaining aspects are then taken forward to Stage 2 of the HRA Process - Appropriate Assessment. The assessment must consider the potential for effects 'in combination' with other plans and projects.

2.1.6 This report has been prepared having regard to all relevant case law relating to the 2017 Regulations, the Habitats Directive and Birds Directive. This includes the ruling by the Court of Justice of the European Union (CJEU) in the case of People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17).

2.1.7 This case held that; "it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site" (paragraph 40). This establishes that 'mitigation measures' cannot be taken into account at the HRA Stage 1 (screening), but they can be taken into account

at HRA Stage 2 - Appropriate Assessment. However, it is important to note that not all mitigation measures are excluded from consideration – only those "intended to avoid or reduce the harmful effects of the… project on that site". Mitigation measures which are, for example, intended to avoid effects on a local watercourse outside the European site designated boundary but which outfalls into the European designated site, can be taken into account as the benefit conveyed to the European site is coincidental and the measures would be delivered as part of good practice even if no European sites were present.

2.1.8 This represents a deviation from the approach usually adopted in the Ecological Impact Assessment (EcIA), which considers embedded mitigation (even those measures that are included to directly avoid or reduce harmful effects on a European designated site) to form a part of the Proposed Development and takes these measures into account when assessing the potential impacts on qualifying habitats and species.

2.1.9 Where mitigation measures are mentioned in this report and taken into account at the screening stage, they are therefore ones which may reduce or avoid harmful effects on certain (local) habitats or species but are not relied on to directly avoid or reduce harmful effects on the qualifying features of the European designated sites. This includes standard best practice mitigation measures incorporated into the Construction Environmental Management Plan (CEMP) such as surface water drainage attenuation.

HRA Stage 2 – Appropriate Assessment

2.1.10 Where it is determined that a conclusion of 'no Likely Significant Effect' cannot be drawn, the HRA assessment proceeds to the next stage of HRA known as Appropriate Assessment. Case law has clarified that 'Appropriate Assessment' is not a technical term. In other words, there are no specific technical analyses, or level of detail, that are classified by law as belonging to Appropriate Assessment rather than the screening for LSE. The Appropriate Assessment constitutes whatever level of further assessment is required to determine whether an adverse effect on integrity would arise.

2.1.11 By virtue of the fact that it follows the screening process, there is an understanding that the analysis will be more detailed than that undertaken at the previous stage. One of the key considerations during Appropriate Assessment is whether there is available mitigation that would address the potential effect, allowing for a conclusion of no adverse effect on integrity. In practice, the Appropriate Assessment takes any element of the Proposed Development that could not be excluded as having LSE following HRA Stage 1 and assesses the potential for an effect in more detail, with a view to concluding whether there would be an adverse effect on site integrity. Adverse effects on site integrity include disruption of the coherent structure and function of the European site(s) and the ability of the site to achieve its conservation objectives.

2.1.12 In 2018 the Holohan ruling was handed down by the European Court of Justice. Among other provisions paragraph 39 of the ruling states that *'As regards other*

habitat types or species, which are present on the site, but for which that site has not been listed, and with respect to habitat types and species located outside that site, … typical habitats or species must be included in the appropriate assessment, if they are necessary to the conservation of the habitat types and species listed for the protected area' [emphasis added]. This ruling has been considered in relation to the Proposed Development and European sites that are linked to the proposal via an impact pathway. For example, the Southern North Sea SAC is designated for harbour porpoise, which range vast distances beyond the designated site boundary. Harbour porpoise *Phocoena phocoena* are known to regularly forage within the lower stretches of the River Tees and potential impacts of the Proposed Development on habitat use in the lower Tees require assessment.

The Rochdale Envelope

2.1.13 In July 2018, the Inspectorate published Advice Note Nine: Rochdale Envelope (The Planning Inspectorate, 2018), explaining how the principles of the Rochdale Envelope should be used by planning applications for the Environmental Impact Assessment (EIA) process.

2.1.14 The Rochdale Envelope[1] is applicable where some of the details of a Proposed Development cannot be confirmed when an application is submitted, and flexibility is needed to address uncertainty. Notwithstanding, all significant potential effects of a Proposed Development must be properly addressed.

2.1.15 It encompasses three key principles:

- The assessment should use a cautious worst-case approach;
- The level of information assessed should be sufficient to enable the Likely Significant Effects of a Proposed Development to be assessed; and
- The allowance for flexibility should not be abused to provide inadequate descriptions of projects.

2.1.16 This HRA has given due consideration to the Rochdale Envelope. The worst-case (i.e., the potentially most impactful) construction/decommissioning and operational scenarios have been assessed in relation to impact pathways.

Nutrient Neutrality

2.1.17 Natural England has issued advice highlighting the need to consider the LSEs of nutrients on internationally designated sites (Natural England, 2022). Development plans can be considered 'nutrient neutral' where they can demonstrate that they will cause no overall increase in nutrient pollution affecting specified European sites. This has been considered in the compiling of this report.

In Combination Effects

2.1.18 It is a requirement of Regulation 63(a) of the 2017 Regulations to not only assess the impacts of a development project alone, but also to investigate whether there is a potential for in-combination effects with other projects or plans. In practice, such in-

[1] The Rochdale Envelope arises from two cases: R. v Rochdale MBC ex parte Milne (No.1) and R. v Rochdale MBC ex parte Tew [1999], which are cases that dealt with outline planning applications for a proposed business park in Rochdale.

combination assessment is of greatest relevance when an impact pathway relating to a project would otherwise be screened out – not because it is not present – but because its individual contribution is considered not to result in LSEs.

2.1.19 For the purposes of this HRA, several plans, projects and strategies proposing/ aiming for development have been identified, which may act in-combination with the Proposed Development. These are set out in Chapter 5 of this report.

2.1.20 Paragraph 4.9 of the Inspectorate Advice Note Ten requires an evaluation of the potential for the Project to require other consents which could also require HRA by different competent authorities, and a statement as to whether the Scheme boundary overlaps with devolved administrations or other European Economic Area (EEA) States.

3.0 BASELINE EVIDENCE GATHERING

3.1 Scope of the Project

3.1.1 There is no guidance that dictates the general physical scope of an HRA of a Project. Therefore, in considering the physical scope of the assessment, we were guided primarily by the identified impact pathways (called the source-pathway-receptor model).

3.1.2 Briefly defined, impact pathways are routes by which the implementation of a project can lead to an effect upon a European designated site. An example of this would be visual and noise disturbance arising from the construction/decommissioning work or operational phase associated with a project.

3.1.3 If there are sensitive ecological receptors within a nearby European site (e.g., non-breeding overwintering birds), this could alter their foraging and roosting behaviour and potentially affect the site's integrity. For some impact pathways (notably air pollution) there is guidance that sets out distance-based zones required for assessment. For others, a professional judgment must be made based on the best available evidence.

3.2 Relevant European Sites

3.2.1 Guidance published by the Environment Agency (Environment Agency, 2016) recommends that for large power generation developments greater than 50 MW, a radius of search of 15 km should be used when identifying relevant European designated sites which may be affected by the development. The Proposed Development is a 1.2 GWth Hydrogen Production Facility and as such, a Zone of Influence of 15 km (minimum) has been used.

3.2.2 Table 3-1 presents the European sites (as shown on Figure 3-1: European Designated Sites Screened into the Assessment of LSE within 15 km) identified within a 15 km radius of the Proposed Development.

Table 3-1: European designated sites within 15 km of the Proposed Development Site

SITE NAME	PROXIMITY TO MAIN SITE (APPROX)	PROXIMITY TO CONNECTION CORRIDORS
Teesmouth and Cleveland Coast Special Protection Area (SPA)	10 m north	Adjacent to/overlapping
The Teesmouth and Cleveland Coast Ramsar	173 m at closest point	Adjacent to/overlapping
North York Moors Special Area of Conservation (SAC)	12.1 km south-east	8.0 km south-east
North York Moors SPA	12.1 km south-east	8.0 km south-east

SITE NAME	PROXIMITY TO MAIN SITE (APPROX)	PROXIMITY TO CONNECTION CORRIDORS
Durham Coast SAC	13.7 km north-west	11.0 km north-west
Northumbria Coast SPA	13.7 km north	11.0 north
Northumbria Coast Ramsar	13.7 km north-west	11.0 km north
Castle Eden Dene SAC	Over 15 km	14.3 km north-west

3.2.3 The North York Moors SAC / SPA, Northumbria Coast SPA / Ramsar and Castle Eden Dene SAC are considered in the context of operational stack emissions from the Proposed Development, which have the potential to affect European sites that lie relatively far from industrial developments.

3.2.4 In addition to the above listed sites, Table 13-2 presents European designated sites list marine mammals or migratory fish as qualifying species which range great distances and are therefore screened into the assessment of LSE.

Table 3-2: European sites >15 km from the proposed development which support qualifying features which could be affected.

SITE NAME	DISTANCE AND DIRECTION FROM SITE (AT CLOSEST POINT)
Berwickshire and North Northumberland Coast SAC	87.72 km north
Humber Estuary SAC	106.38 km south
Southern North Sea SAC	101.34 km east
River Tweed SAC	107.27 km north
Tweed Estuary SAC	135.95 km north
The Wash and North Norfolk Coast SAC	187.05 km south

3.2.5 Although Ramsar sites are not explicitly covered by the Conservation of Habitats and Species Regulations (2017), paragraph 176 of the National Planning Policy Framework (NPPF) in England extends Ramsar sites the same level of protection as SPAs and SACs. Therefore, the Teesmouth and Cleveland Coast Ramsar and the Northumbria Coast Ramsar are considered in this assessment.

Summary of Designated Sites and Qualifying Features

3.2.6 An introduction to the designated sites listed within Tables 3-1 and 3-2 above, and a summary of the qualifying features, conservation objectives and threats / pressures to site integrity is provided in the following sections.

Teesmouth and Cleveland Coast SPA

Introduction

3.2.7 The Teesmouth and Cleveland Coast SPA, originally classified in 1995, is an estuarine and coastal site located on the north-eastern coast of England of approximately 12,210.62 ha. It comprises a range of coastal habitats, such as sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes. The SPA / Ramsar lies along a stretch of coast that has been significantly modified by human activity. The site provides feeding and roosting opportunities for a significant number of waterfowl in winter and the passage period. Furthermore, little tern *Sterna albifrons* breed on beaches within the site during summer and sandwich tern *Sterna sandvicensis* use the SPA / Ramsar as a stop-over location on passage.

3.2.8 The SPA was extended in January 2020 to add breeding avocet *Recurvirostra avosetta*, breeding common tern *Sterna hirundo* and non-breeding ruff *Calidris pugnax* as protected features. The extension also included additional areas of coastal and wetland habitats, the River Tees channel and the shallow coastal waters of Tees Bay.

SPA Qualifying Features

3.2.9 The site qualifies as a SPA under Article 4 of the Birds Directive (2009/147/EC) by supporting populations of the following features (Natural England, 2020a):

- Pied avocet *Recurvirostra avosetta* (breeding);
- Red knot *Calidris canutus* (non-breeding);
- Ruff *Calidris pugnax* (non-breeding);
- Common redshank *Tringa totanus* (non-breeding);
- Sandwich tern *Sterna sandvicensis* (non-breeding);
- Common tern *Sterna hirundo* (breeding);
- Little tern *Sterna albifrons* (breeding); and,
- Waterbird assemblage.

Conservation Objectives

3.2.10 The conservation objectives for the Teesmouth and Cleveland Coast SPA are to:

"*Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:*

- *the extent and distribution of the habitats of the qualifying features;*
- *the structure and function of the habitats of the qualifying features;*
- *the supporting processes on which the habitats of the qualifying features rely;*
- *the population of each of the qualifying features; and,*

- *the distribution of the qualifying features within the site"* (Natural England, 2020b).

Threats and Pressures

3.2.11 The following threats / pressures to the site integrity of the Teesmouth and Cleveland Coast SPA have been identified in Natural England's Site Improvement Plan (Natural England, 2014a):

- Physical modification
- Public access / disturbance
- Direct land take from development
- Water pollution
- Fisheries: Commercial marine and estuarine
- Fisheries: Recreational marine and estuarine
- Undergrazing
- Inappropriate water levels
- Predation
- Coastal squeeze
- Change to site conditions
- Air pollution: Impact of atmospheric nitrogen deposition.

Teesmouth and Cleveland Coast Ramsar

Introduction

3.2.12 The Teesmouth and Cleveland Coast Ramsar site is a wetland of international importance, comprising intertidal sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes. The boundaries of the Teesmouth and Cleveland Coast Ramsar overlap with the Teesmouth and Cleveland Coast SPA. The Ramsar site was extended in 2020 to include additional terrestrial areas within the Tees estuary and along the foreshore to the north and south because of the site's international importance for waterbirds.

Qualifying Features

3.2.13 The site qualifies as a Ramsar for the following Ramsar criteria (Natural England, 2020c):

- Criterion 5 - Assemblages of international importance
  - Species with peak counts in winter
    - 26,786 waterfowl (5-year peak mean 2011/12-2015/16)
- Criterion 6 - Species/populations occurring at levels of international importance
  - Qualifying Species/populations (as identified at designation)

- Species with peak counts in spring / autumn:
- Common redshank *Tringa totanus*; 1,648 individuals representing an average of 1.1% of the East Atlantic population (1987-91)

- Species with peak counts in winter:
- Red knot *Calidris canutus islandica*; 5,509 individuals representing an average of 1.6% of the NE Canada/Greenland/Iceland/UK population (5-year peak mean 1991/92-1995/96)
- Sandwich tern *Thalasseus sandvicensis*; 1,900 individuals representing an average of 4.3% of the GB population (1988-1992)

3.2.14 The threats and pressures to the Teesmouth and Cleveland Coast Ramsar are considered to be the same as for the Teesmouth and Cleveland Coast SPA (refer to paragraph 3.3.7 above).

North York Moors SAC

Introduction

3.2.15 The North York Moors SAC is a 44,053.29 ha in size and is a large site that comprises a variety of habitats, most notably heath and scrub (73%), dry grassland (15%), and bogs and marshes (4%). The site lies in north-east Yorkshire within the North York Moors National Park and contains the largest contiguous area of upland heather moorland in England.

3.2.16 Half the site is covered by dry heath, which forms the main vegetation type on the western, southern and central moors. Wet heath is the second most dominant habitat that is found in the eastern and northern moors, where the soil is not as free-draining. Together the heathland components are the primary reason for qualifying the SAC.

3.2.17 Blanket bog is also a qualifying feature, which occurs along the watersheds of some of the high moors on relatively deep peat. The blanket bog areas are managed for grouse through rotational burning and extensive sheep grazing. In recent decades bracken has become dominant in areas that used to harbour ericaceous species. The site comprises boggy flushes with rushes and mires with Sphagnum mosses and sedges. The SAC, particularly the bog elements, support populations of upland breeding bird species including merlin and golden plover (see the North York Moors SPA below).

Qualifying Features (Natural England, 2019a)

- Annex I habitats that are a primary reason for selection of this site:
  - Northern Atlantic wet heaths with *Erica tetralix*; and
  - European dry heaths
- Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:
  - Blanket bogs

Conservation Objectives (Natural England, 2018a and 2019)

3.2.18 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; the conservation objectives are to:

"*Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;*

- *The extent and distribution of the qualifying natural habitats;*
- *The structure and function (including typical species) of the qualifying natural habitats; and*
- *The supporting processes on which the qualifying natural habitats rely.*"

Threats and Pressures to Site Integrity (Natural England, 2014c)

3.2.19 The following threats / pressures to the site integrity of the North York Moors SAC have been identified in Natural England's Site Improvement Plan:

- Climate change;
- Air pollution: Impact of atmospheric nitrogen deposition;
- Disease;
- Invasive species;
- Managed rotational burning;
- Planning permission: Mineral and waste;
- Game management: Grouse Moors;
- Changes in species distributions;
- Agriculture;
- Energy production;
- Wildfire / arson.

<u>North York Moors SPA</u>

Introduction

3.2.20 The upland moorland that represents the qualifying habitat of the North York Moors SAC (described above) also supports significant populations of upland breeding birds, in particular golden plover and merlin.

Qualifying Features (Natural England, 2019b)

- Annex II species that are a primary reason for selection of this site:
  - Merlin *Falco columbianus*; 526 pairs representing at least 2.3% of the breeding population in Great Britain (numbers are at time of designation); and

- European golden plover *Pluvialis apricaria*; 40 pairs representing at least 3.1% of the breeding population in Great Britain

Conservation Objectives (Natural England, 2019b and 2019c)

3.2.21 With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; the conservation objectives are to:

"*Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Birds Directive, by maintaining or restoring:*

- *The extent and distribution of the habitats of the qualifying features;*
- *The structure and function of the habitats of the qualifying features;*
- *The supporting processes on which the habitats of the qualifying features rely;*
- *The population of each of the qualifying features; and*
- *The distribution of the qualifying features within the site.*"

Threats / Pressure to Site Integrity

3.2.22 The following threats / pressures to the site integrity of the North York Moors SPA have been identified in Natural England's Site Improvement Plan (Natural England, 2014c):

- Climate change;
- Air pollution: Impact of atmospheric nitrogen deposition;
- Disease;
- Invasive species;
- Managed rotational burning;
- Planning permission: Mineral and waste;
- Game management: Grouse Moors;
- Changes in species distributions;
- Agriculture;
- Energy production; and
- Wildfire / arson.

Durham Coast SAC

Introduction

3.2.23 The Durham Coast SAC is a 389.61 ha site comprising coastal sand dunes (43%), shingle / sea cliffs (31%), marine areas (21%) and humid grassland (5%). It is the only example of a vegetated sea cliff on Magnesian Limestone in the UK, extending along the North Sea coastline for 20 km.

3.2.24 The SAC's vegetation is unique in the British Isles, consisting of a mosaic of calcareous and neutral grasslands, tall-herb fen, seepage flushes and wind-pruned scrub. These habitats harbour a wide range of species with varied ecological niches and requirements, often including rare or scarce species. The Durham Coast SAC also supports significant populations of breeding seabirds, wintering waders and rare invertebrates, such as the Durham argus *Aricia Artaxerxes salmacisi* (Natural England, 2014d).

Qualifying Features

- Annex I habitats that are a primary reason for selection of this site:
  - Vegetated sea cliffs of the Atlantic and Baltic Coasts

Conservation Objectives

3.2.25 The conservation objectives for the Durham Coast SAC are to:

"*Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;*

- *The extent and distribution of qualifying natural habitats*
- *The structure and function (including typical species) of qualifying natural habitats, and*
- *The supporting processes on which the qualifying natural habitats rely"* (Natural England, 2018c).

Threats and Pressures

3.2.26 The following threats / pressures to the site integrity of the Durham Coast SAC have been identified in Natural England's Site Improvement Plan (Natural England, 2014e):

- Natural changes to site conditions;
- Inappropriate coastal management;
- Invasive species;
- Fertiliser use;
- Vehicles: Illicit;
- Changes to site conditions; and
- Public access / disturbance.

3.2.27 Additional supplementary advice on conserving and restoring site features was published in 2019 and should be read together with the conservation objectives (Natural England, 2019d).

Northumbria Coast SPA / Ramsar

Introduction

3.2.28 The Northumbria Coast SPA comprises several discrete sections of rocky foreshore between the north of Northumberland and the County Durham. The site also includes an area of sandy beach. The SAC largely includes cliffs, crags / ledges, intertidal rock, open coast and pools. The site is subject to a range of recreational activities, including walking, sea angling, birdwatching and water sports.

3.2.29 The SPA was classified in 2000 for supporting internationally important populations of over-wintering purple sandpiper and turnstone, and a breeding colony of little tern at Beadnell Bay.

SPA Qualifying Features (JNCC, 2018)

3.2.30 Annex I species that are a primary reason for selection of this site:

- Arctic tern *Sterna paradisae*a; 1,549 pairs representing 2.92% of the GB population
- Little tern *Sternula albifrons*; 40 pairs representing 1.7% of the GB population

3.2.31 Annex II species that are a primary reason for selection of this site:

- Turnstone *Arenaria interpres*; 1,739 individuals representing 2.6% of the biogeographic population
- Purple sandpiper *Calidris maritima*; 787 individuals representing 1.6% of the biogeographic population

Ramsar Qualifying Features (RSIS, 2000b)

1.1.1 The site qualifies as a Ramsar for the following Ramsar criteria:

- Criterion 6 - Species/populations occurring at levels of international importance
  - Qualifying Species/populations (as identified at designation)
  - Species with peak counts in winter:
    - Purple sandpiper *Calidris maritima*; 787 individuals representing an average of 1.6% of the population (5-year peak mean for 1992/93 to 1996/97)
    - Turnstone *Arenaria interpres*; 1,739 individuals representing an average of 2.6% of the population (5 year peak mean for 1992/93 to 1996/97)
  - Species with peak counts during the breeding season:
    - Little tern *Sterna albifrons*; 40 pairs representing an average of 1.7% of the GB population (5 year mean for 1993 to 1997)

SPA Conservation Objectives (Natural England, 2019e)

3.2.32 With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

3.2.33 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site.

Threats / Pressures to Site Integrity (Natural England, 2015b)

3.2.34 The following threats / pressures to the site integrity of the Northumbria Coast SPA have been identified in Natural England's Site Improvement Plan:

- Public access / disturbance;
- Water pollution;
- Invasive species;
- Changes in species distributions;
- Predation;
- Coastal squeeze;
- Direct impact from third party;
- Transportation and service corridors;
- Change in land management;
- Air pollution: Risk of atmospheric nitrogen deposition; and
- Fisheries: Commercial marine and estuarine.

Castle Eden Dene SAC

Introduction

3.2.35 Castle Eden Dene represents the most extensive northerly native occurrence of yew *Taxus baccata* woods in the UK. Extensive yew groves are found in association with ash-elm *Fraxinus-Ulmus* woodland, and it is the only site selected for yew woodland on magnesian limestone in north-east England.

Qualifying Features

3.2.36 Annex I habitats that are a primary reason for selection of this site:

- Yew dominated woodland.

Conservation Objectives

3.2.37 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change:

3.2.38 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats;
- The structure and function (including typical species) of qualifying natural habitats, and,
- The supporting processes on which qualifying natural habitats rely.

Threats / Pressures to Site Integrity (Natural England, 2015b)

3.2.39 The following threats / pressures to the site integrity of Castle Eden Dene SAC have been identified in Natural England's Site Improvement Plan:

- Invasive species;
- Forestry and woodland management;
- Deer, and,
- Air pollution: impact of atmospheric nitrogen deposition.

Berwickshire and North Northumberland Coast SAC

Introduction

3.2.40 The Berwickshire and North Northumberland Coast SAC is a 65,226.12ha site in north-east England comprising a variety of habitats, including marine areas / sea inlets (73.2%), tidal rivers and estuaries (13.4%), coastal sand dune (4.5%) and shingle / sea cliffs (6.7%).

3.2.41 The SAC comprises an extensive stretch of intertidal sand- and mudflats, which range from wave-exposed beaches to sheltered muddy flats. Parts of these harbour the largest intertidal beds of narrow-leaved eelgrass *Zostera angustifolia* and dwarf eelgrass *Z. noltei*. Some of the beds harbour large beds of mussels, sand-eels, small crustaceans and polychaete worms.

3.2.42 Furthermore, the SAC comprises an extensive stretch of reef coastline. The subtidal rocky reefs harbour rich marine communities. The community variety is due to the wide range of physical conditions in the area, ranging from wave-exposed locations, open coast to sheltered reefs. The Farne Islands are especially important because they are some of the few rocky islands with extensive reefs.

3.2.43 It is the most south-easterly site selected for grey seal, supporting around 2.5% of the annual UK pup production.

Qualifying Features (JNCC, 2020b)

3.2.44 Annex I habitats that are a primary reason for selection of this site:

- Mudflats and sandflats not covered by seawater at low tide;
- Large shallow inlets and bays;
- Reefs; and
- Submerged or partially submerged sea caves.

3.2.45 Annex II species that are a primary reason for selection of this site:

- Grey seal *Halichoerus grypus*

Conservation Objectives (Natural England, 2014f)

3.2.46 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; the conservation objectives are to:

3.2.47 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Threats / Pressures to Site Integrity (Natural England, 2015b)

3.2.48 The following threats / pressures to the site integrity of the Berwickshire and North Northumberland Coast SAC have been identified in Natural England's Site Improvement Plan:

- Public access / disturbance;
- Water pollution;
- Invasive species;
- Changes in species distribution;
- Predation;
- Coastal squeeze;
- Transportation and service corridors;

- Change in land management;
- Air pollution: Risk of atmospheric nitrogen deposition; and
- Fisheries: Commercial marine and estuarine.

Humber Estuary SAC

Introduction

3.2.49 The Humber Estuary SAC is 36,657.15 ha in size and is a large estuarine site in north-eastern England comprising a variety of habitats, including tidal rivers / estuaries (94.9%), saltmarsh (4.4%), coastal sand dunes (0.4%) and bogs / marshes (0.4%).

3.2.50 The SAC is a large macro-tidal coastal plain estuary with high suspended sediment loads. It is a dynamic system that feeds accreting and eroding intertidal and subtidal sand- and mudflats, saltmarsh and reedbeds. It also harbours a range of sand dune types, sandbanks and coastal lagoons. Salinity declines upstream, giving rise to tidal reedbeds and brackish saltmarsh communities. The SAC harbours a significant fish assemblage, including river lamprey and sea lamprey.

3.2.51 The estuary is a favoured feeding site for wintering and passage wildfowl, which forage in the different habitats of the SPA. The sandy habitats attract knot and grey plover, while waterfowl prefer the wetland zones. At high tide, mixed flocks of birds occupy key roost sites, which are under pressure due to the combined effects of land claim, coastal squeeze and habitat loss.

Qualifying Features (JNCC, 2020d)

3.2.52 Annex I habitats that are a primary reason for selection of this site:

- Estuaries; and
- Mudflats and sandflats not covered by seawater at low tide.

3.2.53 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- Sandbanks which are slightly covered by sea water all the time;
- Coastal lagoons;
- Salicornia and other annuals colonizing mud and sand;
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
- Embryonic shifting dunes;
- Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”);
- Fixed coastal dunes with herbaceous vegetation (“grey dunes”); and
- Dune with *Hippopha rhamnoides*.

3.2.54 Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Sea lamprey *Petromyzon marinus*;

- River lamprey *Lampetra fluviatilis*; and
- Grey seal *Halichoerus grypus*.

Conservation Objectives (Natural England, 2020b)

3.2.55 With regard to the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; the conservation objectives are to:

3.2.56 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site

Threats / Pressures to Site Integrity (Natural England, 2020c)

3.2.57 The following threats / pressures to the site integrity of the Humber Estuary SAC have been identified in Natural England's Site Improvement Plan:

- Water pollution;
- Coastal squeeze;
- Changes in species distributions;
- Undergrazing;
- Invasive species;
- Natural changes to site conditions;
- Public access / disturbance;
- Fisheries: Fish stocking;
- Fisheries: Commercial marine and estuarine;
- Direct land take from development;
- Air pollution: Impact of atmospheric nitrogen deposition;
- Shooting / scaring; and
- Inappropriate scrub control.

Southern North Sea SAC

Introduction

3.2.58 The Southern North Sea SAC is a large (3,695,054 ha), offshore site comprising entirely marine habitat (100%). Its purpose is to protect the primary habitat for harbour porpoise *Phocoena phocoena*, which uses a network of habitat patches in the North Sea.

3.2.59 Harbour porpoises display seasonal differences in the relative use of marine habitats. The SAC was identified using harbour porpoise sightings data to identify areas that consistently harboured elevated densities of harbour porpoise. The SAC has been designated due to its importance for porpoise both in the summer and winter months.

Qualifying Features (JNCC, 2020e)

3.2.60 Annex II species that are a primary reason for selection of this site:

- Harbour porpoise *Phocoena phocoena*

Conservation Objectives (JNCC and Natural England, 2019e)

3.2.61 To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters. In the context of natural change, this will be achieved by ensuring that:

- Harbour porpoise is a viable component of the site;
- There is no significant disturbance of the species; and
- The condition of supporting habitats and processes, and the availability of prey is maintained.

Threats / Pressures to Site Integrity

3.2.62 The following threats / pressures to the site integrity of the Southern North Sea SAC have been identified based on the site's qualifying feature:

- Water pollution;
- Changes in species distributions;
- Fisheries: Commercial marine and estuarine;
- Construction of offshore and coastal infrastructure projects (e.g. wind farms, pipelines, harbours); and
- Noise disturbance.

River Tweed SAC

Introduction

3.2.63 The River Tweed SAC is the most species-rich river with *Ranunculus* in the north-eastern part of its range. It has high ecological diversity which is partly due to its diverse geological setting. Examples of its vegetation include stream water-crowfoot

Ranunculus penicillatus, fan-leaved water-crowfoot *R. circinatus* and common water-crowfoot R. aquatilis. The river is also designated for its significant assemblage of Atlantic salmon *Salmo salar*, otter *Lutra lutra*, sea lamprey *Petromyzon marinus*, brook lamprey *Lampetra planeri* and river lamprey *Lampetra fluviatilis*.

Qualifying Features (JNCC, 2020f)

3.2.64 Annex I habitats that are a primary reason for selection of this site:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

3.2.65 Annex II species that are a primary reason for selection of this site:

- Atlantic salmon; and
- Otter.

3.2.66 Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Sea lamprey;
- Brook lamprey; and
- River lamprey.

Conservation Objectives (Natural England, 2014g)

3.2.67 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; the conservation objectives are to:

3.2.68 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Threats / Pressures to Site Integrity (Natural England, 2014h)

3.2.69 The following threats / pressures to the site integrity of the River Tweed SAC have been identified in Natural England's Site Improvement Plan:

- Water pollution;

- Invasive species;
- Physical modification; and
- Water abstraction.

Tweed Estuary SAC

Introduction

3.2.70 The Tweed Estuary SAC is a 156.24 ha European site, comprising tidal rivers / estuaries (90%) and salt marsh (10%). The SAC is a long and narrow estuary that discharges into the North Sea. Its water quality is classified as excellent throughout, supporting a wide range of habitats. These include substantial sandbanks, areas of rocky shore (at its mouth), estuarine boulders and cobbles (further upstream). The most exposed sandy shores are subject to wave action from the sea and scouring from the outflowing river. Species and habitats reflect these conditions, with diversity decreasing with increasing exposure.

3.2.71 The SAC also harbours intertidal sand- and mudflats. The sand is subject to wave action and scouring by the river, which is reflected by a mobile infaunal community consisting mainly of crustaceans and few polychaetes. More sheltered areas of the estuary support robust polychaetes, amphipods, oligochaetes and enchytraeids.

Qualifying Features (JNCC, 2020g)

3.2.72 Annex I habitats that are a primary reason for selection of this site:

- Estuaries; and
- Mudflats and sandflats not covered by seawater at low tide.

3.2.73 Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Sea lamprey; and
- River lamprey.

Conservation Objectives (Natural England, 2014i)

3.2.74 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; the conservation objectives are to:

3.2.75 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;

- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Threats / Pressures to Site Integrity (Natural England, 2015)

3.2.76 The following threats / pressures to the site integrity of the Tweed Estuary SAC have been identified in Natural England's Site Improvement Plan:

- Public access / disturbance;
- Water pollution;
- Invasive species;
- Changes in species distribution;
- Predation;
- Coastal squeeze;
- Transportation and service corridors;
- Change in land management;
- Air pollution: Risk of atmospheric nitrogen deposition; and
- Fisheries: Commercial marine and estuarine.

The Wash and North Norfolk Coast SAC

Introduction

3.2.77 The Wash is the largest marine embayment (107,718ha) with the second largest intertidal sediment flats in the country. It comprises extensive fine sand and coarse sand banks, which support a community of polychaetes, bivalves and crustaceans. Some unusual communities also occur, including brittlestar beds and reef-building ross worm *Sabellaria spinulosa*.

3.2.78 The North Norfolk Coast is the only British example of a barrier beach system, with extensive areas of saltmarsh with characteristic creek patterns having developed behind sand and shingle spits and bars. Communities include the bivalve peppery furrow shell *Scrobicularia plana* and lugworm *Arenicola marina.* In the more exposed open coast areas, the fauna is sparser.

3.2.79 The SAC is important for breeding and moulting of one of Europe's largest populations of common seal *Phoca vitulina*. Furthermore, the intertidal mudflats and salt marshes represent one of Britain's most important winter-feeding areas for waders and wildfowl.

Qualifying Features (JNCC, 2020c)

3.2.80 Annex I habitats that are a primary reason for selection of this site:

- Sandbanks which are slightly covered by sea water all the time;

- Mudflats and sandflats not covered by seawater at low tide;
- Large shallow inlets and bays;
- Reefs;
- Salicornia and other annuals colonizing mud and sand;
- Atlantic salt meadows (*Glauco-Puccinelllietalia maritimae*); and
- Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticose*).

3.2.81 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- Coastal lagoons

3.2.82 Annex II species that are a primary reason for selection of this site:

- Harbour seal *Phoca vitulina*

3.2.83 Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Otter *Lutra lutra*

Conservation Objectives (Natural England, 2014j)

3.2.84 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; the conservation objectives are to:

3.2.85 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Threats / Pressures to Site Integrity (Natural England, 2014k)

3.2.86 The following threats / pressures to the site integrity of The Wash and North Norfolk Coast SAC have been identified in Natural England's Site Improvement Plan:

- Inappropriate water levels;

- Public access / disturbance;
- Siltation;
- Fisheries: Recreational marine and estuarine;
- Invasive species;
- Inappropriate coastal management;
- Fisheries: Commercial marine and estuarine;
- Predation;
- Coastal squeeze;
- Change in land management;
- Air pollution: Impact of atmospheric nitrogen deposition; and
- Changes in species distributions.

4.0 TEST OF LIKELY SIGNIFICANT EFFECTS

4.1 Introduction

4.1.1 This section examines the LSEs of the Proposed Development. It is structured by development phase. Within each development phase each potential impact pathway (e.g., noise & visual disturbance, air quality etc.) is discussed separately, covering all European sites to which that impact pathway applies. Each European site to which an impact pathway potentially applies is considered below under the heading describing the type of impact and shown on Figure 4-1: European Designated Sites Screened into the Assessment of LSE. The analysis is summarised in the screening matrices in Appendix C of this HRA.

4.2 Construction

Direct Habitat Loss

4.2.1 The Main Site is located immediately adjacent to the Teesmouth and Cleveland Coast SPA and Ramsar. There will be no direct loss of habitat which forms part of the European designated sites within the Main Site.

4.2.2 The Main Site will require a hydrogen pipeline network to various potential industrial off-takers across the Tees Valley to the Production Facility. Various construction methodologies are being considered including Horizontal Direct Drilling (HDD), below ground open-trench, installation on existing above ground pipe racks, and repurposing and reuse of existing pipelines; however, this is subject to ongoing design work, discussions with landowners and statutory consultees as well as being informed by environmental surveys.

4.2.3 The Teesmouth and Cleveland Coast SPA and Ramsar are within the boundary of Proposed Development Site, and there is thus potential for direct loss of habitat where HDD launch pits, open cut trenches or new above ground pipe racks are proposed within or immediately adjacent to the designated sites.

4.2.4 **It is expected at this stage that careful routing decisions or construction techniques will be used to avoid any direct loss of habitat within a European site boundary. However, that cannot be confirmed at this point and therefore habitat loss within the Teesmouth and Cleveland Coast SPA and Ramsar is screened into Appropriate Assessment.**

4.2.5 There will be no direct habitat loss within any other European sites listed in Tables 3-1 and 3-2 and these can be screened out.

Loss of Functionally Linked Habitat

4.2.6 Habitats within and adjacent to the Proposed Development Site have the potential to be used by the qualifying species of the Teesmouth and Cleveland Coast SPA and Ramsar for breeding, roosting and/or feeding.

4.2.7 **Bird surveys to inform the Proposed Development are ongoing at the time of writing. On a precautionary basis, direct loss of functionally linked habitat used by**

the qualifying bird species of the Teesmouth and Cleveland Coast SPA and Ramsar is screened into Appropriate Assessment.

4.2.8 The North York Moors SPA is designated for breeding golden plover which nest within the moorland vegetation. The site is also designated for breeding merlin which nest within mature of degenerate heather. As the habitats within and adjacent to the Proposed Development site are unsuitable for breeding golden plover and merlin there will be no LSE and this pathway can be screened out.

4.2.9 Northumbria Coast SPA/Ramsar is the next closest European site designated for bird species. It is located 10.1 km north of the Proposed Development Site. According to unpublished Natural England guidance on functionally linked land Impact Risk Zones for sites designated for birds[2], significant impacts on functionally- linked habitats from this type of development will not arise more than 10 km at most from the designated site. There will thus be no LSEs and this pathway can be screened out.

4.2.10 All other European sites listed in Tables 3-1 and 3-2 are designated for habitats or non-avian qualifying features and can be screened out.

Noise and Visual Disturbance

4.2.11 Noise and visual disturbance during the construction phase of the Proposed development has the potential to disturb the bird assemblage of the Teesmouth and Cleveland Coast SPA and Ramsar. At the Main Site, visual and noise disturbance could arise from increased human activity on site, the use of machinery and plant and construction of the new building (the tallest element will be the Flare, with a maximum height of 100 m). Visual and noise disturbance from human activity, plant and machinery could also occur during the construction of new pipeline routes.

4.2.12 The Natural England Site Improvement Plan (SIP) for the Teesmouth and Cleveland Coast SPA / Ramsar highlights that the site is sensitive to public access and disturbance, primarily as a result of recreational users accessing the beach (Natural England, 2014a). This recreational pressure effect is primarily due to the birds responding to visual and (probably to a lesser extent) auditory stimuli, which also result from the construction / decommissioning or operation of nearby industrial plants. Therefore, it is considered that the SPA / Ramsar is sensitive to visual and noise disturbance associated with the Proposed Development.

4.2.13 A study on recreational disturbance in the Humber (Fearnley, Liley & Cruickshanks, 2012) assesses different types of noise disturbance on waterfowl referring to studies relating to aircraft (see Drewitt, 1999), traffic (Reijnen, Foppen, & Veenbaas, 1997), dogs (Lord, Waas, & Innes 1997; Banks & Bryant 2007) and machinery (Delaney et al, 1999). These studies identified that there is still relatively little work on the effects of different types of water-based craft and the impacts from jet skis, kite surfers, windsurfers etc. (see Kirby *et al*, 2004 for a review). Some types of disturbance are clearly likely to invoke different responses. In very general terms, both distance from the source of disturbance and the scale of the disturbance (noise level, group size) will influence the response (Delaney *et al*, 1999; Beale & Monaghan, 2005). On UK

[2] Knight M. (March 2019). Impact Risk Zones Guidance Summary – Sites of Special Scientific Interest Notified for Birds. Version 1.1. 8pp.

estuaries and coastal sites, a review of WeBS data showed that, among the volunteer WeBS surveyors, driving of motor vehicles and shooting were the two activities most perceived to cause disturbance (Robinson & Pollitt, 2002).

4.2.14 The degree of impact that varying levels of noise will have on different species of bird is relatively poorly understood. Research published by the Institute of Estuarine & Coastal Studies in 2013, summarises the key evidence base relating to this impact pathway[3]. Based on the observed responses of waterbirds to noise stimuli, an acceptable receptor dose (i.e., maximum noise level at the bird) of 'below 70 dB' has been identified in discussion with Natural England on schemes in other parts of England and elsewhere on the Tees. As part of discussions involving the adjacent Net Zero Teesside Project Natural England officers advised that a 70 dB metric was appropriate to use for impact assessment regarding the Teesmouth and Cleveland Coast SPA / Ramsar. Natural England confirmed that the birds of the SPA / Ramsar site are tolerant of a wide range of noise variation, including levels higher than those to which they are currently exposed at Coatham Dunes[4].

4.2.15 The Teesmouth and Cleveland Coast SPA/Ramsar site harbours qualifying species throughout the entire year (breeding terns and avocet in summer and non-breeding waders in winter), and visual and noise disturbance associated with construction / decommissioning work is thus not a seasonal issue. It requires consideration throughout the entire year. However, only some parts of the SPA / Ramsar are used for nesting by the breeding species.

4.2.16 Given that that the SPA / Ramsar is directly adjacent to the Main Site and connection corridors, it is possible that construction activities could result in visual disturbance of the SPA's / Ramsar's waterfowl if it takes place during the passage or winter period (i.e. October to March inclusive), or to the nesting tern and avocet for which the SPA / Ramsar is designated if it takes place during the breeding period (i.e. March to June), depending on location.

4.2.17 It is also possible that noise disturbance may occur depending on the noise levels arising from the construction works (for example piling at the Main Site).. Therefore, it is concluded that the Proposed Development could result in LSEs on the SPA / Ramsar birds regarding noise disturbance.

4.2.18 In addition to noise, large structures (e.g., tall buildings, bridges and wind turbines) can change the behaviour of birds by affecting their sight- and flight lines. This can result in a collision risk barrier effect or displacement, which could make birds more vulnerable to predation or result in the loss of foraging habitat. The maximum building height and the average building height of the Proposed Development are the main parameters to consider regarding the potential impact of tall buildings. The potential for buildings and structures within the main site to result in visual disturbance will be discussed in further detail at Appropriate Assessment.

[3] The University's research is available at the following link: http://bailey.persona-pi.com/Public-Inquiries/M4%20-%20Revised/11.3.67.pdf.
[4] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002330-NZT%20DCO%205.13%20-%20Habitats%20Regulations%20Assessment%20Report%20(Clean)%20Oct%202022%20(D9).pdf

4.2.19 **Noise and visual disturbance of the non-breeding and breeding interest features of the Teesmouth & Cleveland Coast SPA / Ramsar is screened into Appropriate Assessment.**

4.2.20 Noise and visual disturbance for all other sites listed in Tables 3-1 and 3-2 can be screened out due to distance.

Noise and Visual Disturbance in functionally linked habitat

Birds

4.2.21 Habitats within and adjacent to the Proposed Development Site have the potential to be used by the qualifying bird species of the Teesmouth and Cleveland Coast SPA and Ramsar for breeding, roosting and/or feeding. **Bird surveys are ongoing at the time of writing, therefore disturbance of qualifying bird species within functionally linked habitats has been screened into Appropriate Assessment on a precautionary basis.**

Marine Mammals

4.2.22 Within the wider area which surrounds the Proposed Development Site there are four SACs designated for marine mammals:

- Berwickshire and North Northumberland Coast SAC (approximately 87 km to the north; designated partly for grey seal),
- the Humber Estuary SAC (approximately 106 km to the south-east; designated partly for grey seal),
- Southern North Sea SAC (approximately 101 km to the east; designated partly for harbour porpoise).
- The Wash and North Norfolk Coast SAC (approximately 187 km to the south-east; designated partly for harbour seal).

4.2.23 All these qualifying marine mammal species are mobile and might travel far beyond the designated site boundaries. Therefore, it cannot be excluded that the Proposed Development (or the area immediately surrounding it) might perform a role in supporting these qualifying species.

4.2.24 The Proposed Development Site is located within the International Council for the Exploration of the Sea (ICES) Greater North Sea Ecoregion, which in part forms the boundaries for the Inter-Agency Marine Mammal Working Group (IAMMWG) Marine Mammal Management Units (MUs) for the North Sea (ICES, 2021; IAMMWG, 2022).

4.2.25 The presence of harbour and grey seals within the Teesside area is well known, including abundances, seasonality, and known haul out locations (locations on land where seals come ashore to rest, moult or breed) for these species. The immediate area around the Proposed Development Site is of local importance for harbour seal and grey seal due to the presence of a breeding colony and haul-out sites at Seal Sands and along Greatham Creek. Harbour seals are the most abundant (INCA, 2022).

Harbour Seal

4.2.26 Seal Sands is a known haul-out site for a breeding colony of harbour seal, which use the intertidal mudflats in this area. Greatham Creek is also known to be frequented by small numbers of individuals, which haul-out at multiple locations along the creek, particularly at Bailey Bridge.

4.2.27 Seals Sands and its population in the River Tees, is the only significant haul-out site within the NE England MU (Natural Environment Research Council Special Committee on Seals, 2021), which also includes harbour seals found at Holy Island, situated off the north-east coast of England, south of Berwick-upon-Tweed.

4.2.28 Incidental sightings of harbour seal were recorded by AECOM on Seal Sands during Proposed Development related surveys, on nine different days between October 2022 and March 2023. A total of 144 were recorded across this period and all were considered to be adults. The seals were observed hauled-out at scattered locations on Seal Sands and in Greatham Creek.

4.2.29 The maximum number of harbour seal in the Tees Estuary has increased overall since 2010, with the highest estimate recorded to date observed in August 2022 with 162 individuals (INCA, 2022). This included 36 pups, the highest number and increase recorded. There were also no pup deaths reported during weaning in 2022, being the highest survivability rate recorded since 1989. Within the Tees Estuary, pupping is known to take place mostly at Seal Sands, with some also at Bailey Bridge.

4.2.30 The pupping season at the Tees typically occurs during late June and lasts for about three weeks into late July, typical of other populations in the north-east Atlantic (INCA, 2022). The moulting season follows, typically from mid-August until early September, when seals spend a considerable amount of time out of the water to rest and conserve heat.

4.2.31 Although harbour seals are present within the vicinity of the Proposed Development Site and are likely to use the adjacent sea area for foraging, in the context of wider populations in the North Sea, the immediate Study Area is not considered to be heavily used by this species compared to other areas around the UK coast (refer to Chapter 14: Marine Ecology (PEI Report, Volume I) for further detail).

Grey Seal

4.2.32 The Proposed Development Site and the wider Tees area falls within the North-east England Seal MU. Within this management unit there are major colonies of grey seals in both the north (Isle of May, Fast Castle, Farne Islands) and south (Donna Nook, Blakeney Point and Horsey/Winterton), either side of the Tees area (refer to Chapter 14 of the PEI Report for further detail).

4.2.33 The latest count of grey seals in the North Sea, which included the North-east England MU, as well as East Scotland and Southeast England MUs, took place in between 2016-2018 and was estimated at 19,160 individuals (Natural Environment Research Council Special Committee on Seals, 2021). Pup production in North-east England has continued to increase rapidly with a mean increase of 53% between 2014 and 2019. Most of the increase in the North Sea has been due to the continued

rapid expansion of newer colonies on the mainland coasts in Berkwickshire, Lincolnshire, Norfolk and Suffolk.

4.2.34 Grey seals forage in the open sea in depths up to 100 m and, like harbour seals, they return regularly to haul-out on land where they rest, moult and breed. They may range widely to forage, with foraging trips lasting between 1 to 30 days (Natural Environment Research Council Special Committee on Seals, 2021). Modelling has shown that grey seals typically spend 43% of their foraging time within 10 km of a haul-out site (McConnell *et al*., 1999), with maximum foraging range believed to be up to 135 km (Natural Environment Research Council Special Committee on Seals, 2020).

4.2.35 Seal Sands site on the River Tees is an important haul-out site for this species, although the grey seal population here is smaller than that for harbour seals (INCA, 2022). However there has been an overall increase in the grey seal population since 2010. Maximum recordings of individuals on Seal Sands were down between 2018 and 2020. However, a peak count of 96 individuals was recorded in August 2022, when all grey seals counted were hauled-out on Seal Sands, suggesting that population size is increasing.

4.2.36 Incidental sightings recorded by AECOM during Project related surveys on nine different days between October 2022 and March 2023 observed 94 adult grey seals, all hauled-out on Seal Sands.

4.2.37 In December 2022, a grey seal pup at Seal Sands was recorded alongside an adult female, which is thought to be the first observation of a grey seal born in the Tees (INCA, 2022). Grey seals are also known to use Greatham Creek but are only occasionally recorded there in small numbers.

4.2.38 Although grey seals are present within the Study Area and are likely to use the adjacent sea area for foraging, in the context of the populations in the wider North Sea the Study Area is not considered to be heavily used by this species.

Noise and Visual Disturbance - Seals

4.2.39 The potential for noise and visual disturbance to affect harbour seals and grey seals is considered in Chapter 14: Marine Ecology (PEI Report, Volume I). Marine and land-based construction activities associated with the Proposed Development will create airborne sound and changes in visual cues which have the potential to disturb seals that are hauled-out nearby or have surfaced. The effects of disturbance could include a cessation of feeding, travelling, resting, breeding and/or socialising. Long-term effects of repeated disturbance could include a permanent displacement and/or a decline in fitness and productivity (such as moulting and breeding success).

4.2.40 **Noise modelling is being completed at the time of writing, therefore based upon a precautionary approach, noise and visual disturbance of grey seals and harbour seals within functionally linked land (qualifying features of the Berwickshire and North Northumberland Coast SAC, the Humber Estuary SAC and the Wash and North Norfolk Coast SAC) are taken forward to Appropriate assessment.**

Harbour Porpoise

4.2.41 The Southern North Sea SAC, which is designated for harbour porpoise, is located over 100 km away from the Proposed Development Site. The Inspectorate have agreed that effects upon the Southern North Sea SAC can be scoped out of the ES as there are no impact pathways from underwater sound arising from the proposals (The Planning Inspectorate, 2023). As such, LSE upon harbour porpoise is also screened out.

Migratory Fish

4.2.42 Two sites to the north of the Proposed Development are designated for migratory fish; the River Tweed SAC (approx. 107 km to the north) and the Tweed Estuary SAC (approx. 135 km to the north). The River Tweed SAC is designated for Atlantic salmon and sea lamprey, while the Tweed Estuary SAC is designated for sea lamprey only. The aforementioned Humber Estuary SAC is also designated partly for sea lamprey. These species are anadromous (i.e. spawn upstream in rivers) and complete their life cycle in the sea. Atlantic salmon in particular are known to undertake long migratory journeys in the sea during their adult life stage. Therefore, it was considered to what extent the Proposed Development could interfere with fish migration routes along the east coast of England.

4.2.43 **The proposed connection routes will cross the River Tees and Greatham Creek, and there is potential for noise and vibration arising from construction to affect migratory fish. Therefore, based upon a precautionary approach, the potential for noise and vibration to affect Atlantic salmon and sea lamprey (qualifying features of the River Tweed SAC and the Tweed Estuary SAC) will be taken forward to Appropriate Assessment.**

Atmospheric Pollution

4.2.44 The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH_3) and sulphur dioxide (SO_2) and are summarised in Table 4-1. Ammonia can have a directly toxic effect upon vegetation, particularly at close distances to the source such as near road verges (CEH, 2016a). NOx can also be toxic at very high concentrations (far above the annual average Critical Level). However, in particular, high levels of NOx and NH_3 are likely to increase the total nitrogen deposition to soils, potentially leading to deleterious effects in resident ecosystems. For example, an increase in the total nitrogen deposition from the atmosphere is widely known to enhance soil fertility and to lead to eutrophication. This often has adverse effects on the community composition and quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats (Wolseley et al, 2006; Dijk, 2011). The total nitrogen deposition resulting from a plan or project is therefore often assessed as the overarching parameter determining atmospheric pollution.

4.2.45 The only pollutants likely to be associated with construction of the Proposed Development are NOx and ammonia, which will be primarily determined by the associated traffic movements (relating to both on-site construction traffic and commuter traffic) and any diesel plant required for construction or decommissioning.

Table 4-1: Main sources and effects of air pollutants on habitats and species (CEH, 2016b)

POLLUTANT	SOURCE	EFFECTS ON HABITATS AND SPECIES
Ammonia (NH_3)	Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilization of animal wastes. It is a naturally occurring trace gas, but ammonia concentrations are directly related to the distribution of livestock. It also derives from some vehicle exhausts. Ammonia reacts with acid pollutants such as the products of SO_2 and NO_X emissions to produce fine ammonium (NH_{4+}) - containing aerosol. Due to its significantly longer lifetime, NH_{4+} may be transferred much longer distances (and can therefore be a significant trans-boundary issue). While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.	The negative effect of NH_{4+} may occur via direct toxicity, when uptake exceeds detoxification capacity and via N accumulation. Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath species (lichens, mosses) to grasses is often seen. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides (NOx)	Nitrogen oxides are mostly produced in combustion processes. Half of NO_X emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes. In contrast to the steep decline in Sulphur dioxide emissions, nitrogen oxides are falling	Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g. roadside verges). A critical level of NOx for all vegetation types has been set to 30 ug/m3. Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3)) contributes to the total

POLLUTANT	SOURCE	EFFECTS ON HABITATS AND SPECIES
	slowly due to control strategies being offset by increasing numbers of vehicles.	nitrogen deposition and may lead to both soil and freshwater acidification. In addition, NOx contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.
Nitrogen deposition	The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO_X) or reduced (e.g. NH_3) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices. The N pollutants together are a large contributor to acidification (see above).	All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally. Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N as well as many graminoid (grass) species. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.

4.2.46 The Air Pollution Information System (APIS) forms the major source of information regarding the air quality impact pathway. It specifies a NOx concentration (Critical Level) for the protection of vegetation of 30 μgm^{-3}. In addition, ecological studies have determined 'Critical Loads' for atmospheric nitrogen deposition (that is, NOx combined with ammonia NH_3).

4.2.47 The Teesmouth and Cleveland Coast SPA / Ramsar is partly designated for breeding little tern, which make their simple nests ('scrapes') in various habitats, such as shingle and dunes. One of their requirements for breeding success is an absent or short sward, so they can form their nests. APIS identifies that terns are sensitive to the broad impacts from NOx, as excessive input might result in the increase of tall grasses and soil acidification, preventing the ability of terns to breed successfully.

4.2.48 The APIS website has a Site Relevant Critical Load Function tool which enables the sensitivity of each interest feature of each European site to be examined. Scrutiny of that tool for Teesmouth and Cleveland Coast SPA / Ramsar site identifies that the only species for which APIS suggests adverse effects may occur due to elevated NOx or nitrogen deposition are the nesting terns, for the reasons given above, and nesting avocet. APIS identifies that this species is sensitive to nitrogen deposition on its nesting habitat. However, the habitat associated with this species on APIS is littoral sediment, which has a relatively high nitrogen tolerance (a minimum critical load of 20 kg N/ha/yr).

4.2.49 According to Natural England Guidance (Natural England, 2018b) and Institute of Air Quality Management Guidance (IAQM, 2019) beyond 200 m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant. This is therefore the distance that has been used throughout this HRA to determine whether the Teesmouth and Cleveland Coast SPA / Ramsar is likely to be significantly affected by site traffic associated with the Proposed Development.

4.2.50 An assessment of the traffic likely to be associated with the project has been conducted. The greatest number of vehicle movements will occur in the construction / decommissioning phase of the development. A Transport Assessment (TA) is being undertaken to determine the effects of the construction phase on the transport network, which includes a description of current and future baseline conditions (including link and junction flows), calculations of the construction traffic flows and the likely routes to be taken by site traffic and abnormal traffic loads. An Air Quality Impact Assessment will also be undertaken and using the National Highways Design Manual for Roads and Bridges (DMRB) screening model, Volume LA 105 (Air Quality).

4.2.51 The results of the modelling are not available at time of writing. Therefore, Likely Significant Effects on the nesting terns and nesting avocet through NOx and nitrogen deposition cannot be screened out at this point. **Therefore, atmospheric pollution in the Teesmouth and Cleveland Coast SPA / Ramsar due to construction / decommissioning traffic is screened into Appropriate Assessment.**

Changes in Water Quality (including Nutrient Neutrality)

4.2.52 There is potential for changes in water quality resulting from:

- disturbance of contaminated soils and perched groundwater, and the creation of new pathways to sensitive receptors (including construction workers and controlled waters) during construction;
- pollution of surface watercourses within or near the Proposed Development Site during construction and decommissioning, due to spillages or polluted surface water run-off entering a watercourse;

4.2.53 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support, and therefore integral to meeting a site's Conservation Objectives. Poor water quality can have a range of environmental impacts. At high concentrations, toxic chemicals and heavy metals can result in the immediate death of aquatic life (both flora and fauna). At lower

concentrations, negative impacts may be more subtle and could increase vulnerability to disease or change the behaviour of wildlife. These substances, especially Polychlorinated Biphenyls (PCBs), accumulate in minuscule benthic organisms and then biomagnify as they are passed up the food chain. Furthermore, they are not easily biodegraded over time. Overall, there are two broad types of toxic compounds in aquatic environments, namely synthetic and non-synthetic (i.e. naturally occurring) substances.

4.2.54 Toxic contamination may arise from synthetic toxic compounds, such as pesticides, PCBs (polychlorinated biphenyls) and biocides. Some of these substances are endocrine disrupting chemicals, which have the capacity to mimic animal hormones, prevent their production or breakdown. As discussed above, many of the synthetic compounds tend to accumulate over time and are likely to be present in animal tissue or substrate for long periods of time. Another factor in determining the magnitude of water pollution is the amount of hydrological mixing and tidal flushing that a site receives.

4.2.55 Non-synthetic compounds, such as fuel oils and heavy metals, occur in the environment naturally at relatively low concentrations, but become toxic at higher concentrations. Oil pollution is particularly damaging (and persistent) in intertidal environments, where natural degradation and weathering of oils is slow. Aside from their significant contribution to nutrient levels, Wastewater Treatment Works (WwTWs) are also major contributors of heavy metals, such as zinc, lead, copper and nickel. Heavy metal pollution might change the benthic assemblages in intertidal habitats. For example, it was demonstrated that a high concentration of heavy metals resulted in less diverse communities with lower overall abundances of crustaceans and polychaetes (Stark, 1998).

4.2.56 The Teesmouth and Cleveland Coast SPA / Ramsar is designated for its breeding tern and avocet and overwintering waterfowl. While aquatic pollutants may have direct effects on SPA / Ramsar birds, it is the indirect effects of synthetic and non-synthetic compounds on their supporting habitats and prey species that are of greatest concern. Natural England's SIP for the SPA / Ramsar indicates that past improvements to wastewater treatment and catchment management have significantly reduced the input of nutrients and contaminants into the Tees (Natural England, 2014a). However, the SIP still identifies water pollution as a concern for the SPA / Ramsar because contaminants from historic pollution events are stored in the sediments, potentially still affecting the benthic fauna.

4.2.57 To establish the ecological baseline communities, a Phase 1 study and macroinvertebrate sampling was undertaken in sites relevant to the Proposed Development. These included Greatham Creek and Bran Sands. The saltmarsh habitat located around Greatham Creek is comprised of species such as annual sea-blite *Suaeda maritima*, common saltmarsh-grass *Puccinellia maritima*, sea plantain *Plantagon maritima*, greater sea-spurrey *Spergularia media*, sea lavender *Limonium vulgare*, long-spiked glasswort *Salicornia dolichostacha*, yellow glasswort *Salicornia fragilis*, sea aster *Aster tripolium*, sea arrowgrass *Triglochin maritima* and saltmarsh rush *Juncus gerardii*. Bran Sands is an area of intertidal muddy sandflats to the north

of the Proposed Development. The results show that Bran Sands supports relatively complex and diverse benthic communities, including species such as common cockle *Cerastoderma edule* and lugworm *Arenicola marina*.

4.2.58 While none of the species of the infaunal community are qualifying features of the SPA / Ramsar, they are likely to be integral food sources for qualifying waders, including redshank and knot. These species forage on a range of species, such as molluscs and crustaceans. By affecting the prevailing water quality, the Proposed Development might reduce the abundance and diversity of benthic invertebrates, which could have a knock-on effect on the qualifying bird species. This is particularly important because, despite the industrialised nature of the surrounding area, chemical sediment analysis has shown no evidence of high contaminant levels that might affect benthic habitat and / or species.

4.2.59 It is considered that the potential for toxic contamination of European sites during the construction phase is an issue that requires further consideration, given that in places the SPA/Ramsar site lies adjacent to the Proposed Development Site, and in some instances overlaps with the boundary. Given the short distance involved, there is potential for toxic runoff and leachate reaching sensitive ecological receptors. **This impact pathway is screened in for Appropriate Assessment regarding the Teesmouth and Cleveland Coast SPA / Ramsar as it could affect the ability of the site to achieve its Conservation Objectives by impacting the supporting processes on which the qualifying features of the SPA/Ramsar rely.**

4.2.60 During the construction / decommissioning phase of the Proposed Development, non-toxic wastewater will be primarily produced by toilets for construction / decommissioning staff. This will be treated on-site using package plant with effluent disposed off-site (i.e. not discharged into local watercourses). Therefore, it is concluded that organic pollution from sewage effluent is not an issue for the construction or decommissioning period. Construction / decommissioning period treated wastewater impacts on the Teesmouth and Cleveland Coast SPA / Ramsar are therefore screened out from Appropriate Assessment as there is no mechanism for it to affect the Conservation Objectives of the site.

4.2.61 **In summary, the Proposed Development is screened in for Appropriate Assessment due to potential water quality impacts during construction / decommissioning as a result of oil, fuel and chemical spillages resulting in toxic surface run-off and leachate into the Teesmouth and Cleveland Coast SPA / Ramsar.**

4.3 Operational Period

Visual and noise disturbance

4.3.1 Once complete, the Proposed Development will be operational 24 hours a day. An assessment of the potential for visual and noise disturbance during the operational period was therefore undertaken. It is considered that activity within the Main Site options would not result in significant visual disturbance of qualifying birds in the Teesmouth and Cleveland Coast SPA / Ramsar because the site of the Proposed Development has a long history of industrial use and the overwintering birds in this SPA / Ramsar have traditionally been used to activity from site staff even though

numbers of people in the area have been low in recent years. Overall, visual disturbance of Teesmouth and Cleveland Coast SPA / Ramsar during operation is screened out from Appropriate Assessment due to habituation which will not interfere with the ability of the SPA to achieve its Conservation Objectives.

4.3.2 **At the time of writing, noise modelling for the main site was not available. Therefore, based upon a precautionary approach, LSE on the Teesmouth and Cleveland Coast SPA / Ramsar from operational noise is screened into Appropriate Assessment. All other European sites can be screened out due to their distances from the Project.**

Atmospheric pollution

4.3.3 At time of writing, an Atmospheric Impact Assessment (AIA) is being undertaken using detailed air dispersion modelling to determine the potential impact of the NOx and ammonia emissions from the operational power station. However, it has not yet been completed.

4.3.4 It has already been discussed in the construction / decommissioning period section of this HRA report that the terns and nesting avocets of the Teesmouth & Cleveland Coast SPA / Ramsar are the only species which are sensitive to the broad impacts from NOx and nitrogen deposition. The APIS Site Relevant Critical Load Function tool also identifies that:

- No species are identified as being adversely affected by acidification (which can result from nitrogen deposition); and
- Since the SPA / Ramsar is designated for breeding tern and avocet and for passage / wintering waterfowl and waders, toxic effects of ammonia on vegetation are less ecologically important to the SPA / Ramsar site than its role in nitrogen deposition.

4.3.5 The air quality modelling as it currently stands identifies that several of the modelled locations within Teesmouth & Cleveland Coast SPA/Ramsar will be subject to nitrogen deposition as a result of the scheme which exceeds 1% of the minimum part of the critical load range (reaching 2.7% of the critical load). In line with Natural England guidance this means that likely significant effects cannot be dismissed on purely mathematical grounds. Consideration will be required of the areas affected and the extent to which this will affect those SPA and Ramsar birds (terns and avocets) that are sensitive to nitrogen deposition. Since air quality modelling is still being finalised at time of writing and the 1% of the critical load threshold is exceeded, **LSEs on the SPA/Ramsar site cannot be dismissed and Appropriate Assessment is required.**

4.3.6 The North York Moors SAC is designated for blanket bogs (nitrogen Critical Load of 5-10 kg N/ha/yr) and two types of heathland communities (nitrogen Critical Load of 5-10 kg N/ha/yr). According to the Site Relevant Critical Load page on APIS for the SPA these are not only the reasons for SAC designation but also the key habitats on which the SPA species rely within the SPA boundary. As such these two sites are discussed together here despite having different interest features as the relevant habitats are identical. A review of habitat mapping in MAGIC indicates that the north-western

section of the SAC comprises only heathland and the critical Load of 5-10 kg N/ha/yr applicable to heathland is therefore to be used and there will be no impact on bogs. **The North York Moors SAC/SPA has been included in the air quality modelling for the PEI Report because it falls beyond the 10 km zone used for the air quality assessment. However, this will be reviewed in the context of the latest guidance for the ES**.

4.3.7 Durham Coast SAC is not identified on APIS as being sensitive to nitrogen or acid deposition and no Critical Loads are available for this site on which to base any assessment. With regard to the Northumbria Coast SPA / Ramsar, according to APIS the only interest features sensitive to nitrogen deposition are the nesting terns. These colonies are located at the mouth of the Long Nanny Burn in Beadnell Bay, much further north than the area affected by the Proposed Development. Since these sites are either not sensitive to nitrogen deposition or will be affected to a negligible degree, LSEs on the Durham Coast SAC and the Northumbria Coast SPA / Ramsar from air pollution can be screened out.

4.3.8 The operational phase of the Proposed Development will also be associated with site traffic (e.g. vehicles transporting staff or machinery within the site) and commuter traffic. However, Chapter 15: Traffic and Transport (PEI Report, Volume I) identifies that the Proposed Development will have a maximum of 130people (staff) working on a shift basis over 24 hours per day and as such this is not considered to result in a severe impact upon the highway network, and no further assessment of the operational effects has been included... The traffic flow generated during the operational phase of the Proposed Development is well below the threshold for defining an 'Affected Road' in National Highways parlance[5] and is therefore considered to have a negligible effect on air quality. Pollution from operational vehicle movements is therefore screened out from Appropriate Assessment.

4.3.9 **In summary, the Proposed Development is screened in for Appropriate Assessment regarding operational atmospheric pollution due to the forecast nitrogen dose at the closest part of Teesmouth & Cleveland Coast SPA / Ramsar and North York Moors SAC / SPA.**

Water quality

4.3.10 In the absence of mitigation, similar water quality issues are likely to be relevant for the Proposed Development in the operational phase as apply in the construction / decommissioning phase. This includes potentially toxic surface run-off and leachate from machinery and plant involved in the day-to-day operation of the power plant, and non-toxic pollution from sewage effluent. Unmitigated, these pollutants may enter the Teesmouth and Cleveland Coast SPA / Ramsar directly or indirectly via groundwater / surface water in hydrological continuity with these European sites.

4.3.11 The effluent streams from the Proposed Development will include process water (e.g. process condensate from the reforming process, cooling tower blowdown water and demineralisation plant rejects), foul water and surface water runoff. A summary of

[5] Defined as a change of 1,000 two-way AADT (Annual Average Daily Traffic)

the water cycle is provided in Appendix 9D Nutrient Neutrality Screening Assessment (PEI Report, Volume III).

4.3.12 A new surface water drainage network and management system will be provided for the Main Site that will provide adequate interception, conveyance, and treatment of surface water runoff from buildings and hard standing. This will be separate to foul systems for welfare facilities and process effluent generated by the operation of the Proposed Development Site. The connection corridors will not require additional drainage as they will be using existing pipe racks, pipe bridges, culverts or otherwise installed underground.

4.3.13 Surface water drainage will discharge to the Tees Estuary via Dabholm Gut. There are three options for this route: 1) direct feed to Dabholm Gut (with any new pipework and outfall to be consented under a subsequent planning application); 2) discharge via the existing Brans Sands discharge pipeline; or 3) discharge via the NZT pipeline.

4.3.14 Due to the nature of the Proposed Development, it is likely that a range of different diffuse pollutant types (including nutrients) may be present in surface water runoff, with concentrations varying depending on many factors. However, this risk will be offset by the fact that the Proposed Development Site is a brownfield site that is currently not operating (i.e., surface water from the Proposed Development Site may already contain diffuse chemical pollutants).

4.3.15 A Surface Water Drainage Strategy will be defined in consultation with the Environment Agency, the Lead Local Flood Authorities and other statutory agencies.

4.3.16 Once operational the Proposed Development would provide staff with toilets that are connected to the mains. Wastewater will discharge to the NZT outfall at Tees Bay. In March 2022, Natural England published advice to competent authorities regarding the effects of increased nutrients on a series of European sites around England. For these identified European sites, Natural England's advice was that their ability to achieve their conservation objectives was compromised by existing nutrient inputs from agricultural and treated effluent sources. In their March 2022 letter, Natural England identified Teesmouth & Cleveland Coast SPA as one of the European sites suffering from excess nutrient inputs. This **impact pathway is therefore screened in for Appropriate Assessment.**

4.3.17 **In summary, the Proposed Development in the operational period is screened in for Appropriate Assessment regarding the Teesmouth and Cleveland Coast SPA / Ramsar, pending further design information. This is due to the following impact pathways that could affect the Conservation Objectives of the SPA through affecting the supporting processes of the SPA:**

- Water quality impacts as a result of oil, fuel and chemical spillages resulting in toxic surface run-off and leachate;
- Wastewater effluent from domestic water usage within the site.

4.3.18 All other European designated sites are screened out due to the distance from the Project or the lack of hydrological connections.

Coastal squeeze

4.3.19 Coastal squeeze is a term that originates from coastal management, whereby intertidal habitats which could be used by the Teesmouth and Cleveland Coast SPA / Ramsar birds are lost as the sea level rises and inland brownfield development (e.g., a sea wall or an industrial complex) prevents the inland migration of habitats (e.g. saltmarsh) and its associated species. A good background summary on this impact pathway can be found in Doody (2013). As a result, the habitat is 'squeezed' and reduces in size. This is a significant process, particularly in geographic areas that are highly urbanised or that are rapidly transitioning from an undeveloped to developed state.

4.3.20 The main site will be located on brownfield land in a coastal landscape. As such, the project will not result in any loss of greenfield land adjacent to the coast. Overall, it is considered that LSEs can be excluded, and coastal squeeze as a result of the Proposed Development is screened out from Appropriate Assessment as it will not arise.

4.3.21 **In summary, coastal squeeze will not arise and is therefore not taken forward to Appropriate Assessment.**

4.4 Decommissioning Period

4.4.1 The Production Facility will have a design life of 25 years (for each Phase). At the end of its operational life, the most likely scenario would be that the Proposed Development would be shut down, with all above ground structures on the Main Site removed, and the ground remediated as required to facilitate future re-use. The Applicant will assess at that time whether any infrastructure should be retained for future use. The same timescales would apply for the hydrogen pipeline and utility connections.

4.4.2 A Decommissioning Plan (DEMP) (including Decommissioning Environmental Management Plan) would be produced and agreed with the Environment Agency as part of the Environmental Permitting surrender process and pursuant to a DCO Requirement. The Decommissioning Environmental Management Plan would consider in detail all potential environmental risks on the Proposed Development Site and contain guidance on how risks can be removed or mitigated.

4.4.3 It is considered that the following pathways of effect could occur during decommissioning and based upon a precautionary approach, these will be considered further at Appropriate Assessment.

- Direct habitat loss;
- Loss of functionally linked land;
- Noise and visual disturbance;
- Noise and visual disturbance within functionally linked land;
- Atmospheric pollution;
- Changes in water quality;
- Effects on foraging resources which support qualifying bird species.

5.0 IN COMBINATION EFFECTS

5.1.1 It is a requirement of Regulation 63(a) of the 2017 Regulations to not only assess the impacts of a development project alone, but also to investigate whether there might be 'in-combination' effects with other projects or plans proposing development in adjacent authorities. In practice, such an 'in-combination' assessment is of greatest relevance when an impact pathway relating to a project would otherwise be screened out not because there is no impact pathway but because its individual contribution is considered to be inconsequential.

5.1.2 For example, other industrial development projects near the Proposed Development might also have effects on the air quality within the Teesmouth and Cleveland Coast SPA / Ramsar, acting in-combination with the potential NOx deposition from the CCGT units. Furthermore, the potential contaminant and nutrient input from the Proposed Development will act in-combination with water pollutants deriving from housing or industrial development allocated in Local Plans that cover adjacent authorities. Therefore, due consideration must be given to these 'in-combination' proposals, because they might exacerbate the impacts identified as relevant for the Proposed Development.

5.1.3 For the purposes of this HRA, have identified several plans, projects and strategies proposing / aiming for development, which may act in-combination with the Proposed Development have been identified. The following projects / plans require consideration:

- The Net Zero Teesside Project (awaiting Secretary of State's decision at time of writing) - This consists of a full chain carbon capture, utilisation and storage ('CCUS') project, comprising a CO_2 gathering network, including CO_2 pipeline connections from industrial facilities on Teesside to transport the captured CO_2 (including the connections under the tidal River Tees); a combined cycle gas turbine ('CCGT') electricity generating station with an abated capacity circa 850 gigawatts output (gross), cooling water, gas and electricity grid connections and CO_2 capture; a CO_2 gathering/booster station to receive the captured CO_2 from the gathering network and CCGT generating station; and the onshore section of a CO_2 transport pipeline for the onward transport of the captured CO_2 to a suitable offshore geological storage site in the North Sea.
- Clean Growth Strategy – Sets out the aim of the UK Government to deliver increased economic growth while decreasing emissions. The Strategy sets out policies and proposals to reduce emissions over the next decade, including the use of carbon capture and storage.
- Redcar & Cleveland Local Plan (Adopted May 2018) – The Redcar and Cleveland Local Plan sets out the vision and overall development strategy for the Borough in the planning period up to 2032. It details the provision of a minimum of 3,978 dwellings and 405 ha of employment land in the plan period; potential impacts to Teesmouth & Cleveland Coast SPA/Ramsar include recreational pressure leading to disturbance simultaneously with pipeline construction work at Coatham Dunes.

- Stockton-on-Tees Local Plan & Policies Map (Adopted January 2019) – The Stockton-on-Tees Local Plan sets out the detailed strategic development targets for the Borough in the planning period up to 2032. It sets out that a minimum of 10,150 new homes and 300 ha of employment land will be provided within the plan period; potential impacts to Teesmouth & Cleveland Coast SPA/Ramsar include recreational pressure leading to disturbance simultaneously with pipeline construction work at Coatham Dunes.
- Tees Valley Joint Minerals and Waste Development Plan Document (Adopted September 2011) – This Development Plan Document (DPD) contains the area's overall approach to the use of mineral resources and the management of waste. It consists of the Minerals and Waste Core Strategy DPD and the Mineral and Waste Policies and Sites DPD.
- South Tees Regeneration Master Plan (RMP, 2017) – The RMP is the overall vision and strategy for the South Tees area, seeking to bring new opportunities for investment and maximising economic development in the area; potential impacts to Teesmouth & Cleveland Coast SPA/Ramsar include recreational pressure and large-scale construction, leading to disturbance simultaneously with pipeline construction work at Coatham Dunes.
- Tees Valley Combined Authority (TVCA) – The TVCA has published three separate strategies ('Strategic Economic Plan', 'Investment Plan', 'Infrastructure Plan') that aim at increasing economic growth and creating more jobs in the Tees Valley area.
- Other projects listed in Chapter 23: Cumulative and Combined Effects of the (PEI Report, Volume I).

5.1.4 These will be analysed for the DCO Application HRA documentation, which will contain a Stage 2 Report to inform Appropriate Assessment. The in-combination assessment will particularly consider the potential cumulative effect of disturbance if increased recreational activity due to Local Plans and Proposed Development construction occur at the same time, and of the air quality and water quality pathways. However, none are expected to result in impact pathways being 'screened in' that have been 'screened out' in the preceding text. This is due to the precautionary nature of the Likely Significant Effect screening exercise undertaken for this HRA.

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APPENDIX A: FIGURES

Figure 1-1: Proposed Development Site from PEI Report, Volume II

Figure 3-1: European Designated Sites Screened into the Assessment of LSE within 15 km

Figure 4-1: European Designated Sites Screened into the Assessment of LSE

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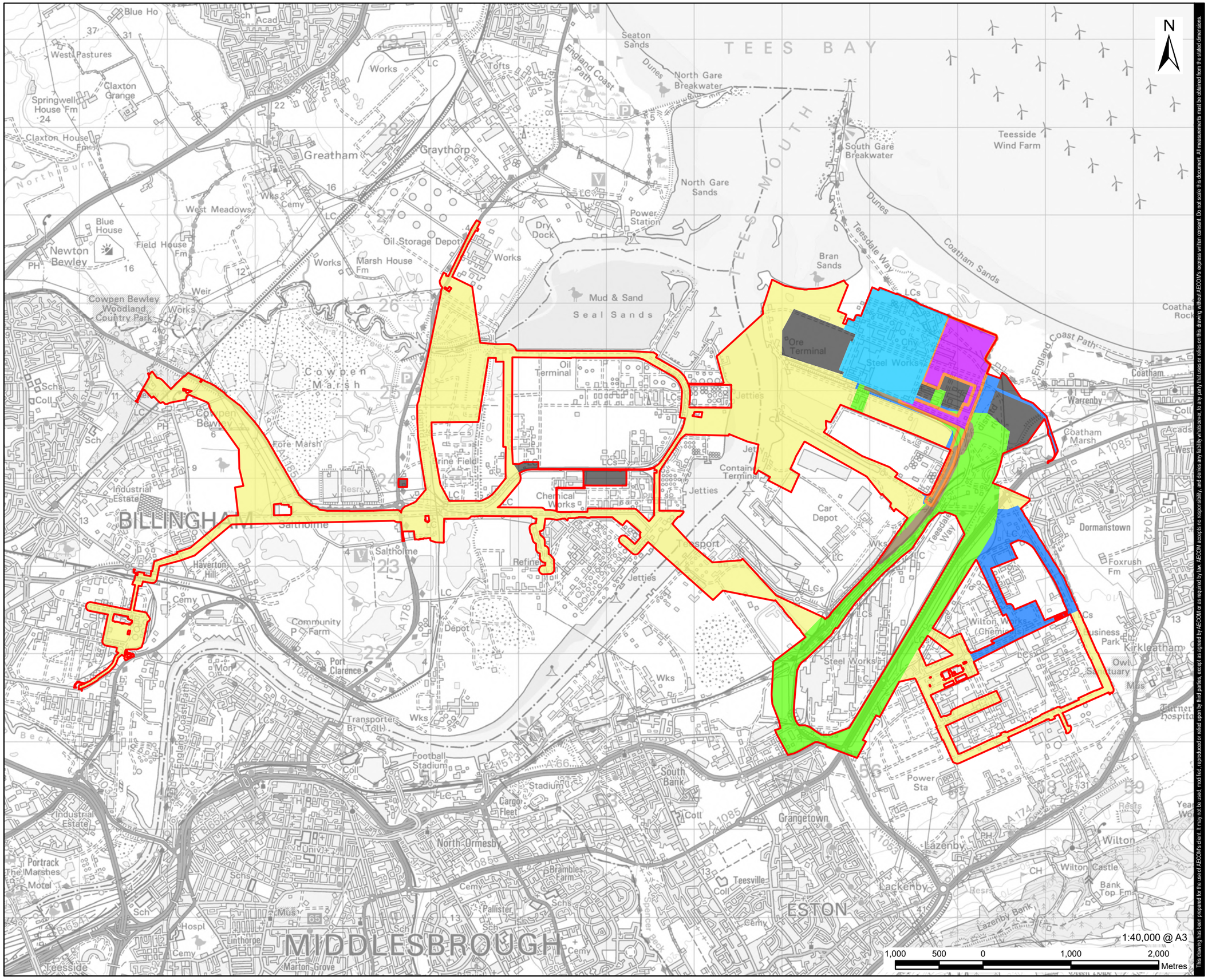

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H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

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LEGEND

- Proposed Development Site Boundary
- Main Site
- CO_2 Export Corridor
- Electrical Connection Corridor
- Hydrogen Pipeline Corridor
- Indicative Temporary Construction Laydown Areas
- Natural Gas Connection Corridor
- Other Gases Connection Corridor (O_2 and N_2)
- Water Connection Corridor

NOTES

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ISSUE PURPOSE

HRA

PROJECT NUMBER

60689030

FIGURE TITLE

Proposed Development Site from PEI Report, Volume II

FIGURE NUMBER

Figure 1-1

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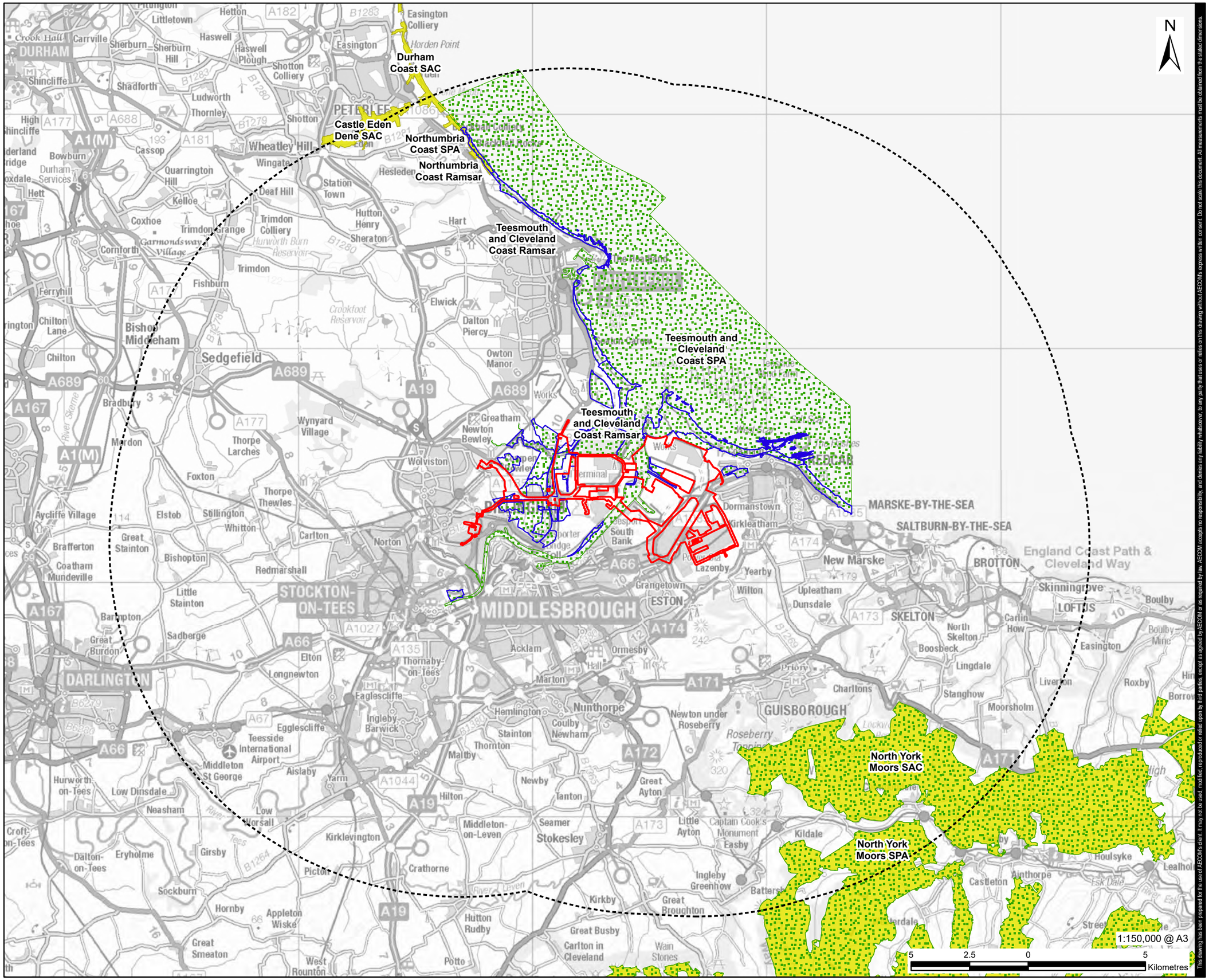

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LEGEND

- Proposed Development Site Boundary
- Proposed Development Site Boundary - 15 km Buffer
- Ramsar
- Special Areas of Conservation (SAC)
- Special Protection Area (SPA)

NOTES

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ISSUE PURPOSE

HRA

PROJECT NUMBER

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FIGURE TITLE

European Designated Sites Screened into the Assessment of LSE within 15 km

FIGURE NUMBER

Figure 3-1

Revision: 0 Drawn: MAB Checked: AD Approved: KA Date: 2023-09-04

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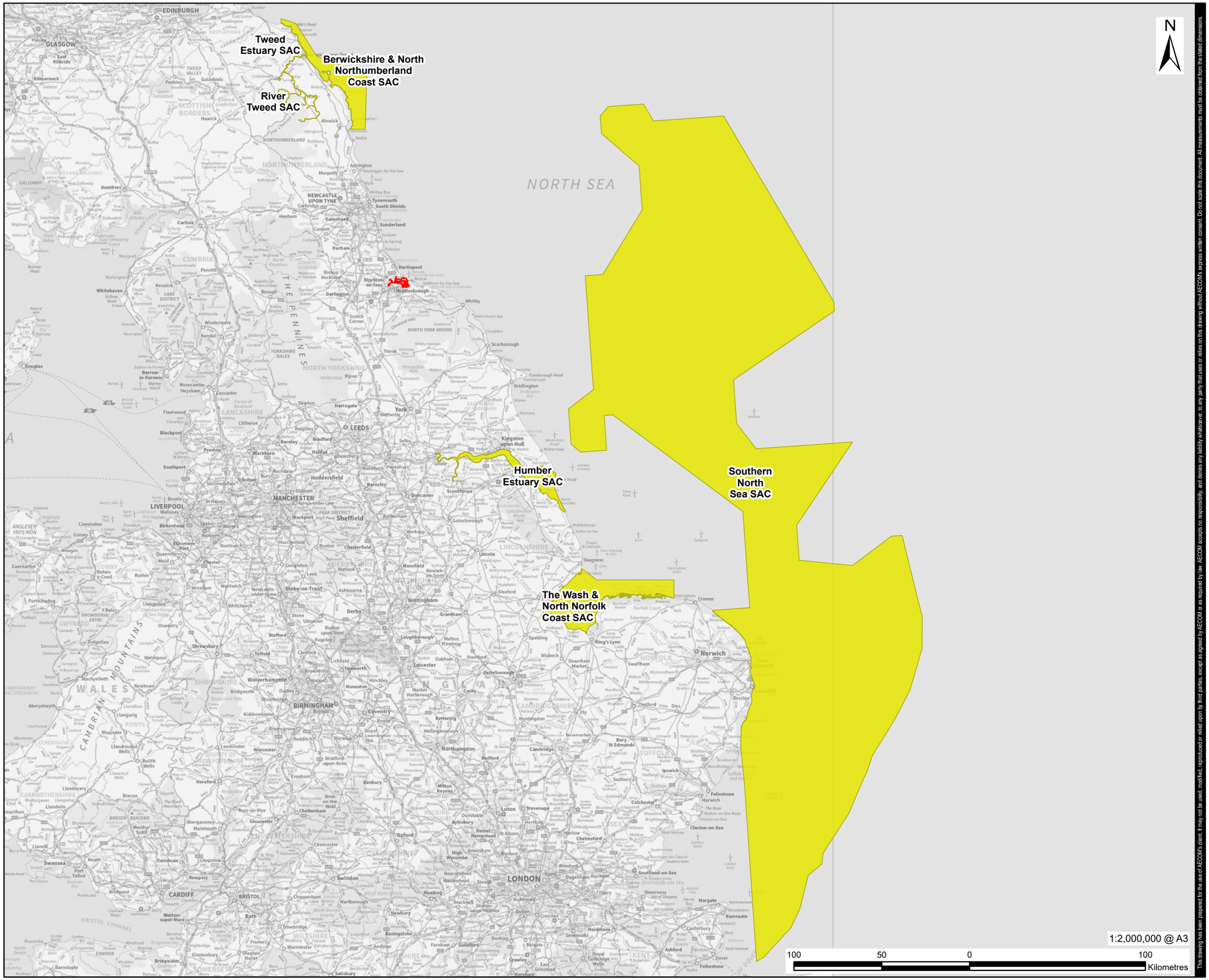

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LEGEND

- Proposed Development Site Boundary
- Special Areas of Conservation (SAC)

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ISSUE PURPOSE

HRA

PROJECT NUMBER

60689030

FIGURE TITLE

European Designated Sites Screened into the Assessment of LSE

FIGURE NUMBER

Figure 4-1

APPENDIX B: SUMMARY OF IMPACT PATHWAYS REFERRED TO IN THE DETAILED SCREENING MATRICES (APPENDIX C).

DESIGNATION	IMPACT PATHWAYS IDENTIFIED USING THE CURRENT EVIDENCE BASE.	PRESENTED IN SCREENING MATRICES AS
Teesmouth and Cleveland Coast SPA / Ramsar	Direct habitat loss during construction or decommissioning. Loss of Functionally linked land during construction, operation or decommissioning Visual and noise disturbance during construction, operation and decommissioning Atmospheric pollution during construction operation and decommissioning Changes in water quality during construction, operation and decommissioning Coastal squeeze upon completion of the project	Direct habitat loss Visual and noise disturbance Atmospheric pollution Water quality Coastal squeeze
North York Moors SAC	Atmospheric pollution during operation	Atmospheric pollution
North York Moors SPA	Atmospheric pollution during operation	Atmospheric pollution
Durham Coast SAC	Atmospheric pollution during operation	Atmospheric pollution
Northumbria Coast SPA / Ramsar	Atmospheric pollution during operation	Atmospheric pollution
Berwickshire and North Northumberland Coast SAC	Disturbance of functionally linked habitat during construction and decommissioning	Disturbance of functionally linked habitat
Southern North Sea SAC	Disturbance of functionally linked habitat during construction and decommissioning	Disturbance of functionally linked habitat

DESIGNATION	IMPACT PATHWAYS IDENTIFIED USING THE CURRENT EVIDENCE BASE.	PRESENTED IN SCREENING MATRICES AS
The Wash and North Norfolk Coast SAC	Disturbance of functionally linked habitat during construction and decommissioning	Disturbance of functionally linked habitat
Humber Estuary SAC	Disturbance of functionally linked habitat during construction and decommissioning	Disturbance of functionally linked habitat
River Tweed SAC	Disturbance of functionally linked habitat during construction and decommissioning	Disturbance of functionally linked habitat
Tweed Estuary SAC	Disturbance of functionally linked habitat during construction and decommissioning	Disturbance of functionally linked habitat
Castle Eden Dene SAC	Atmospheric pollution during operation	Atmospheric pollution

General matrix key:

✓ = Likely significant effect **cannot** be excluded

✗ = Likely significant effect **can** be excluded

C = Construction

O = Operation

D = Decommissioning

APPENDIX C: SCREENING MATRICES

Appendix C1: Detailed screening matrix assessing the qualifying features of the Teesmouth and Cleveland Coast SPA / Ramsar against the identified impact pathways during construction (C columns), operation (O columns) and decommissioning (D columns).

EFFECT	VISUAL AND NOISE DISTURBANCE			ATMOSPHERIC POLLUTION			WATER QUALITY			DIRECT HABITAT LOSS	COASTAL SQUEEZE	IN COMBINATION EFFECTS		
Stage of Proposed Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**C**	**O**	**D**
Little tern *Sterna albifrons*	✓a	✕b	✓a	✓c	✓e	✓c	✓f	✓f	✓f	✓g	✕h	✓i	✓i	✓i
Common tern *Sterna hirundo*	✓a	✕b	✓a	✓c	✓e	✓c	✓f	✓f	✓f	✓g	✕h	✓i	✓i	✓i
Sandwich tern *Sterna sandvicensis*	✓a	✕b	✓a	✕d	✕d	✕d	✓f	✓f	✓f	✓g	✕h	✓i	✓i	✓i
Pied avocet *Recurvirostra avosetta*	✓a	✕b	✓a	✓c	✓e	✓c	✓f	✓f	✓f	✓g	✕h	✓i	✓i	✓i
Knot *Calidris canutus*	✓a	✕b	✓a	✕d	✕d	✕d	✓f	✓f	✓f	✓g	✕h	✓i	✓i	✓i
Ruff *Calidris pugnax*	✓a	✕b	✓a	✕d	✕d	✕d	✓f	✓f	✓f	✓g	✕h	✓i	✓i	✓i
Redshank *Tringa totanus*	✓a	✕b	✓a	✕d	✕d	✕d	✓f	✓f	✓f	✓g	✕h	✓ i	✓ i	✓ i
Waterbird assemblage	✓a	✕b	✓a	✕d	✕d	✕d	✓f	✓f	✓f	✓g	✕h	✓ i	✓	✓ i

a. Paragraph 4.2.11 highlights that Likely Significant Effects of noise and visual disturbance on the SPA / Ramsar arising from construction for the Proposed Development cannot be excluded. Therefore, it is considered that appropriate assessment and mitigation measures will be required to avoid adverse effects on site integrity.

b. Paragraphs 4.3.2 highlights potential for adverse noise disturbance effects during the operation of the Proposed Development on the SPA / Ramsar. Noise modelling for the main site was not available at the time of writing. Therefore, based upon a precautionary approach, LSE on the Teesmouth and Cleveland Coast SPA / Ramsar from operational noise is screened into Appropriate Assessment.

c. Little tern, common tern and avocet are the main nesting qualifying species that APIS identifies as sensitive to atmospheric pollution. Modelling is still being undertaken. Therefore, likely significant effect cannot be dismissed at this stage.

d. The qualifying species marked d are not sensitive to atmospheric nitrogen deposition according to APIS (Paragraph 4.2.14). While sandwich tern are sensitive to atmospheric pollution in principle, the SPA/Ramsar population is wintering only and therefore not sensitive to nitrogen deposition from the Proposed Development.

e. Operational site traffic has been screened out from the assessment because the Proposed Development will only involve 172 2-way daily traffic movements. However, paragraph 4.3.8 shows that nitrogen deposition resulting from the stacks of the Proposed Development will be above 1% of the Critical Load threshold for relevant Teesmouth and Cleveland Coast SPA / Ramsar habitats at the closest areas of the SPA/Ramsar site surrounding the plant. The 1% Critical Load limit is typically used by Natural England and the Environment Agency to denote potential significant atmospheric pollution impacts which require further analysis. Therefore, likely significant effects on the SPA/Ramsar site cannot be dismissed and appropriate assessment is required. While sandwich tern is sensitive to atmospheric pollution in principle, the SPA / Ramsar population is wintering only and therefore not sensitive to nitrogen deposition from the Proposed Development.

f. The Teesmouth and Cleveland Coast SPA / Ramsar (and SPA / Ramsar) is sensitive to negative changes in the water quality during the construction period. Paragraph 4.2.52 highlights that this particularly applies to toxic surface runoff, which is an issue requiring further consideration. A study on the ecological impact of changing water quality in the pools of the SPA / Ramsar is ongoing. This impact pathway is screened in for Appropriate Assessment. Paragraphs 4.3.10 and 4.3.11 also identify that Likely Significant Effects during the operational period cannot be excluded.

g. Paragraph 4.2.1 to 4.2.3 discuss the construction of the project, Although the pipeline will be direct-drilled below the riverbed and the SPA/Ramsar and will therefore not result in the loss of habitat or any vibration of the water column, the Proposed Order Limits does overlap with the SPA; while it is expected that detailed routing design can avoid land take from the SPA, or ensure it is achieved by direct drilling, direct landtake cannot be screened out at this stage.

h. Paragraph 4.3.20 states that the Proposed Development lies on an existing brownfield site and therefore will not materially contribute to coastal squeeze. This impact pathway is screened out from Appropriate Assessment.

i. Paragraphs 5.1.3 to 5.1.5 identify plans and projects with the potential to act in combination with the Proposed Development. Since likely significant effects will arise from construction and decommissioning noise on all SPA/Ramsar features, from operational air quality impacts (on nesting terns and avocet only), and from construction and operational period water quality impacts on all SPA/Ramsar features, these will also operate in combination with other plans and projects. No ‘in combination’ coastal squeeze effect will occur as this impact pathway has been dismissed.

Appendix C2: Detailed screening matrix assessing the qualifying features of the North York Moors SAC against the identified impact pathway during operation (O column) and decommissioning (D column).

Name of European site and Designation: North York Moors SAC

EU Code: UK0030228		
Proximity to Main Site: 12.1 km		
Effect	**Atmospheric pollution**	**In Combination Effects**
Stage of Proposed Development	**O**	**O**
Northern Atlantic wet heaths with *Erica tetralix*	✓a	✓c
European dry heaths	✓a	✓c
Blanket bogs	✕b	✕d

a. Paragraph 4.3.9 indicates that air quality modelling is still being undertaken. Therefore, this impact pathway is screened in for Appropriate Assessment, where the updated modelling and process improvements will be taken into account.

b. Paragraph 4.3.6 also highlights that the operational nitrogen deposition from the main site would not result in a material increase in nitrogen deposition on the most sensitive qualifying habitat (blanket bog) of the SAC. Therefore, this impact pathway is screened out from Appropriate Assessment.

c. Since likely significant effects will arise from operational air quality impacts (on heathland only), these will also operate in combination with other plans and projects.

d. Since blanket bog is beyond the operational air quality zone of influence of the scheme no in combination effect will arise.

Appendix C3: Detailed screening matrix assessing the qualifying features of the North York Moors SPA against the identified impact pathway during operation (O column).

Name of European site and Designation: North York Moors SPA

EU Code: UK9006161		
Proximity to Main Site: 12.1 km		
Effect	**Atmospheric pollution**	**In Combination Effects**
Stage of Proposed Development	**O**	**O**
Merlin *Falco columbianus*	✓a	✓b
Golden plover *Pluvialis apricaria*	✓a	✓b

a. In the breeding season merlin mainly rely on dwarf shrub heath (identified as having a critical nitrogen load of 10-20 kg N/ha/yr on APIS) as may golden plover to a lesser extent. Air quality modelling is still being undertaken Therefore, this impact pathway is screened in for Appropriate Assessment where the updated modelling and process improvements will be taken into account.

b. Since likely significant effects will arise from operational air quality impacts on heathland only, these will also operate in combination with other plans and projects.

Appendix C4: Detailed screening matrix assessing the qualifying features of the Durham Coast SAC against the identified impact pathways during operation (O column).

Name of European site and Designation: Durham Coast SAC

EU Code: UK0030140		
Proximity to Main Site: 13.7 km		
Effect	**Atmospheric pollution**	**In Combination Effects**
Stage of Proposed Development	**O**	**O**
Vegetated sea cliffs of the Atlantic and Baltic Coasts	✕a	✕b

a. The qualifying feature of the Durham Coast SAC is not sensitive to atmospheric nitrogen or acid deposition. The site is therefore screened out from Appropriate Assessment.

b. Since the qualifying feature is not vulnerable to atmospheric pollution no in combination effect will arise

Appendix C5: Detailed screening matrix assessing the qualifying features of the Northumbria Coast SPA / Ramsar against the identified impact pathways during construction (C) and decommissioning(D).

Name of European site and Designation: Northumbria Coast SPA/Ramsar				
EU Code: UK9006131				
Proximity to Main Site: 7.6 km				
Effect	**Atmospheric pollution**		**In Combination Effects**	
Stage of Proposed Development	**C**	**D**	**C**	**D**
Purple sandpiper *Calidris maritima*	✕a	✕a	✕b	✕b
Ruddy turnstone *Arenaria interpres*	✕a	✕a	✕b	✕b
Little tern *Sterna albifrons*	✕a	✕a	✕b	✕b

a. Paragraph 4.2.48 details that the nesting little tern are the only qualifying feature of the Northumbria Coast SPA / Ramsar that is sensitive to atmospheric pollution. However, the tern nesting locations lie beyond the area affected by nitrogen deposition from the Proposed Development.

b. Since the only sensitive interest feature lies beyond the air quality impact zone of the Proposed Development no in combination effect will arise.

Appendix C6: Detailed screening matrix assessing the qualifying features of the Berwickshire and North Northumberland Coast SAC against the identified impact pathways during construction (C column) and decommissioning (D column).

Name of European site and Designation: Berwickshire & North Northumberland Coast SAC

EU Code: UK0017072				
Distance to Proposed Development: 87 km				
Effect	**Disturbance in functionally linked habitat**		**In Combination Effects**	**In Combination Effects**
Stage of Proposed Development	**C**	**D**	**C**	**D**
Mudflats and sandflats not covered by seawater at low tide	N/A	N/A	N/A	N/A
Large shallow inlets and bays	N/A	N/A	N/A	N/A
Reefs	N/A	N/A	N/A	N/A
Submerged or partially submerged sea caves	N/A	N/A	N/A	N/A

Grey seal *Halichoerus grypus*	✓a	✓a	✓b	✓b

a. Paragraph 4.2.32 discusses that grey seal use functionally linked habitat beyond designated site boundaries. Noise modelling is being completed at the time of writing, therefore based upon a precautionary approach, noise and visual disturbance of grey seals and harbour seals within functionally linked land (qualifying features of the Berwickshire and North Northumberland Coast SAC, the Humber Estuary SAC and the Wash and North Norfolk Coast SAC) are taken forward to Appropriate assessment.

b. Paragraphs 5.1.3 to 5.1.5 identify plans and projects with the potential to act in combination with the Proposed Development. Since likely significant effects may arise from construction and decommissioning there is the potential in combination effects will be considered in more detail at Appropriate Assessment.

Appendix C7: Detailed screening matrix assessing the qualifying features of the Humber Estuary SAC against the identified impact pathway during construction (C column) and decommissioning (D column).

Name of European site and Designation: Humber Estuary SAC

EU Code: UK0030170

Distance to Proposed Development: 110 km

Effect	**Disturbance of functionally linked habitat**		**In Combination Effects**	
Stage of Proposed Development	**C**	**D**	**C**	**D**
Estuaries	N/A	N/A	N/A	N/A
Mudflats and sandflats not covered by seawater at low tide	N/A	N/A	N/A	N/A
Sandbanks which are slightly covered by sea water all the time	N/A	N/A	N/A	N/A
Coastal lagoons	N/A	N/A	N/A	N/A

Name of European site and Designation: Humber Estuary SAC

EU Code: UK0030170

Distance to Proposed Development: 110 km

Effect	**Disturbance of functionally linked habitat**		**In Combination Effects**	
Stage of Proposed Development	**C**	**D**	**C**	**D**
Salicornia and other annuals colonizing mud and sand	N/A	N/A	N/A	N/A
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	N/A	N/A	N/A	N/A
Embryonic shifting dunes	N/A	N/A	N/A	N/A
Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”)	N/A	N/A	N/A	N/A

Name of European site and Designation: Humber Estuary SAC

EU Code: UK0030170

Distance to Proposed Development: 110 km

Effect	**Disturbance of functionally linked habitat**		**In Combination Effects**	
Stage of Proposed Development	**C**	**D**	**C**	**D**
Fixed coastal dunes with herbaceous vegetation ("grey dune")	N/A	N/A	N/A	N/A
Dunes with *Hippopha rhamnoides*	N/A	N/A	N/A	N/A
Sea lamprey *Petromyzon marinus*	✕a	✕a	✕d	✕d
River lamprey *Lampetra fluviatilis*	✕b	✕b	✕d	✕d
Grey seal *Halichoerus grypus*	✓c	✓c	✓d	✓d

a. Paragraph 4.2.45 addresses the potential of the Proposed Development to result in disturbance of migratory routes for fish. However, the proposals do not involve construction or operation activities in the marine environment that could affect the migratory fish. Therefore, this species is screened out from Appropriate Assessment.

b. While river lamprey might use functionally linked habitat beyond the designated site boundary, they are not migratory and there will not be Likely Significant Effects of the Proposed Development due to its long distance to the Humber Estuary SAC.

c. Paragraph 4.2.32 discusses that grey seal use functionally linked habitat beyond designated site boundaries. Noise modelling is being completed at the time of writing, therefore based upon a precautionary approach, noise and visual disturbance of grey seals will be taken forward to Appropriate Assessment.

d. Paragraphs 5.1.3 to 5.1.5 identify plans and projects with the potential to act in combination with the Proposed Development. Since likely significant effects may arise from construction and decommissioning there is the potential in combination effects will be considered in more detail at Appropriate Assessment.

Appendix C8: Detailed screening matrix assessing the qualifying features of the Southern North Sea SAC against the identified impact pathway during construction (C column) and decommissioning (D column).

Name of European site and Designation: Southern North Sea SAC				
EU Code: UK0030395				
Distance to Proposed Development: 102km				
Effect	**Disturbance in functionally linked habitat**		**In Combination Effects**	
Stage of Proposed Development	**C**	**D**	**C**	**D**
Harbour porpoise *Phocoena phocoena*	✕a	✕a	✕b	✕b

a. The Southern North Sea SAC, which is designated for harbour porpoise, is located over 100 km away from the Proposed Development Site. The Planning Inspectorate have agreed that effects upon the Southern North Sea SAC can be scoped out of the ES as there are no impact pathways from underwater sound arising from the proposals (The Planning Inspectorate, 2023). As such, LSE upon harbour porpoise is also screened out.

b. Since a likely significant effect will arise alone, it cannot be dismissed 'in-combination.'

Appendix C9: Detailed screening matrix assessing the qualifying features of The Wash and North Norfolk Coast SAC against the identified impact pathway during construction (C column) and decommissioning (D column).

Name of European site and Designation: The Wash and North Norfolk Coast SAC				
EU Code: UK0017075				
Distance to Proposed Development: 174 km				
Effect	**Disturbance in functionally linked habitat**		**In Combination Effects**	
Stage of Proposed Development	**C**	**D**	**C**	**D**
Sandbanks which are slightly covered by sea water all the time	N/A	N/A	N/A	N/A
Mudflats and sandflats not covered by seawater at low tide	N/A	N/A	N/A	N/A
Large shallow inlets and bays	N/A	N/A	N/A	N/A
Reefs	N/A	N/A	N/A	N/A

Name of European site and Designation: The Wash and North Norfolk Coast SAC				
EU Code: UK0017075				
Distance to Proposed Development: 174 km				
Effect	**Disturbance in functionally linked habitat**		**In Combination Effects**	
Salicornia and other annuals colonizing mud and sand	N/A	N/A	N/A	N/A
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	N/A	N/A	N/A	N/A
Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticose*)	N/A	N/A	N/A	N/A
Coastal lagoons	N/A	N/A	N/A	N/A
Harbour seal *Phoca vitulina*	✓a	✓a	✓c	✓c

Name of European site and Designation: The Wash and North Norfolk Coast SAC				
EU Code: UK0017075				
Distance to Proposed Development: 174 km				
Effect	**Disturbance in functionally linked habitat**		**In Combination Effects**	
Otter *Lutra lutra*	✕b	✕b	✕d	✕d

a. Paragraphs 4.2.26 to 4.2.31 discuss how harbour seal use functionally linked habitat beyond designated site boundaries. Noise modelling is being completed at the time of writing, therefore based upon a precautionary approach, noise and visual disturbance of harbour seals within functionally linked land is taken forward to Appropriate assessment.

b. While otter might use functionally linked habitat beyond the designated site boundary, there will not be Likely Significant Effects of the Proposed Development due to its long distance to The Wash and North Norfolk Coast SAC.

c. Paragraphs 5.1.3 to 5.1.5 identify plans and projects with the potential to act in combination with the Proposed Development. Since likely significant effects may arise from construction and decommissioning there is the potential in combination effects will be considered in more detail at Appropriate Assessment.

d. Since there is no impact pathway to affect the interest feature of the SAC no in combination effects will arise.

Appendix C10: Detailed screening matrix assessing the qualifying features of the River Tweed SAC against the identified impact pathway during construction (C column) and decommissioning (D column).

Name of European site and Designation: River Tweed SAC				
EU Code: UK0012691				
Distance to Proposed Development: 138 km				
Effect	**Disturbance in functionally linked habitat**		**In Combination Effects**	
Stage of Proposed Development	**C**	**D**	**C**	**D**
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	N/A	N/A	N/A	N/A
Atlantic salmon *Salmo salar*	✓a	✓a	✓c	✓c

Name of European site and Designation: River Tweed SAC				
EU Code: UK0012691				
Distance to Proposed Development: 138 km				
Effect	**Disturbance in functionally linked habitat**		**In Combination Effects**	
Otter *Lutra lutra*	✕b	✕b	✕c	✕c
Sea lamprey *Petromyzon marinus*	✓a	✓a	✓c	✓c
Brook lamprey *Lampetra planeri*	✕b	✕b	✕c	✕c
River lamprey *Lampetra fluviatilis*	✕b	✕b	✕c	✕c

a. Paragraph 4.2.42 addresses the potential of the Proposed Development to result in disturbance of migratory routes for fish. The proposed connection routes will cross the River Tees and Greatham Creek, and there is potential for noise and vibration arising from construction to affect migratory fish. Therefore, based upon a precautionary approach, the potential for noise and vibration to affect sea lamprey will be taken forward to Appropriate Assessment.

b. While otter, brook lamprey and river lamprey might use functionally linked habitat beyond the designated site boundary, they are not migratory and there will not be Likely Significant Effects of the Proposed Development due to its long distance to the River Tweed SAC.

c. Since a likely significant effect will arise alone, it cannot be dismissed ‘in combination’.

Appendix C11: Detailed screening matrix assessing the qualifying features of the Tweed Estuary SAC against the identified impact pathways during construction (C column) and decommissioning (D column).

Name of European site and Designation: Tweed Estuary SAC				
EU Code: UK0030292				
Distance to Proposed Development: 137 km				
Effect	**Disturbance of functionally linked habitat**		**In Combination Effects**	
Stage of Proposed Development	**C**	**D**	**C**	**D**
Estuaries	N/A	N/A	N/A	N/A
Mudflats and sandflats not covered by seawater at low tide	N/A	N/A	N/A	N/A
Sea lamprey *Petromyzon marinus*	✓a	✓a	✓c	✓c
River lamprey *Lampetra fluviatilis*	✕b	✕b	✕c	✕c

a. Paragraph 4.2.42 addresses the potential of the Proposed Development to result in disturbance of migratory routes for fish. The proposed connection routes will cross the River Tees and Greatham Creek, and there is potential for noise and vibration arising from construction to affect migratory fish. Therefore, based upon a precautionary approach, the potential for noise and vibration to affect sea lamprey will be taken forward to Appropriate Assessment.

b. While river lamprey might use functionally linked habitat beyond the designated site boundary, they are not migratory and there will not be Likely Significant Effects of the Proposed Development due to its long distance to the Tweed Estuary SAC.

c. Since a likely significant effect will arise alone, it cannot be dismissed ‘in combination’.

Appendix C12: Detailed screening matrix assessing the qualifying features of the Castle Eden Dene SAC against the identified impact pathway during operation (O column)

Name of European site and Designation: Castle Eden Dene SAC

EU Code: UK0012768		
Distance to Proposed Development: 13.3 km		
Effect	**Atmospheric pollution**	**In Combination Effects**
Stage of Proposed Development	**O**	**O**
Yew woodland	✓a	✓c

a. Paragraph 4.3.9 indicates that air quality modelling is still being undertaken. Therefore, this impact pathway is screened in for Appropriate Assessment, where the updated modelling and process improvements will be taken into account.

H2Teesside Project

Preliminary Environmental Information Report

Volume III – Appendices

Appendix 13A: Ornithology Baseline Report

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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13A.0 ORNITHOLOGY BASELINE REPORT

13A.1 Introduction

13A.1.1 This report provides the ornithology baseline gathered to date for H2Teesside (the Proposed Development) in support of the Preliminary Environmental Impact (PEI) Report Chapter 13: Ornithology (PEI Report, Volume 1). The baseline presented herein forms the basis for the assessment of potential impacts of the Proposed Development on ornithological features within the defined Zone of Influence[1].

13A.1.2 The data presented have been gathered over a series of preliminary (Stage 1) surveys carried out between January and March (inclusive) 2022 and a desk study carried out in June 2022, to inform the Proposed Development preliminary design and site selection process. In September 2022 the surveys were resumed with an increased spatial scope to reflect the scale of the updated Proposed Development design and to provide coverage of breeding and passage periods for birds[2]. Surveys and desk study activities to gather baseline data have been ongoing since that time and will continue through to at least August 2023.

13A.1.3 The baseline presented here is based on the desk study and the non-breeding bird field surveys undertaken by AECOM between January 2022 and March 2023 (inclusive). Data beyond this period will be heavily biased towards passage and breeding birds and, because these surveys are incomplete, the baseline for them cannot currently be presented or assessed.

Background to the Proposed Development

13A.1.4 Details regarding the Proposed Development are detailed in Chapter 4: Proposed Development (PEI Report, Volume I).

Survey Areas

13A.1.5 A selection of shortlisted sites for the proposed hydrogen generating infrastructure was identified in 2021. Based on the Proposed Development design iterations at that time, and ongoing design development since then, broad survey areas were identified, including:

- the Foundry, which covers the land proposed for the Main Site and its environs east of the River Tees;
- Seal Sands, which covers some of the connection corridors west of the River Tees but east of the A178; and
- North Tees Marshes, which covers the remainder of the connection corridors west of the River Tees and west of the A178.

13A.1.6 Further information on these survey areas is provided herein.

[1] The ZoI is defined in Chapter 13: Ornithology (PEI Report, Volume I).
[2] Bird behaviours can be divided into broad seasons termed “breeding” (to cover the reproductive periods for the majority of species) and “non-breeding”. The latter season can be further divided into “wintering” (during which time birds have settled into areas where they spend the winter feeding) and “passage” (when migratory birds migrate between breeding and wintering grounds.

Purpose

13A.1.7 This report describes the approach and findings of the ornithology baseline data gathering undertaken for the survey areas.

13A.1.8 The objectives of this ornithology baseline report are to:

- identify statutory and non-statutory biodiversity and nature conservation designations with ornithological interest features within the potential Zone of Influence (ZoI) of the Proposed Development; and
- identify a preliminary ornithological baseline for the relevant survey areas, to include key third party records and the results of bird surveys undertaken up to and including March 2023[3].

13A.2 Wildlife Legislation and Guidance Relevant to Birds

Wildlife Legislation

13A.2.1 The following legislation and guidance are considered potentially relevant to the scope of the ornithology assessment:

- The Conservation of Habitats and Species Regulations (Habitats Regulations) 2017 (as amended);
- The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;
- Wildlife and Countryside Act (WCA) 1981 (as amended);
- Countryside Rights of Way (CRoW) Act 2000; and
- Natural Environment and Rural Communities (NERC) Act 2006.

13A.2.2 Prior to 31 December 2020, Annex 1 of the EC Birds Directive listed rare and vulnerable species of regularly occurring or migratory wild birds that were subject to special conservation measures. The Directive also provided for the designation of SPAs for the protection of these species, which formed part of the Natura 2000 network of sites protected by European wildlife legislation. European Union (EU) legislation as it applied to the UK on 31 December 2020 is now a part of UK domestic legislation as 'retained EU legislation'. Changes have been made to parts of the Habitats Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 so that they effectively continue the legislation which implemented the EU Habitats and Species Directive and parts of the Wild Birds Directive through the provisions of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Most of these changes involve transferring functions from the European Commission to the appropriate authorities in England. All other processes or terms of the 2017 Regulations remain unchanged. Internationally designated wetlands 'Ramsar Sites' are protected under the CRoW Act 2000 and are not affected by the exit from the EU.

[3] This has been selected as a cut off for baseline reporting because it includes data for at least one full wintering period. Baseline breeding bird data from surveys after March 2023 will not be available for reporting purposes until at least August 2023.

13A.2.3 Part 1 of the WCA affords general protection to all species of wild bird, and specific protection to certain species of bird in Schedule 1 (birds protected by special penalties). It is an offence (subject to exceptions) to:

- kill, injure, or take any wild bird;
- take, damage, or destroy the nest of any wild bird while that nest is in use or being built;
- take or destroy an egg of any wild bird; and
- disturb any wild bird listed on Schedule 1 of the WCA while nesting or disturb the dependent young of such a bird.

13A.2.4 The WCA requires the prosecuting authority to prove that an offence was intentional, however the Countryside and Rights of Way (CRoW) Act 2000 strengthens the provisions of the WCA by introducing an additional offence of "reckless" disturbance, which means that ignorance of the presence of a protected species cannot be used as a reliable defence should a breach of the WCA be committed. The NERC Act 2006 strengthens the WCA further with respect to the protection of the nests of certain birds listed on Schedule Z1A, even when they are not in use.

13A.2.5 Through the National Planning Policy Framework (NPPF) and Section 40 of the NERC Act 2006, local planning authorities also have a duty to consider species listed on Section 41 (S41) of the Act as being of principal importance for nature conservation in England when considering a planning application (also referred to as 'NERC S41' species).

Guidance

13A.2.6 The UK Biodiversity Action Plan (BAP) was withdrawn in March 2011, the lists of Priority Species and Habitats being superseded by those within Section 41 of the NERC Act (2006). Local Biodiversity Action Plans (LBAPs) are no longer used as a formal expression of delivery of biodiversity targets but identify sub-regional priorities for nature conservation and propose agreed actions to conserve/maintain/enhance/increase local Priority Species and Habitats.

13A.2.7 Tees Valley Nature Partnership (2012) identify 10 bird species that can be regarded as LBAP Priority Species on this basis. These are barn owl (*Tyto alba*), ringed plover (*Charadrius hiaticula*), grey partridge (*Perdix perdix*), tree sparrow (*Passer montanus*), corn bunting (*Emberiza calandra*), shelduck (*Tadorna tadorna*), little tern (*Sternula albifrons*), bittern (*Botaurus stellaris*), swift (*Apus apus*) and yellow wagtail (*Motacilla flava*).

13A.2.8 Stanbury *et al.* (2021) have published lists of Birds of Conservation Concern (BoCC). Red List species are those whose breeding population or range is rapidly declining (50% or more in the last 25 years), recently or historically, and those of global conservation concern. Amber List species are those whose breeding population is in moderate decline (25 – 49% in the last 25 years), rare breeders, internationally important and localised species, and those of unfavourable conservation status in Europe. Green List species are those not of immediate conservation concern. Non-

native species are classified as Not Assessed. These lists confer no legal status; however, they are useful when assessing the significance of predicted impacts and determining the level of mitigation that may be required when birds are affected by development or any other activity. Furthermore, inclusion on the Red List was a factor in determining the species for which BAPs were developed.

13A.3 Methods and Data Sources

Desk Study

13A.3.1 A desk study was undertaken to identify ecological designations specifically for their ornithological interest, as well as contemporary records of protected and notable species of potential relevance to the Proposed Development and locations of ornithological interest or sensitivity (such as habitats regularly used by roosting birds for which designated sites are notified). A summary of the data sources, search areas and data requested/received is provided in Table 13A-1. Desk Study areas are shown in Figure 13A-2, except where these are stated as being "data specific", in which case the data received, and their spatial context are described in Section 4 (Results) and associated appendices to this report.

13A.3.2 A partial data set was acquired from British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS) in May 2022 to reflect the spatial extent of the Proposed Development in its early design phase. Further data will be acquired to reflect the most up to date design, for inclusion in the reports and assessments supporting the final DCO Application. The results section therefore provides a limited data set from this source, and this will be updated in due course.

13A.3.3 In addition to the area-specific requests for data set out in Table 13A-1, Natural England were consulted on the scope of the initial surveys and assessment, at which time they supplied some additional information.

13A.3.4 Sharing of baseline data between this project and Net Zero Teesside (NZT) was agreed. Relevant baseline gathered for NZT project is included herein and is reported as first-hand (rather than third party) data in Section 13A.4. The NZT data include locations at which breeding bird surveys were undertaken and breeding bird assemblages were identified, as well as a number of species-specific records that are not currently provided by the data gathered specifically for this project. These locations are shown in Figure 13A-3.

Table 13A-1: Desk Study Sources and Search Areas

DATA SOURCE	SEARCH AREA	ACCESSED/DATA RECEIVED	DATA OBTAINED
Environmental Records Information Centre (ERIC) North East	Up to 2 km	August 2021, updated September 2022	Species records, non-statutory site locations, and interest features/reasons for designation

DATA SOURCE	SEARCH AREA	ACCESSED/DATA RECEIVED	DATA OBTAINED
Industry Nature Conservation Association (NCA)	Data specific	March 2022	Species records, roost, and breeding site locations for several species
Multi Agency Geographic Information for the Countryside (MAGIC) https://magic.defra.gov.uk/	Up to 15 km	November 2022	Statutory designated site locations (2 km for local statutory designations)
Joint Nature Conservation Committee (JNCC) website https://jncc.gov.uk/our-work/our-work-a-z/	Up to 15 km	November 2022	Reasons for designation and other information on international statutory designated sites
Natural England Designated Sites View website https://designatedsites.naturalengland.org.uk/	Up to 15 km	November 2022	Reasons for designation and other information on national and local statutory designated sites
British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS)	Data specific	May 2022	Detailed count data for wetland birds occurring within selected wetland habitat count areas across Teesside
Net Zero Teesside baseline reports and Environmental Statement Ornithology Baseline Report (AECOM, 2021)	Data Specific	May 2023	Species records including breeding and non-breeding birds, gathered between 2018 and 2022.

Field Survey

Wetland Bird Counts

13A.3.5 The original scope of work included two high tide and two low tide bird counts in each of January, February, and March 2022 and within two broad survey areas (referred to as "The Foundry" and "Seal Sands") that reflected the spatial extent of the Proposed Development at that time. Survey effort was limited by land access in January 2022 such that only one high and low tide survey was achieved in The Foundry survey area, and no surveys were possible in the Seal Sands Survey area.

13A.3.6 A further broad survey area (referred to as "North Tees Marshes") was added in September 2022 to accommodate the larger spatial extent of the Proposed Development. Since this time surveys across all areas have continued monthly and will continue up to and including a minimum of August 2023.

13A.3.7 A summary of the wetland bird survey scope completed is provided in Table 13A-2. Survey metadata are provided in Annex A.

Table 13A-2: Summary of Wintering Bird Surveys Completed

NB: HT = High Tide, LT = Low Tide[4]

SITE[5]	POSITION IN LANDSCAPE	JAN 2022	FEB 2022	MAR 2022	SEPT 2022	OCT 2022	NOV 2022	DEC 2022	JAN 2023	FEB 2023	MAR 2023
The Foundry	Coastal	1 HT 1 LT	2 HT 2 LT	2 HT 2 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT
Seal Sands	Coastal	No surveys	2 HT 2 LT	2 HT 2 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT
North Tees Marshes	Inland	No surveys	No surveys	No surveys	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT	1 HT 1 LT

[4] A single survey was, in most cases, completed over 2-3 days due to the size of the survey area and the short survey window of 4 hours
[5] Survey effort within The Foundry and Seal Sands survey areas was limited by land access in January 2022. North Tees Marshes survey area was not established until September 2022.

13A.3.8 The surveys followed the general principles of a Wetland Birds Survey (WeBS). The survey areas were divided into count sectors based on consideration of the following factors such that all habitat suitable for water birds within a minimum of 500 m of the footprint of each part of the Proposed Development Site was included in the survey:

- distribution of habitats and the known habitat requirements of birds within the different genera and taxonomic families likely to be encountered within the survey areas;
- the preliminary layout or locations of proposed infrastructure;
- the availability of suitable locations from which adequate visual coverage of habitats could be achieved;
- the presence of geographical and habitat features that might provide markers by which the surveyor could judge the location of birds and to aid with navigation around the survey area;
- the minimisation of risks to health and safety (primarily of the surveyor); and
- the availability of land access.

13A.3.9 These areas were extended in some cases to include habitats beyond 500 m where it was anticipated, based on habitat type and connectivity, that these were likely to have some functional importance and continuity with habitats used by wetland birds within 500 m of the Proposed Development Site, and that were within an area that could reasonably be included on each survey and that was readily accessible.

13A.3.10 The count sectors are shown in Figures 13A-4a (The Foundry), 13A-4b (Seal Sands) and 13A-4c (North Tees Marshes). Following the first survey in January 2022, the following changes were made to the sectors:

- Figure 13A-4a - Sectors 3, 4, 5, 5a, 18 and 19 were removed from the Foundry survey area due to a combination of disturbance levels, topographical and habitat conditions unsuitable for wetland birds and (in the case of Sector 18) distance from the footprint of the Proposed Development6. Sector 17 was never surveyed as it could not be accessed, although it was retained as a potential count sector for the duration of the surveys;
- Figure 13A-4b- Sectors 1, 3, 10 - 12, and 14-16 were removed from the Seal Sands survey scope due to habitat conditions unsuitable for wetland birds and consistent lack of access to this land;
- an additional sector (18a) was added to the Seal Sands survey area, to separate out the spit of land and the habitats within it (which include saltmarsh and saline lagoon) from the open intertidal habitats of the wider Seal Sands Bay;

[6] Sector 18 was re-instated from September 2022 onwards following updates to the Proposed Development design.

- Sectors 22 and 23 (and their respective sub-sectors) were added to the Seal Sands survey area to obtain better coverage of the lagoon and marsh habitats of Greenabella Marsh to the west of Seal Sands Bay;
- a further sector (25) was added to the Seal Sands survey area in March 2023, to help address ongoing difficulties with gaining access to survey the intertidal habitats immediately adjacent to Navigator Terminal on the west bank of the River Tees, which is an area referred to herein as "Vopak Foreshore".

13A.3.11 The following birds, which include all species that are reasons for the notification of the various coastal statutory designated sites within the Study Area (see Table 13A-3, Section 13A.4) were recorded during the counts, where observed:

- cormorants and shags;
- waders;
- terns, skuas, auks and gulls;
- sawbills;
- grebes;
- divers;
- herons;
- wildfowl (including all ducks, geese and swans); and
- kingfisher (*Alcedo atthis*).

13A.3.12 Surveys followed the standard WeBS protocol, involving the systematic counting of all water birds within each sector. Survey times, weather conditions, visibility and sources of disturbance were recorded for each count sector on each survey and are included in Annex A. Surveys were carried out as much as possible within two hours either side of the high or low tide (depending on the survey), however this period was extended where necessary to permit the coverage of all parts of the survey areas, considering the short daylengths during January and February and the tide times.

13A.3.13 Additional to the standard systematic bird counts, bird behaviours were also recorded using pre-determined behaviour codes (roosting, preening, feeding, loafing). Where conditions of access, visibility and time available for completion of surveys allowed, any locations where birds were found to be congregating in large tight or sedentary flocks, especially feeding areas and roosts, were recorded on survey maps and counts made of birds at those locations. The purpose of this was to provide spatial context to the count data such that habitats/locations regularly used by target species could be identified.

Limitations

13A.3.14 Species, particularly highly mobile ones such as birds, can be transient and their presence intermittent. Desk study data provide a snapshot of the presence of species rather than a comprehensive record of all the species that use the habitats

within a search area. Furthermore, they are dependent on records being collected and submitted to the relevant records centre, rather than being collected systematically by means for a formal survey protocol carried out at regular intervals. Therefore, the absence of a species record cannot be interpreted as the absence of a species within a search area. Conversely, the effects of habitat and other environmental changes (such as climate change) and other factors acting that influence the distribution and numbers of a given species over time means that the absence of a species record cannot be taken to mean that the species is entirely absent from a search area.

13A.3.15 It is possible that the restrictions on travel imposed by national government to help stem the spread of Covid-19 in 2020 and 2021 could have reduced the number of records submitted to records centres nationwide during this period. Therefore, the number of third-party bird records for these two years may be lower than would otherwise be expected. However, there is no strong indication of this in any of the data received.

13A.3.16 Bird counts could not be carried out across all parts of the survey areas on all surveys due to conditions of restricted access and/or certain conditions imposed by landowners when accessing private land. This, in combination with tide times and short daylengths prevented the complete coverage of survey areas during daylight hours on some of the surveys in January and February 2022. To mitigate the restrictions of short daylength, the survey window was extended slightly on some occasions beyond that of a standard WeBS count.

13A.3.17 Greenabella Marsh (Sectors 22 and 23 plus their respective subsectors within the Seal Sands survey area) was not surveyed on the low tide surveys of 9 and 22 March 2022 as to do so risked disturbance to potentially breeding avocet (*Recurvirostra avosetta*), which is a Schedule 1 bird under the Wildlife and Countryside Act 1982 (as amended). These sectors were included in the final survey on 30th March 2022 as there were no indications of this species breeding there by this time. Bird counts in these areas have been further limited by heavily restricted land access since September 2022. The surveys are ongoing until at least August 2023 and the status of sensitive breeding birds across the Survey Area will be kept under review to avoid disturbance to nesting Schedule 1 birds.

13A.3.18 This report does not include any first-hand data for breeding birds, surveys for which are ongoing. This will be reported in the final baseline report that accompanies the Environmental Statement supporting the DCO application. A limited set of relevant third-party data and NZT breeding bird data is included in this report.

13A.4 Results

13A.4.1 The following sections describe the baseline ornithological conditions recorded to date within the Study and Survey Areas. Tabulated summary results identifying relevant receptors for inclusion in the assessments within the PEI Report include a preliminary ecological value for each receptor (further detail around which is set out in Section 13.5 of Chapter 13: Ornithology, PEI Report, Volume I) to support

focussed EcIA. These are identified with reference to the geographical level at which the receptor matters. The following frames of reference used herein are based on guidance published by the Chartered Institute of Ecology and Environmental Management (2021):

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (e.g. North-east);
- District (Hartlepool, Stockton-on-Tees or Redcar and Cleveland);
- Local (ecological features that do not meet criteria for valuation at a District or higher level, but that have sufficient value to merit retention or mitigation); and
- Negligible (common and widespread ecological features of such low priority that they do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status).

Desk Study

Designated Sites

13A.4.2 Table 13A-3 summarises the designated sites within the Study Area (see Table 13A-1 for the search areas applied to different designations) and their spatial relationship to the Proposed Development Site. The designated sites are shown on Figure 13A-5 (statutory sites) and Figure 13A-6 (non-statutory sites).

13A.4.3 There are three Special Protection Areas (SPAs), two Ramsar sites, three Sites of Special Scientific Interest (SSSIs) and two National Nature Reserves (NNRs) within 15 km of the Proposed Development. There are four Local Nature Reserves (LNRs), 11 Local Wildlife Sites (LWS) and one Royal Society for the Protection of Birds (RSPB) Reserve within 2 km of the Proposed Development.

Table 13A-3: Designated Sites (notified for ornithological features) Within the Study Area

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Statutory				
Teesmouth and Cleveland Coast SPA	Internationally important numbers of marine and shore birds, including: • Avocet (*Recurvirostra avosetta*) (Breeding); • Knot (*Calidris canutus*) (Non-breeding); • Ruff (*Calidris pugnax*) (Non-breeding); • Redshank (*Tringa tetanus*) (Non-breeding); • Sandwich tern (*Thalasseus sandvicensis*) (Non-breeding); • Common tern (*Sterna hirundo*) (Breeding); • Little tern (*Sternula albifrons*) (Breeding); • Waterbird assemblage of 26,014 individual waterfowl including sanderling (*Calidris alba*), knot, shelduck (*Tadorna tadorna*), cormorant (*Phalacrocorax carbo*), shoveler (*Spatula clypeata*) and teal (*Anas crecca*). Other major components of the assemblage feature include wigeon (*Mareca penelope*), lapwing (*Vanellus vanellus*), herring gull (*Larus argentatus*) and black-headed gull (*Chroicocephalus ridibundus*).	International	10 m north at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
	In addition to breeding sites the SPA includes areas designated for marine foraging habitats for little tern and common tern that extend several kilometres out to sea and along the tidal River Tees; and terrestrial and intertidal foraging areas for avocet and ruff.			
North York Moors SPA	Designated for internationally important numbers of breeding birds including: • Golden plover (*Pluvialis apricaria*); and Merlin (*Falco columbarius*)	International	12.1 km south-east at closest point	8 km south-east at closest point
Northumbria Coast SPA	Designated for internationally important numbers of marine and shorebirds including: • Turnstone (*Arenaria interpres*) (breeding); • Purple sandpiper ( ) (wintering); • Little tern (breeding); and • Arctic tern (*Sterna paradisaea*) (breeding).	International	13.7 km north at closest point	11 km north at closest point
Teesmouth and Cleveland Coast Ramsar	The site qualifies as a Ramsar for the following Ramsar criteria (Natural England, 2020): Criterion 5 - Assemblages of international importance Species with peak counts in winter 26,786 waterfowl (5-year peak mean 2011/12-2015/16)	International	173 m north at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
	Criterion 6 - Species/populations occurring at levels of international importance Qualifying Species/populations (as identified at designation) Species with peak counts in spring / autumn: Redshank; 1,648 individuals representing an average of 1.1% of the East Atlantic population (1987-91) Species with peak counts in winter: Knot; 5,509 individuals representing an average of 1.6% of the NE Canada/Greenland/Iceland/UK population (5-year peak mean 1991/92-1995/96) Sandwich tern; 1,900 individuals representing an average of 4.3% of the GB population (1988-1992)			
Northumbria Coast Ramsar	The site qualifies as a Ramsar for the following Ramsar criteria (JNCC, 2000): Criterion 6 – Species/populations occurring at levels of international importance: • Qualifying Species/populations (as identified at designation) – Species with peak counts in winter:	International	13.7 km north at closest point	11 km north at closest point

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
	Purple sandpiper 787 individuals representing an average of 1.6% of the population (5-year peak mean for 1992/93 to 1996/97); Turnstone 1,739 individuals representing an average of 2.6% of the population (5-year peak mean for 1992/93 to 1996/97); Species with peak counts during the breeding season; Little tern 40 pairs representing an average of 1.7% of the GB population (5 year mean for 1993 to 1997),			
Teesmouth and Cleveland Coast SSSI	Nationally important features supported by a mosaic of coastal and freshwater habitats: • >20,000 Non-breeding waterbirds; • Aggregations of breeding birds – avocet, common tern, little tern. • Aggregations of non-breeding birds – gadwall (*Mareca strepera*), knot, purple sandpiper, redshank, ringed plover(*Charadrius hiaticula*), ruff, sanderling, Sandwich tern, shelduck, shoveler; and, • Assemblages of breeding birds - Mixed: sand-dunes and saltmarsh, lowland open waters and their margins.	National	5 m north at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Durham Coast SSSI	Designated for: • Aggregations of breeding birds – cormorant, fulmar (Fulmarus glacialis), kittiwake (Rissa tridactyla), little tern; and • Aggregations of non-breeding birds – purple sandpiper, sanderling.	National	11.2 km north at closest point	9.4 km north at closest point
North York Moors SSSI	Designated for: • Aggregations of breeding birds – golden plover and merlin	National	12.1 km south-east at closest point	8 km south-east at closest point
Teesmouth NNR	Designated for the following ornithological interest features: • >20,000 waterbird assemblage; • BAP breeding birds; waders, grey partridge, skylark (Alauda arvensis), linnet (Linaria cannabina), reed bunting (Emberiza schoeniclus); • Knot, redshank and shelduck (non-breeding); • Little tern (breeding); • Ringed plover (in spring); and, • Sandwich tern (post-breeding).	National	1.8 km west at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Castle Eden Dene NNR	The NNR is Designated for habitats and species groups including birds7.	National	>15 km north-west	14.4 km north-west at closest point
Seaton Dunes and Common LNR	Aggregations of non-breeding birds - Knot, ringed plover, sanderling and turnstone.	District	2.9 km north-west at closest point	1.32 km north at closest point
Cowpen Bewley Woodland Country Park LNR	Variety of habitats and 80 species of bird	District	7.48 km west at closest point	Overlapping
Charlton's Pond LNR	Charlton's Pond consists of wetlands, amenity grassland and woodland with suitable habitat for wildfowl.	District	8.9 km south-west at closest point	513 m west at closest point
Billingham Beck Valley Country Park LNR	Colourful meadows, ponds, marsh and woodland. This wetland provides a home for plants and animals, including bird species8.	District	10.5 km south-west at closest point	1.4 km west at closest point
Non-statutory				
Phillips Tank Farm Grassland LWS	The area supports c3.7% of total SPA bird numbers plus breeding lapwing.	Regional	4.4 km west at closest point	Adjacent
Zinc Works Bird Field LWS	Good numbers of wintering and migratory waterbirds & very important for migratory passerines. >0.5% of the national population of	Regional	2.5 km north-west at closest point	1.3 km north at closest point

[7] There is no formal list of species for which this site is notified
[8] No specific details are provided for this site regarding species of bird present.

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
	passage ring ouzels (Turdus torquatus) recorded. Regularly holds more than 0.1% of the national population of any wintering or passage species and the site regularly holds more than 5% of the cited bird interest of the Teesmouth and Cleveland Coast SPA (this to include 5% of a cited individual bird population or of the combined water bird population, currently stated as 21,406).			
Saltern Saltmarsh LWS	The area supports c3.7% of total SPA bird numbers and important site for breeding lapwing.	Regional	4.7 km west at closest point	78 m north-west at closest point
Saltholme RSPB Reserve	The site is one of the largest breeding colonies of common terns in the UK and breeding lapwing (red list) are present, as well as being used by foraging peregrine (Falco peregrinus) and breeding species such as marsh harrier (Circus aeruginosus), Cetti's warbler (Cettia cetti) and little ringed plover (Charadrius dubius). Much of the reserve lies within the Teesmouth and Cleveland Coast SPA and SSSI.	District	5.3 km south-west at closest point	Overlapping
Greenabella Marsh LWS	Rough grassland with wetland areas. Significant bird populations.	District	3.5 km west at closest point	Overlapping

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Greatham Creek North Bank Saltmarsh LWS	Designated mainly for saltmarsh vegetation. Some ornithological interest but not sufficient to merit LWS status on its own.	District	4 km west at closest point	Overlapping
Cowpen Bewley Woodland Country Park LWS	Variety of habitats and 80 species of bird.	District	6.8 km west	Overlapping
Coatham Marsh LWS	Designated for a range of wetland habitats, and of interest for a range of breeding and non-breeding birds.	District	1.3 km east at closest point	Adjacent
Seaton Common LWS	The site is a wet grassland which attracts large numbers of passage migrants over winter and is a breeding ground for birds in the summer months	District	2.5 km north-west at closest point	1.3 km north at closest point
Power Station Grassland and Wetland LWS	Ungrazed grassland with pools and large areas of scrub. The breeding bird community includes stonechat (Saxicola rubicola), sedge warbler (Acrocephalus schoenobaenus) and grasshopper warbler (Locustella naevia).	District	3.3 km north-west at closest point	877 m north at closest point
Portrack Marsh LWS	The site regularly holds more than 0.1% of the national population of any wintering or passage species of the cited bird interest of the Teesmouth and Cleveland Coast SPA and the site regularly holds more than 5% of the cited gadwall, shoveler and redshank population.	District	10.3 km south-west at closest point	1.9 km south-west at closest point

DESIGNATED SITE	INTEREST FEATURES(S)/REASON(S) FOR NOTIFICATION	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Billingham Beck Valley LWS	Wetland providing es a home for plants and animals, including bird species9.	District	10.5 km south-west at closest point	1.4 km west at closest point

[9] The site description does not specify species of birds present or their numbers.

Species Records

ERIC North East Records

13A.4.4 ERIC Northeast provided thousands of species records, a large sub-set (more than 74,000) of which are birds. While this serves to confirm the widely known fact that the Teesside area is a particularly well-recorded area, particularly with respect to birds, that is regularly watched by large numbers of amateur and professional ornithologists, there is little information within the data set pertaining to bird behaviours or habitat use that can be used to determine where the potential impacts of the Proposed Development would be expected to have the greatest impact on birds, nor can the data be used to determine specific impact avoidance, mitigation or compensation measures.

13A.4.5 The ERIC data were filtered by age, location, and description so that any records demonstrating regular non-breeding habitat use other than feeding were identified, since a large proportion of the records describe feeding behaviours in a general sense. Principally such habitat use would be restricted to roosting, therefore the data set was filtered to identify this behaviour. Unconfirmed records were omitted (i.e., only those records that the supplier states are "*considered correct*" were included). This process identified eight records of five species, which are summarised in Table 13A-4.

13A.4.6 Relevant records of breeding birds number only two, both of which were booming (calling) male bittern within Saltholme RSPB Reserve in 2012. All other records were of common and widespread species, and species that are not qualifying species of designated sites.

Table 13A-4: Relevant Bird Records Supplied by ERIC North OBJ OBJ

SPECIES	CONSERVATION STATUS10	DATE OF RECORD	LOCATION11	GRID REF	NUMBER OF BIRDS	ACTIVITY
Grey heron Ardea cinerea	Green	11/12/2017	Seaton Snook, Teesmouth	NZ5326	1	Roosting on Seaton Channel side of Snook at first light
Turnstone	Amber	11/12/2017	Seaton Snook, Teesmouth	NZ5326	1	Roosting on Seaton Channel side of Snook at first light
Long - eared owl Asio otus	Green	14/01/2017	Haverton Hole	NZ4823	1	Roosting
Long - eared owl	Green	14/01/2017	Haverton Hole	NZ4823	2	Roosting in scrub
Long - eared owl	Green	26/11/2017	Haverton Hole	NZ4923	1	
Long - eared owl	Green	17/11/2012	RSPB Saltholme	NZ5023	3	Roosting and watchpoint
Long - eared owl	Green	17/11/2017	RSPB Saltholme	NZ5022	1	Roosting in scrub
Long - eared owl	Green	22/11/2017	RSPB Saltholme	NZ5022	1	
Dunlin Calidris alpina	Red, Annex 1	05/08/2017	Seal Sands	NZ5225	1	Roosting over high tide
Knot	Amber, Ramsar SPA, SSSI	05/08/2017	Seal Sands	NZ5225	3	Roosting over high tide
Knot	Amber, Ramsar SPA, SSSI	28/05/2017	RSPB Saltholme	NZ5022	1	
Knot	Amber, Ramsar, SPA, SSSI	11/12/2017	Seaton Snook, Teesmouth	NZ5326	4	Roosting on Seaton Channel side of Snook at first light

[10] Green/Amber/Red = status as listed in Birds of Conservation Concern; Annex 1 = Annex 1 of the Habitats Regulations (as amended); Schedule 1 = Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); Ramsar/SPA/SSSI = a reason for notification of designated site(s). Further details in Section 13.2.
[11] Distances from the Proposed Development are not shown because the records are supplied at 10km grid square resolution

SPECIES	CONSERVATION STATUS10	DATE OF RECORD	LOCATION11	GRID REF	NUMBER OF BIRDS	ACTIVITY
Bittern	Amber, Annex 1, Schedule 1	06/04/2012	Haverton Hole	NZ4823	1	Booming male
Bittern	Amber, Annex 1, Schedule 1	14/04/2012	RSPB Saltholme	NZ5023	1	Booming male

INCA Records

13A.4.7 INCA provided location-specific bird records with notes on habitat use. The non-breeding records include locations of several key wader roosts along the Teesside coast, within Seal Sands, Teesmouth and the River Tees channel. These are summarised in Table 13A-5. The full data set, including a map showing the records referenced to the tabulated data, is reproduced in Annex B (to be provided).

13A.4.8 All known roosts occur on intertidal habitats, or on terrestrial habitat immediately adjacent to intertidal habitats. Of particular importance for roosts are the habitats surrounding and adjacent to Seal Sands, particularly the eastern side of Seal Sands Bay, but there are also significant roosts on Bran Sands, South Gare and Coatham Sands. All of these are either adjacent to or within a short distance of the Proposed Development boundary.

13A.4.9 The list of breeding locations for SPA/SSSI birds is reproduced in Table 13A-6 and includes three qualifying species of Teesmouth and Cleveland Coast SPA, Ramsar and SSSI breeding at various locations along the Teesside coastline and within the North Tees Marshes either side of A178.

Table 13A-5: Teesside Wader Roosts (Source: INCA)

ROOST ID	NAME	MAIN SPECIES12	ADDITIONAL INFO	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
1	Hartlepool North Sands below Britmag	**Redshank, knot** (in mid-hundreds at least, unclear if still occupied)	Predominantly around MHWM[13], not on the elevated made ground above the former Britmag site (although oystercatcher (*Haematopus ostralegus*) occasionally roost there too)	9.7 km north-west	7.83 km north
2	Hartlepool West Harbour roost	**Turnstone, redshank, purple sandpiper**	None	7.79 km north-west	5.82 km north
3	Newburn Bridge	**Redshank, ringed plover**, oystercatcher	None	7.11 km north-west	4.91 km north
4	North Gare	**Knot**, grey plover (*Pluvialis squatarola*), oystercatcher	None	2.87 km north-west	2.13 km north
5	Seaton Snook	Oystercatcher, grey plover, **knot**, dunlin (latter in autumn)	None	1.86 km north-west	927 m north
6	Greatham Creek saltmarsh	Curlew (*Numenius arquata*), **redshank**	None	4.96 km west	287 m west

[12] Species in bold font are qualifying features (either as individual species or assemblage species) of one or more of Teesmouth and Cleveland Coast SPA/Ramsar/SPA, Teesmouth and Cleveland Coast SSSI, Northumbria Coast SPA, Durham Coast SSSI, and Teesmouth NNR (see Table 13A-3)
[13] Mean High Water Mark

ROOST ID	NAME	MAIN SPECIES12	ADDITIONAL INFO	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
7	Brinefield Number 4 Tidal Pool	**Lapwing, redshank**, dunlin (latter in autumn)	None	4.46 km north-west	Overlapping
8	Greenabella Seawall and marsh	**Redshank**, curlew	Broad area	3.82 km west	12.25 m north-west
9	Seal Sands seawall/land east of intertidal project	Curlew	Broad area	3.27 km west	Overlaps
10	Seal Sands peninsula - 'Redshank corner'	**Redshank, shelduck**	Base of western side of the peninsula	2.15 km west	61 m north-west
11	Seal Sands peninsula - 'Oil Drum'	**Shelduck**, oystercatcher, curlew	Halfway up the western side of the peninsula	2.04 km west	434 m north
12	Seal Sands peninsula - 'Entrance to peninsula enclosure'	**Shelduck**, curlew, oystercatcher, **redshank**	Broad area	2.06 km west	775 m north
13	Seal Sands peninsula - 'Tip of peninsula'	Oystercatcher	Tip of peninsula	2.16 km west	909 m north
14	Middlesbrough Dock	**Redshank**	Approximate location	6.77 km south-west	2.59 km south-west
15	North Tees Mudflat seawall	**Redshank**	None	4.22 km south-west	653 m south-west

ROOST ID	NAME	MAIN SPECIES12	ADDITIONAL INFO	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
16	Bran Sands Island	**Cormorant**, oystercatcher (when exposed)	None	1.09 km north-west	213 m north
17	South Gare/ German Charlies	Oystercatcher, formerly (?) **knot**	None	1.82 km north	1.75 km north
18	Coatham Sands	200-300 Oystercatcher (but join South Gare / German Charlies roost if disturbed)	Beach. Birds move to the South Gare German Charlies roost if disturbed. One or two bar-tailed godwits (*Limosa lapponica*), very few dunlin, some sanderling, some **black - headed gull**, occasionally up to ten sandwich terns, etc.	484 m north-east	476 m north-east
19	Coatham Boating Lake	**Redshank**	None	3.05 km east	1.91 km east

Table 13A-6: Teesside SPA Species Breeding Locations (Source: INCA)

SPECIES	LOCATION NAME	NGR	YEAR	NUMBERS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Little Tern	Crimdon Denemouth	NZ489367	2018	72 pairs, 9 nests, no young fledged (owing to predation).	12.72 km north-west	10.1 km north-west
	South Gare	NZ558279	2018	1 pair, 1 nest, no young fledged (reasons unknown).	1.75 km north	1.65 km north
	Seaton Carew	NZ529294	2019	40-50 pairs, 36-38 nests, 38-40 young fledged.	4.5 km north-west	2.82 km north
	Crimdon Denemouth	NZ489367	2020	5 apparently occupied nests; 4 young fledged	12.72 km north-west	10.1 km north-west
	Seaton Carew	NZ529294	2020	60 apparently occupied nests; 3 young fledged. This location continued as the main breeding colony in 2021. No newer records than this are available for this species.	4.5 km north-west	2.82 km north
	South Gare	NZ558279	2020	Nesting attempt by a single pair	1.75 km north	1.65 km north
	North Gare	NZ539282	2020	Nesting attempt by a single pair	2.94 km north-west	2.18 km north
Common Tern	Saltholme	NZ502230	2018	263 nests, 147 young ringed.	5.89 km south-west	506 m west
	Cowpen Marsh	NZ505247	2018	24 nests, 24 young ringed.	5.18 km west	347 m west
	Portrack Marsh	NZ468195	2019	1-2 nests, 4 young fledged	10.53 km south-west	2.09 km south-west

SPECIES	LOCATION NAME	NGR	YEAR	NUMBERS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
	Saltholme	NZ502230	2020	185 pairs in total but none fledged due to predation	5.89 km south-west	506 m west
	Saline Lagoon	NZ509252	2020	90 pairs, 41 chicks colour ringed	4.75 km west	27.4 m west
	Cowpen Marsh	NZ505247	2020	18 pairs, six young fledged	5.18 km west	347 m west
Avocet	North Tees Marshes	NZ509252	2018	22 nests, 8 young fledged from various locations. Grid Reference given is for No4 Brinefield Saline Lagoon, where 12 nests were recorded.	4.75 km west	27.4 m west
	Saline Lagoon	NZ509252	2019	12 nests, 20 young ringed	4.75 km west	27.4 m west
	Long Drag	NZ515245	2019	2 nests, outcome unknown	4.21 km west	Overlapping
	Greenabella	NZ512256	2019	2+ nests, 6 young ringed	4.46 km west	Overlapping
	Calor Gas Pool	NZ504217	2019	1 nest, 3-4 young fledged	6.31 km south-west	1.61 km south-west
	Saltholme	NZ502230	2020	19 pairs, no young fledged	5.89 km south-west	506 m west
	North Tees Marshes	NZ509252	2020	Numbers not known; some chicks fledged	4.75 km west	27.4 m west

Natural England

13A.4.10 Natural England commissioned a study to understand the distribution of wintering water birds at selected sites across Teesside (Percival, 2015), to inform the review of protected sites undertaken by Natural England at that time.

13A.4.11 The report describes the use by wintering water birds across several key areas north/west of the River Tees (all of which are within the natural gas connection corridors but outside the footprint of the Main Site), as shown in the figure reproduced from Percival (2015) in Annex C:

- Greatham Tank Farm, which overlaps the Proposed Development Boundary;
- Greenabella Marsh, which overlaps the Proposed Development Boundary;
- Cowpen Marsh, which is immediately west of the Proposed Development Boundary;
- Brinefield No. 4, which is within the Proposed Development Boundary;
- Long Drag and Seal Sands Foreshore (shown as "Seal Sands" on the plan in Annex C), which overlaps the Proposed Development Boundary;
- Vopak Foreshore and Brownfield, overlaps the Proposed Development Boundary; and
- North Tees Mudflat and Brownfield, which is 699 m south-east of the Proposed Development Boundary.

13A.4.12 A number of these areas are identified as supporting significant numbers of wintering wetland birds and, although some of them are described in rather general terms, there is clearly a high degree of consistency with the roost records supplied by INCA. Key locations include:

- Cowpen Marsh, which is important for wigeon, teal, mallard (*Anas platyrhynchos*), lapwing and curlew. Most species used the site for feeding, but lapwing also roosted and there were occasional gull roosts recorded (mainly herring gull and black-headed gull);
- Greenabella Marsh, which was used by significant numbers of wigeon, teal and shoveler and was a regular high tide roost for black-tailed godwit (*Limosa limosa*) and redshank. Most of the bird records were within the pools at the southern end of this area;
- North Tees Mudflat and brownfield supported important numbers of feeding wader and gulls at low tide, the latter also roosting here. The adjacent terrestrial habitats were used by small numbers of roosting and feeding curlew;
- Long Drag and Seal Sands brownfield was identified as important for feeding and roosting redshank within the pools at the western end of the area, and for roosting curlew which were recorded at several locations adjacent to the Emergency Access Road and within the grasslands immediately south of it.

13A.4.13 Additionally, several areas held relatively small numbers of wetland birds: Vopak foreshore was used by small numbers of feeding birds and as an occasional roost by cormorant; Greatham Tank Farm was shown to be important for water birds mainly moving to and from Cowpen Marsh; and Brinefield Number 4 held small numbers of feeding waders, shelduck and dabbling ducks.

British Trust for Ornithology (BTO) WeBS Data

13A.4.14 Low tide data were purchased for sectors counted in 2022-2023 within the Dabholme Gut – Bran Sands – Coatham Sands area, covering intertidal habitats that are within approximately 500m of the Proposed Development. Data for additional sectors beyond 500m were obtained where these are contiguous with those that lie within 500m of the Main Site, to provide continuity of baseline data for the section of coast and associated habitats west, north, and northeast of the Main Site. The low tide sectors for which data were purchased are shown on the plan in Annex D (to be provided), along with the complete data set provided by WeBS.

13A.4.15 Core Count (high tide) data were purchased for the same broad area. An equivalent plan of the Core Count sectors for which data were obtained, and the complete Core Count data set for those sectors, is included in Annex E (to be provided). While there are differences in the comparative extent of the low tide and core count sectors, it is possible (with one exception) to identify individual or groups of low tide sectors that are approximately analogous to the core count sectors, as set out in Table 13A-7.

Table 13A-7: Spatial comparison between BTO WeBS Low Tide and Core Count sectors

CORE COUNT SECTOR	EQUIVALENT LOW TIDE SECTOR(S)
Bran Sands South	DT21
Bran Sands North	DT23 – DT25, DT29
Coatham Sands North	DT25, DT27
Redcar and Coatham Sands South	DT28
Quarries and Lagoons	No equivalent

13A.4.16 The data received provide extremely detailed information on numbers of water birds within the Teesside area as a whole and within individual sectors, but the data lack detail regarding habitat use by or distribution of birds at a scale finer than sector-level. For the purposes of the rest of this section the Teesmouth and Cleveland Coast designations (Ramsar, SPA and SSSI) will be referred to as “the designations”.

13A.4.17 Key metrics are presented for low tide data and core count data (in Tables 13A-8 and 13A-9 respectively), focusing on those species for which the designated sites are notified.

13A.4.18 The low tide count data include 13 of the 20 species for which the designations are notified, although the metrics for total number of species recorded indicate that

collectively this area supports a much larger number of species regardless of their inclusion or otherwise as notified features of the designations. Gulls (particularly herring and black – headed) occur in relatively large numbers in all sectors (especially in Sector DT21), therefore no further narrative will be offered regarding these species.

13A.4.19 Of the species listed, those occurring on the open coastal habitat of Redcar and Coatham Sands (sectors DT26 – DT28) are restricted mainly to waders (redshank, knot and sanderling and very small numbers of ringed plover and purple sandpiper), with smaller numbers of cormorant and wigeon. Similar observations can be made for Bran Sands area (Sectors DT23 – DT25, and DT29), where redshank was by far the most abundant species at low tide, although none of the species were consistently counted in large numbers in this area and the metrics for number of species recorded overall were generally lower than in other areas. This observation is somewhat at odds with the data generated during AECOM's surveys (paragraphs 13.1.68 – 13.1.95) and this serves to demonstrate the inherent variability of bird numbers and habitat use with time (which can occur for reasons of between - year variability in bird numbers as well as conditions experienced at the time of the baseline surveys), and the importance of using data collected over a suitable length of time and the use of multiple data sources for assessment purposes.

13A.4.20 Sector DT21 covers the section of the lower River Tees adjacent to the mouth of Dabholme Gut, and Dabholme Gut itself. The data indicate that at low tide, this area supports by far the largest number and variety of wetland birds of all the sectors for which data were obtained, with a wide range of waders and ducks gathering (presumably) to feed. Here, redshank, shelduck, teal, lapwing, gadwall and ringed plover numbers were exceptional in comparison with other sectors. Dabholme Gut is known to be of key importance for these species (Smith, 2011).

Table 13A-8: Mean count and mean density[14] (birds per hectare) of Ramsar, SPA and SSSI birds in WeBS Low Tide count sectors in 2018/19[15]

SPECIES[16]	PREFERRED HABITAT[17]	WHOLE SITE	LOW TIDE SECTOR							
			DT21	DT23	DT24	DT25	DT26	DT27	DT28	DT29
Knot	Intertidal	31 (0.21)	-	-	0 (0.3)	-	-	-	29 (0.3)	-
Redshank	Intertidal & non-tidal	391 (0.74)	86 (12.21)	3 (0.14)	6 (0.75)	7 (0.19)	1 (0.09)	13 (0.85)	9 (0.9)	6 (0.16)
Sanderling	Intertidal	72 (0.47)	-	-	-	-	-	6 (0.37)	55 (0.58)	-
Shelduck	All habitats	140 (0.81)	129 (3.23)	-	-	-	-	-	-	1 (0.02)
Cormorant	All habitats	46 (0.03)	3 (0.08)	-	-	6 (0.05)	8 (0.05)	0 (0.01)	6 (0.02)	-
Teal	All habitats	797 (1.99)	677 (16.92)	-	-	-	-	-	-	-
Wigeon	All habitats	158 (0.37)	-	-	-	-	-	-	2 (0.01)	-
Lapwing	Intertidal & non-tidal	819 (4.48)	227 (32.36)	-	-	-	-	-	-	-
Herring gull	All habitats	1328 (0.85)	31 (0.78)	11 (0.29)	38 (3.15)	57 (0.47)	55 (0.39)	37 (0.96)	120 (0.44)	41 (1.17)

[14] Mean density in parentheses. Mean counts of 0 accompanied by mean density of >0 are due to rounding down of mean count to the nearest whole number, in the case of low counts
[15] Low tide counts cover the period November – February inclusive, during which time counts are undertaken monthly. Not all sectors are counted every month in this period (details of coverage are provided in the full WeBS data set in Appendix D)
[16] Species not listed in the WeBS data set and those that are present as breeding species only are excluded from the table. Metrics for number of species metrics at foot of table are for all species included in data set.
[17] Habitat categories as set by WeBS for survey and analysis purposes. N/A = Not applicable

SPECIES[16]	PREFERRED HABITAT[17]	WHOLE SITE	LOW TIDE SECTOR							
			DT21	DT23	DT24	DT25	DT26	DT27	DT28	DT29
Black-headed gull s	All habitats	479 (0.31)	60 (1.5)	28 (0.76)	6 (0.5)	14 (0.11)	17 (0.12)	62 (1.58)	99 (0.36)	5 (0.14)
Gadwall	All habitats	32 (0.18)	21 (0.52)	-	-	1 (0.0)	-	-	-	-
Purple sandpiper	Intertidal	3 (0.05)	-	-	-	-	-	0 (0.02)	-	-
Ringed plover	Intertidal	20 (0.15)	-	-	1 (0.09)	-	-	2 (0.15)	-	-
Number of species recorded – all habitats	N/A	16	11	4	4	6	6	5	7	4
Number of species recorded – Sub tidal	N/A	14	2	-	2	3	5	4	7	1
Number of species recorded – Intertidal	N/A	9	2	3	5	2	3	7	4	2
Number of species recorded – Intertidal and Non-Tidal	N/A	9	4	2	2	3	2	2	3	2
Total number of species recorded	N/A	48	19	9	13	14	16	18	21	9

13A.4.21 The Core Count data include the same 13 (out of 20) species for which the designations are notified, that were detected by the Low Tide counts (i.e., no additional species for which the designations were notified were recorded at High Tide within a broadly similar geographical area). As noted for the Low Tide data, herring and black – headed gulls were present in relatively large numbers in all sectors, these species being ubiquitous across Teesside coastal habitats. Therefore, no further narrative is offered for these species.

13A.4.22 Observations and inferences from the Core Count data are very similar to those for the Low Tide count data:

- The open coastal sands of Coatham Sands North and Redcar and Coatham Sands South supported predominantly waders (knot, redshank, sanderling, ringed plover, and small numbers of purple sandpiper with peak counts occurring in autumn and spring), relatively small numbers of ducks (teal and wigeon) with numbers peaking in autumn and winter, and cormorant;
- Bran Sands Bay (covered by sector "*Bran Sands North*") supported large numbers of waders (knot, redshank, sanderling, lapwing, and ringed plover with peak counts occurring between autumn and spring) and smaller numbers of ducks (shelduck and teal, with autumn and winter peak counts). Cormorant numbers were highest in this sector; and
- Bran Sands South (which covers the River Tees channel, part of Dabholme Gut and Bran Sands Lagoon immediately to the north of Dabholme Gut) was notable for wintering redshank and lapwing, with ducks well represented by shelduck, teal and gadwall (peak counts for which occurred between January and March), and cormorant.

13A.4.23 The Core Count sector "*Quarries and Lagoons*" covers a large area of the dunes, dune ponds and dune slacks between the Main Site and the open coast of Coatham Sands. It should be noted, however, that this count sector overlaps the northern end of the Teesworks working site and a very small part of the northern corner of the Main Site, immediately to the south of South Gare Road. The habitats within the Teesworks site have been subjected to intensive ground works and demolition of buildings and other infrastructure in recent years and are highly disturbed/modified. Therefore, it is unlikely that significant numbers of wetland birds would have been counted here during WeBS counts.

13A.4.24 This sector supported small numbers of waders (redshank and lapwing) and ducks (shelduck, teal and wigeon). These species would ordinarily be drawn primarily to the series of ponds within the dune system; however, AECOM's experience and knowledge of this area indicates that only one of the dune ponds (immediately adjacent to South Gare Road and approximately 170m east of the Foundry shortlisted site) has any open water habitat or marginal habitats attractive to these species (all other ponds having become relatively dry and dominated by dense bulrush *Typha* and reed *Phragmites australis* swamp). Most of the species listed in Table 13A-9 for this sector have been observed by the author at or close to this

pond and it is highly likely that most of the birds counted in this sector and represented in Table 13A-9 show the same spatial distribution.

Table 13A-9: Five-year[18] Mean peak and maximum peak[19] high tide counts of Ramsar, SPA and SSSI species[20] within WeBS Core Count Sectors

SPECIES	CORE COUNT SECTORS				
	BRAN SANDS SOUTH	BRAN SANDS NORTH	COATHAM SANDS NORTH	QUARRIES AND LAGOONS	REDCAR AND COATHAM SANDS SOUTH
Knot	-	185 (253, Aug 2015)	73 (90, Aug 2019)	-	236 (680, Mar 2020)
Redshank	162 (190, Feb 2016)	208 (284, Sep 2018)	81 (214, Oct 2016)	18 (71, Mar 2016)	243 (330, Jan 2019)
Sanderling	-	15 (27, Aug 2019)	173 (279, Apr 2016)	-	259 (360, Aug 2018)
Shelduck	78 (118, Mar 2016)	3 (5, Dec 2018)	-	3 (11, Apr 2016)	-
Cormorant	50 (63 Aug 2015)	78 (117 Aug 2016)	16 (22, Jan 2018)	-	11 (15, Jan 2016)
Teal	286 (827, Dec 2018)	18 (53, Nov 2018)	36 (105, Sep 2016)	3 (10, Dec 2016)	1 (1, Sep 2016)
Wigeon	2 (7, Sep 2016)	0 (1, Oct 2018)	20 (20, Sep 2017)	0 (2, Oct 2016)	-
Lapwing	294 (640, Jan 2019)	407 (740, Dec 2016)	-	27 (61, Aug 2015)	-
Herring gull	264 (740, Aug 2015)	102 (188, Jan 2019)	171 (220, Apr 2018)	18 (32, May 2018)	158 (201, Sep 2018)
Black-headed gull	346 (570, Feb 2019)	41 (84, Jul 2019)	358 (1,232, Oct 2016)	24 (32, Oct 2015)	162 (261, Feb 2019)

[18] Count years 2015/16 – 2019/20; a count "year" begins in July
[19] Maximum peak and month of peak count in parentheses)
[20] Species with zero counts for the sectors listed are excluded from the table

SPECIES	CORE COUNT SECTORS				
	BRAN SANDS SOUTH	BRAN SANDS NORTH	COATHAM SANDS NORTH	QUARRIES AND LAGOONS	REDCAR AND COATHAM SANDS SOUTH
Gadwall	14 (45, Jan 2020)	-	-	-	-
Purple sandpiper	-	0 (2, Dec 2017)	6 (11, Feb 2019)	-	2 (2, Feb 2020)
Ringed plover	-	32 (72, May 2017)	110 (178, May 2019)	-	46 (129, Aug 2017)

NZT data

13A.4.25 Ornithological interest features relevant to the H2Teesside Proposed Development include several breeding bird assemblages, individual breeding bird species, and non-breeding birds[21]. These have been identified through a combination of bespoke surveys and third-party data, much of which are spatially and technically relevant to H2Teesside.

13A.4.26 In summary, the key areas of ornithological interest identified by the NZT project that are also potentially relevant to the Proposed H2Teesside development were identified as:

- The brownfield habitats, including semi-improved neutral grassland, ephemeral/short perennial and bare ground intersected by small standing and flowing freshwaters (ponds, streams, ditches and rivers/streams) and ditches within Teesworks, which supported a locally important breeding bird assemblage and small numbers of breeding and roosting species that are of no greater than local importance;
- Coatham Dunes, were identified as supporting a locally important assemblage (at Borough level) of breeding birds and provide a foraging resource for barn owl;
- Coatham Sands and Bran Sands were identified as important for feeding, roosting and loafing waders, gulls and terns;
- The mouth and channel of the River Tees were identified as important for foraging common tern;
- The north Tees Marshes up to and including Seal Sands Bay and Saltholme RSPB reserve were identified as important for breeding and wintering birds, with particular interest for marsh harrier, avocet, wintering ruff and roosting waders and shelduck;
- Scattered locations along the coastal sands north of the River Tees were identified as important for breeding SPA and SSSI species and roosting coastal birds (this was based upon the same data set presented in Tables 13A-5 and 13A-6);
- Breeding barn owl was identified at one location within Teesworks and in the wider area at RSPB Saltholme and on the North Tees Marshes west of Seal Sands Bay; and
- Some habitats within Teesworks supported breeding little ringed plover and breeding and roosting lapwing (although those habitats have since been subjected to intensive earthworks and site clearance and are no longer suitable for these species).

[21] The list of designated sites relevant to NZT is identical that for H2Teesside.

13A.4.27 The relevant ornithological features are not set out in detail in this report but are summarised within Section 13.5 – Summary of key Locations for Birds, and Table 13A.13.

Field Surveys – Non-Breeding Wetland Bird Counts

13A.4.28 Bird counts using a WeBS method, particularly on estuarine or other large wetland sites, often generate large amounts of count data from which it can be difficult to extract meaningful trends or conclusions. Instead, the data collected should be used as a guide to assess relative ornithological risk associated with the Main Site and Connection Corridors, and the narrative and summary data below reflect this approach.

13A.4.29 Summary count data (peak counts by sector for each of The Foundry, Seal Sands and North Tees Marshes survey areas) are provided in (respectively) Appendices 13A-F, 13A-G and 13A-H for context, however these data are simplified versions of the full data set and, given that there are approximately 6 months remaining of the survey period, are not intended to inform detailed analysis at this stage.

13A.4.30 Large numbers of a wide variety of wetland birds, including waders, ducks, geese, sawbills, cormorants, and gulls (including qualifying species of the various coastal designated sites, and species that are not qualifying features) were recorded on all surveys. The total number of species recorded to date numbers 78, of which 20 are qualifying features of one or more of the Ramsars, SPAs and SSSIs listed in Table 13A-3. There is nothing exceptional about the count data in the context of the Teesside area's importance as a stronghold for such species, however the specific methods used for the purposes of this study have enabled some key locations to be identified based on their use as roosts and key feeding areas and this information is presented in the sections that follow.

The Foundry

13A.4.31 The habitats that occur immediately adjacent to the Foundry are within a busy industrial site characterised by active and defunct steelworks infrastructure, bulk storage areas, other industrial and ancillary infrastructure. This is punctuated by brownfield habitats, grasslands, occasional ponds, and scattered scrub. Beyond the limits of the working areas, these habitats merge into areas of semi-improved grassland, ephemeral/short perennial vegetation, scattered scrub, dunes, and dune grasslands (which to the north of the shortlisted site include dune slacks and ponds), beyond which are the coastal and intertidal habitats of the Teesside Coast and Teesmouth. Large parts of the survey area, including Redcar and Coatham Sands and Bran Sands to the north, are characterised by wide open sandy beaches. To the west of the shortlisted site, at the western edge of the survey area within the mouth of the River Tees, habitats are a combination of artificial structures (piers, dock walls), rocky and sandy shore, small inlets, and a tidal lagoon (Bran Sands Lagoon) and artificial tidal channel (Dabholme Gut).

13A.4.32 Low and high tide counts generated recorded similar numbers of wetland bird species (46 and 44 species respectively). The intertidal habitats of Coatham Sands (Sectors 1-2), Bran Sands Bay (Sectors 6-7 and adjacent terrestrial habitats within

sectors 8 and 8a), Bran Sands Lagoon (Sector 16) and Dabholme Gut (Sector 18) produced the largest species counts regardless of any designations; the largest numbers of qualifying species of Teesmouth and Cleveland Coast SPA, Ramsar and SSSI also occurred in these sectors. Sectors 3, 4, 5, 5a were not counted systematically and generated no records. Similarly Sectors 11, 17 and 19 within Teesworks collectively generated very few bird records.

13A.4.33 High tide counts followed a similar pattern, but Bran Sands Bay generated larger bird counts, which are likely to be related to the presence of a larger number of high tide roosts scattered around the perimeter of the Bay (paragraphs 13.1.76 – 13.1.78 and Table 13A-10).

13A.4.34 Larger numbers of birds were recorded within Sectors 8, 8a and 8b at high tide than at low tide, indicating that the terrestrial habitats here may have some importance to roosting birds during high tide. Sectors 2, 4, 5, 5a, 12 and 17 generated no records of wetland birds and sector 19 generated a peak count of only 4 herring gulls, however Bran Sands Lagoon and Dabholme Gut generated relatively large counts of birds, indicating that they provide attractive habitat to wetland birds at all tidal states.

13A.4.35 Bird roosts within the Foundry survey area are summarised in Table 13A-10 and shown on Figure 13A-7, with supporting narrative on these locations and other potentially key areas in the following paragraphs.

Table 13A-10: Details of Roosts Recorded During Surveys of the Foundry from January 2022 to March 2023

REFERENCE	DATE(S) RECORDED	DETAILS[22]	DISTANCE FROM MAIN SITE	DISTANCE FROM PROPOSED DEVELOPMENT BOUNDARY	TIDE
F1	25/01/22	Mixed gull roost (common and **black – headed gulls**)	836 m north-west	238 m north	Low
F2	25/01/22	Mixed gull roost (common and **black – headed gulls**), also loafing and feeding, at least 300 birds Oystercatcher roost, at least 600 birds	571 m north-east	547 m north-east	Low
F3	26/01/22 10/02/22 22/02/22 23/02/22 10/03/22 21/09/22	**Cormorant**/shag (P*halacrocorax aristotelis*) (min 130); **herring gull** (min 116); common gull (min 26), great black-backed gull (*Larus marinus*), oystercatcher (min 11), grey plover (min 48), **knot** (55), dunlin (min 130), **ringed plover** (min. 10) plus small numbers of **turnstone, redshank** and **sanderling** on several rock spits/outcrops	1.09 km north-west	174 m north	High and Low
F4	26/01/22 17/02/22 29/03/22	Curlew (min 23), oystercatcher (min 24); **redshank** (70), **turnstone** (min 15)	796 m north-west	600 m north-east	High
F5	10/02/22	**Teal** roost	1.07 km west	118 m north	High

[22] Counts provided where available. Numbers are minima (using the highest available count recorded) because it can be impossible to view all of habitat unit/roost site. Species in **bold font** are qualifying features (either as individual species or assemblage species) of one or more of Teesmouth and Cleveland Coast SPA/Ramsar/SPA/SSSI, Northumbria Coast SPA and Ramsar, and Durham Coast SSSI. Some locations include feeding as well as roosting birds.

REFERENCE	DATE(S) RECORDED	DETAILS[22]	DISTANCE FROM MAIN SITE	DISTANCE FROM PROPOSED DEVELOPMENT BOUNDARY	TIDE
F6	10/02/22 21/09/22	Mixed gull roost (common, **black-headed** and **herring gulls**)	379 m north-west	Within	High
F7	10/02/22 21/09/22	**Herring gull** roost	133 m south	Within	High
F8	10/02/22 21/09/22	**Teal**, **lapwing** roost; foraging **redshank**; **loafing black – headed gulls**	713 m south-west	Within	High
F9	10/02/22 17/02/22 29/03/22	**Redshank** roost (min 17)	1.14 km north-west	936 m north	High
F10	21/09/22	**Lapwing** Bar-tailed godwit	533 m south-west	Within	High
F11	21/09/22	**Teal** **Redshank** **Black-headed gull**	848 m south	Within	High

13A.4.36 A large gull and oystercatcher roost occurred on the upper shores of Coatham Sands at low tide in January 2022, with sanderling, cormorant, and shag present on most surveys. This record is a close match to the records provided by INCA (see Annex B and Table 13A-5).

13A.4.37 Bran Sands Bay, as well as clearly being favoured by many species (ringed plover, redshank, oystercatcher, knot, dunlin, turnstone, curlew) as a feeding habitat, supported a cluster of roosts around its periphery, the most important of which occurs on the line of rocky outcrops northwards of the small peninsula at its western end, as far as Bran Sands Island, within Sector 7. The roosts here are often inundated at high tide resulting in a dynamic situation that involves movements to and from these roosts by a variety of waders (redshank, lapwing, curlew, oystercatcher), gulls, and cormorants, with movements to other roosts and exposed feeding areas within the wider Teesside area, including Seal Sands and occasionally the peninsula of land immediately south of the Bay. A small but regular redshank roost occurred in the small inlet on the north-eastern edge of Bran Sands Bay.

13A.4.38 Irrespective of the importance of the wider environs of the Teesside Coastline and the various ornithological designated sites that overlap it, based on the observed regularity and type of habitat use by wetland birds, the following should be regarded as the most important or sensitive areas for wetland birds within the Foundry survey area:

- Bran Sands Bay and the peninsula of land immediately south of it (Sectors 6, 7, 8a);
- Bran Sands Lagoon (Sector 16);
- Dabholme Gut (Sector 18); and
- Coatham Sands.

Seal Sands

13A.4.39 Most of the undeveloped habitats adjacent to Seal Sands Bay, along with the bay itself, provide a mix of habitats (open muds/sands; sandy and rocky shores; saline lagoons, ponds and pools; grasslands of varying types; tidal river channels; reedbeds; and saltmarsh) that can be exploited by a wide variety of wetland birds, and a continuity of habitats that enables birds to move freely and easily between them dependent on habitat preferences, conditions and ecological needs at any given time.

13A.4.40 Sectors 2 and 5 held no birds at low tide while sectors 5 and 7 held no birds at high tide. However, Sector 2 yielded records of only very small numbers of 2 species at high tide and can therefore be regarded as relatively barren with respect to non-breeding birds.

13A.4.41 Low tide counts generated more records overall of wetland birds than high tide counts. At low tide, the exposed mudflats within Seal Sands Bay attracted large numbers of mainly wading birds, reflected in the high counts and/or frequency of occurrence of species such as dunlin, curlew, knot, oystercatcher, grey plover, and redshank in sectors 18-20. A variety of ducks (mallard, teal, shelduck, pochard

Aythya ferina, tufted duck *Aythya fuligula* and shoveler) were also present regularly and/or in large numbers but with a distribution bias toward the more sheltered habitats such as the pools within Sectors 4, 22, 23, the saline lagoon within the headland at the eastern end of Seal Sands Bay (Sector 18a) and to a lesser extent the channel of Greatham Creek (Sectors 17, 17a and 21) immediately east of the A178.

13A.4.42 At high tide, the surrounding terrestrial habitats supported relatively larger number of birds and the majority of species were represented by ducks, geese, mergansers and gulls rather than waders.

13A.4.43 The terrestrial count sectors immediately to the south of Seal Sands Bay (2, 4, 6, 7, 8 and 9) generated small counts of a limited suite of waders and ducks. In the case of several species of wader (curlew, oystercatcher, turnstone and redshank) some of these counts were attributable to birds roosting and sometimes feeding along the sea wall and adjacent grasslands surrounding the Bay (Table 13A-11) at high tide.

13A.4.44 The low numbers of species from Sectors 22-23 (and sub-sectors) across Greenabella Marsh immediately to the west of Seal Sands Bay are likely to reflect a persistent lack of access to these survey areas since September 2022, rather than genuinely small counts, and therefore these figures should be treated with caution at this stage. However, these sectors typically support a small assemblage of ducks and waders and can be particularly well used during adverse conditions of strong winds and/or sea swell. At these times, and during advancing tides, movements of wetland birds were observed along Greatham Creek channel towards the saltmarshes west of the A178, and onto Greenabella Marsh. The habitats around some of the pools in Sector 22 are suitable for breeding Avocet and this is reflected in the records of breeding SPA species supplied by INCA (Table 13A-6 and the figure provided in Annex B).

13A.4.45 The open short grassland habitats, pools and channels within sectors G4 and G5 to the south of Greatham Creek consistently supported relatively large numbers of waders (mostly curlew and lapwing but also small numbers of oystercatcher, redshank and dunlin in Sector G5), with small numbers of Avocet and large numbers of several species of duck congregating within and immediately around the open water habitats at the northern end of G5. Based on their presence in the area, and the availability of suitable habitat, Schedule 1 waders such as avocet and little ringed plover might breed within Sector G5.

13A.4.46 Bird roosts within the Seal Sands survey area are summarised in Table 13A-11 and shown on Figure 13A-8, with supporting narrative on these locations and other potentially key areas in the following paragraphs.

Table 13A-11: Details of Roosts Recorded During Stage 1 Surveys of Seal Sands from January 2022 to March 2023

REFERENCE	DATE(S) RECORDED	DETAILS[23]	DISTANCE FROM MAIN SITE	DISTANCE FROM PROPOSED CONNECTION CORRIDORS	TIDE
SS1	11/02/22	Curlew roost	3.85 km west	23.5 m north-west	High
SS2	11/02/22	Oystercatcher roost	4.04 km west	Within	High
SS3	11/02/22	**Turnstone** roost	2.97 km west	Adjacent	High
SS4	17/02/22	Feeding and roosting curlew (9)	3.26 km west	Adjacent and within	High
SS5	17/02/22	Feeding curlew (1) and oystercatcher (6)	2.55 km west	Overlaps	High
SS6	17/02/22	Roosting shag (*Phalacrorax aristotelis*, 5)	2.03 km west	37.23 m north-west	High
SS7	30/03/22	Small oystercatcher roost on seawall	3.35 km west	8.66 m north-west	High
SS8	30/03/22	**Redshank** roost	2.14 km west	47.62 m north-west	High
SS9	13/12/22	Red-breasted merganser (*Mergus serrator*; 7) **Herring gull (1)** Oystercatcher (2)	4.02 km west	Within	Low
SS10	19/12/22	**Teal (74)** **Wigeon (166)** **Redshank (6)**	4.41 km west	Within	High

[23] Counts provided where available. Where provided, numbers are minima using the highest count available. Species in **bold** font are qualifying features (either as individual species or assemblage species) of one or more of Teesmouth and Cleveland Coast SPA/Ramsar/SSSI, Northumbria Coast SPA and Ramsar, Durham Coast SSSI. Some locations include feeding as well as roosting birds.

REFERENCE	DATE(S) RECORDED	DETAILS[23]	DISTANCE FROM MAIN SITE	DISTANCE FROM PROPOSED CONNECTION CORRIDORS	TIDE
		Dunlin (20) Tufted duck (*Aythya fuligula*, 4) Little grebe (1) **Black-headed gull (2)** Gadwall (14)			

13A.4.47 The limited roost records in Table 13A-11 point to the Seal Sands area supporting roosting birds predominantly at high tide, which is consistent with the observation that at low tide the extensive exposed intertidal substrates within the bay provide a significant feeding resource that is both relatively sheltered from strong onshore winds and is readily exploited by foraging birds. Additionally, the data support the expectation that the primary interest of this area is as a feeding resource at low tide, with the surrounding onshore habitats being exploited preferentially at high tide when a combination of shelter and foraging resources are required.

13A.4.48 None of the roosts summarised in Table 13A-11 were recorded on more than a single survey, however the records do broadly concur with those supplied by INCA (Table 13A-5 and Annex B), the findings of Percival (2015) and with advice provided by Natural England during an informal consultation meeting[24], including the records of feeding and roosting curlew within and immediately adjacent to the footprint of the shortlisted site.

13A.4.49 In addition to the roosts observed above, and irrespective of the narrative in previous paragraphs, the following areas held large numbers of birds on all surveys and should be regarded as integral to the function of Seal Sands Bay and associated habitats as a key part of the Teesmouth and Cleveland Coast Ramsar/SPA/SSSI:

- Seal Sands Bay was occupied by large numbers of feeding waders at low tide;
- Sector 18a (the headland at the east of Seal Sands Bay and the sheltered saline lagoon and saltmarsh habitats within it) held large numbers of feeding and roosting waders and ducks, plus smaller numbers of gulls, on all surveys (High and Low Tide); and
- Greenabella Marsh was important as a feeding refuge and roost (regardless of tidal state) for waders and ducks. The habitats further inland, to the west, provide further wetland habitat of high value that is contiguous with Greenabella Marsh and is connected to Seal Sands Bay by Greatham Creek. This is discussed further in the following section "*North Tees Marshes*".

North Tees Marshes

13A.4.50 The North Tees Marshes survey area covers a large expanse of saltmarsh, reedbed and wet grassland habitats intersected by a network of tidal creeks and channels, largest of which is Greatham Creek, which drains into Seal Sands Bay. The survey area also includes agricultural land farmed for arable and livestock to the north of Greatham Creek, south of the A1185 and northwest of the railway line that intersects the western edge of the survey area. Additionally, the ponds within Cowpen landfill site are included in the survey area, as are the grasslands and man-made pools within the "Phillips Tank Farm" oil storage site at the northern end of the survey area.

13A.4.51 Target species were recorded within almost all sectors at both high and low tide. The distribution of birds at low tide appears to be more diffuse than at high tide,

[24] Natural England -Initial Engagement, 14th February 2022. In which the relative importance of the sea wall around the perimeter of Seal Sands Bay and some of the adjacent brownfield grasslands for roosting and feeding waders was highlighted.

presumably because of the larger areas of habitat available to a greater range of species when intertidal habitats are exposed. However, sectors G9 and B13 at high tide and B19 at both low and high tide returned zero counts. These sectors either offer very little suitable habitat for wetland birds, being a combination of overgrown grassland and/or hard standing; and/or are relatively disturbed by passing human traffic and farm activity. Cowpen landfill ponds (sectors B7 – B12) attracted large numbers of ducks and geese and their relative attractiveness may have contributed to the zero counts within the adjacent stubble field of B13.

13A.4.52 The majority of target species occurred in large numbers across the low-lying wet and open habitats either side of the lower reaches of Greatham Creek at both tides (though peak counts were collectively larger at low tide), with numbers dropping away on the north side of Greatham Creek (with the notable exception of Sectors G13 and G13a Phillips Tank Farm) and the highest numbers (both of species and of individuals) occurring in Sectors G3, G6, G7, B15 and B16. The counts within B16 are likely to under-represent the true contribution of this sector to the overall count totals and species numbers because this sector was not easily viewed with the available land access for most of the surveys to date and potential viewpoints from B18 could not be used without unacceptable levels of disturbance to birds on the Creek below.

13A.4.53 At both low and high tides, the fields southwest of the A1185 between Saltholme Substation and the village of Cowpen Bewley returned modest but fairly consistent peak counts of a limited range of gulls (mostly black-headed), waders (curlew, lapwing, redshank and snipe) and ducks (mallard and teal). On the opposite side of the road, the grassland and ephemeral pools within Sector G2 returned consistent counts of ducks (shoveler, teal, mallard, wigeon, shelduck, gadwall) and waders (curlew, lapwing, redshank and anecdotally[redacted], black-tailed godwit) plus gulls (black-headed)[25].

13A.4.54 Table 13A-12 and Figure 13A-9 summarise the species recorded feeding and roosting on mass within this survey area. However, there is no discernible pattern of habitat use apparent within these data. This is primarily because the expanse of saltmarsh and wetland habitats is so large, and because high tide conditions rarely inundate all of the habitats; typically, the exposed muds and sands of the tidal pool, channels and creeks are submerged at high tide, but the vegetated banks and plateaux between them remain exposed at all times. Consequently, at all tides the distribution of birds is rather diffuse at the scale of the whole survey area.

13A.4.55 There is some evidence of occasional use of the agriculturally improved land immediately west of the railway line as a roost and/or feeding area (roost NTM7), mostly at high tide, as evidenced by the presence of a lapwing and gull roost recorded in sector B24 and the presence on a number of counts of small numbers of geese, waders, and (within the upper reaches of Greatham Creek) small numbers of mallard and teal (see Annex H).

[25] Not recorded during formal surveys, but the author has noted the occasional presence of this species when passing through the survey area.

Table 13A-12: Details of Roosts Recorded During Surveys of the North Tees Marshes from January 2022 to March 2023

REFERENCE	DATE(S) RECORDED	DETAILS[26]	DISTANCE FROM MAIN SITE	DISTANCE FROM CONNECTION CORRIDORS	HIGH OR LOW TIDE
NTM1	22/09/22	**Redshank** **Herring gull** Lesser black-backed gull **Black-headed gull**	4.93 km west	270 m north-west	High
NTM2	22/09/22	**Redshank** Dunlin Curlew	5.33 km west	705 m north-west	High
NTM3	20/12/22	**Lapwing** **Black-tailed godwit** **Redshank** **Teal** Dunlin **Wigeon**	4.91 km west	236 m west	High
NTM4	20/12/22	Black-tailed godwit **Redshank** Dunlin **Teal**	4.76 km west	83 m west	High

[26] Counts provided where available. Where provided, numbers are minima using the highest count available. Species in **bold** font are qualifying features (either as individual species or assemblage species) of one or more of Teesmouth and Cleveland Coast SPA/Ramsar/SPA/SSSI, Northumbria Coast SPA, Durham Coast SSSI. Some locations include feeding as well as roosting birds.

REFERENCE	DATE(S) RECORDED	DETAILS[26]	DISTANCE FROM MAIN SITE	DISTANCE FROM CONNECTION CORRIDORS	HIGH OR LOW TIDE
5	18/01/23	**Wigeon (245)** feeding and roosting on banks adjacent to inundated channel	4.7 km west	85 m west	High
NTM6	18/01/23	**Lapwing (117)** **Black-headed gull (34)**	7.28 km west	1.08 km west	High

Breeding Bird Surveys

13A.4.56 To be completed when surveys completed.

Laydown sites – North Tees; Wilton International

Incidental records

13A.4.57 This section summarises the occurrence of species and supporting habitats that have been noted while undertaking formal surveys for wetland birds, rather than through any formal recording protocol.

13A.4.58 A barn owl roost has been noted at each of the following locations:

- Underneath the arch of a railway flyover at NGR NZ4929 2627, where pellets and white splash were observed; and
- At a disused brick building (assumed to be a pumping house) adjacent to the saltmarshes north of Greatham Creek at NGR NZ5056 2606, where extensive white splash, numerous pellets of various ages and several moulted adult female feathers were observed.

13A.4.59 The latter location includes a limited amount of habitat suitable for barn owls to nest. It is likely to be used all year round for roosting and, potentially for part of the year as a breeding site. The former location is likely to be used as a roost site only because it does not contain any suitable habitat for nesting or rearing young, possessing no safe ledges on which to lay eggs nor any shelter from adverse weather and daylight.

13A.4.60 Additionally, there is a limited area of apparently unmanaged grassland with a tall sward and potentially a substantial layer of leaf litter beneath it that could support a population of small mammals. This is likely to constitute suitable foraging habitat for barn owls.

13A.4.61 Avocet were noted in late March 2023 feeding around the saline pools at the northern end of Sector G5 and this location might ultimately support one of more breeding pairs of this species. Avocet have bred historically adjacent to the lower reaches of Greatham Creek channel (see Table 13A-6 and Annex B).

13A.5 Summary of Key Locations for Birds

13A.5.1 Irrespective of the presence of any designated sites, the entirety of the Teesside coast can be considered to support significant populations of non-breeding birds. The baseline data presented in this report have identified some locations or broad areas that are of potentially greater sensitivity due to their proximity to the Proposed Development and reliance on them by birds either during potentially adverse tide and/or weather conditions, or on a regular basis irrespective of the conditions[27].

13A.5.2 Within the Foundry survey area these include:

- Dabholme Gut;

[27] The list of key locations may change as baseline data gathering and consultation activities are progressed.

- Bran Sands Lagoon;
- Bran Sands Bay, which regularly supports feeding birds and includes several regularly used roosts; and
- the northern edge of Coatham Dunes and the wider coastline of Coatham Sands, which supports foraging and roosting birds.

13A.5.3 Within the Seal Sands survey area these include:

- The entirety of Seal Sands Bay and its periphery, including the sea wall and the promontory/spit of land at its eastern extent;
- Greenabella Marsh;
- Greatham Creek channel; and
- The Brinefields, channels and saline lagoons south of Greatham Creek channel and east of the A178.

13A.5.4 Within and adjacent to the North Tees Marshes survey area these include:

- All saltmarshes and inundated/wet grassland between The A1185 to the south, the A178 to the East and the railway line to the northwest; and
- The ponds and lagoons at Cowpen Landfill.

13A.5.5 There are numerous locations and areas that are regularly used by feeding and roosting birds that are either relatively distant from the shortlisted sites or are used either irregularly or by relatively small numbers of birds, as set out in previous sections of this report and associated appendices. These may need to be included in any assessment undertaken at a later date, once further development design details and operational parameters (such as emissions to air) are known.

13A.5.6 The terrestrial habitats within the land around Wilton International and most of the industrialised land around Teesport estate, through which various connection corridors might be installed, are of very low risk in terms of the potential for wetland birds associated with the various designated sites across Teesside, and for other species at any time of year by virtue of the relatively high disturbance levels, the presence of active industry, and the limited availability of suitable habitats in these areas.

13A.6 Identification of Ornithological Receptors

13A.6.1 Table 13A-13 draws upon the baseline presented in this report, and relevant records drawn from the NZT project baseline, to identify a list of ornithological receptors with the potential to be impacted either adversely or beneficially by the Proposed Development. The list is based on incomplete baseline and, at the time of writing, an early phase Proposed Development design. Therefore, this list may be revised upwards (i.e., to include more ornithological receptors) or downwards (fewer

receptors) as more baseline data are gathered and the Proposed Development design is refined alongside ongoing consultation with key stakeholders[28].

13A.6.2 For the sake of brevity, the table excludes all designated sites from Table 13A-3, which it is assumed at this stage will be taken forward for assessment until or unless it can be demonstrated that the project design has eliminated the possibility of impacts and effects on them.

13A.6.3 All relevant species and species assemblages are included. Species receptors that are qualifying features of a designated site are considered separately from the designations only where there is merit in doing this. An example of this would be breeding avocet, which in addition to being a qualifying feature of Teesmouth and Cleveland Coast SPA is also a rare breeding species in the UK[29] and is offered enhanced protection under Schedule 1 of the Wildlife and Countryside Act regardless of the reasons for inclusion as a qualifying feature of the designated site.

[28] Including but not necessarily limited to Natural England, RSPB and Local planning Authorities.
[29] Avocet are included on the list of native species monitored and reported on by the Rare Breeding Birds Panel (RBBP): https://rbbp.org.uk/list-of-species-currently-reported-on-by-rbbp/"https://rbbp.org.uk/list-of-species-currently-reported-on-by-rbbp/

Table 13A-13: Relevant Ornithological Species Receptors Identified to Date[30]

RECEPTOR	DETAILS AND APPROX. LOCATION(S)	SOURCE	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Breeding little tern	Breeds at Crimdon Dene and Seaton Carew. Forages over coastal near-shore waters predominantly north of the River Tees and occasionally present at Coatham Sands.	Desk study NZT	National	4.5 km north-west	2.82 km north
Breeding avocet	Several locations across the North Tees Marshes.	Field surveys Desk study	National	4.75 km west	27.4 m west
Breeding little ringed plover	Formerly bred within Teesworks. Has bred at Saltholme RSPB. Regular breeding at locations across the North Tees Marshes and North Gare.	Desk Study NZT	District	211 m east	112 m east
Breeding ringed plover	Seaton Carew and former breeding within Teesworks	Desk Study NZT	District	172 m east	68 m east
Breeding common tern	Saltholme RSPB, Cowpen Marsh, Portrack Marsh, Brinefields Saline Lagoon.	Desk Study NZT	District	4.75 km west	27.4 m west
Breeding lapwing	North Tees Marshes including Saltholme RSPB. Formerly bred within Teesworks and Coatham Dunes.	NZT	Local	174 m east	65 m east

[30] Multiple locations and/or multiple years of occurrence are available for some species, in which case the distance is measured to the closest last known or last recorded occupied location. Breeding locations used are those where breeding was confirmed. Approximate distances are provided for receptors represented only by third party records that do not confirm precise locations.

RECEPTOR	DETAILS AND APPROX. LOCATION(S)	SOURCE	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Breeding Cetti's Warbler	Historical breeding confirmed within Saltholme RSPB reserve.	NZT	District	Approx. 6.86 km south-west	Approx. 460 m south
Barn owl	One breeding and roosting location within Teesworks. Pole mounted barn owl boxes at Saltholme RSPB and Greenabella Marsh. Two roosts within the North Tees Marshes survey area. Forages over Coatham Dunes, adjacent grasslands and Coatham Marsh and likely to forage widely across the North Tees Marshes.	Field surveys Desk Study NZT	District	840 m south-east	Overlapping
Breeding marsh harrier	Bred within Saltholme RSPB reserve in 2019.	NZT	National	Approx 6.6 km south-west	Approx. 125 m south
Breeding bittern	Saltholme RSPB.	Desk Study	National	Approx. 6.5 km south-west	Approx. 125 m south
Non-breeding water bird assemblage	Present across entire Teesside area, including at least 57 species (other than qualifying features of designated sites[31]).	Field surveys, desk study	Regional	Overlapping	Overlapping

[31] Qualifying features of designated sites are excluded from the wider water bird assemblage features as they are assessed separately as part of the relevant designated site(s).

RECEPTOR	DETAILS AND APPROX. LOCATION(S)	SOURCE	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Breeding bird assemblage (Teesworks)	Teesworks: breeding on open and sparsely vegetated ground, ephemeral/short perennial vegetation, in scrub and on/close to water courses. Nine non-breeding species. Fourteen breeding species including 2 Red List, 8 Amber List and 4 S41 species.	NZT surveys[32]	Local	Immediately east	Overlapping
Breeding bird assemblage (Coatham Dunes)	Predominantly ground- nesting birds breeding among the dunes, dune slacks and ponds. Twenty breeding species including 3 Red List, 6 Amber List and 1 Tees BAP and NERC S41 species. Includes 17 pairs of skylark and a range of dabbling ducks and passerines.	NZT (2018)	District	Immediately north	Immediately north
Breeding bird assemblage (Navigator Terminal)	Birds breeding within open rank grassland and small areas of scrub. Twenty non-breeding species. Five breeding species including 3 Red List species, 1 Amber List species and 4 NERC Section 41 species.	NZT (2022)	Local	1.24 km west	Overlapping

[32] Multiple surveys were carried out across different overlapping areas between 2018 and 2022. The summary results provided are from the most recent survey in 2022.

RECEPTOR	DETAILS AND APPROX. LOCATION(S)	SOURCE	ECOLOGICAL VALUE AND STATUS	PROXIMITY TO MAIN SITE	PROXIMITY TO PROPOSED DEVELOPMENT BOUNDARY
Breeding bird assemblage (Saltholme Laydown)	Birds breeding within open grassland and broadleaved woodland adjacent to Saltholme Substation: Eight breeding species recorded (1 Red List).	NZT (2022)	Local	6.2 km south-west	Overlapping
Breeding bird assemblage (Saltholme substation)	Birds breeding within open grassland, broadleaved plantation woodland and scattered scrub. Six non-breeding species. Seventeen breeding species including 2 Red List species, 6 Amber List species and 5 NERC Section 41 species	NZT (2018)	Local	6.27 km south-west	Overlapping
Breeding bird assemblage (Compounds and laydown at Haverton Hill)	Birds nesting on ground, in trees/scrub and in wet ditches. Nine breeding species including 2 Amber List species.	NZT (2020)	Local	7.4 km south-west	Overlapping
Breeding bird assemblage (Haverton Hill Laydown)	Birds nesting in in trees, scrub, and hedgerows on periphery of laydown area. Fifteen non-breeding species. Fifteen breeding species including 6 Amber List species and 2 NERC Section 41 species.	NZT (2022)	Local	7.77 km south-west	Overlapping

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ANNEX A: SURVEY METADATA

The Foundry

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
25.01.22	08:05	16:28	LT	1.85m, 14:31	12:39 - 16:50	2, SW	8	1km to Poor	3	None	8(S)	11, 14, 16-18	No land access
26.01.22	08:03	16:30	HT	4.46m, 09:39	07:55 - 11:28	4, SW	6	1km +	5	None	10(DW)	8, 8a, 8b, 11, 14, 16-18	No land access
10.02.22	07:36	17:01	HT	4.04m, 10:39	08:25 - 12:35	4 to 6, SW-WSW	0	3km +	2 to 12	None	1(DW), 6(DW, S), 7(S, B)	None	N/A
17.02.22	07:21	17:15	HT	5.25m, 16:20	14:30 - 17:10	6, W	2 to 3	5km +	7	None	1(W), 2(W), 6(SB)	3-5, 8-19	No land access
22.02.22	07:16	17:28	LT	1.36m, 13:13	11:08 - 13:15	F5/gusting F6 W	3 to 6	5km +	10	Brief rain squall	1(DW), 2(DW), 6(BD), 7(BD)	3-5, 8-19	No land access
23.02.22	07:07	17:28	LT	1.59m, 14:00	11:45 - 14:00	F6/gusting F7 SW	4	5km +	11	None	6(BD), 7(BD)	3-5, 8-19	No land access
09.03.22	06:35	17:56	LT	1.8m, 13:45	11:20 - 16:20	5, S	4	5km +	11 to 13	None	6(BD), 7(BD)	3, 4, 5, 18, 19	No land access
10.03.22	06:33	17:57	HT	4.2m, 08:36	07:00 - 11:00	3, SSW	2	5km +	8 to 14	None	7(S), 8b(S)	3, 4, 5, 18, 19	No land access
29.03.22	06:45	19:34	HT	4.8m, 14:46	12:30 - 16:30	2, NE	8	3km +	9 to 10	None	7(S), 8(S), 8b(S), 15(S)	3, 4, 5, 18, 19	No land access
30.03.22	06:43	19:36	LT	1.3m, 09:38	07:30 - 11:40	3, NE	8	5km +	3 to 4	Sleet	6(BD), 7(BD)	3, 4, 5, 18, 19	No land access

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
21.09.22	06:48	19:07	HT	4.3m, 13:58	11:58 - 15:59	3, SSW	3 to 8	3km +	17 to 20	None	1(DW), 2(DW), 6(S), 7(DW), 8(S), 8a(S), 11(S), 15(S), 15a(S), 16(S)	18	No land access
23.09.22	06:52	19:01	LT	1.38m, 09:19	07:40 - 11:00	1 to 3, NW	0 to 1	3km +	9 to 13	None	2(DW), 6(DW, W), 7(DW, BD)	None	N/A
23.09.22	06:51	19:02	LT	1.38m, 09:19	07:19 - 11.10	1, NNW	0 to 1	3km +	8 to 14	None	8a(S), 11(S), 15(S), 15a(S), 16(S)	16, 18	Restricted view of Sector 16 from edge of Sector 14
11.10.22	07:25	18:17	LT	0.6m, 11:34	09:30 - 13:30	2, SSW	3 to 7	3km +	10 to 14	None	8a(S), 15a(S), 16(S)	16, 18	No land access (including Sector 14 to view Sector 16)
11.10.22	07:25	18:17	LT	0.6m, 11:34	09:30 - 13:30	2, SSW	3 to 7	3km +	10 to 14	None	6(DW, W), 7(DW, W)	None	N/A
19.10.22	07:41	17:59	HT	4.0m, 12:02	10:00 - 12:30	2, ENE	8	3km +	11 to 13	None	1(W), 6(DW), 7(DW), 8a(S), 16(S)	16, 18	No land access (including Sector 14 to view Sector 16)

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
02.11.22	07:08	16:28	HT	4.4m, 10:15	08:15 - 11:15	3 to 4, S	8	3km +	8 to 11	None	7(S), 8a(S)	16, 18	No land access (including Sector 14 to view Sector 16)
02.11.22	07:08	16:28	HT	4.4m, 10:15	08:15 - 11:15	3 to 4, S	8	3km +	8 to 11	None	None	None	N/A
10.11.22	07:24	16:12	LT	1.1m, 10:36	08:15 - 11:45	5, SSW	8	3km +	12 to 15	None	8a(S), 15a(S), 16(S)	18	No land access
10.11.22	07:24	16:12	LT	1.1m, 10:36	08:30 - 11:15	5, S	8	3km +	13	None	None	None	N/A
13.12.22	08:19	15:39	LT	1.9m, 12:24	10:30 - 14:20	1, SW	8	1km	-1	None	6(S), 7(S), 8a(S)	18	No land access
20.12.22	08:24	15:40	HT	4.8m, 12:57	10:50 - 15:00	3 to 5, SW	2 to 3	3km +	8 to 9	None	6(O)	18	No land access
10.01.23	08:23	16:02	LT	1.64m, 12:08	09:30 - 13:30	5, S	8	3km +	5 to 8	Drizzle	6(S), 7(S)	18	No land access
17.01.23	08:17	16:14	HT	4.36m, 11:16	09:15 - 13:15	1, W	0	3km +	-2 to 1	None	None	1, 2, 3a, 6, 18	These sectors were surveyed by another surveyor
17.01.23	08:17	16:14	HT	4.36m, 11:16	09:35 - 13:20	1, W	0	3km +	-2 to 1	None	1(DW), 6(W), 18(SH)	7, 8, 8a, 8b, 9-14,	These sectors were surveyed by

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
												15, 15a, 16, 17	another surveyor
15.02.23	07:26	17:11	HT	4.19m, 10:35	08:50-12:20	2-4, SW	2 to 3	3km+	6 to 9	None	6(SB, DW), 18(S)	7, 8, 8a, 8b, 9-14, 15, 15a, 16, 17	These sectors were surveyed by another surveyor
15.02.23	07:27	17:12	HT	4.19m, 10:35	08:50-12:20	2, S	2	3km+	5 to 10	None	None	1, 2, 3a, 6, 18	These sectors were surveyed by another surveyor
21.02.23	07:14	17:24	LT	0.78m, 10:36	08:36-12:31	2-4, SW	2 to 6	3km+	10 to 12	None	None	8, 8a, 8b 9-15, 15a, 16, 17	These sectors were surveyed by another surveyor
21.02.23	07:14	17:24	LT	0.78m, 10:36	08:36-12:31	2-4, SW	2 to 6	3km+	10 to 12	None	1(W), 2(DW), 6(BD, DW), 7(BD, DW), 18(S)	3, 4, 5, 5a, 8, 8a, 8b, 9-15, 15a, 16, 17, 19	These sectors were surveyed by another surveyor
21.03.23	06:06	18:20	LT	0.88m, 09:36	07:30-11:30	4, SSW	5	3km+	10 to 13	None	7(BD), 8(Aggregate stockpiling), 9(Demolition works), 10(Demolition	N/A	N/A

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
											works), 11(Aggregate stockpiling), 12(GI works), 13(GI works)		
21.03.23	06:06	18:20	LT	0.88m, 09:33	08:15-11:30	2-4, SW	5 to 8	3km+	10 to 13	None		8, 8a, 8b 9-15, 15a, 16, 17	These sectors were surveyed by another surveyor
28.03.28	06:48	19:33	HT	4.7m, 08:54	07:30-11:30	42 S	8	3km+	4 to 7	None	7(BD), 8(Aggregate stockpiling), 9(Demolition works), 10(Demolition works), 11(Aggregate stockpiling), 12(GI works), 13(GI works)	N/A	N/A
28.03.28	06:48	19:33	HT	4.7m, 08:54	07:45-10:50	2, S	8	3km+	4 to 7	None		7, 8, 8a, 8b 9-15, 15a, 16, 17	These sectors were surveyed by another surveyor

Seal Sands

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
11.02.22	7.35	17:03	HT	4.2m, 11:53	09:50 - 13:50	4, SSW	0	3km +	1 to 6	None	6 (S)	2, 3, 4, 7-11, 13-16, 25	No land access
17.02.22	07:21	17:15	HT	5.25m, 16:20	14:02 - 17:38	4 to 7, Variable	0	3km +	6 to 9	None	4 (S), 8(S), 18 (S), 23c(S)	1, 3, 10-12, 14-16, 23a-23c, 23e-23g, 23, 25	Unsuitable habitat, short daylength, no land access
22.02.22	07:11	17:25	LT	1.36m, 13:13	11:00 - 15:00	5 to 6, W	0 to 4	3km +	7 to 9	None	18(S), 18a(S), 19(S)	1, 3, 10-12, 14-16, 17-21, 25	Unsuitable habitat, no land access
23.02.22	07:07	17:28	LT	1.59m, 14:00	11:30 - 15:30	6 to 7, SSW	4	3km +	9 to 12	None	18(S), 18a(S), 19(S)	1, 3, 10-12, 14-16, 23a-23c, 23e-23g, 23, 25	Unsuitable habitat, no land access
09.03.22	06:34	17:56	LT	1.75m, 13:46	12:35 - 16:30	4 to 5, S	3 to 5/8	3km +	12	None	21(DWL)	1, 3, 10-12, 14-16, 23a-23c, 23e-23g, 23, 25	Unsuitable habitat, no land access
17.03.22	06:14	18:11	HT	5.14m, 15:20	13:15 - 17:20	4 to 5	3	3km +	10 to 11	None	18a(S)	1, 3, 10-12, 14-16, 23a-23c, 23e-23g, 23, 25	Unsuitable habitat, no land access

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
22.03.22	06:01	18:21	LT	1.13m, 12:54	09:55 - 14:05	1 to 2, SE	3	3km +	15	None	21(DWL)	1, 3, 10-12, 14-16, 23a-23c, 23e-23g, 23, 25	Unsuitable habitat, no land access
30.03.22	06:41	19:36	HT	5.16m, 15:33	13:15 - 17:15	3, NE	8	3km +	3 to 4	Frequent sleet/rain showers	18a(S)	1, 3, 10-12, 14-16, 25	Unsuitable habitat, no land access
21.09.22	06:48	19:07	HT	4.26m, 13.58	11:58 - 15:58	2 to 4, S	1 to 8	3km +	16 to 18	None	17a(S), 21(S), G4(S), G5(S)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access
29.09.22	07:03	18:46	LT	0.80m, 12:42	10:42 - 13:10	3, NNE	5	3km +	14 to 17	None	2(W), 17a(W), 21(W)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access
12.10.22	07:25	18:16	LT	0.8m, 12:07	10:00 - 12:30	4, SSW	4	3km +	11 to 15	None	17a(W), 21(W)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access
20.10.22	07:43	17:55	HT	4.2m, 13:19	11:15 - 13:20	2 to 3, E	4 to 7	2 to 3km	12	Light to heavy rain	17a(S), G4(S), G5(S)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access
03.11.22	07:10	16:26	HT	4.5m, 11:43	09:35-12:25	2-3, S	7 to 4	3km +	9 to 11	None	G5(V/I)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access
10.11.22	07:24	16:12	LT	1.1m, 10:36	08:40-11:45	4-6, S	8	3km +	14 to 15	Occasional light drizzle	None	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
13.12.22	08:19	15:38	LT	1.9m, 12:24	10:30-14:34	1, E	8	c.100m clearing to c. 1km	-2	None	19(DW/DWL)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access
14.12.22	08:20	15:38	LT	2.08m, 13:07	11:00-14:10	2, NW	1	3km +	0 to 1	None	None	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access
20.12.22	08:24	15:39	HT	4.76m, 12:57	11:04-14:58	4, S	3	3km+	8	None	22(S), 22d(S), 22e(S)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access
11.01.23	08:21	16:02	LT	1.64m, 12:08	10:10-13:50	4 to 6, SW	1 to 3	3km+	7	None	17a(S), 24(S)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access/other sectors covered by Steve Carter on 12.01.23
12.01.23	08:22	16:05	LT	1.75m, 12:45	10:45-14:45	4 to 5, S	8 to 1	3km+	8 to 9	One heavy shower	None	2, 17, 17a, 21, 22, G4, G5, 25	No land access/other sectors covered by Shona Jessiman on 11.01.23
19.01.23	08:14	16:18	HT	4.74m, 13:19	11:10-14:50	2, WSW	0 to 3	3km+	2 to 4	None	4(P - Marsh Harrier), 24(S), G4(S), G5(S)	2, 17, 17a, 21, 22, G4, G5, 25	No land access/other sectors covered by another

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
													surveyor on 19.01.23
19.01.23	08:14	16:18	HT	4.74m, 13:19	11:20-14:30	2, WSW	0 to 3	3km+	2 to 4	None	None	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access/ other sectors covered by another surveyor on 19.01.23
17.02.23	07:21	17:15	HT	4.56m, 13:02	11:02-13:30	4 to 7, W	2 to 4	3km+	10	None	24(S)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access/ other sectors covered by another surveyor
17.02.23	08:14	16:18	HT	4.74m, 13:19	10:30-13:30	7, W	7	3km+	9 to 11	None	None	2, 17, 17a, 21, 22, G4, G5, 25	No land access/ other sectors covered by another surveyor on 17.02.23
23.02.23	07:08	17:27	LT	0.77m, 11:57	10:05-13:05	1 to 2, W	0	3km+	6 to 7	None	24(S)	1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access/ other

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
													sectors covered by another surveyor.
23.02.23	07:08	17:27	LT	0.77m, 11:57	10:05-13:05	1 to 2, W	0	3km+	6 to 7	None	None	1, 2, 10-17, 17a, 21-22f, 24, G4, G5, 25	No land access/ other sectors covered by another surveyor
21.03.23	06:06	18:20	LT	0.88m, 09:36	08:45-09:15	4, SSW	5	3km+	10 to 13	None	None	All except 25	Viewed from The Foundry
23.03.23	06:01	18:24	LT	0.63m, 10:52	08:45-12:45	4, SSW	3	3km+	9 to 12	None	None	2, 17, 17a, 18a, 21, 22, G4, G5, 25	No land access/ other sectors covered by another surveyor on 17.02.23
23.03.23	06:01	18:24	LT	0.63m, 10:52	08:55-12:35	2 to 5, SW	4 to 8	3km+	10 to 12	Light drizzle for first hour		1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access/ other sectors covered by another surveyor.

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
28.03.23	06:48	19:33	HT	4.7m, 08:54	08:45-09:15	42 S	8	3km+	4 to 7	None	None	All except 25	Viewed from The Foundry
30.03.23	06:41	19:36	HT	3.91m, 11:06	09:10-12:15	2 to 3, SW	4 to 8	3km+	10 to 13	Light drizzle for first hour		1, 3, 5-9, 13, 18, 18a, 22-23g, 25	No land access/ other sectors covered by another surveyor.

North Tees Marshes

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
21.09.22	06:48	19:07	HT	4.26m, 13:58	11:58 - 15:58	2 to 4, S	1 to 8	3km +	16 to 18	None	G3(C, P(fox), S), G6(W)	G7-G13, B1-B24, 24	Restricted land access
22.09.22	06:50	19:05	HT	4.56m, 14:47	12:47 - 16:47	3 to 4, S	8	3km +	17	2	B21(S)	G7-G13, B1-B19, 24	Restricted land access
22.09.22	06:50	19:05	HT	4.60m, 14:47	12:47 - 16:47	4, SSW	8	3km +	17	None then drizzle	G7(W), G8(W), G9(W), G10(W), G11(W), G12(W), G13(W), B10(I), B13(I), B15(W), B19(W), B20(W)	G1-G6, G13, B1-B9, B11, B12, B14, B16-B18, B21-B24, 24	Restricted land access
28.09.22	07:01	18:49	LT	0.70m, 12:07	10:07 - 14:07	2, NW	4	3km +	10 to 13	None	G7(W), G8(W), G9(W), G10(W), G11(W), G12(W), G13(W), B10(I), B13(I), B15(W), B19(W), B20(W),	G1-G6, G13, B1-B9, B11, B12, B14, B16-B18, B21-B2424	Restricted land access

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
											B21(AC), B24(AC)		
28.09.22	07:03	18:46	LT	0.78m, 12:42	10:42 - 13:10	4, NE	6	3km	14 to 18	None during survey, heavy rain in hour before.	G3(P (peregrine)), G6(P (buzzard))	G1-G6, G13, B1-B9, B11, B12, B14, B16-B18, B21-B24, 24	Restricted land access
18.10.22	07:39	18:00	HT	4.0m, 10:29	08:29 - 11:39	2, WSW	1 to 7	3km +	6 to 12	None	G2(S), G3(S), G6(S), G7(S), G8(S), G9(S), G10(S), B15(S), B20(S), B21(S, DW), B22(S)	B1-B13, B16-B18, G13, 24	Restricted land access
25.10.22	07:52	17:43	LT	0.7m, 10:29	08:38 - 10:30	2, SW	1 to 2	3km +	11 to 13	None	B21(DW), B24(DW)	B1-B13, B16-B18, G13, 24	Restricted land access
25.10.22	07:52	17:43	LT	0.7m, 10:29	08:29 - 11:47	2, SW	2	3km +	13	None	B15(W)	B1-B13, B16-B18, G13, 24	Restricted land access
26.10.22	07:55	17:41	LT	0.6m, 11:04	09:04 - 11:45	4 to 5, S	2 to 7	3 km +	14 to 17	One heavy shower at the end.	B7(S), B9(S), B10(S), B12(S), B22(S), B23(S)	G1-G13a, B1-B6, B15, B17, B19-B21, B24, 24	Restricted land access

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
26.10.22	07:55	17:41	LT	0.6m, 11:04	09:04 - 11:27	4, SW	2	3km +	13	None	None	G1-G13a, B7-B24, 24	Restricted land access
02.11.22	07:08	16:28	HT	4.4m, 10:15	09:00-12:12	2 to 4, S	6 to 8	3km+	8-10	None	G7(W3, W4), G8(W3), G9(W1), G10(W1)	G1, G4, G5, G11, G12, G13, B1-B14, B16-B19, 24	Visibility restricted from counting location (unknown to surveyor at the time) i.e., G11, G12 & B19
02.11.22	07:08	16:28	HT	4.4m, 10:15	08:15 - 10:50	2 to 4, S	6 to 8	3km +	8 to 10	None	B21(S), B24(DWL)	G1-G13a, B1-B19, B22, B23, 24	These areas covered by other surveyors
03.11.22	07:10	16:26	HT	4.5m, 11:43	09:40 - 12:40	2, S	4	3km +	9 to 12	None	None	G1-G13a, B1-B6, B14, B15, B17-B21, B24, 24	Restricted land access
09.11.22	07:21	16:14	LT	0.9m, 10:04	08:18 - 11:18	2 to 3 NE	5 to 8	3km +	10	None	G7(DW), G8(W)	G1, G10-G12, B1-B14, B16, B18-B24, 24	Covered the following two days
10.11.22	07:24	16:12	LT	1.1m, 10:36	09:06 - 11:30	2 to 5 SW	8	3km +	14	Drizzle throughout	B21(DW)	G1-G9, G13, B1-	These areas covered the day before/after

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
												B19, B22-B23, 24	
11.11.22	07:27	16:10	LT	1.3m, 11:05	09:15 - 11:50	3 to 6 SW	7 to 5	3km +	13-15	None	B9(S), B10(S), B16(S, P(Fox)), B22(S), B23(S)	G1-G13a, B1-B6, B14, B15, B17, B19-B21, B24, 24	Land access/other sectors covered by other surveyors
11.11.22	07:27	16:10	LT	1.3m, 11:05	09:05 - 11:21	4, SW	5	3km +	13	None	None	G1-G13a, B7-B24, 24	Land access/other sectors covered by other surveyors
12.12.22	09:40	12:40	LT	1.7m, 11:43		1, SW	8	3km +	-3 to -1	None	B7(S), B8(S), B10(S)	G1, G3-G13a, B1-B6, B15, B17-B21, B24, 24	Land access/other sectors covered by other surveyors
14.12.22	08:20	15:38	LT	2.08m, 13:07	11:10-15:10	2, NW	2	3km+	-1	None	G7(S)	G1-G6, G13, B1-B16, B18, B21-B24	Access and limited time to complete
14.12.22	08:20	15:38	LT	2.08m, 13:07	11:07-14:50	0 to 2, NW	1 to 3	3km+	-1 to 2	None	G13(S)	B16, B18, B22, B23, B21, B24, 24	Access and limited time to complete

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
15.12.22	08:20	15:38	LT	2.26m, 13:58	12:00-14:45	1 to 3, NW	3 to 8	3km+	3 to 2	Occ light snow/rain showers	G1(S), B1(S), B2(S), B3(S), B5(P (Marsh harrier))	G2-G13a, B7-B24, 24	Access and limited time to complete
19.12.22	08:24	15:39	HT	4.54m, 12:05	10:33-14:10	7, S	8 to 6	3km+	14	Occ light showers	None	G1, G4, G7-G13a, B1-B13, B15-B24	Access and limited time to complete
20.12.22	08:24	15:40	HT	4.8m, 12:57	10:57-14:57	1 to 5, S	4 to 1	3km+	8	None	G13(S), G13a(S), B17(P (Marsh harrier)), B21(S)	G1-G9, B1-B5, B7-B14, B16, B18, B22, B23, 24	Land access/other sectors covered by other surveyors
21.12.22	08:25	15:41	HT	5.0m, 13:45	11:30 - 14:30	3 to 5, SW	1	3km+	7 to 9	None	None	G1, G3-G13, B1-B6, B15, B17-B21, B24, 24	Land access/other sectors covered by other surveyors
21.12.22	08:25	15:41	HT	5.0m, 13:45	11:45 - 14:50	1 to 5, SW	3 to 0	3km+	8	None	G1(S), G7(S), G8(S), B2(S), B4(S), B5(S)	G2-G6, G10-G13a, B7-B24, 24	Land access/other sectors covered by other surveyors
11.01.23	08:21	16:02	LT	1.64m, 12:08	10:05 - 14:00	6, SW	4 to 6	3km+	7	Occ light showers	G8(S), G11(S)	G1-G7, G13, B1-B16, B18, B22, B23, 24	Land access/other sectors covered by other surveyors

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
11.01.23	08:21	16:02	LT	1.64m, 12:08	10.00 - 13.05	6, SW	4 to 6	3km+	7 to 8	Occ light showers	None	G1, G3-G13a, B1-B6, B15, B17-B22, 24	Land access/other sectors covered by other surveyors
12.01.23	08:22	16:05	LT	1.75m, 12:45	11:09 - 13:39	5, SW	5	3km+	9	Intermittent drizzle 11:10 - 11:50; heavy rain 11:50 - 11:57, then dry	B3(DW), B4(DW), B5(DW)	G2-G13, B7-B24, 24	Land access/other sectors covered by other surveyors
12.01.23	08:21	16:04	LT	1.75m, 12:45	10:40-14:50	2 to 5, SW	4 to 8	3km+	8	One brief, heavy shower	G3(AC), G13(S), G13a(S)	G1, G2, G8-G12, B1-B14, B16-B24, 24	Land access/other sectors covered by other surveyors
18.01.23	08:16	16:16	HT	4.51m, 12:20	10.20 - 13.20	2, WNW	1 to 3	3km+	3 to 4	None	None	G1, G3-G13a, B1-B6, B15, B17-B22, 24	Land access/other sectors covered by other surveyors
18.01.23	08:14	16:14	HT	4.51, 12:20	10:25 - 15:10	2-4, WNW	2	3km+	3.5	None	G7(S, JR, OR), G8(S)	G1-G6, G13, B1-B16, B2, 24	Land access/other sectors covered by other surveyors
18.01.23	08:14	16:14	HT	4.51, 12:20	10:20-14:15	2, WNW	1 to 3	3km+	3 to 4	None	G13a(S)	G1, G2, G7-G12, B1-B14,	Land access/other sectors covered

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
												B16-B24, 24	by other surveyors
18.01.23	08:14	16:14	HT	4.51, 12:20	10:32-13:23	4, W	2	3km+	3	None	G1(workers in hi vis), B4(N (Marsh harrier))	G2-G13, B7-B24, 24	Land access/other sectors covered by other surveyors
15.02.23	07:26	17:11	HT	4.19, 10:35	09:40-11:15	2, SW	Three	3km+	7 to 9	None	None	G2-G13a, B7-B24, 24	Land access/other sectors covered by other surveyors
16.02.23	07:24	07:13	HT	4.29, 11:51	09:55-11:30 (B20, B21, B24). 11:55-12:55 (G11, G12, G10, G9, B17, G8 & G7). 13:28-13:40 (B15)	2 to 3, S/SW		>3km+	7 to 8	None	None	G1-G6, G13, G13a, B1-B14, B16, B18, B22, B23, 24	No access/visibility

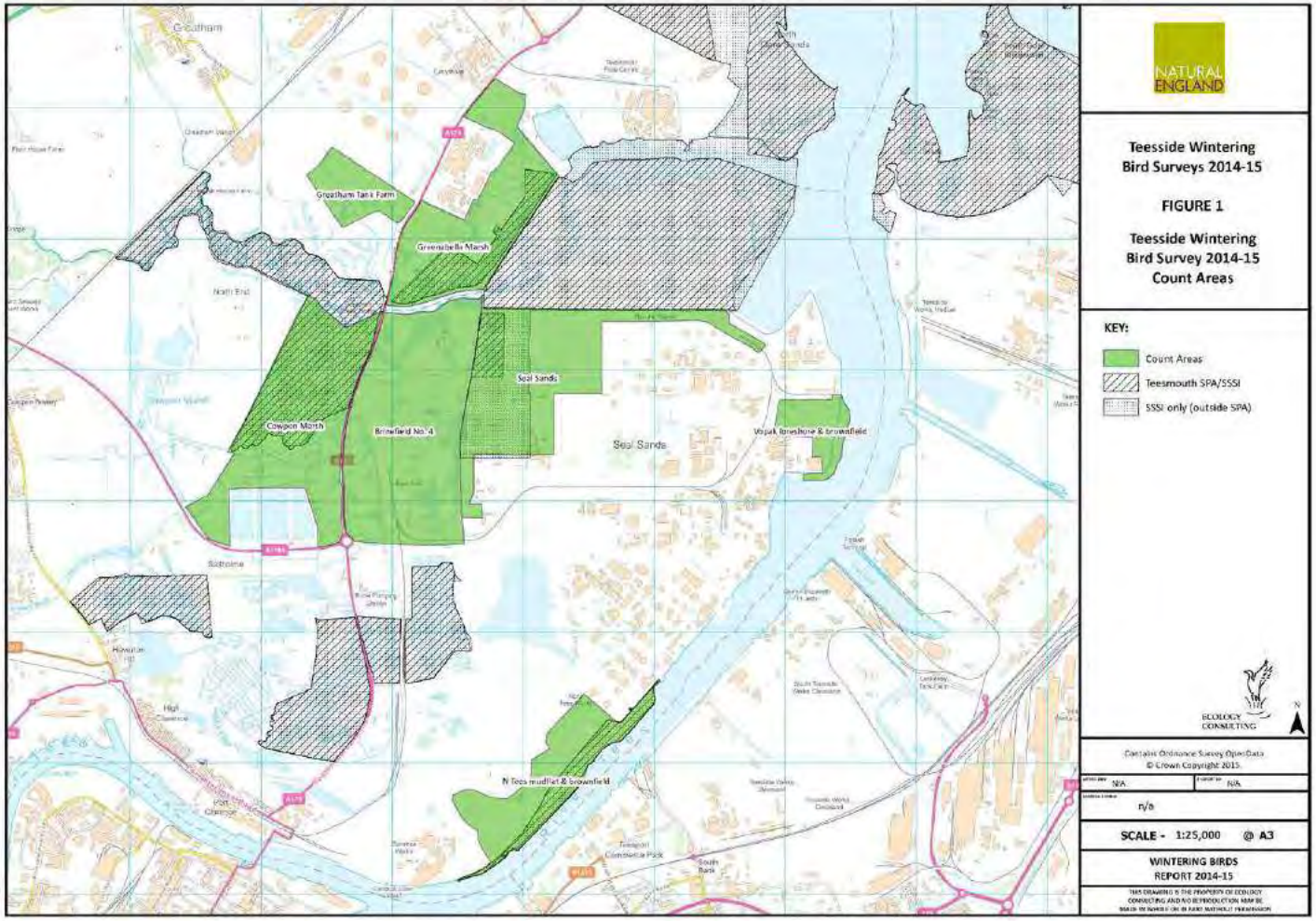
DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
16.02.23	07:24	17:13	HT	4.29, 11:51	10:20-13:50	3 to 3, S/SW	4 to 8	3km+	7 to 9	None	G3(P (2x marsh harrier)), G13a(S)	G1, G2, G8-G12, B1-B24, 24	Land access/other sectors covered by other surveyors
16.02.23	07:25	17:24	HT	4.29, 11:51	10:00-13:40	2, SW	7	3km+	7 to 12	None	None	G1, G3-G13a, B1-B6, B15, B17, B19-B22, 24	Land access/other sectors covered by other surveyors
22.02.23	07:10	17:25	LT	0.72, 11:18	09:30-13:10	2 to 5, NW	8	3km+	8	Drizzle last half hour	G3(P (Marsh harrier)), G6(P (Peregrine)), G13(S)	G1, G2, G7-G12, B1-B14, B16-B24, 24	Land access/other sectors covered by other surveyors
22.02.23	07:10	17:25	LT	0.72, 11:18	09:15-12:45	2 to 5, NW	8	3km+	8	Drizzle last half hour	None	G1, G3-G13a, B1-B6, B15, B17, B19-B22, 4	Land access/other sectors covered by other surveyors
22.02.23	07:10	17:25	LT	0.72, 11:18	09:41-11:05	2 to 5, NW	8	3km+	8	Drizzle last half hour	None	G1-G6, G13, G13a, B1-B16, B18, B22, B23, 24	All other sectors covered by SJ

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
23.02.23	07:08	17:27	LT	0.77,11:57	10:45-12:30	2, NW	1	3km+	5 to 7	None	None	G2-G13a, B7-B24, 24	Land access/other sectors covered by other surveyors
21.03.23	06:06	18:25	LT	0.88m, 09:33	09:20-11:20	3, SW	7	3km+	12 to 13	None	B4(1 JCB working and 2 men in hi vis)	G2-G13a, B7-B24, 24	Land access/other sectors covered by other surveyors
22.03.23	06:03	18:22	LT	0.70m, 10:14	09:00-12:00	4, SW	3	3km+	9 to 11	None	None	G1, G3-G13a, B1-B6, B15, B17, B19-B21, B24, 24	Land access/other sectors covered by other surveyors
22.03.23	06:03	18:22	LT	0.7m, 10:14	08:30-12:00	4, SW	3	3km+	9 to 12	None			Other sectors covered by SD
22.03.23	06:03	18:22	LT	0.7m, 10:14	08:55 - 12:00	4, SW	3	3km+	9 to 11	None	None	G1-G6, G13, G13a, B1-B14, B16, B18, B22, B23, 24	Land access/other sectors covered by other surveyors
28.03.23	06:48	19:33	HT	4.38m, 08:54	08:30-10:30	1-2, S	8	3km+	5 to 6	Occ light rain	None	G2-G13, B7-B24, 24	Land access/other sectors covered

DATE	SUN-RISE	SUNSET	TIDE	TIDE HEIGHT & TIME	SURVEY TIMES	WIND (BEAUFORT, DIRECTION)	CLOUD (OKTAS)	VISIBILITY	TEMP (CELSIUS)	PRECIPITATION	DISTURBANCE (SECTOR & TYPE)	SECTORS NOT SURVEYED	REASON(S) FOR RESTRICTED COVERAGE
													by other surveyors
29.03.23	06:46	19:35	HT	4.09m, 09:49	08:20-11:20	2, S	8	3km+	9 to 12	None	None	G1, G3-G13a, B1-B6, B15, B17, B19-B21, B24, 24	Land access/other sectors covered by other surveyors
29.03.23	06:46	19:35	HT	4.09m, 09:49	08:20-11:45	1-2, S	8	3km+	9 to 11	None			Other sectors covered by SD
29.03.23	06:46	19:35	HT	4.09m, 09:49	08:40-11:35	2, S	8	3km+	10 to 12	Occ light rain	None	G1-G6, G13, G13a, B1-B16, B18, B22, B23, 24	Land access/other sectors covered by other surveyors

ANNEX B: INCA ROOST RECORDS

ANNEX C: AREAS SURVEYED IN SUPPORT OF NATURAL ENGLAND REVIEW OF PROTECTED SITES (SOURCE: PERCIVAL, 2015)


Greatham
Greatham Tank Farm
Greatham Marsh
North End
Seal Sands
Cowpen Marsh
Brinefield No.4
Seal Sands
Saltholme
N Tees mudflat & brownfield
NATURAL ENGLAND
Teesside Wintering Bird Surveys 2014-15
FIGURE 1
Teesside Wintering Bird Survey 2014-15 Count Areas
KEY:
Count Areas
Teesmouth SPA/SSSI
SSSI only (outside SPA)
ECOLOGY CONSULTING
Contains Ordnance Survey OpenData © Crown Copyright 2015.
N/A
N/A
n/a
SCALE - 1:25,000 @ A3
WINTERING BIRDS REPORT 2014-15

ANNEX D: BTO LOW TIDE COUNT DATA

ANNEX E: BTO CORE COUNT DATA

ANNEX F: SUMMARY WETLAND BIRD COUNT DATA FOR THE FOUNDRY SURVEY AREA

High Tide (January 2022 – March 2023 inclusive)

	SECTOR																						
Species[33]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Bar-tailed Godwit	0	0	0	0	0	0	0	7	11	0	0	0	0	0	0	0	0	0	0	0	55	0	0	0
Black-headed Gull[3]	0	0	0	1	0	0	0	110	200	45	7	0	10	0	0	0	0	7	3	0	72	0	90	0
Black-tailed Godwit	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	16	0	40	0
Black-throated Diver *Gavia arctica*	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose *Branta canadensis*	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Gull *Larus canus*	1	2	0	0	0	0	0	14	150	103	3	0	52	0	0	0	0	2	0	0	0	0	0	0
Common Scoter *Melanitta nigra*	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[33] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI

	SECTOR																						
Species[33]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Common Tern[1 3]	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Cormorant[6]	0	3	0	0	0	0	0	1	35	0	0	0	0	0	0	0	0	0	0	1	2	0	2	0
Cormorant[6]/ Shag[34]	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curlew	0	0	0	0	0	0	0	23	15	2	8	5	0	2	0	0	0	0	1	0	4	0	1	0
Curlew Sandpiper	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dunlin	0	0	0	0	0	0	0	160	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eider *Somateria mollissima*	5	6	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gadwall[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	20	0
Great Black Backed Gull	1	1	0	0	0	0	0	0	8	0	0	0	5	0	0	0	0	82	0	0	6	0	0	0

[34] Birds not identified to species level.

	SECTOR																						
Species[33]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Goldeneye *Bucephala clangula*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0
Golden Plover	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	38	0	0	0
Great Crested Grebe *Podiceps cristatus*	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	3	0
Grey Plover	0	0	0	0	0	0	0	2	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull[3]	10	10	0	0	0	0	0	36	133	18	3	0	28	20	0	0	5	58	36	0	62	0	5	4
Kittiwake[6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
Knot[1 2 3 6]	0	0	0	0	0	0	0	10	55	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Lapwing[3]	0	0	0	0	0	0	0	0	0	0	56	0	0	0	0	0	0	0	8	0	77	0	8	0
Lesser Black Backed Gull	2	1	0	0	0	0	0	0	3	22	0	0	0	0	1	0	0	2	0	0	3	0	0	0
Little Egret *Egretta garzetta*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0

	SECTOR																						
Species[33]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Little Grebe *Tachybaptus ruficollis*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0
Mallard	0	0	0	0	0	0	0	2	0	0	4	0	0	0	0	0	0	0	4	0	13	0	16	0
Moorhen *Gallinula chloropus*	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	6	0
Oystercatcher	3	2	0	0	0	0	0	54	69	1	4	0	0	0	0	0	0	0	0	0	2	0	0	0
Purple Sandpiper[3 4 5]	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Razorbill *Alca torda*	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	0	0	0	16	1	0	2	0	0	0	0	0	0	0	0	0	28	0	6	0
Redshank[1 2 3]	0	5	0	13	0	0	0	140	17	0	45	0	0	0	0	0	0	0	0	0	92	0	120	0
Ringed Plover[2 3]	2	7	0	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sanderling[1 2 3 6]	20	15	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	SECTOR																						
Species[33]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Sandwich Tern[1 2 3]	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shag	0	4	0	0	0	0	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shelduck[2 3]	3	0	0	0	0	0	0	8	4	0	4	0	0	0	0	0	0	11	10	0	46	0	26	0
Snipe *Gallinago gallinago*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2	0	1	0
Teal[1]	0	0	0	2	0	0	0	0	8	0	26	0	0	0	0	0	0	0	0	0	63	0	400	0
Tufted Duck	0	0	0	0	0	0	0	0	0	0	52	0	0	0	0	0	0	0	0	0	0	0	0	0
Turnstone[4 5 6]	0	0	0	0	0	0	0	26	11	0	4	0	0	0	0	0	0	0	0	0	0	0	10	0
Wigeon[3]	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Number of Species	9	13	0	6	0	0	0	18	28	6	15	1	5	2	1	0	1	7	9	3	23	0	17	1
Teesmouth and Cleveland Coast SPA Species	1	2	0	2	0	0	0	3	6	0	2	0	0	0	0	0	0	0	0	0	2	0	2	0

	SECTOR																						
Species[33]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Teesmouth and Cleveland Coast Ramsar Species	3	3	0	1	0	0	0	4	6	0	2	0	0	0	0	0	0	1	1	0	2	0	2	0
Teesmouth and Cleveland Coast SSSI Species	4	5	0	2	0	0	0	6	10	2	5	0	2	1	0	0	1	3	4	0	6	0	6	1
Northumbria Coast SPA Species	0	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Northumbria Coast Ramsar Species	0	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Durham Coast SSSI species	1	2	0	0	0	0	0	4	4	0	2	0	0	0	0	0	0	0	0	1	2	0	2	0

Low Tide (January 2022 – March 2023 inclusive)

	SECTOR																						
Species[35]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Bar-tailed Godwit	0	0	0	0	0	0	0	25	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed Gull[3]	50	40	0	1	0	0	0	96	130	0	4	0	0	0	0	0	0	8	0	0	128	0	105	0
Black-tailed Godwit	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
Canada Goose	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caspian Gull *Larus cachinnans*	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Gull	3	26	0	0	0	0	0	25	320	0	5	0	0	0	0	0	0	1	0	0	6	0	0	0
Common Sandpiper *Actitis hypoleucos*	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Tern[1 3]	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[35] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI

	SECTOR																						
Species[35]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Cormorant[6]	5	30	0	0	0	0	0	1	130	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0
Curlew	0	3	0	2	0	0	0	17	19	6	2	1	0	0	0	0	0	0	0	0	2	0	6	0
Dunlin	0	0	0	0	0	0	0	92	220	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Eider	0	10	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gadwall[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
GBB Gull	3	2	0	0	0	0	0	1	96	4	0	0	0	0	0	0	0	48	0	0	9	0	0	0
Goldeneye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
Great Crested Grebe	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	0	0	0	0	0	0	0	1	9	0	1	0	0	0	0	0	0	0	0	5	2	0	0	0
Grey Plover	0	0	0	0	0	0	0	13	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guillemot *Uria aalge*	5	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull[3]	31	65	0	0	0	0	0	56	92	0	3	0	6	38	0	29	1	28	36	0	43	0	5	0
Kittiwake[6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0
Knot[1 2 3 6]	0	0	0	0	0	0	0	20	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	SECTOR																						
Species[35]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Lapwing[3]	0	0	0	0	0	0	0	0	86	0	0	0	0	0	0	0	0	14	7	0	83	0	0	0
Lesser Black Backed Gull	0	1	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	6	0	0	1	0	0	0
Little Egret	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	2	0	3	0
Little Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Little Ringed Plover	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	17	0
Mediterranean Gull *Ichthyaetus melanocephalus*	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Moorhen	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
Mute Swan *Cygnus olor*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Oystercatcher	22	150	0	0	0	0	0	34	57	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0
Red-breasted Merganser	0	2	0	0	0	0	0	4	24	0	7	0	0	0	0	0	0	0	0	0	23	0	0	0

	SECTOR																						
Species[35]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Redshank[1 2 3]	0	0	0	0	0	0	0	75	36	0	4	0	0	0	0	0	0	0	0	0	5	0	105	0
Red-throated Diver *Gavia stellata*	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ringed Plover[2 3]	0	0	0	0	0	0	0	3	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sanderling[1 2 3 6]	5	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandwich Tern[1 2 3]	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shag	1	10	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shelduck[2 3]	0	0	0	0	0	0	0	12	10	0	0	0	0	0	0	0	0	0	3	0	29	0	65	0
Snipe	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	2	0	3	0
Teal[1]	0	0	0	0	0	0	0	6	0	0	32	0	0	0	0	0	0	0	2	0	5	0	350	0
Turnstone[4 5 6]	4	0	0	0	0	0	0	25	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wigeon[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0
Total Number of Species	12	15	0	4	0	0	0	21	25	2	13	2	1	1	0	1	1	6	6	4	20	0	12	0

	SECTOR																						
Species[35]	**1**	**2**	**3**	**3a**	**4**	**5**	**5a**	**6**	**7**	**8**	**8a**	**8b**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**15a**	**16**	**17**	**18**	**19**
Teesmouth and Cleveland Coast SPA Species	1	2	0	0	0	0	0	4	3	0	1	0	0	0	0	0	0	0	1	0	2	0	2	0
Teesmouth and Cleveland Coast Ramsar Species	1	1	0	0	0	0	0	4	3	0	0	0	0	0	0	0	0	0	1	0	2	0	2	0
Teesmouth and Cleveland Coast SSSI Species	3	3	0	1	0	0	0	6	7	0	3	0	0	0	1	1	0	3	3	1	6	0	5	0
Northumbria Coast SPA Species	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northumbria Coast Ramsar Species	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Durham Coast SSSI	3	2	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0

ANNEX G: SUMMARY WETLAND BIRD COUNT DATA FOR SEAL SANDS SURVEY AREA

High Tide (January 2022 – March 2023 Inclusive) Table 1

	SECTOR																				
Species[36]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**17a**	**18**	**18a**	**19**
Avocet[1 3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bar-tailed Godwit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0
Black-headed Gull[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	2	5
Black-tailed Godwit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dark Bellied Brent Goose *Branta bernicla*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Canada Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Common Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coot *Fulica atra*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cormorant[6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Curlew	0	2	0	1	0	22	0	56	9	0	0	0	0	0	0	0	0	0	30	108	10
Dunlin	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0
Eider	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Gadwall[3]	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[36] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI

	SECTOR																				
Species[36]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**17a**	**18**	**18a**	**19**
Great Black Backed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Golden Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Crested Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Greylag Goose *Anser*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull[3]	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5	29	0
Jack Snipe *Lymnocryptes minimus*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Kingfisher	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knot[1 2 3 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
Lapwing[3]	0	4	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	333	0
Little Egret	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Long-tailed Duck *Clangula hyemalis*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	8	12	6	3
Moorhen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	SECTOR																				
Species[36]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**17a**	**18**	**18a**	**19**
Mute Swan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Oystercatcher	0	0	0	2	0	0	0	8	8	0	0	0	0	0	0	0	9	0	150	154	0
Pintail *Anas acuta*	0	0	0	2	0	0	0	3	3	0	0	0	0	0	0	0	0	0	7	0	4
Pochard *Aythya ferina*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	17
Redshank[1 2 3]	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	202	30
Red-throated Diver	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
Shag	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Shelduck[2 3]	0	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	188	217	45
Shoveler[3]	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snipe	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spotted Redshank *Tringa erythropus*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Teal[1]	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	4	2	3	39	0
Tufted Duck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turnstone[4 5 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
Wigeon[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	28	8
Total Number of Species	0	1	0	9	0	1	0	5	1	0	0	0	0	0	0	0	5	4	10	20	13

	SECTOR																			
Species[36]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**17a**	**18**	**18a**	**19**
Teesmouth and Cleveland Coast SPA Species	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	3	1
Teesmouth and Cleveland Coast Ramsar Species	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2	3	2
Teesmouth and Cleveland Coast SSSI Species	0	1	0	4	0	1	0	2	0	0	0	0	0	0	0	0	0	1	5	7	4
Northumbria Coast SPA Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Northumbria Coast Ramsar Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Durham Coast SSSI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	2

High Tide (January 2022 – March 2023 Inclusive) Table 2

	SECTOR																				
Species[37]	**20**	**21**	**22**	**22a**	**22b**	**22c**	**22d**	**22e**	**22f**	**23**	**23a**	**23b**	**23c**	**23d**	**23e**	**23f**	**23g**	**24**	**G4**	**G5**	**25**
Avocet[1 3]	0	0	0	0	2	0	0	2	0	0	0	0	0	4	0	0	0	0	0	7	0
Bar-tailed Godwit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed Gull[3]	14	2	0	0	6	0	0	11	0	0	9	0	0	0	0	0	0	0	42	200	0
Black-tailed Godwit	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0
Dark Bellied Brent Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	4	34	0
Common Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
Common Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Coot	0	0	5	16	4	2	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0
Cormorant[6]	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curlew	12	2	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	60	65	0
Dunlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
Eider	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gadwall[3]	0	7	0	4	0	0	0	10	0	0	0	0	0	3	0	0	0	0	0	16	0
Great Black Backed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

[37] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI

	SECTOR																				
Species[37]	**20**	**21**	**22**	**22a**	**22b**	**22c**	**22d**	**22e**	**22f**	**23**	**23a**	**23b**	**23c**	**23d**	**23e**	**23f**	**23g**	**24**	**G4**	**G5**	**25**
Golden Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Great Crested Grebe	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Greylag Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	17	26	0
Grey Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Herring Gull[3]	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Jack Snipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kingfisher	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Knot[1 2 3 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lapwing[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105	150	0
Little Egret	0	1	0	0	1	1	0	2	0	0	0	0	0	1	0	0	1	0	1	4	0
Little Grebe	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Long-tailed Duck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Mallard	0	20	0	0	6	2	6	3	4	0	0	0	0	1	0	0	0	1	9	20	0
Moorhen	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Mute Swan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
Oystercatcher	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3
Pintail	0	2	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pochard	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	SECTOR																				
Species[37]	**20**	**21**	**22**	**22a**	**22b**	**22c**	**22d**	**22e**	**22f**	**23**	**23a**	**23b**	**23c**	**23d**	**23e**	**23f**	**23g**	**24**	**G4**	**G5**	**25**
Red-breasted Merganser	2	6	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Redshank[1 2 3]	20	6	0	0	0	1	0	1	0	0	0	0	0	6	0	0	0	0	0	11	0
Red-throated Diver	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Shelduck[2 3]	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	2	4	0
Shoveler[3]	0	0	0	1	18	2	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0
Snipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	0	0
Spotted Redshank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Teal[1]	5	37	0	1	11	1	1	5	0	0	0	0	0	20	0	0	0	0	1	74	0
Tufted Duck	0	0	7	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
Turnstone[4 5 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wigeon[3]	0	7	0	0	6	5	12	2	0	0	0	0	0	2	0	0	0	0	0	166	0
Total Number of Species	8	14	5	8	10	8	5	11	1	0	1	0	0	10	0	0	2	5	17	27	1
Teesmouth and Cleveland Coast SPA Species	2	2	0	1	2	2	1	3	0	0	0	0	0	3	0	0	0	0	1	3	0
Teesmouth and Cleveland	1	1	0	0	0	2	1	2	0	0	0	0	0	1	0	0	0	0	1	2	0

	SECTOR																				
Species[37]	**20**	**21**	**22**	**22a**	**22b**	**22c**	**22d**	**22e**	**22f**	**23**	**23a**	**23b**	**23c**	**23d**	**23e**	**23f**	**23g**	**24**	**G4**	**G5**	**25**
Coast Ramsar Species																					
Teesmouth and Cleveland Coast SSSI Species	3	4	0	1	5	4	3	7	0	0	1	0	0	4	0	0	0	1	3	7	0
Northumbria Coast SPA Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northumbria Coast Ramsar Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Durham Coast SSSI	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Low Tide (January 2022 – March 2023 Inclusive) Table 1

	SECTOR																				
Species[38]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**17a**	**18**	**18a**	**19**
Avocet[1 3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bar-tailed Godwit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	20	22
Black-headed Gull[3]	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	10	2	54	1	17
Black-tailed Godwit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	11
Dark Bellied Brent Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Canada Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1	3
Coot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cormorant[6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	51	1	3
Curlew	0	0	0	1	0	14	0	58	3	0	0	0	0	0	0	0	1	2	71	17	27
Dunlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	5	284
Gadwall[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0
Golden Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Great Crested Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
Greylag Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	67

[38] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI

	SECTOR																				
Species[38]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**17a**	**18**	**18a**	**19**
Guillemot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	274	78	30
Kingfisher	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knot[1 2 3 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	44
Lapwing[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	220	4
Lesser Black Backed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Little Egret	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Little Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Long-tailed Duck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	8	0	4
Moorhen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mute Swan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oystercatcher	0	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	3	5	198	33	48
Pintail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
Red-breasted Merganser	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	7	1	11
Redshank[1 2 3]	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	2	6	60	139	141
Ringed Plover[2 3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	8
Shag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Shelduck[2 3]	0	0	0	6	0	0	0	2	0	0	0	0	0	0	0	0	0	0	206	102	45
Shoveler[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
Snipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	SECTOR																				
Species[38]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**17a**	**18**	**18a**	**19**
Spotted Redshank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	1
Teal[1]	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	2	15	0	5	66
Tufted Duck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turnstone[4 5 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6	2
Wigeon[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
Total Number of Species	0	0	0	8	0	1	0	3	1	0	0	0	0	0	0	0	12	8	21	16	25
Teesmouth and Cleveland Coast SPA Species	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	3
Teesmouth and Cleveland Coast Ramsar Species	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	1	1	3	2	3
Teesmouth and Cleveland Coast SSSI Species	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	4	2	5	5	8
Northumbria Coast SPA Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Northumbria Coast Ramsar Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1

	SECTOR																				
Species[38]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**17a**	**18**	**18a**	**19**
Durham Coast SSSI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	2	3

Low Tide (January 2022 – March 2023 Inclusive) Table 2

	SECTOR																				
Species[39]	**20**	**21**	**22**	**22a**	**22b**	**22c**	**22d**	**22e**	**22f**	**23**	**23a**	**23b**	**23c**	**23d**	**23e**	**23f**	**23g**	**24**	**G4**	**G5**	**25**
Avocet[1 3]	2	0	0	0	0	2	8	0	0	0	0	0	0	0	0	0	0	0	0	14	0
Bar-tailed Godwit	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed Gull[3]	40	9	0	0	0	3	0	0	0	0	0	0	0	2	0	0	15	0	0	9	3
Black-tailed Godwit	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dark Bellied Brent Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0
Common Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coot	0	0	0	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0
Cormorant[6]	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Curlew	42	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	8	0
Dunlin	305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Gadwall[3]	0	0	0	4	0	0	8	12	0	0	0	0	0	0	0	0	0	0	0	14	0
Golden Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Crested Grebe	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0
Greylag Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	21	2	0
Grey Plover	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[39] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI

	SECTOR																				
Species[39]	**20**	**21**	**22**	**22a**	**22b**	**22c**	**22d**	**22e**	**22f**	**23**	**23a**	**23b**	**23c**	**23d**	**23e**	**23f**	**23g**	**24**	**G4**	**G5**	**25**
Guillemot	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull[3]	57	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Kingfisher	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knot[1 2 3 6]	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lapwing[3]	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	28	0
Lesser Black Backed Gull	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Egret	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Little Grebe	2	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Long-tailed Duck	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	9	15	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	8	22	0
Moorhen	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0
Mute Swan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0
Oystercatcher	40	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	13
Pintail	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redshank[1 2 3]	127	5	0	0	1	0	1	1	0	0	0	0	0	6	0	0	0	0	0	7	0
Ringed Plover[2 3]	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shelduck[2 3]	12	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	0	3
Shoveler[3]	0	0	0	0	4	26	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0
Snipe	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	6	0	1	1	0

	SECTOR																				
Species[39]	**20**	**21**	**22**	**22a**	**22b**	**22c**	**22d**	**22e**	**22f**	**23**	**23a**	**23b**	**23c**	**23d**	**23e**	**23f**	**23g**	**24**	**G4**	**G5**	**25**
Spotted Redshank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Teal[1]	6	85	0	3	5	8	0	11	0	0	0	0	0	6	0	0	0	0	0	31	0
Tufted Duck	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turnstone[4 5 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wigeon[3]	0	12	0	0	2	18	5	3	0	0	0	0	0	4	0	0	0	0	0	76	0
Total Number of Species	22	14	1	6	4	8	7	8	0	1	0	0	0	5	0	0	4	1	10	20	5
Teesmouth and Cleveland Coast SPA Species	4	2	0	1	2	2	2	2	0	0	0	0	0	2	0	0	0	0	0	3	0
Teesmouth and Cleveland Coast Ramsar Species	4	1	0	0	1	0	2	2	0	0	0	0	0	1	0	0	0	0	1	1	1
Teesmouth and Cleveland Coast SSSI Species	7	5	0	1	3	4	5	5	0	0	0	0	0	3	0	0	1	0	2	6	3
Northumbria Coast SPA Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	SECTOR																			
Species[39]	**20**	**21**	**22**	**22a**	**22b**	**22c**	**22d**	**22e**	**22f**	**23**	**23a**	**23b**	**23c**	**23d**	**23e**	**23f**	**23g**	**24**	**G4**	**G5**	**25**
Northumbria Coast Ramsar Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Durham Coast SSSI	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

ANNEX H: SUMMARY WETLAND BIRD COUNT DATA FOR NORTH TEES MARSHES SURVEY AREA

High Tide (January 2022 – March 2023 Inclusive) Table 1

	SECTOR																	
Species[40]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Avocet[1 3]	0	1	0	8	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Barnacle Goose *Branta leucopsis*	0	154	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bar-tailed Godwit	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed Gull[3]	1	58	14	3	0	49	0	0	30	0	2	20	0	0	0	0	0	71
Black-tailed Godwit	0	0	0	3	40	1	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	60	147	31	2	0	0	0	0	0	0	113	12	0	7	2	8	2	0
Common Gull	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Coot	0	0	80	4	0	0	0	0	3	2	6	20	0	0	0	0	0	0
Cormorant[6]	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curlew	8	70	80	60	60	3	0	0	0	0	75	0	1	0	0	30	81	0
Dunlin	0	0	0	71	3	21	0	0	0	0	0	0	0	0	0	0	0	0
Egyptian Goose *Alopochen aegyptiaca*	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gadwall[3]	4	4	28	2	1	0	0	0	8	0	3	0	0	0	0	0	0	0
Great Black Backed Gull	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Goldeneye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[40] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI

	SECTOR																	
Species[40]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Golden Plover	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goosander	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Crested Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Egret *Ardea alba*	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Sandpiper *Tringa ochropus*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Grey Heron	1	0	2	0	2	0	0	0	0	0	10	0	2	1	0	0	1	0
Greylag Goose	0	8	42	2	0	0	0	0	0	0	100	1	0	35	99	38	0	0
Grey Plover	0	0	0	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull[3]	3	0	0	1	2	2	0	1	0	0	0	100	0	0	0	0	0	0
Kingfisher	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Lapwing[3]	1	200	183	12	30	0	0	10	17	0	38	8	0	0	0	1	57	50
Lesser Black Backed Gull	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Little Egret	0	0	2	7	3	0	0	0	0	0	1	0	0	0	0	0	0	0
Little Grebe	0	0	1	3	3	1	0	0	1	0	0	3	0	0	0	0	0	0
Little Ringed Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	0	1	14	21	30	18	0	2	8	0	10	12	0	2	2	0	23	2
Marsh Harrier *Circus aeruginosus*	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

	SECTOR																	
Species[40]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Mediterranean Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moorhen	0	0	6	3	0	0	0	0	2	1	0	8	0	0	0	0	0	0
Mute Swan	0	0	2	0	0	1	0	0	0	0	0	2	0	0	0	0	1	0
Oystercatcher	0	0	4	1	1	0	0	0	0	0	2	2	0	0	0	0	0	0
Pink-footed Goose *Anser brachyrhynchus*	0	0	1	0	0	0	0	0	0	0	1	0	0	3	0	0	0	0
Pintail	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pochard	0	0	15	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redshank[1 2 3]	1	1	2	40	143	85	2	0	0	1	2	0	0	0	0	0	1	1
Red-throated Diver	0	0	0	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ringed Plover[2 3]	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ruff[1 3]	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shag	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shelduck[2 3]	0	19	2	10	27	8	0	2	0	0	2	5	0	2	0	0	0	0
Shoveler[3]	0	27	0	0	20	0	0	0	0	0	6	2	0	0	0	0	0	0
Snipe	0	0	0	57	2	0	0	0	0	1	1	1	12	16	1	0	0	1

	SECTOR																	
Species[40]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Spotted Redshank	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Teal[1]	30	41	12	106	225	80	0	0	0	1	32	14	0	70	6	50	40	3
Tufted Duck	0	0	0	0	0	0	0	0	8	0	0	10	0	0	0	0	0	0
Turnstone[4 5 6]	0	0	7	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
White-fronted Goose *Anser albifrons*	0	0	1	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0
Whooper Swan *Cygnus*	0	1	0	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wigeon[3]	70	222	110	188	605	50	0	0	0	0	30	0	0	20	0	0	75	0
Woodcock *Scolopax rusticola*	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Total Number of Species	10	20	27	29	21	16	1	4	9	5	19	18	4	10	5	5	10	6
Teesmouth and Cleveland Coast SPA Species	2	2	2	4	3	3	1	0	0	2	2	1	0	1	1	1	2	2
Teesmouth and Cleveland Coast Ramsar Species	1	2	2	3	2	2	1	1	0	1	2	1	0	1	0	0	1	1
Teesmouth and Cleveland Coast SSSI Species	6	8	6	10	8	6	1	3	3	1	7	5	1	2	0	1	3	3

	SECTOR																	
Species[40]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Northumbria Coast SPA Species	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Northumbria Coast Ramsar Species	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Durham Coast SSSI	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

High Tide (January 2022 – March 2023 Inclusive) Table 2

	SECTOR																		
Species[41]	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**	**B21**	**B22**	**B23**	**B24**	**B25**
Avocet[1 3]	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Barnacle Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bar-tailed Godwit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed Gull[3]	1	0	0	31	2	61	0	36	46	0	0	2	0	20	21	0	0	100	0
Black-tailed Godwit	0	0	0	0	0	0	0	0	63	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	1	0	44	0	0	0	0	0	0	0	0	0	0	2	0	0	45	0
Common Gull	0	0	0	7	0	87	0	0	4	0	0	0	0	0	0	0	0	2	0
Coot	5	12	0	27	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cormorant[6]	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0
Curlew	2	0	0	0	0	1	0	82	65	125	1	3	0	0	0	0	2	4	0
Dunlin	0	0	0	0	0	4	0	0	58	0	0	0	0	0	0	0	0	0	0
Egyptian Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gadwall[3]	6	7	0	8	4	0	0	0	0	3	0	0	0	0	0	0	0	0	0
Great Black Backed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goldeneye	3	3	2	7	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden Plover	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0
Goosander	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

[41] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI

	SECTOR																		
Species[41]	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**	**B21**	**B22**	**B23**	**B24**	**B25**
Great Crested Grebe	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Egret	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	1	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	7	0	0
Greylag Goose	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0
Grey Plover	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Herring Gull[3]	0	0	0	0	0	1	0	0	47	0	0	0	0	2	0	0	0	0	0
Kingfisher	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0
Lapwing[3]	0	0	0	0	2	2	2	118	221	0	3	28	0	0	0	0	0	117	0
Lesser Black Backed Gull	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	2	0
Little Egret	0	0	0	0	1	0	0	0	2	1	0	0	0	1	4	0	2	0	0
Little Grebe	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Little Ringed Plover	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	20	2	2	10	37	0	0	0	25	12	0	0	0	0	4	6	22	0	0
Marsh Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mediterranean Gull	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Moorhen	0	0	2	0	2	0	0	0	1	0	0	0	0	0	2	0	1	0	0
Mute Swan	0	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Oystercatcher	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Pink-footed Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0

	SECTOR																		
Species[41]	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**	**B21**	**B22**	**B23**	**B24**	**B25**
Pintail	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pochard	17	4	0	5	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Redshank[1 2 3]	0	0	0	2	1	3	0	0	48	5	3	1	0	0	1	2	8	0	0
Red-throated Diver	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Ringed Plover[2 3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ruff[1 3] *Calidris pugnax*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaup *Aythya marila*	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shag	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Shelduck[2 3]	0	0	0	12	4	0	0	0	6	35	7	0	0	0	0	6	6	0	0
Shoveler[3]	0	0	0	26	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0
Snipe	0	1	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Spotted Redshank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Teal[1]	48	1	0	34	5	0	0	0	29	9	30	0	0	0	10	10	37	0	0
Tufted Duck	7	6	2	4	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turnstone[4 5 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White-fronted Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whooper Swan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wigeon[3]	59	4	2	32	46	26	0	0	100	36	150	0	0	0	0	0	97	0	0
Woodcock	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

	SECTOR																		
Species[41]	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**	**B21**	**B22**	**B23**	**B24**	**B25**
Total Number of Species	12	13	7	17	19	11	3	4	25	9	6	4	0	4	10	4	10	8	0
Teesmouth and Cleveland Coast SPA Species	1	1	0	3	2	1	0	0	3	2	2	1	0	0	2	2	2	0	0
Teesmouth and Cleveland Coast Ramsar Species	0	0	0	2	2	1	0	0	2	2	2	1	0	0	1	2	2	0	0
Teesmouth and Cleveland Coast SSSI Species	3	2	1	6	6	5	1	2	7	4	4	3	0	2	2	2	3	2	0
Northumbria Coast SPA Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northumbria Coast Ramsar Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Durham Coast SSSI	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0

Low Tide (January 2022 – March 2023 Inclusive) Table 1

	SECTOR																	
Species[42]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Avocet[1 3]	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnacle Goose	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bar-tailed Godwit	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed Gull[3]	1	0	0	7	1	1	0	0	17	0	6	10	0	0	0	0	0	0
Black-tailed Godwit	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dark Bellied Brent Goose	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	100	10	32	2	0	0	0	0	0	0	120	48	0	0	20	9	90	0
Common Gull	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Common Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coot	0	0	90	1	0	0	0	0	4	1	3	20	0	0	0	0	0	0
Cormorant[6]	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cormorant[6]/ Shag[43]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curlew	8	19	150	38	82	5	0	0	0	0	55	0	4	0	30	40	90	1
Dunlin	0	0	0	18	11	3	0	0	0	0	0	0	0	0	0	0	0	0

[42] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI
[43] Not identified to species level

	SECTOR																	
Species[42]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Egyptian Goose	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gadwall[3]	0	0	26	0	0	0	0	0	7	0	0	0	2	0	0	0	0	0
Great Black backed gull	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Goldeneye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden Plover	0	3	0	210	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Great Crested Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Greenshank *Tringa nebularia*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	0	0	1	0	0	0	0	0	0	0	13	1	1	0	1	0	2	0
Greylag Goose	2	0	28	2	0	0	0	0	0	0	100	1	0	2	35	0	20	0
Grey Plover	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull[3]	1	0	0	3	1	2	0	0	0	0	2	100	0	0	0	0	0	0
Kingfisher	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knot[1 2 3 6]	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lapwing[3]	2	35	65	250	32	17	0	1	7	0	60	6	12	0	6	0	20	0
Little Egret	0	0	3	5	1	0	0	0	0	0	1	0	0	0	0	0	0	0
Little Grebe	0	0	2	4	0	0	0	0	2	0	0	3	0	0	0	0	0	0
Long-tailed Duck	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Mallard	4	0	15	12	0	4	0	0	14	0	8	70	8	0	7	0	11	8

	SECTOR																	
Species[42]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Marsh Harrier	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mediterranean Gull	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Moorhen	0	0	3	0	0	0	0	0	1	0	0	10	0	0	0	0	0	0
Mute Swan	0	0	2	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0
Oystercatcher	0	0	2	5	0	0	0	0	0	0	2	2	0	0	0	0	0	0
Pintail	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pochard	0	0	14	0	0	0	0	0	4	0	0	2	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	11	18	8	0	0	0	0	0	0	0	0	0	0	0	0
Redshank[1 2 3]	0	21	0	47	76	40	0	0	0	0	0	0	0	0	0	0	3	4
Scaup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shelduck[2 3]	0	4	10	10	16	13	0	0	0	0	6	0	0	0	0	0	0	0
Shoveler[3]	0	28	0	0	0	0	0	0	7	0	4	5	0	0	0	0	0	0
Snipe	4	0	3	1	0	0	0	0	0	0	1	1	10	10	5	0	5	0
Spoonbill *Platalea alba*	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Spotted Redshank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Teal[1]	2	26	20	220	42	40	0	0	0	0	8	10	6	0	5	0	21	33
Tufted Duck	0	0	2	0	0	0	0	0	5	0	0	26	0	0	0	0	0	0
Turnstone[4 5 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Rail *Rallus aquaticus*	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

	SECTOR																	
Species[42]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
White-fronted Goose	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0
Whooper Swan	0	0	0	60	11	0	0	0	0	0	0	0	0	0	0	0	0	0
Wigeon[3]	62	526	200	70	21	0	0	0	0	0	42	0	0	0	0	0	64	70
Total Number of Species	10	10	24	28	14	12	0	1	13	1	17	17	7	2	10	2	11	5
Teesmouth and Cleveland Coast SPA Species	1	2	1	4	2	2	0	0	0	0	0	0	0	0	0	0	1	1
Teesmouth and Cleveland Coast Ramsar Species	0	2	1	3	2	0	0	0	0	1	0	0	0	0	0	0	1	1
Teesmouth and Cleveland Coast SSSI Species	4	5	4	8	6	5	0	1	4	0	5	4	2	0	1	0	2	1
Northumbria Coast SPA Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northumbria Coast Ramsar Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	SECTOR																	
Species[42]	**G1**	**G2**	**G3**	**G6**	**G7**	**G8**	**G9**	**G10**	**G11**	**G12**	**G13**	**G13a**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Durham Coast SSSI	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Low Tide (January 2022 – March 2023 Inclusive) Table 2

	SECTOR																		
Species[44]	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**	**B21**	**B22**	**B23**	**B24**	**B25**
Avocet[1 3]	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
Barnacle Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bar-tailed Godwit	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Black-headed Gull[3]	2	0	0	14	1	22	0	0	17	0	0	2	0	23	0	1	0	30	0
Black-tailed Godwit	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0
Dark Bellied Brent Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	1	3	0	0	0	250	0	0	0	0	0	0	0	0	0	120	0
Common Gull	0	0	0	0	0	24	0	0	0	1	0	0	0	0	0	0	0	0	0
Common Sandpiper	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0
Coot	16	6	0	28	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cormorant[6]	2	1	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Cormorant[6]/ Shag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Curlew	0	0	0	1	0	0	0	0	72	1	0	10	0	0	0	1	2	3	0
Dunlin	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0
Egyptian Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gadwall[3]	8	3	0	15	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[44] Numbered codes against species names indicate qualifying features of designated sites as follows: 1 = Teesmouth and Cleveland Coast SPA; 2 = Teesmouth and Cleveland Coast Ramsar; 3 = Teesmouth and Cleveland Coast SSSI; 4 = Northumbria Coast SPA; 5 = Northumbria Coast Ramsar; 6 = Durham Coast SSSI

	SECTOR																		
Species[44]	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**	**B21**	**B22**	**B23**	**B24**	**B25**
Great Black Backed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goldeneye	2	3	2	4	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden Plover	0	0	0	0	0	0	0	0	500	0	0	0	0	0	0	0	0	0	0
Great Crested Grebe	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Sandpiper	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Greenshank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Grey Heron	1	0	0	0	1	0	0	0	2	1	0	4	0	0	1	1	5	0	0
Greylag Goose	0	1	1	0	1	0	0	0	0	0	0	0	0	0	120	0	0	180	0
Grey Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull[3]	0	0	0	3	0	2	0	0	25	0	0	0	0	0	0	0	0	0	0
Kingfisher	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Knot[1 2 3 6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lapwing[3]	2	0	0	0	0	43	0	0	255	0	0	0	0	6	0	0	0	0	0
Little Egret	0	0	0	0	0	0	0	0	9	1	0	0	0	0	3	1	1	0	0
Little Grebe	1	2	0	1	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0
Long-tailed Duck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Mallard	20	4	1	5	68	4	0	0	14	7	0	0	0	0	2	10	4	0	0
Marsh Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mediterranean Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moorhen	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

	SECTOR																		
Species[44]	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**	**B21**	**B22**	**B23**	**B24**	**B25**
Mute Swan	0	4	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oystercatcher	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0
Pintail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pochard	22	10	0	2	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	1	0	0	0	17	0	0	0	0	0	1	0	0	0	0
Redshank[1 2 3]	0	1	0	1	1	2	0	0	210	3	1	0	0	0	0	12	4	0	0
Scaup	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shelduck[2 3]	0	0	0	1	0	2	0	0	4	10	3	0	0	0	0	0	2	0	0
Shoveler[3]	0	0	0	35	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0
Snipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spoonbill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spotted Redshank	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0
Teal[1]	40	4	0	40	32	4	0	0	420	200	0	0	0	0	0	0	25	0	0
Tufted Duck	4	6	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turnstone[4 5 6]	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Water Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White-fronted Goose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whooper Swan	0	0	0	0	1	0	0	0	74	0	0	0	0	0	0	0	0	0	0
Wigeon[3]	100	0	0	45	5	0	0	0	1000	0	0	0	0	0	0	0	28	0	0

	SECTOR																		
Species[44]	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**	**B21**	**B22**	**B23**	**B24**	**B25**
Total Number of Species	13	13	6	19	15	10	0	1	25	8	2	3	0	2	7	6	10	5	0
Teesmouth and Cleveland Coast SPA Species	1	2	0	2	2	2	0	0	3	2	1	0	0	0	0	1	2	0	0
Teesmouth and Cleveland Coast Ramsar Species	0	1	0	2	1	2	0	0	2	2	2	0	0	0	0	1	2	0	0
Teesmouth and Cleveland Coast SSSI Species	4	2	0	7	4	5	0	0	8	2	2	1	0	2	0	2	3	1	0
Northumbria Coast SPA Species	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Northumbria Coast Ramsar Species	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Durham Coast SSSI	1	1	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	1	0

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Appendix 14A: Net Zero Teesside: Benthic EUNIS biotopes in River Tees and Tees Bay

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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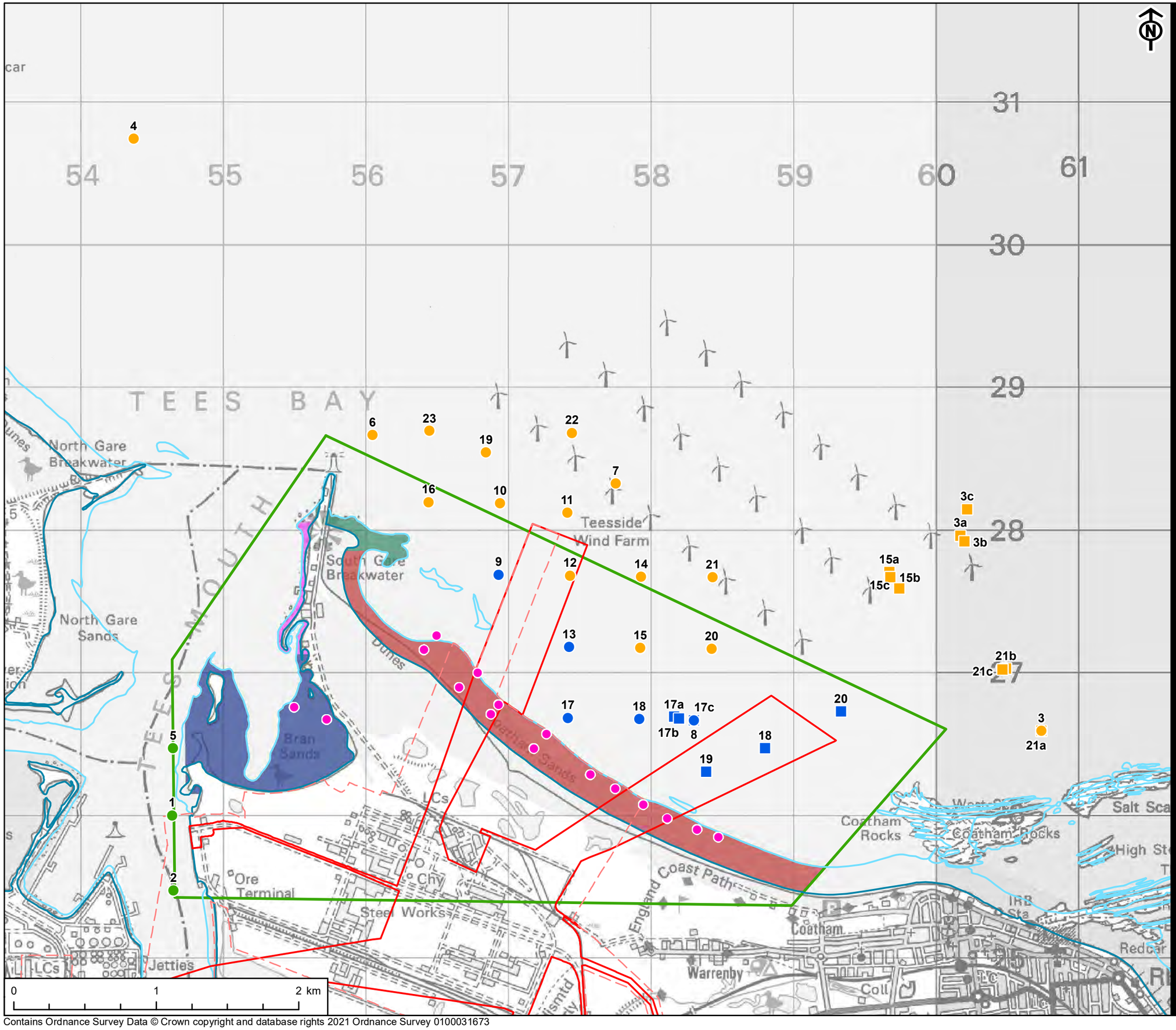
14A.0 NET ZERO TEESSIDE: BENTHIC EUNIS BIOTOPES IN RIVER TEES AND TEES BAY

Project Management Initials: RL Designer: LC Checked: AR Approved: RG



Scale @ A3 1:25,000

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PROJECT

NET ZERO TEESSIDE PROJECT

Net Zero Teesside

APPLICANTS

NZT POWER LTD. AND NZNS STORAGE LTD.

KEY

- Site Boundary
- PEIR Site Boundary
- Mean Low Water
- Mean High Water
- Phase II Intertidal Sample Location

Subtidal Sampling Location - Survey

- AECOM
- Teesside OWF *

EUNIS Biotope - Symbol Colour

- A5.233 (SS.SSa.IFiSa.NcirBat) – *'Nephtys cirrosa and Bathyporeia spp. in infralittoral sand'*
- A5.242 (SS.SSa.IMuSa.FfabMag) – *'Fabulina fabula and Magelona mirabilis with venerid bivalves and amphipods in infralittoral compacted fine muddy sand'*
- A5.331 (SS.SMu.ISaMu.NhomMac) – *'Nephtys hombergii and Macoma balthica in infralittoral sandy mud'*
- Phase I Intertidal Study Area

Intertidal Phase I Broad Scale EUNIS Biotope

- A1.113, [Semibalanus balanoides] on exposed to moderately exposed or vertical sheltered eulittoral rock
- A1.323, [Fucus vesiculosus] on variable salinity mid eulittoral boulders and stable mixed substrata
- A2.2, Littoral sand and muddy sand
- A2.242, [Cerastoderma edule] and polychaetes in littoral muddy sand

* Entec UK Limited (2011). Teesside Windfarm Ltd, Teesside Offshore Wind Farm FEPA Monitoring, Benthic Survey Report 2010

TITLE

FIGURE 14D-14
TEESSIDE OFFSHORE WIND FARM AND NET ZERO TEESSIDE SUBTIDAL BENTHIC EUNIS BIOTOPE AND SEDIMENT CLASSIFICATION MAP

REFERENCE

NZT_210511_SBS_14D-141_v2

SHEET NUMBER | DATE

1 of 1 | 11/05/21

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Appendix 16A: Landscape Character

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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16A.0 LANDSCAPE CHARACTER

16A.1 National Landscape Character

16A.1.1 The Study Area contains 3 National Character Area (NCA) Profiles:

- NE435:NCA Profile:15: Durham Magnesian Limestone Plateau (Natural
- England, 2013/04/22);
- NE439:NCA Profile: 23 Tees Lowlands (Natural England, 2014/08/26) and;
- NE352:NCA Profile 25: North York Moors and Cleveland Hills (Natural
- England, 2015/01/14).

16A.1.2 The relevant characteristics of these NCAs are summarised in Table 16A-1.

Table 16A-1: National Character Area Summary Table

NATIONAL CHARACTER AREA	KEY CHARACTERISTICS
Natural England	
NCA 23: Tees Lowlands (Natural England, 2014)	• *"A broad, low-lying and open plain of predominantly arable agricultural land, with low woodland cover and large fields, defined by wide views to distant hills;* • *A large area of urban and industrial development around the Tees Estuary, much of which is on reclaimed land, contrasts with the quieter rural areas to the south and west;* • *Major industrial installations around Teesmouth form a dramatic skyline, but are juxtaposed with expansive mudflats, sand dunes and salt marshes;* • *Slow-moving rivers Tees and Leven meander through the landscape with steep, well-wooded banks;* • *A distinctive area of low-lying farmland with remnants of former wetland habitat in the flood plain of the River Skerne to the northwest;* • *Permo-Triassic red mudstones and sandstones are masked by glacial drift and alluvial material but can be seen outcropping at the coast in places;* • *Principal transport corridors, power lines and energy infrastructure are conspicuous elements in the landscape. Industrial development fringing the tidal reaches of the River Tees contrasts with the surrounding rural landscape;* • *Brownfield sites where semi-natural vegetation has started to regenerate on previously developed land; and*

NATIONAL CHARACTER AREA	KEY CHARACTERISTICS
Natural England	
	• *Green corridors such as minor valleys and former railway lines provide links between urban areas and the surrounding countryside."*
NCA 25: North York Moors and Cleveland Hills (Natural England, 2015)	• *"Upland plateaux, generally below 400 m, dissected by a series of dales – some broad and sweeping but others narrow, steep sided and wooded – creating strong contrasts between open moors and enclosed valleys;* • *Extensive areas of heather moorland on plateaux and hills, largely under sporting ownership, including large expanses of upland heathland and blanket bog habitats, creating a sense of space, expansiveness and openness;* • *Mosaics of upland heathland vegetation supporting internationally important populations of breeding merlin and golden plover;* • *Some areas of extensive conifer and mixed plantations, especially in the south-east, and broadleaved woodland on steep valley sides;* • *Valley landscapes characterised by pastoral farming, with a clear demarcation and strong visual contrast between the enclosed fields with some species-rich grasslands and wetlands, farms and settlements, and the bracken-fringed moorlands above;* • *Drystone walls and hedgerows enclosing the small pastures and meadows in dales and fringing farmland, often replaced by fences in arable areas;* • *Large-scale arable landscapes to the south and east;* • *Jurassic sandstones, mudstones and limestone forming a dramatic coastal landscape of high cliffs, high vegetated maritime slopes, and small coves and bays, with coastal towns and compact fishing village;* • *Sparsely settled, with scattered farmsteads and small villages, and traditional buildings constructed of local sandstone or limestone and with red pantile roofs, creating a strong visual unity;* • *A rich archaeological heritage from many different periods, especially on the moorland plateaux; and* • *Panoramic views over moorland plateaux, ridges and dales and out over surrounding lowland landscapes and the North Sea."*

NATIONAL CHARACTER AREA	KEY CHARACTERISTICS
Natural England	
NCA Profile 15: Durham Magnesian Limestone Plateau (Natural England, 2013)	• *"Open, large-scale landscape with big fields, low hedges and few trees on the plateau tops, incised with stream valleys along limestone escarpment to the west and denes running down to the coast to the east.* • *Dramatic coastline with exposed cliffs of limestone and boulder clay, undulating series of small, sheltered bays and headlands, flower-rich Magnesian Limestone grassland, steep-sided wooded coastal denes, and sand dunes and beaches that support large populations of waders and seabirds.* • *Striking west-facing limestone escarpment forming a series of spurs and vales, heavily quarried but still supporting a mosaic of limestone grassland, scrub and woodland.* • *Strong influence of historic mining industry on both local culture and the landscape, in the form of ex-coal mining towns and villages with distinctive surrounding areas of allotments and pony paddocks, reclaimed colliery sites, disused and existing railways, and industrial archaeology.* • *A productive farmed landscape with a high proportion of large arable fields and some pasture for sheep and cattle grazing.* • *Historic villages subject to a high degree of 20th-century expansion.* • *Widespread urban and industrial development in the north and major transport corridors throughout."*

16A.1.3 At a national scale the Study Area includes the Marine Character Area (MCA): North East described in the National Seascape Character Assessment for England (MM01134) (Marine Management Organisation, 2018). The relevant characteristics are summarised in Table 16A-2.

Table 16A-2: Marine Character Area Summary Table

SEASCAPE CHARACTER AREA	KEY CHARACTERISTICS
Marine Management Organisation 2018	
MCA 22 Tyne, Tees and Wear Estuaries and Coastal Waters	• *"Shelving coastal waters off the extensively developed coast of the Tyne, Tees and Wear lowlands encompassing Tynemouth, South Shields, Sunderland, Seaham, Hartlepool and Redcar, deepening to approximately 30-50 metres offshore. Encompassing the estuaries and tidal rivers inland;*

SEASCAPE CHARACTER AREA	KEY CHARACTERISTICS
	• *Contrasting areas of undeveloped exposed coastline of sweeping sandy beaches, punctuated by estuaries and rocky outcrops that form slight headlands between South Shields and Hartlepool;* • *Diverse ecological habitats and important populations of rare species. Rocky foreshore and sandy beach that regularly supports internationally important numbers of purple sandpiper, ruddy turnstone and little tern (Northumbria Coast Ramsar site and Teesmouth and Cleveland Coast SPA);* • *Offshore, the East Coast War Channels were vital for transporting coal and other goods from the Tyne to the Thames and France, during WWI and WWII. Additional protection was provided from Heugh Gun Battery 26 of 69 (Scheduled Monument) located on the Headland at Hartlepool and the 'disappearing gun' at Trow Point. The coast includes a range of important military heritage sites;* • *Global influence of shipbuilding in the area, focused around Sunderland, Teesside, Hartlepool and Tyneside dating from the late 13th Century. Shipbuilding now largely replaced by vessel and marine structure decommissioning and the offshore wind industries;* • *Large fishing fleets based at the region's major commercial fishing and shellfish ports at North Shields, with other landings at smaller ports such as Hartlepool and Blyth;* • *Good coastal access along much of the coast providing increasing opportunities for recreation and tourism, including fishing from the now clean former industrial beaches, and walking along stretches of the England Coast Path;* • *Expansive views across the North Sea including the moving turbines of the Teesside and Blyth (Demonstrator) Offshore Wind Farms;* • *Viewed from the sea, the coastline is perceived as a well lit. The southern part of the MCA is intensely lit by the extensive industrial facilities at Middlesbrough;* • *The exposure of the coast with general absence of sheltering headlands results in a wild and unforgiving seascape when storms sweep in from the North Sea;* • *Open, large-scale landscape with big fields, low hedges and few trees on the plateau tops, incised with stream valleys along limestone escarpment to the west and denes running down to the coast to the east;*

SEASCAPE CHARACTER AREA	KEY CHARACTERISTICS
	• *Dramatic coastline with exposed cliffs of limestone and boulder clay, undulating series of small, sheltered bays and headlands, flower-rich Magnesian Limestone grassland, steep-sided wooded coastal denes, and sand dunes and beaches that support large populations of waders and seabirds;* • *Striking west-facing limestone escarpment forming a series of spurs and vales, heavily quarried but still supporting a mosaic of limestone grassland, scrub and woodland;* • *Strong influence of historic mining industry on both local culture and the landscape, in the form of ex-coal mining towns and villages with distinctive surrounding areas of allotments and pony paddocks, reclaimed colliery sites, disused and existing railways, and industrial archaeology;* • *A productive farmed landscape with a high proportion of large arable fields and some pasture for sheep and cattle grazing;* • *Historic villages subject to a high degree of 20th-century expansion; and* • *Widespread urban and industrial development in the north and major transport corridors throughout".*

16A.2 Regional landscape Character

16A.2.1 The Proposed Development Site and Study Area are not covered by any regional Landscape Character Assessment.

16A.3 Local Landscape Character

16A.3.1 The Study Area is covered by three local landscape character assessments:

- Redcar and Cleveland Landscape Character Assessment (Redcar and Cleveland Borough Council, 2006);
- Stockton and Tees Landscape Character Assessment (Stockton-on-Tees Borough Council, 2011); and
- Hartlepool Landscape Assessment (Hartlepool Borough Council, 2000).

16A.3.2 Redcar and Cleveland Landscape Character Assessment divides the rural areas of the Borough into broad Landscape Character Tracts (LCTr). Four of the landscape tracts fall within the Study Area. The relevant characteristics of these landscape tracts are summarised in Table 16A-3.

Table 16A-3: Landscape Tracts Summary table

LANDSCAPE CHARACTER TRACT	KEY CHARACTERISTICS
Redcar and Cleveland Landscape Character Assessment	
Eston Hills	• *"Characterised by a complex of prominent steep-sided hills linked by low saddles which form a parallel series of foothills, or outliers, to the main escarpment of the Cleveland Hills, which lie within the North York Moors National Park. Open moorland and wooded hillsides and escarpments contribute to the distinctive character of this area and give it an identity unlike any other part of the Borough. An area of parkland at Wilton is important within the tract;* • *Extensive and contrasting views are available from many locations; to the south there is the backdrop of the Cleveland Hills. To the north there are views over the urban and industrial developments of Teesside and Redcar;* • *The Eston Hills Tract consists of three distinct but closely grouped elevated areas: the Eston Hills upland between Dunsdale and Ormesby, the higher land at Upleatham, and that situated between Skelton and Slapewath. Associated with these uplands are 'saddles' of relatively lower land linking them and the slopes that edge them. Also included are the upper reaches of Skelton Beck, known as Tocketts Beck and Waterfall Beck in this tract; and* • *Under the Character Assessment, the landscapes in this tract are classified into Sensitive Landscapes over the landscape units on the higher land, the beck valleys and the parkland, with Restoration Landscapes over the remainder. The uplands have a high strength of character, a product of a dominant landform and a strong woodland pattern. The lower-lying areas are characterised by a more open landscape structure of isolated woods and hedges set within a farmland context."*
Redcar Flats	• *"The Redcar Flats are contained by the escarpment of the Eston Hills to the south and the coast to the north. Over the inland part of the tract, the presence of high quality farmland has encouraged intensive arable cultivation and the enlargement of fields. The hedgerow pattern is sparse and there are few landscape features to interrupt the open, gently sloping landscape;* • *Long views predominate in this landscape, and skyline features take on particular importance. The industry at Wilton Works, and the abrupt urban edges of Redcar, Marske, New Marske, Saltburn*

LANDSCAPE CHARACTER TRACT	KEY CHARACTERISTICS
	and the A174 and railway corridors have a strong local influence on landscape character; • *Under the Character Assessment, the coastal zone in this tract is classified as Sensitive Landscape. In this open landscape, largely the product of maritime exposure, any development will be very open to view; and* • *Other Sensitive Landscape areas in this tract are the parkland at Kirkleatham and the wooded valley at Hazel Grove, where the priority is the retention of existing landscape constituents. The remainder of this tract, inland of the coast, is classified as Restoration Landscape. Existing features in this denuded landscape are relatively sparse, due to hedgerow decline and loss, and their retention is important to 'place' new development, to act as the basis for additional planting, or for the creation of 'new landscape.' "*
Guisborough Lowland	• *"This tract encompasses Guisborough and lies to the south of the Eston Hills. It is gently undulating with a distinctive lightly wooded character. Woodland blocks are numerous but small, and hedges tend to be thin or gappy with few trees. It is physically confined, sandwiched between Eston Hills to the north and the Langbaurgh Ridge to the south. The largely arable farmland is undulating in the west, but is flatter towards Guisborough and starts to rise towards Roseberry Topping;* • *The urban edge of Nunthorpe has an intrusive visual impact on fringe farmland, and the A171 is prominent locally;* • *The tract to the west of Guisborough takes its character largely from the hedgerow network over the farmland, with only scattered small woodlands, rather than from any strongly wooded content;* • *To the east of Guisborough, however, there is a varied character of farmland, hedges and woodland associated with the parkland at Gisborough Hall. Under the Character Assessment, the landscape in this tract is classified as Restoration Landscape, except for the parkland at Gisborough Hall, which is a Sensitive Landscape; and* • *The landscape of this tract out with the parkland is noted for the scarcity of hedgerow trees and the scattered small woodland blocks."*

LANDSCAPE CHARACTER TRACT	KEY CHARACTERISTICS
East Cleveland Plateau	• *This tract comprises an open, elevated coastal plateau rising towards the south to meet the North York Moors. The plateau has an exposed, open rural character with largescale farmland bordered by hedges. A number of lanes are also characterised by hedges on each side. The plateau is dissected by a complex system of deeply-incised sheltered, heavily-wooded valleys or gills, which meet the coast at two points within this tract; these are separated by higher land, where dramatic cliffs fall to wave-cut platforms at sea level;* • *A history of mining and related industries within the tract has left its mark on the landscape, and pockets of industry associated with villages and, in the open countryside, spoil heaps and disused mineral railways, have a strong influence on the landscape character. Many of the spoil heaps have now been regraded and planted, as at Liverton Mines and Lumpsey, and some have been removed as at Lingdale. Others, though, remain, most notably that at Kilton which is visible over a wide area;* • *Under the landscape Character Assessment, the wooded valleys and coast are classed as Sensitive Landscapes, whilst the remainder of the tract falls in the Restoration Landscape classification;* • *The coast within this tract, classified as Sensitive Landscape in the Character Assessment, is within 'The North Yorkshire and Cleveland Heritage Coast,' where protection of character is given priority. Where development does take place, its location and design are of crucial importance; and* • *New planting for screening or integration should closely reflect the nature and detail of the existing vegetation".*

16A.3.3 The Study Area includes the East Billingham to Teesmouth Landscape Character Area as defined by Stockton on Tees Landscape Character Assessment 2011. East Billingham to Teesmouth and Thorpe and Billingham Beck Valley Character Areas fall within the Study Area. The relevant characteristics of this Landscape Character Area are contained in Table 16A-4.

Table 16A-4: Landscape Character Areas Summary Table

LANDSCAPE CHARACTER AREA	KEY CHARACTERISTICS
Stockton on Tees Landscape Character Assessment	
East Billingham to Teesmouth	• *"Extensive and contrasting views are available from many locations; to the south there is the backdrop of the Cleveland*

LANDSCAPE CHARACTER AREA	KEY CHARACTERISTICS
	Industrial landscape fringing Billingham integrated with large areas of open space including wetlands and reclaimed semi improved pasture; • *Farmland is open and flat with minimal landscape features;* • *Industry dominates area to the east along the River Tees;* • *Open space within industrial areas contain significant wildlife value with a number of ecological designations present including Sites of Special Scientific Interest (SSSI's), Site of Nature Conservation Importance (SNCI), Special Protection Area (SPA), Ramsar Site and Teesmouth National Nature Reserve;* • *Important 'ridge and furrow' within the field pattern around the settlement of Cowpen Bewley;* • *The Stockton to Hartlepool railway line is notable feature within the landscape, dividing the Landscape Character Area between estuarine and non-estuarine/rural fringe influences; and* • *Cowpen Bewley Woodland Park provides the only wooded element within this Landscape Character Area;* • *The key landscape characteristics of this area are the ecological wetland habitats, in particular the SSSI's at Seal Sands and Cowpen Marsh. These are unique features within the Borough and provide a substantial amount of ecological benefit to an otherwise industry dominated landscape. Industrial features such as large storage tanks and flares associated with the oil refineries and chemical works within the Tees estuary dominate views towards the east with vertical features outside the industrial areas, comprising transmission towers and overhead power lines; and* • *The River Tees runs along the southern boundary of this area where it exits land at Tees Mouth, just north of Seal Sands".*
Thorpe and Billingham Beck Valley	• *"Green corridor stretching from the rural areas of the Stockton on Tees Borough into the heart of the conurbation creating a 'Green Wedge' between Stockton and Billingham;* • *Wide beck valley gradually narrowing as it extends into Billingham Beck valley extending between Stockton and Billingham;* • *Field sizes vary from medium well-defined fields to larger field pattern in the west with poorly maintained hedgerows;* • *Land use consisting mainly of semi improved and improved pasture along the valley floor and extending up the sides;*

LANDSCAPE CHARACTER AREA	KEY CHARACTERISTICS
	• *Transport links include A19, A177 and Stockton to Darlington railway line cutting through the agricultural landscape; and* • *A network of minor roads create a complex vehicle network across the area. Public footpath links are limited".*

16A.3.4 The Hartlepool Landscape Assessment, 2000 defines seven Landscape Types. The Study Area includes four landscape types as defined by Hartlepool Landscape Assessment: Coastal Fringe, Estuarine, Rural Fringe and Undulating Farmlands. The characteristics contained in Table 16A-5.

Table 16A-5: Landscape Character Types Summary Table

LANDSCAPE CHARACTER TYPES	KEY CHARACTERISTICS
Hartlepool Landscape Assessment	
Coastal Fringe	• *"The coastal fringe area to the east of the Borough encompasses not only the beach area itself but also those adjoining areas of land which can clearly be seen to have been influenced by or be part of the maritime ecosystem; and* • *This character area, for the purposes of the study, extends to the normally exposed tidal beach, exposed rock and sea cliff areas, and also man-made features such as coastal defences, harbour or sea wall installations. In addition to these features are the fringe elements normally found adjoining the coast itself, these being defined as coastal dunes, coastal grassland, salt marshes or areas of low tree and shrub cover."*
Estuarine	• *"The estuarine area lies in the southeast and eastern fringe of the Borough. Typically it is defined by flat, featureless plains, which are permeated by or in close proximity to estuarine water bodies;* • *This definition includes areas of semi-natural open water (tidal and fresh), associated salt marsh, reed beds, sand and mud flats. These areas also typically include low lying agricultural land, low tree and shrub cover and some coastal grassland. Estuarine land characteristically does not exceed 10 metres AOD; and* • *The Estuarine landscape occupies a small but visually unique area of the study area, which suffers due to its proximity to the adjacent oil storage depot, BNFL power plant and Tioxide works. On a broader scale, the visual backdrop created by the Teesside industrial complex has a strong visual influence on the general*

LANDSCAPE CHARACTER TYPES	KEY CHARACTERISTICS
	landscape, an influence that is unfortunately exacerbated by the flat, low-lying nature of the surrounding landscape."
Rural Fringe	• *"The rural fringe refers to those areas adjacent or in close proximity to the urban environment, which typically have either lost or had the rural character influenced by adjacent urban development (consequently, the Rural Fringe boundary extends along the edge of the built area of Hartlepool, and surrounds the built edge of the outlying village settlements;* • *Such areas are often subject to litter/vandalism/tipping or malicious damage, and include sites that are unmanaged or poorly maintained or enclosed within degraded boundaries; and* • *The majority of Rural Fringe sites are in a generally good or acceptable condition."*
Undulating Farmland	• *"The farmland landscape covers the majority of the western Borough area, and largely defines the rural area of Hartlepool;* • *Appropriate and aesthetically pleasing sense of scale and enclosure created by hedgerow boundaries and field patterns;* • *·Boundary hedgerows and tree belts create visual interest and provide a rich tapestry of varied field patterns that contribute positively to the overall character and value of the landscape;* • *Generally pleasant view across sprawling, largely unspoilt rural landscape; natural landscape division between urban area and outlying settlements;* • *·Removal of hedgerows, and subsequent field enlargement, in some locations disrupts aesthetic sense of scale and enclosure, and introduces barren, industrial element into the rural landscape; and* • *Industrial farm buildings extremely prominent in many areas, with little or no attempt to ameliorate visual impact."*

16A.4 References

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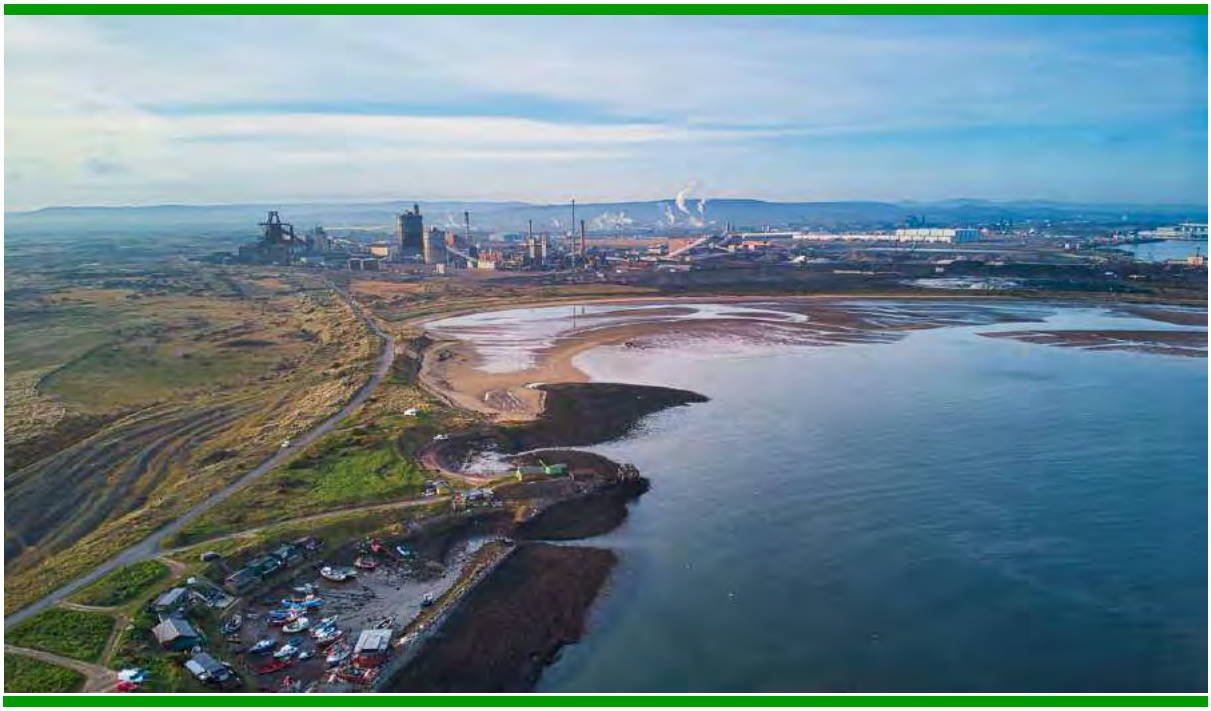
Appendix 16B: Landscape and Visual Impact Assessment Proposed Methodology

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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16B.0 LANDSCAPE AND VISUAL IMACT ASSESSMENT PROPOSED METHODOLOGY

16B.1 Assessment Methodology

16B.1.1 The Landscape and Visual Impact Assessment (LVIA) has been based on the following guidance:

- Guidelines for Landscape and Visual Impact Assessment, Third Edition. (2013), Landscape Institute and Institute of Environmental Management and Assessment, referred to as GLVIA3 in this methodology;
- An Approach to Landscape Character Assessment (2014), Natural England;
- Technical Guidance Note (TGN) 02/21: Assessing Landscape Value Outside National Designations;
- TGN: 04/2020: Infrastructure; and
- TGN 06/2019: Visual Representation of Development Proposals.

16B.1.2 Photography incorporated into the figures accompanying the LVIA has been undertaken in accordance with Technical Guidance Note (TGN) 06/2019: Visual Representation of Development Proposals (Landscape Institute, 2019) unless stated otherwise.

16B.2 Zone of Theoretical Visibility (ZTV) Analysis

16B.2.1 The ZTVs have been generated by analysis of a 3D digital terrain model (DTM) of the surrounding terrain and the Proposed Development using the following parameters:

- contours/terrain model based on OS Terrain 5 DTM dataset;
- eye height of viewer set at 1.8 m; and
- visibility assessed on a 50 m grid throughout the Study Area.

16B.2.2 The output provides a graphical representation of the computer calculated inter-visibility between a viewer (at 1.6 m height) and the top of the landform based on points distributed across the Study Area.

16B.3 Assessment Process

16B.3.1 Following assessment of the baseline landscape and visual context of the development the LVIA assesses the:

- sensitivity of receptors, whether the landscape or viewers;
- magnitude of effect, whether adverse or beneficial; and
- significance of the effects based on a comparison of sensitivity of receptor to magnitude of effect.

16B.3.2 Effects may be temporary, permanent, short-term, medium-term or long-term. Landscape and visual effects may be further categorised as being either direct i.e. originating from the site, or indirect e.g. off-site visual effect of construction traffic.

16B.4 Landscape Assessment Methodology

16B.4.1 In predicting the effects of the Proposed Development on the landscape within the Study Area GLVIA3 states the following steps should be undertaken to identify and describe the landscape effects:

- identify the components of the landscape that are likely to affected by the Proposed Development (landscape receptors); and
- identify the interactions between the landscape receptors and different components of the Proposed Development at its different stages.

Sensitivity of Landscape Receptors

16B.4.2 Landscape receptors are described within GLVIA3 (para 5.34) as *"components of the landscape that are likely to be affected by the scheme"*. These can include overall character and key characteristics, individual elements or features and specific aesthetic or perceptual aspects (such as wildness or tranquillity).

16B.4.3 It is the interaction between the different components of the Proposed Development and these landscape receptors which has potential to result in landscape effects (both adverse and beneficial).

16B.4.4 The sensitivity of the landscape receptor is a combination of their susceptibility to change of the specific type of development being assessed combined with the value of the landscape.

Sensitivity to Change

16B.4.5 The susceptibility to change is a measure of the ability of a landscape to *"accommodate the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies"* (para 5.40, GLVIA3). The assessment of susceptibility must be tailored to the Proposed Development and considered as part of the assessment of the effects. Table 16B-1: Landscape Susceptibility to Change provides criteria level in relation to susceptibility.

Table 16B-1: Landscape Susceptibility to Change

CRITERIA LEVEL	SUSCEPTIBILITY TO CHANGE
High	The receptor has a low capacity to accommodate the Proposed Development without effects upon its overall integrity. The landscape is likely to have a strong pattern/ texture or is a simple but distinctive landscape and/or with high value features and essentially intact.

CRITERIA LEVEL	SUSCEPTIBILITY TO CHANGE
Medium	The receptor has some capacity to accommodate the Proposed Development without effects upon its overall integrity. The pattern of the landscape is mostly intact and/or with a degree of complexity and with features mostly in reasonable condition.
Low	The receptor is robust; it can accommodate the Proposed Development without effects upon its overall integrity. The landscape is likely to be simple, monotonous and/or degraded with common/ indistinct features and minimal variation in landscape pattern.

Landscape Value

16B.4.6 Establishing the landscape value of the Proposed Development Site and Study Area is necessary to determine the landscape sensitivity at both a Site and Study Area scale.

16B.4.7 The value of a landscape receptor reflects its importance in terms of any designations that may apply, or its importance in itself as a landscape or landscape resource, which may be due to its ecological, cultural or recreational value. The following factors are provided within the TGN 02/21: Assessing Landscape Value Outside National Designations and are complementary to the indicators and factors generally agreed to influence value described within GLVIA3 (GLVIA3 p.84, para 5.28):

- natural heritage (ecological, geological, geomorphological or physiographic interest);
- cultural heritage (archaeological, historical or cultural interest);
- landscape condition (physical state with regard to individual elements and landscape structure);
- associations (a landscape connected with notable people, events and the arts);
- distinctiveness (sense of identity);
- recreational value (recreational opportunities where experience of landscape is important);
- perceptual (valued for perceptual qualities such as wildness or tranquillity);
- functional (performs an identifiable and valuable function);
- conservation interests (presence of features of wildlife, earth science, archaeological, historical or cultural interest); and
- recreation value (valued for recreational activity).

16B.4.8 Judgements on landscape value for each receptor will be informed by the following criteria:

- high: nationally designated or iconic, unspoiled landscape with few, if any degrading elements;
- medium: regionally or locally designated landscape or an undesignated landscape with locally important features which may include some degrading elements; and
- low: undesignated landscape with few, if any, distinct features or several degrading elements.

16B.4.9 In combining susceptibility to change and value GLVIA3 indicates that combining susceptibility and value can be achieved in a number of ways and needs to include professional judgement. However, it is generally accepted that a combination of high susceptibility and high value is likely to result in the highest sensitivity, whereas a low susceptibility and low value is likely to resulting in the lowest level of sensitivity. A summary of the likely characteristics of the different levels of sensitivity is described in Table 16B-2: Landscape and Landscape Elements Sensitivity Criteria. It should be noted that these are indicative and in practice there is not a clear distinction between criteria levels.

Table 16B-2: Landscape and Landscape Elements Sensitivity Criteria

CRITERIA LEVEL	CHARACTERISTICS
High	• Areas of landscape character that are highly valued for their scenic quality (including most statutorily designated landscapes); and/or • elements/features that could be described as unique; or are nationally scarce; or • mature vegetation with provenance such as ancient woodland or mature parkland trees. Mature landscape features which are characteristic of and contribute to a sense of place and illustrate time-depth in a landscape and if replaceable, could not be replaced other than in the long term.
Medium	• Areas that have a positive landscape character but include some areas of alteration/degradation/or erosion of features; and/or • perceptual/aesthetic aspects has some vulnerability to unsympathetic development; and/or features/elements that are locally commonplace; unusual locally but in moderate/poor condition; or • mature vegetation that is in moderate/poor condition or readily replicated.

CRITERIA LEVEL	CHARACTERISTICS
Low	• Areas that are relatively bland or neutral in character with few/no notable features; and/or • a landscape that includes areas of alteration/degradation or erosion of features; and/or • landscape elements/features that are common-place or make little contribution to local distinctiveness.
Very Low	• Damaged or substantially modified landscapes with few characteristic features of value, capable of absorbing major change; and/or • landscape elements/features that might be considered to detract from landscape character such as obtrusive man-made artefacts (e.g. power lines, large scale developments, etc.).

Nature of Landscape Effects (Magnitude)

16B.4.10 The nature of the effect that is likely to occur, *i.e.* its magnitude, is determined by considering four separate factors, namely:

- size/scale;
- geographical extent;
- duration; and
- reversibility.

Size or Scale

16B.4.11 Judgements regarding the size or scale of the changes to the landscape need to be made for each potential effect. GLVIA3 (para 5.59) specifies that these judgements should take into account the following:

- the extent of existing landscape elements that will be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape – in some cases this may be quantified;
- the degree to which aesthetic or perceptual aspects of the landscape are altered either by removal of existing components of the landscape or by addition of new ones; and
- whether the effect changes the key characteristics of the landscape, which are critical to its distinctive character.

16B.4.12 The criteria should be presented in a verbal scale, which *'distinguishes the amount of change without being overly complex'* (GLVIA3 para 5.49).

16B.4.13 The size and scale of an effect is determined by considering the amount of change experienced by a receptor, based on the indicative criteria set out in Table 16B-3: Landscape Size/Scale Criteria.

Table 16B-3: Landscape Size/Scale Criteria

CRITERIA LEVEL	FEATURE/ELEMENT	AESTHETIC/ PERCEPTUAL ASPECT	KEY CHARACTERISTICS/ OVERALL CHARACTER
Large	Total or substantial loss or large-scale damage to landscape features resulting in the integrity of the landscape being compromised.	Change wholly or largely alters an aesthetic/perceptual aspect, such that it becomes difficult/ impossible to appreciate, when considered against the baseline.	Loss of or changes to the critical key characteristics of the landscape, resulting in a change to the overall landscape character.
Medium	Partial loss or medium scale damage to landscape features resulting in a partial change to the element/feature which may in some cases diminish its overall integrity.	Change is such that the development has an influence upon an aesthetic/perceptual aspect, but said aspect remains appreciable.	Partial loss or small changes to the key characteristics of the landscape but not resulting in an obvious change to the overall character of the area.
Small	Slight loss or small-scale damage to landscape features with its integrity remaining unchanged.	Change has little tangible effect upon an aesthetic/ perceptual aspect.	Minor changes to key characteristics which result in no or little change to the overall landscape character.

Geographical Extent

Table 16B-4: Geographical Extent Criteria

CRITERIA LEVEL	DESCRIPTION
Large	The effects may influence several landscape types/character areas.
Medium	The effects may influence the landscape type/character area within which the development is located.

CRITERIA LEVEL	DESCRIPTION
Small	The effects may influence the immediate setting of the site.
Negligible	The effects may influence the development site only.

Duration and Reversibility

16B.4.14 The duration of an effect and its reversibility are linked but separate consideration of the criteria for defining these are in Table 16B-5: Duration Criteria and Table 16B-6: Reversibility Criteria.

Table 16B-5: Duration Criteria

CRITERIA LEVEL	DESCRIPTION
Temporary	Less than 12 months
Short-term	0-5 years
Medium-term	5-10 years
Long-term	10+ years

16B.4.15 The reversibility of an effect relates to the prospects and practicality of an effect being able to be reversed and is determined based on the indicative criteria set out in Table 16B-6.

Table 16B-6: Reversibility Criteria

CRITERIA LEVEL	DESCRIPTION
Reversible	Change can be wholly or largely reversed. For example, the removal of a wind farm development following decommissioning.
Partially reversible	Change is partially reversible. For example, the restoration of a quarry to something similar to the baseline.
Irreversible	Change cannot realistically be reversed i.e. it is permanent.

16B.4.16 The factors above are considered in combination to provide an overall magnitude of change for each receptor, the magnitude of change for landscape receptors may be interpreted as per the indicative scales in Table 16B-7: Landscape Magnitude Criteria.

Table 16B-7: Landscape Magnitude Criteria

CRITERIA LEVEL	DESCRIPTION
High	Introduction of incongruous development which would result in noticeable change over an extensive

CRITERIA LEVEL	DESCRIPTION
	area, affecting many key characteristics and the experience of the landscape.
Medium	Introduction of uncharacteristic development which would result in noticeable change over a large area, or more intensive change over a limited area, affecting some key characteristics and the experience of the landscape.
Low	Introduction of development that is not uncharacteristic which would result in a small change over a limited area affecting few characteristics.
Very Low	Little perceptible change to the landscape characteristics.

Assessing the Significance of Landscape Effects

16B.4.17 The overall significance of landscape effects is a combination of the sensitivity of the landscape receptor and the magnitude of the effects. GLVIA3 (para 5.56) states that *"there is no definitive rule regarding what defines a significant effect, but in making the judgement it is reasonable to say that:*

- *Major loss or irreversible negative effects, over an extensive area, or element and/or aesthetic and perceptual aspect that are key to the character of nationally valued landscape are likely to be of the greatest significance; [and]*
- *Reversible negative effects of short duration, over a restricted area, on elements and/or aesthetic and perceptual aspects that contribute to but are not key characteristics of landscape value are likely to be the least significant and may depending upon the circumstance, be judged as not significant."*

16B.4.18 Plate 16B-1 presents a diagram that describes the relationship between sensitivity and magnitude of impacts on the landscape to determine the effect. GLVIA 3 dictates that this is not a prescriptive process and is provided as a guide to how combinations of sensitivity and magnitude are typically combined.

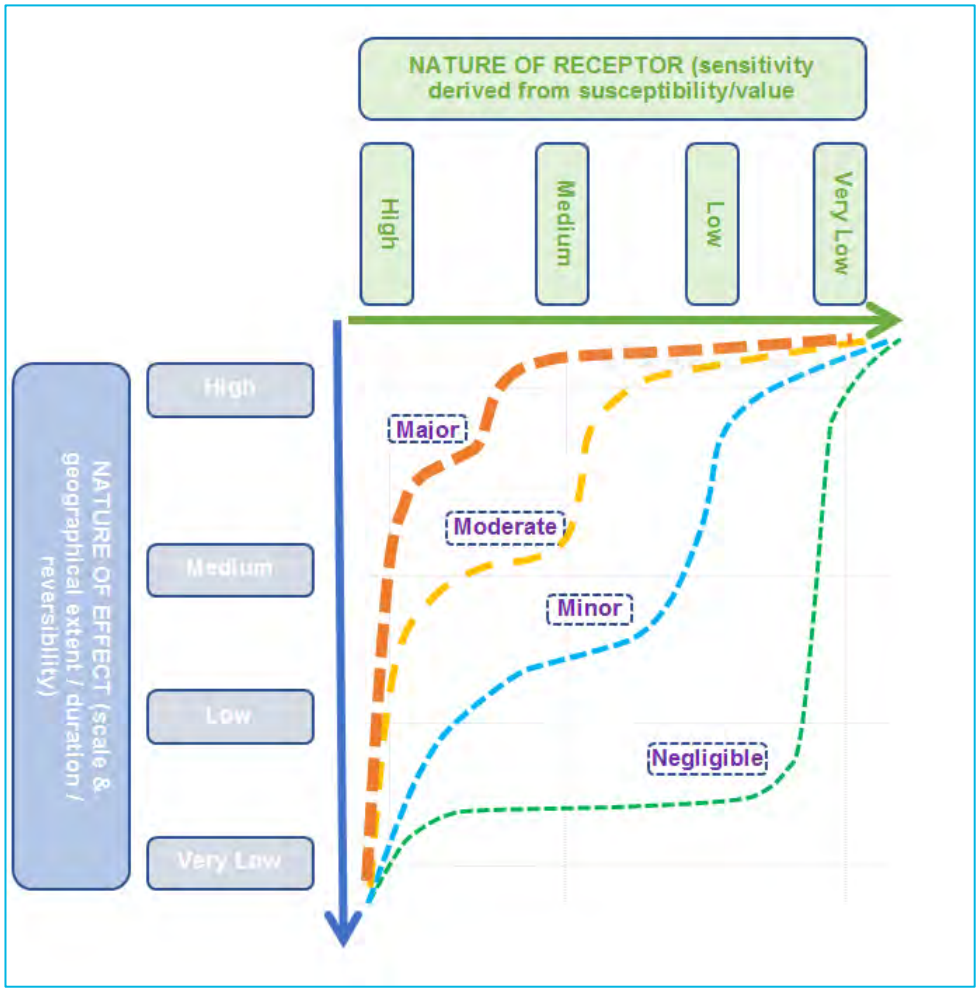

Plate 16B-1: Classification of Landscape Effects

16B.5 Visual Assessment Methodology

16B.5.1 *"An assessment of visual effects deals with the effects of change and development on the views available to people and their visual amenity"* (GLVIA3, para 6.1).

16B.5.2 In predicting the effects of the Proposed Development on the viewpoints being assessed, GLVIA3 states it is helpful to consider (but not restricted to) the following issues:

- nature of the view (full, partial or glimpsed);
- proportion of the proposed development visible;
- distance of the viewpoint from the proposed development and whether it would be the focus of the view or only a small element;
- whether the view is stationary, transient or sequential; and
- the nature of the changes to the view.

16B.5.3 Additionally, the seasonal effects of vegetation are to be considered, in particular the varying degree of screening and filtering of views.

Assessing the Significance of Effects

16B.5.4 The overall significance of visual effects is a combination of the sensitivity of the visual receptor and the magnitude of the visual effects. GLVIA3 clearly states that there is no definitive rule regarding what defines a significant effect, but in making the judgement the following points should be considered (para 6.44):

- effects on people who are particularly sensitive to changes of views and visual amenity are more likely to be significant;
- effects on people at recognised and important viewpoints or from recognised scenic routes are more likely to be significant; and
- large-scale changes which introduce new, non-characteristic or discordant or intrusive elements into the view are more likely to be significant than small changes or changes involving features already present within the view.

Sensitivity of Viewpoints

16B.5.5 The susceptibility of visual receptors to changes in the view and visual amenity is related to the activity they are engaged in and the extent to which their attention is focussed on the views and visual amenity at that location. As such, those receptors most sensitive to change are likely to include people engaged in outdoor activities where an appreciation of the landscape is the focus, or residents in areas where the landscape setting contributes to the setting of the properties.

16B.5.6 Conversely, those considered least sensitive to change include (but are not restricted to) people engaged in outdoor sports or recreation where there is no focus on the surrounding landscape/views, and people at their place of work where the focus is on the work activity.

16B.5.7 See Table 16B-8: Visual Susceptibility to Change Criteria for a full description of the criteria used to assess the susceptibility of viewpoints.

Table 16B-8: Visual Susceptibility to Change Criteria

CRITERIA LEVEL	SUSCEPTIBILITY TO CHANGE
High	• Residents at home; • People engaged in outdoor recreation, whose attention/interest is likely to be focused on the landscape or particular views, including strategic/ popular public rights of way; • Visitors to heritage assets or other attractions, where views of the surroundings are an important contributor to the experience; • Communities where views contribute to the landscape setting enjoyed by residents; and • Travellers on scenic routes.

CRITERIA LEVEL	SUSCEPTIBILITY TO CHANGE
Medium	• Travellers on road, rail, or other transport routes; • Users of local, and less used Public Rights of Way or where the attention is not focused on the landscape; and • Schools and other institutional buildings and their outdoor areas, play areas.
Low	• Introduction of development that is not uncharacteristic which would result in a small change over a limited area affecting few characteristics. Travellers on road, rail or other transport routes not focused on the landscape/particular views e.g. on motorways and "A" road or commuter routes; • People engaged in outdoor sport/recreation which does not involve/depend upon appreciation of views of the landscape; and • People at their place of work whose attention may be focused on their work/activity and not their surroundings.

Value of Views

16B.5.8 In making judgements about the value of each view, the assessment should take into account the following:

- recognition of the value to a particular view, e.g. in relation to heritage assets or planning designations; and
- indicators of the value attached to views by others, e.g., in guide books, tourist maps, literary references, painting etc.

16B.5.9 Table 16B-9: Value of View Criteria shows a full description of the criteria used to assess the value of the view.

Table 16B-9: Value of View Criteria

CRITERIA LEVEL	DESCRIPTION
High	• A recognised high-quality view, well- frequented and/or promoted as a beauty spot/visitor destination; • A view with cultural associations (recognised in art, literature or other media); and • A view which relates to the experience of other features, for example heritage assets.
Medium	• The view, whilst it may be valued locally, is not widely recognised for its quality or has low visitor numbers. The view has no strong cultural associations.

CRITERIA LEVEL	DESCRIPTION
Low	• A view with no recognised quality and/or is unlikely to be visited specifically to experience the views available.

16B.5.10 In combining susceptibility to change and value it is generally accepted that a combination of high susceptible and high value is likely to result in the highest sensitivity, whereas a low susceptibility and low value is likely to resulting in the lowest level of sensitivity. A summary of the likely characteristics of the different levels of sensitivity is described in Table 16B-10: Visual Sensitivity Criteria. It should be noted that these are indicative and in practice there is not a clear distinction between criteria levels.

Table 16B-10: Visual Sensitivity Criteria

CRITERIA LEVEL	DESCRIPTION
High	• A view that is well balanced, containing attractive features and notable for its scenic quality; and/or • A view which is an important part of the receptor's reason for being there; and/or • A view which is experienced by large numbers of people and/or is recognised for its qualities.
Medium	• An otherwise attractive view that includes some unattractive or discordant features, or visual detractors; and/or • A view which plays a small part in the receptors being there; and/or • A view that is recognised locally.
Low	• A view that is unattractive, discordant and/or contains many visual detractors; and/or • A view which is unlikely to be part of the receptor experience.

Nature of Visual Effects (Magnitude)

16B.5.11 The guidance provided in GLVIA3 (para 6.38) requires that each of the following variables need to be evaluated for each of the visual effects identified:

- size or scale of the change of view, including loss of or additional views, degree of contrast in terms of form, mass, scale, colour and texture etc;
- geographic extent in terms of angle of view, distance etc; and
- duration and reversibility in term of longevity of effects and whether reversible.

Size and Scale

16B.5.12 The size and scale of an effect is determined by considering the amount of change experienced by a receptor, based upon the indicative criteria set out in Table 16B-11: Visual Size/Scale Criteria.

Table 16B-11: Visual Size/Scale Criteria

CRITERIA LEVEL	DESCRIPTION
Large	• The proposed development may result in extensive changes to the existing view (including the loss of existing characteristic features and/ or introduction of new discordant landscape features); and/ or • A change to an extensive proportion of the view; and/ or • Views where the Proposed Development would become the dominant landscape feature or contract heavily with the current scene.
Medium	• Changes will result in changes to the view but not fundamentally change its characteristics; and/ or • Changes that would be immediately visible but not be the key features of the view.
Small	• Changes which would not result in a change to the composition of the view; and/ or • Changes that would only affect a small portion of the view or introduce new features that could be screened.

Geographical Extent

16B.5.13 The geographical extent of an effect is determined by the indicative criteria set out in Table 16B-12: Geographical Extent Criteria. It should be noted that whether a view is at short, medium, or long- range will vary depending upon the type of development proposed.

Table 16B-12: Geographical Extent Criteria

CRITERIA LEVEL	DESCRIPTION
Large	Changes where the proposed development is located: • in the main focus of the view; and/ or • at close range; and/or • over a large area.
Medium	Changes where the proposed development is located: • obliquely to the main focus of the view; and/ or • at medium range; and/ or • over a narrow area.

CRITERIA LEVEL	DESCRIPTION
Small	Changes where the proposed development is located: • on the periphery of the main focus of the view; and/ or • at long range; and/ or • over a small area.

Duration and Reversibility

16B.5.14 The duration of an effect and its reversibility are linked but separate consideration of the criteria for defining these are as in Table 16B-13: Duration Criteria and Table 16B-14: Reversibility Criteria.

Table 16B-13: Duration Criteria

CRITERIA LEVEL	DESCRIPTION
Temporary	Less than 12 months
Short-term	1-5 years
Medium-term	5-10 years
Long-term	10+ years

16B.5.15 The reversibility of an effect relates to the prospects and practicality of an effect being able to be reversed and is determined based on the indicative criteria set out in Table 16B-14: Reversibility Criteria.

Table 16B-14: Reversibility Criteria

CRITERIA LEVEL	DESCRIPTION
Reversible	Change can be wholly or largely reversed. For example, the removal of a wind farm development following decommissioning.
Partially reversible	Change is partially reversible. For example, the restoration of a quarry to something similar to the baseline.
Irreversible	Change cannot realistically be reversed, *i.e*. it is permanent.

16B.5.16 These four factors are then considered together to derive an overall magnitude of change for each receptor, which is determined by use of professional judgement, based on the indicative criteria set out in Table 16B-15: Visual Magnitude Criteria (indicative).

Table 16B-15: Visual Magnitude Criteria (indicative)

CRITERIA LEVEL	DESCRIPTION
High	• The development, or a part of it, would become the dominant and contrasting feature or focal point in the view; • Little or no scope for adequate mitigation.
Medium	• The development, or a part of it, would form a prominent feature or element of the view which is readily apparent to the receptor in the view; and • Partial mitigation is possible.
Low	• The development, or a part of it, would be noticeable but not alter the overall balance of features and elements that comprise the existing view; and • Partial or full mitigation is possible.
Very Low	• Only a very small part of the development would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view and/or occupy a negligible proportion of the view; and • Full mitigation is possible.

Beneficial or Adverse Change

16B.5.17 The magnitude also needs to be assessed as to whether it is a beneficial or adverse change. These are defined as follows:

- For beneficial change the Proposed Development, or part of it, would appear in keeping with existing landscape character and would make a positive visual and/or physical contribution to key characteristics. Removal of uncharacteristic features would also be a beneficial change; and
- For adverse change the Proposed Development, or part of it, would be perceived as an alien or intrusive component in the context of existing landscape character and would have a negative visual and/ or physical effect.

Assessing the Significance of Visual Effects

16B.5.18 The overall significance of visual effects is a combination of the sensitivity of the visual receptor and the magnitude of the effects. GLVIA3 (para 6.42) states that *"the significance of visual effects is not absolute and can only be defined in relation to each development and its specific location."*

16B.5.19 In paragraph 6.44 it also states that in making judgements about the significance of visual effects the following points should be noted:

- effects on people who are particularly sensitive to changes in the views and visual amenity are more likely to be significant;

- effects on people at recognised and important viewpoints or from recognised scenic routes are more likely to be significant; and
- large-scale changes which introduce new, non-characteristic or discordant features or intrusive elements into the view are more likely to be significant than small changes or changes involving features already present within the view.

16B.5.20 The relationship between the sensitivity of receptors and the magnitude of impacts allows the effects to be classified. Plate 16B-2: Classification of Visual Effects provides a diagram used to describe this relationship, and so allow a relative level of significance of any predicted effects on visual receptors to be categorised.

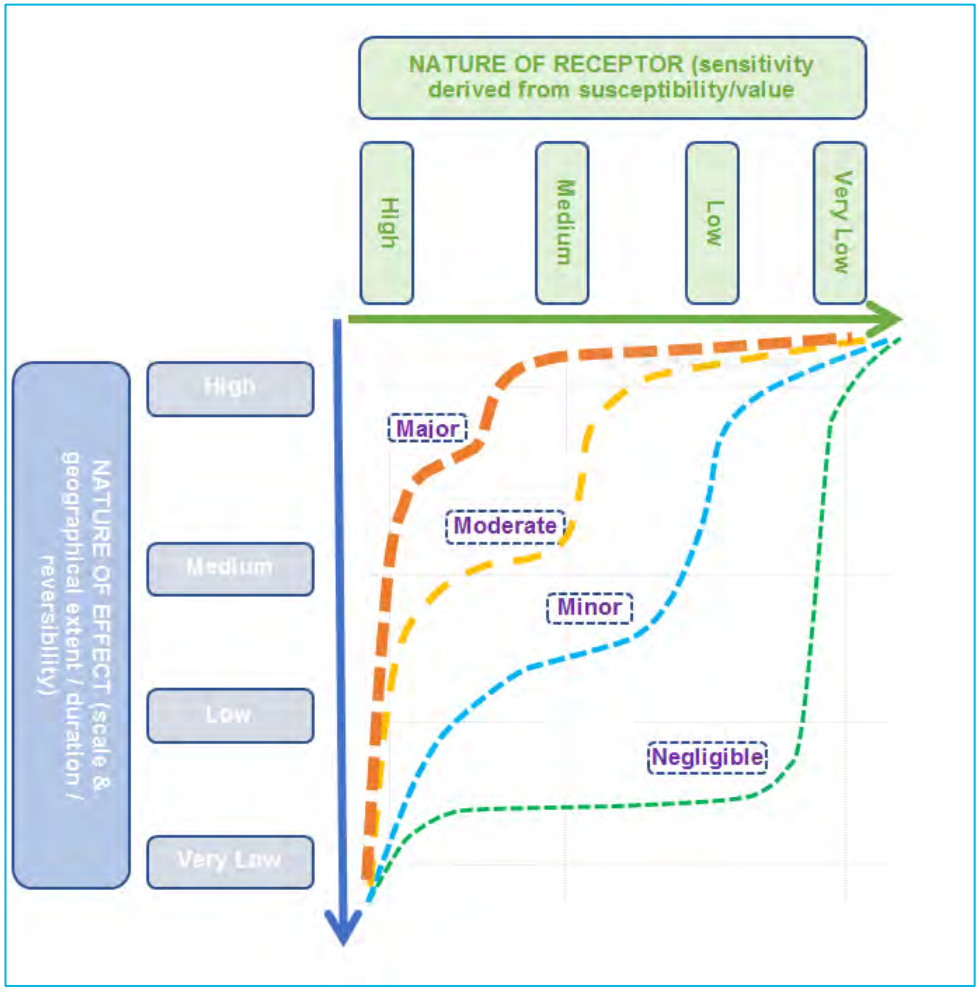

Plate 16B-2: Classification of Visual Effects

16B.5.21 The matrix is indicative of a continuum of effects which are assessed by professional judgement and justification, further clarification of the type of effects which are likely within each category can be found in Table 16B-16: Categories of Landscape and Visual levels of Effect.

Levels of Effect

16B.5.22 The objective of the assessment process is to identify and evaluate potential significant effects arising from the Proposed Development. The assessment identifies the residual effects likely to arise from the design taking into account mitigation measures and change over time. The level of effect is assessed by considering the sensitivity of the receptor and the predicted magnitude of effect in relation to the baseline conditions.

16B.5.23 To provide a level of consistency and transparency to the assessment and allow comparisons to be made between the various landscape and visual receptors subject to assessment, the assessment of beneficial and adverse effects is based on pre-defined criteria as outlined in Table 16B-16: Categories of Landscape and Visual levels of Effect. When assessing the degree of individual effects, these may fall across several different categories and professional judgement is therefore used to determine which level best fits the overall effect on a landscape or visual receptor.

Table 16B-16: Categories of Landscape and Visual levels of Effect

LEVEL OF EFFECT	DESCRIPTION OF LANDSCAPE EFFECT	DESCRIPTION OF VISUAL EFFECT
Major	Considerable change over an extensive area of a highly sensitive landscape, fundamentally affecting the key characteristics and the overall impression of its character.	The development would become a prominent feature and would result in a very noticeable change to an existing highly sensitive and well composed view.
Moderate	Small or noticeable change to a highly sensitive landscape or more intensive change to a landscape of medium or low sensitivity, affecting some key characteristics and the overall impression of its character.	The development would introduce some enhancing or detracting features to an existing highly sensitive and well composed view or would be prominent within a less well composed and less sensitive view, resulting in a noticeable improvement or deterioration of the existing view.
Minor	Small change to a limited area of landscape of high or medium sensitivity or a more widespread area of a less sensitive landscape, affecting few characteristics without altering the overall impression of its character.	Where the proposed development would form a perceptible but not enhancing or detracting feature within a view of high or medium sensitivity or would be a more prominent feature within a poorly composed view of low sensitivity, resulting in a small improvement or deterioration of the existing view.

LEVEL OF EFFECT	DESCRIPTION OF LANDSCAPE EFFECT	DESCRIPTION OF VISUAL EFFECT
Negligible	No discernible improvement or deterioration to the existing landscape character.	No discernible improvement or deterioration in the existing view.
No Effect	The development would not affect the landscape receptor.	The development would not affect the view.

16B.6 References

- Landscape Institute (2019*) Technical Guidance Note (TGN): Visual Representation of Development Proposals* [online]. Available at TGN-06-19-Visual_Representation (windows.net). Landscape Institute (2020) TGN 04/20: Infrastructure LI-Infrastructure-TGN-FINAL-200924.pdf (windows.net).
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H2Teesside Project

Preliminary Environmental Information Report

Volume III – Appendices

Appendix 16C: Potential Viewpoints

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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16C.0 POTENTIAL VIEWPOINTS 3

TABLES

Table 16C-1: Potential Viewpoints 3

16C.0 POTENTIAL VIEWPOINTS

16C.1.1 The viewpoints included in Table 16C-1 were identified as potential viewpoints to be taken forward for consideration in the landscape and visual impact assessment for the Proposed Development, as identified by letters. Those viewpoints that have subsequently been selected for assessment are identified by the numbers 1 to 14 in Table 16C-1 and illustrated on Figure 16-3: Zone of Theoretical Visibility and Potential Viewpoint Locations (PEI Report, Volume II).

Table 16C-1: Potential Viewpoints

POTENTIAL VIEWPOINT ID	REPRESENTATIVE VIEWPOINT NUMBER	NAME AND LOCATION	RECEPTOR TYPE	GRID REFERENCE	DESCRIPTION
A	1	Albion Terrace, Hartlepool	Residential and Public Right of Way (PRoW) users	452933, 533502	Long distance panoramic view across the North Sea.
B	2	The Cliff, Seaton Carew	Residential and PRoW users	452473, 530118	View from within Seaton Carew Conservation Area along the long-distance England Cost Path.
C	3	Teesmouth National Nature Reserve, England Coast Path	Recreational	452488, 527854	View from the England Coast Path, off Tees Road.
D	4	North Gare Sands	Recreational	453752, 527277	View across North Gare Sands across the Tees Mouth towards the former steelworks site.
E	5	South Gare Breakwater	Recreational	455638, 527828	View across the estuary and North Sea from the South Gare Breakwater.

POTENTIAL VIEWPOINT ID	REPRESENTATIVE VIEWPOINT NUMBER	NAME AND LOCATION	RECEPTOR TYPE	GRID REFERENCE	DESCRIPTION
F	6	Cowpen Bewley Country Park	Recreational	448591, 525700	View from viewpoint within Cowpen Bewley Country Park.
G	7	England Coast Path, Warrenby	Recreational	458610, 525421	View from the England Coast Path adjacent to the edge of Redcar Beach Caravan Park.
H	8	Redcar seafront	Recreational and residential	459886, 525465	Elevated view along the waterfront at Redcar, adjacent to the bandstand on Newcomen Terrace.
I	9	Coatham Marsh Nature Reserve	Recreational	459168, 524686	View from within Coatham Marsh, off Kirkleatham Lane.
J	10	Eston Nab	Recreational	456899, 518348	Elevated view from Eston Nab across Teesside.
K	11	Longbeck Lane	Residential and road users	461856, 521012	Long distance view from Longbeck Lane.
L	12	Carpark off A1085 Coast Road, Marske by the Sea	Recreational	463156, 523188	Elevated view from the carpark off A1085 Coast Road.
M	Discounted	Birchington Avenue, Eston, Lackenby	Residential	455521, 520005	View from the edge of residential area. Views restricted by intervening vegetation and built form.
N	Discounted	Cresswell Road, Grangetown	Residential	455360, 520847	View from the edge of residential area. Views restricted by intervening vegetation and built form.

POTENTIAL VIEWPOINT ID	REPRESENTATIVE VIEWPOINT NUMBER	NAME AND LOCATION	RECEPTOR TYPE	GRID REFERENCE	DESCRIPTION
O	Discounted	Priestman Road, Middlehaven	Road users and recreational	450534, 520731	View to the north along the River Tees. Views restricted by buildings and industry along the course of the river.
P	13	Saltholme Wildlife Reserve and Discovery Park	Recreational	449838, 523250	Elevated view from viewpoint within RSPB Saltholme.
Q	14	Saltholme Wildlife Reserve and Discovery Park	Recreational	450382, 522831	Long view from within RSPB Salthome.

H2Teesside Project

Preliminary Environmental Information Report

Volume III – Appendices

Appendix 17A: Cultural Heritage Desk-based Assessment

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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17A.0 CULTURAL HERITAGE

17A.1 Introduction

17A.1.1 This document presents a desk-based assessment (DBA) which sets out the cultural heritage baseline conditions of the Proposed Development Site and associated Study Area. It is included as an Appendix to Chapter 17: Cultural Heritage of the Preliminary Environmental Information (PEI) Report (PEI Report, Volume I).

17A.1.2 This DBA identifies all known designated and non-designated heritage assets within a defined Study Area surrounding the Proposed Development Site to assess its archaeological potential and to identify key heritage considerations. It places the Proposed Development Site within its wider heritage context to inform the assessment of significance of cultural heritage assets. Cultural heritage in this context means the above and below-ground archaeology, built heritage, the historic landscape and any other elements which may contribute to the historic and cultural heritage of the area.

17A.1.3 This DBA is supported by the following figures which are presented in PEI Report (Volume II):

- Figure 17-1: Location of designated cultural heritage assets;
- Figure 17-2: Location of non-designated cultural heritage assets;
- Figure 17-3: Location of cultural heritage events; and
- Figure 17-4: Historic Landscape Character.

17A.2 Site and Proposed Development Description

17A.2.1 The Proposed Development and its components are described in Chapter 4: Proposed Development (PEI Report, Volume I).

17A.2.2 The Proposed Development Site and it surrounds are described in Chapter 3: Description of the Existing Environment (PEI Report, Volume III).

17A.3 Structure of this DBA

17A.3.1 This DBA is structured into the following sections:

- Section 17.4 makes reference to relevant legislation, planning policy and assessment guidance;
- Section 17.5 presents the assessment methodology for the DBA;
- Section 17.6 presents the cultural heritage baseline for the Proposed Development Site and Study Area, including a summary of fieldwork surveys carried out;
- Section 17.7 presents a summary of modern disturbance based on a review of geotechnical data;
- Section 17.8 presents notes and photographs from the site walkover survey;

- Section 17.9 presents an assessment of the archaeological potential within the Proposed Development Site; and
- Section 17.10 sets out the next steps and actions that are required to complete the Environmental Statement (ES).

17A.4 Legislation, Planning Policy, and Guidance

17A.4.1 Legislation, policy and guidance of relevance to the cultural heritage assessment is reported in Chapter 17: Cultural Heritage (PEI Report, Volume I).

17A.5 Assessment Methodology

Study Area

17A.5.1 The Study Area has been designed to capture the historic environment baseline data correlating to the predicted impacts from the Proposed Development.

17A.5.2 The Study Area for capturing data relating to non-designated heritage assets (archaeological sites, findspots, locally listed buildings) comprises 1 km from the Proposed Development Site. This Study Area is assessed as proportionate and relevant for identifying cultural heritage assets that may be physically impacted by the Proposed Development, included buried assets outside of the Proposed Development Site that may extend into it. In addition, the Study Area provides relevant information relating to previous archaeological sites and studies that, collectively, provide a contextual baseline for the Proposed Development Site in line with the guidance set out in Chartered Institute for Archaeologists (CIfA) guidance (CIfA, 2020).

17A.5.3 The Study Area for capturing data relating to designated heritage assets (World Heritage Sites, scheduled monuments, listed buildings, conservation areas, registered parks and gardens, registered battlefields) extends to 5 km from the Proposed Development Site. The extent of this Study Area has been informed by an understanding of the area's topography and the nature of the Proposed Development. It is assessed to be appropriate for identifying assets whose setting may change because of the construction, operational, or decommissioning activities of the Proposed Development. This larger Study Area has been further informed by the preliminary Zone of Theoretical Visibility (ZTV) shown on Figure 16-5: Zone of Theoretical Visibility and Representative Viewpoint Locations (PEI Report, Volume II) and from the results of a site visit which are presented in Section 17.8 of this DBA.

Baseline Data Sources

17A.5.4 The following data sources have been reviewed as part of the preparation of the DBA:

- Tees Archaeology Historic Environment Record (HER) for information relating to non-designated heritage assets and fieldwork events http://www.teesarchaeology.com/projects/HER [data received 8 February 2023];
- Redcar and Cleveland HER for information relating to non-designated heritage assets and fieldwork events Historic environment and heritage management | Redcar and Cleveland (redcar-cleveland.gov.uk) [data received 13 January 2023];

- National Heritage List for England (NHLE) for designated heritage assets datasets available from https://historicengland.org.uk/listing/the-list/data-downloads/ [accessed 10 February 2023];
- Existing heritage assessment reports undertaken for other development proposals, including those to support Net Zero Teesside DCO;
- Defence of Britain Database archive available from https://archaeologydataservice.ac.uk/archives/view/dob/download.cfm [accessed 7 February 2023];
- Ordnance Survey historic mapping data from the National Library of Scotland https://www.nls.uk/ and tithe maps from The Genealogist https://www.thegenealogist.co.uk/tithe/;
- National Collection of Aerial Photographs for aerial photographs https://ncap.org.uk/;
- Cambridge Air Photos, University of Cambridge https://www.cambridgeairphotos.com/areas/redcar+and+cleveland/page3.html;
- the results of previous geotechnical site investigations, as referenced in the Groundsure Report presented in Appendix 10A: Geology, Hydrogeology and Land Contamination Desk Based Summary Report (PEI Report, Volume III);
- local authority data including conservation area appraisals and buildings on the local list from Redcar and Cleveland, Hartlepool, Stockton-on-Tees and Middlesbrough Borough Councils' websites; and
- online sources, including British Geological Survey (BGS) for geological data (BGS Maps Portal, available from: https://webapps.bgs.ac.uk/data/MapsPortal/).

Site walkover

17A.5.5 A site walkover and visual assessment of heritage assets within some parts of the Proposed Development Site and Study Area was undertaken in April 2023. The results of the walkover, including photographs and observations relating to the setting and character of heritage assets, is set out in Section 17.8 of this DBA.

17A.5.6 The aims of the site walkover were to:

- identify known and previously unknown heritage assets within the Site and Study Area, including non-designated buildings of heritage interest not recorded on the HER;
- identify and describe the experience and setting of heritage assets within the Site and Study Area;
- gain an understanding of the importance of long-range views for some heritage assets and an appreciation of how views change as the viewer moves through the landscape; and
- identify the location and extent of modern ground disturbance and previous construction impacts.

Assessing Heritage Significance in the DBA

17A.5.7 Historic England has published a series of Good Practice Advice (GPA) of which those of most relevance to this appraisal are GPA2 *Managing Significance in Decision-taking,* GPA3 *The Setting of Heritage Assets* (Second Edition) and *Advice Note 12: Statements of Heritage Significance*.

17A.5.8 GPA2 emphasises the importance of having a knowledge and understanding of the significance of heritage assets likely to be affected by the development and that the "*first step for all applicants is to understand the significance of any affected heritage asset and, if relevant the contribution of its setting to its significance*" (paragraph 4). Early knowledge of this information is also useful to a local planning authority in pre-application engagement with an applicant and ultimately in decision making (paragraph 7).

17A.5.9 GPA3 provides detail on the setting of heritage assets and provides general advice on understanding setting, and how it may contribute to the significance of heritage assets and allow that significance to be appreciated. The document also provides advice on how views contribute to setting. Paragraph 8 of the advice note confirms that the extent of the setting, as defined in the National Planning Policy Framework (NPPF), is not fixed and may change as the asset and its surroundings evolve. Paragraph 9 states that although the setting is not itself a heritage asset, nor a heritage designation, land comprising a setting may itself be designated.

17A.5.10 GPA3 also provides a broad approach to assessing the impact of a proposed development on the setting of heritage assets, and outlines a series of steps that can be applied proportionately to the complexity of the case:

- Step 1 is to identify the heritage assets and their settings which have the potential to be impacted;
- Step 2 comprises assessing the degree to which these settings make a contribution to the significance of the heritage assets, or allow significance to be appreciated;
- Step 3 is to assess the effects of a proposed development on that significance or allow significance to be appreciated;
- Step 4 comprises exploring ways to maximise enhancement and avoid or minimise harm; and
- Step 5 should be making and documenting the decision and monitoring the outcomes.

17A.5.11 Advice Note 12 outlines a recommended approach to assessing the significance of heritage assets in line with the requirements of NPPF. It includes a suggested reporting structure for a 'Statement of Heritage Significance', as well as guidance on creating a statement that is proportionate to the asset's significance (its heritage value) and the potential degree of impact of a proposed development.

17A.5.12 The Advice Note also offers an interpretation of the various forms of heritage interest that an asset can possess, based on the terms provided in the NPPF Glossary (Annex 2: Glossary) as follows:

- Archaeological Interest – there will be archaeological interest in a heritage asset if it holds, or has the potential to hold, evidence of past human activity worthy of expert investigation at some point;
- Architectural and Artistic Interest – these are interests in the design or general aesthetics of a place. They can arise from conscious design or fortuitously from the way the heritage asset has evolved. More specifically, architectural interest is an interest in the art or science of the design, construction, craftsmanship and decoration of buildings and structures of all types. Artistic interest is an interest in other human creative stills, such as sculpture; and
- Historic Interest – an interest in past lives and events (including pre-historic). Heritage assets can illustrate or be associated with them. Heritage assets with historic interest not only provide a material record of our nation's history but can also provide meaning for communities derived from their collective experience of a place and can symbolise wider values such as faith and cultural identity.

17A.5.13 The significance of potential heritage assets is also based on regional research resource assessments and research frameworks as well as thematic and period-specific publications.

Assessing Archaeological Potential

17A.5.14 The potential for an area of the Proposed Development Site to contain previously undiscovered archaeological remains is rated in this DBA as high, medium, low or negligible. This rating is based on an understanding of the archaeological resource and the number and proximity of known and predicted archaeological/historical sites and find spots within the Proposed Development Site and Study Area. Further considerations include the Proposed Development Site's historical and current land-use, the prevailing topography, geology, the results of archaeological evaluation, professional opinion and the results of stakeholder consultation and engagement. The archaeological potential of the Proposed Development Site is set out in Section 17.9 of this DBA.

Limitations

17A.5.15 Site access for the site visits was not granted for all areas of the Proposed Development Site and Study Area. Areas not accessed at the time of writing and to inform this preliminary iteration of the DBA include:

- The Main Site;
- The former Redcar Bulk Terminal to the west of the Main Site;
- Area around Coatham Dunes, to the north of the Main Site;
- Area to the south-west of Tod Point Road; and
- Fields to the north of Cowpen Bewley village.

17A.5.16 The lack of site access means that the assessment of archaeological potential in these areas is limited to desk-based sources only and the presence or absence of previously unrecorded features of heritage interest in these areas cannot be confirmed in this assessment. This will be updated where possible as the assessment progresses to the ES stage.

17A.6 Baseline Conditions

Summary of heritage assets

17A.6.1 There are 588 heritage assets recorded on the combined HERs, comprising extant buildings and features of heritage interest, sites of former structures, historic landscape features and sites of find spots where the asset has been removed from its location. Further features, not recorded on the HERs, have been identified from historic map evidence and from other data sources, including the Defence of Britain archived database. These features, where relevant to the context of the Proposed Development Site, are referenced in the archaeological and historical background section of this DBA and identified (where applicable) by their record identification number.

17A.6.2 In addition, there are 26 scheduled monuments, 532 listed buildings, 22 conservation areas, and two parks and gardens within the Study Area for designated assets. The majority of these assets are included in the gazetteer (to be submitted with the ES) to demonstrate the spatial extent of data capture for the assessment. However, the majority have been scoped out of the PEI Report as their distance from the Proposed Development Site would preclude any potential change to their setting that would affect their heritage value. As such, assets are only included in this DBA where they provide historical context, are relevant for establishing the archaeological potential of the Proposed Development Site, or where there is potential for them to experience change as a result of the Proposed Development.

17A.6.3 The following sets out the cultural heritage baseline conditions for the Proposed Development Site and Study Area. Some non-designated and designated heritage assets are described in Section 17.8 Site Walkover of this DBA so that the asset can be described and understood in the context of its current setting.

Geology and Topography

17A.6.4 According to the British Geological Survey (BGS) Geology of Britain Viewer (British Geological Survey, 2023) the superficial deposits which underly much of the Proposed Development Site are tidal flat deposits comprising estuarine alluvium. Areas of Devensian Glaciolacustrine Deposits (clay and silts) lie to the west of the Proposed Development Site, whilst Devensian Glacial Till is present to the north west. Areas of Blown Sand are recorded around the mouth of the River Tees and in the northern part of the Proposed Development Site (Main Site).

17A.6.5 The underling bedrock geology beneath much of the Proposed Development Site is Mercia Mudstone Group, with areas of Sherwood Sandstone Group lying to the north and Redcar Mudstone Formation in the area of the Main Site.

17A.6.6 Soils across much of the Proposed Development Site are described on Cranfield Soil and Agrifood Institute's Soilscapes mapping (Cranfield Soil and Agrifood Institute, 2023) as "*loamy and clayey soils of coastal flats with naturally high groundwater*". Sand dune soils line the northern area of the Proposed Development Site (along the mouth of the River Tees). Beyond the Tees valley to the north west and south east the soil becomes *"slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soil"* interspersed with small areas of *"slightly acid loamy and clayey soils with impeded drainage".*

17A.6.7 The topography of the Proposed Development Site comprises a low-lying estuarine landscape. This consists of extensive stretches of intertidal habitats containing mudflats, salt marsh, coastal dunes and wetland adjacent to the estuary.

17A.6.8 The surrounding land-use is dominated by the large heavy industrial areas which line the River Tees on both sides, with the major towns of Middlesborough and Stockton-on-Tees to the south and south-west, Lazenby to the south-east and Redcar to the east. Hartlepool sits to the north. This industrial land-use is mixed with interspersed pockets of flat open farmland, woodland and natural coastal and wetland habitats including North Gare Beach, Teesmouth National Nature Reserve and RSPB Saltholme.

17A.6.9 Whilst there are local undulations, the Proposed Development Site's location within the Tees valley means that is it typically low lying at between 1 m – 5 m above Ordnance Datum (aOD), reaching *c.*10 m AOD at its eastern and western extremities on the slightly higher valley contours.

Previous Archaeological Investigations in the 1 km Study Area and Site

17A.6.10 Previous archaeological work within the 1 km Study Area of the Proposed Development Site (Figure 17-3 PEI Report, Volume II) comprises 99 events, which includes archaeological monitoring, borehole and geoarchaeological survey, geophysical survey, fieldwalking, earthwork surveys, archaeological trial trench evaluations and archaeological excavations. This work has demonstrated a landscape with a varied and rich archaeological resource. Medieval activity dominates the archaeological record although evidence for earlier activity is also present. Early prehistoric find sites are not common, but later prehistoric activity, as well as centres of Iron Age and Roman activity, have been recorded.

17A.6.11 The following investigations have occurred within the Proposed Development Site and are identified by their HER reference number:

- SMR1220 – a watching brief carried out in 1992 noted peat deposits that contained large pieces of wood.
- SMR667 – fieldwalking in 1995 recorded a number of possible archaeological anomalies, unfortunately the location of these was not well recorded and their precise location and nature is uncertain.
- SMR883 and SMR1007 – in 2012 a watching brief (SMR883) uncovered a number of possible archaeological feature indicative of Iron Age/Roman presence and possible settlement. This led to a programme of archaeological excavation

(SMR1007) later that same year, which revealed a significant Late Iron Age – Roman settlement site, which included a mound burial.

- SMR872 – a borehole survey was conducted in 2012 towards the centre of the Main Site, which demonstrated made ground to a depth of 5 m-8 m.
- SMR1456 – a watching brief in 2017 recorded the presence of a known World War II (WWII) spigot and mortar emplacement.
- SMR1470, 1468, 1498 and 1497 – a programme of archaeological works conducted in 2019 a geophysical survey (SMR1470) and subsequent watching brief (SMR1498) and trial trench evaluation (SMR1468) and a following archaeological excavation (SMR1497). These works uncovered a major Roman settlement. As well as the usual agricultural and domestic features (pits, postholes, field boundaries etc) two cist burials and 3 corn dryer flues were noted. Substantial amounts of Roman pottery as well as other finds (animal bone, coins, jewellery etc) were made.
- SMR1555 – a watching brief conducted in 2020 found a small quantity of Roman pottery.
- SMR1515 – a trial trench evaluation undertaken in 2020 (near to SMR1555) found no archaeological features or finds.
- Not recorded on the HER – Teesworks Industrial Zone, Historic Building Recording focussing on structures associated with the Redcar Blast Furnace.

Archaeological and Historical Background

Palaeolithic (*c.* 700,000 – 11,600 BC)

17A.6.12 There is little evidence for the Palaeolithic period in general across much of northern England, possibly due to the damaging effects of the Devensian glaciation (Roskams and Whyam 2005). Cave sites such as Kirkdale cave and Victoria cave offer some insights, as do open sites such as Biselsbeck farm and Hotham – these sites appearing to be niches of surviving pre-Devensian activity (Roskams and Whyam, 2005).

17A.6.13 At around 27000 – 21000 BP (towards the end of the Palaeolithic period). The Proposed Development Site would have sat under the North Sea Ice sheet, and as the ice receded silts were deposited creating peaty woodland and wetlands, particularly in low lying areas (Straw 2016). These peaty marshlands, particularly those in estuarine locations, offered valuable resources to prehistoric groups which would have used these areas for hunting and fishing.

17A.6.14 Palaeolithic activity tends to be represented in the archaeological record by finds of flint tools associated with hunting and fishing and/or the waste flint associated with the production of such, either as individual pieces or larger scatters of material. Recent land reclamation activities within the Study Area may well have destroyed much of the archaeological evidence of this period. However, it is possible that deeply buried deposits do survive, particularly in wet-land zones, and have the potential to contain information about this period.

17A.6.15 Within the study there is a single Palaeolithic find spots (SMR6212), located at South Gare, *c.*850 m north of the Proposed Development Site. The find is a single bifacially worked flint tool, which may have been washed out of deeper deposits onto the beach.

Mesolithic (*c.* 11,600 – 4,300 BC)

17A.6.16 The natural environment changed dramatically during the Mesolithic period as temperatures rose and forest cover spread (typically mixed deciduous forest), however this did not occur uniformly, and some regions experienced retarded vegetation development (Allen and Gardiner 2009). The first areas occupied were often these areas where vegetation had not flourished, or where deliberate clearance had taken place. This is represented in the toolkits of the Mesolithic period, which contain specialist wood working/tree felling equipment (transversely sharpened axes and adzes) and items suited to more mobile lifestyles. As with the Palaeolithic period it is these flint tools which typically provide evidence of this period.

17A.6.17 At the start of this period what is now the North Sea was an area of dry land (known as Doggerland) which extended as far north as Shetland and, in places, connected the British Isles with continental Europe. As the climate warmed and the ice melted, sea levels rose and by *c.*6000 BC the coastline was only a little to the east of its modern location (Shennan *et al*, 2000). This flooding had a dramatic effect on the vegetation of the region, with the mature mixed deciduous forest that had once stretched out onto the North Sea plain being replaced by wetlands and a coastal landscape, evidence of which exists as a submerged forest along the coast near Hartlepool (Batchelor and Green 2012). It is also possible that deforestation of upland areas at least partially contributed to the formation of these coastal wetlands Straw 2016, Carter 2014). The Tees Estuary therefore underwent a change from woodland to saltwater marshland (evidenced in intertidal peat beds, (Batchelor and Green 2012, Carter 2014)) and the area would have been a focal point for hunting and fishing activities (Daniels 2014).

17A.6.18 A variety of assets that could date to this period are located within the Study Area. During excavations for a quay wall in 1949 a number of objects were pulled out of deep deposits (recorded in the HER as being approximately 10 m below ground). These consisted of a human skull, 'Coatham Man' (SMR612), an assemblage of Red Deer bones (SMR5380) and a tool handle made from antler (SMR5379). These have been given a Mesolithic – Neolithic date range. The finds were made on the west bank of the River Tees, *c.*310 m to the east of the Main Site.

Neolithic (*c.* 4,300 – 2,200 BC)

17A.6.19 The Neolithic period marks the adoption of agriculture associated with more widespread tree clearance and associated changes in flint tools. During this period, people adopted a more settled lifestyle, one which is more visible in the archaeological record. Pottery appears and it is also when the first monuments are constructed, such as long cairns, chambered cairns and round cairns (Masters 1984) as well as large, enclosed ceremonial spaces (Oswald *in prep* as detailed in Frodsham 2019). The construction of these impressive monuments represents a major

investment of resources and a significant landscape event. During this period the climate continues to warm and sea level continued to rise, albeit at a now significantly slower rate. This appears to have caused coastal areas to be re-submerged by the rising tide, and by *c.* 2000 BC the coastline lay somewhat inland of its current position (Wugham *et al* 2005). In terms of the vegetation of the region, the continued sea-level rise led to further water-logging and submersion of the coastal woodland on sites that had previously been too elevated to be affected by this during the Mesolithic period.

17A.6.20 Within the wider region, Neolithic settlement appears to be focused on the upland area of Milfield and the six key settlement sites located here at Thirlings, Coupland, Yeavering, Cheviot Quarry North, Cheviot Quarry South and Lanton Quarry (Frodsham 2019). There are few burial or other monuments in the immediate region of the Proposed Development Site with most being geographically related to the above settlement sites. A long cairn is known at Loftus (c.13 km to the south east of the Proposed Development Site) which is of a complex type almost unknown in the region (Vyner 1984). Near to this location there is also evidence for Neolithic salt working – brine storage pits, salterns and hearths, found alongside the remains of stone tools and ceramic vessels (Sherlock 2021). A large rectangular enclosure (with sides more than 100 m long) is known at Easington Lane *c.*23 km to the north-west (Hale 2008). In addition, polished stone axes (typical of this period and often a sign of prestige or used as a trade item, rather than an actual tool) have been found in Yarm and Preston.

17A.6.21 There are seven finds within the Study Area which date to this period. None of these finds sit within the Proposed Development Site. The finds include three find spots of stone axes (SMR1002, 1066 and 2848) and it is notable that SMR1002 and SMR1066 were found a few hundred metres apart on the western edge of the Study Area.

17A.6.22 Other finds include SMR1689 a thumbnail scraper, SMR3477 a stone arrowhead, SMR6263 a flint core fragment and SMR6798 the fragment of a human skull bone found by a dog walker on Cotham Sands, and radiocarbon dated to this period. As noted, it is also possible that the skull, deer bones and antler handed mentioned above (SMR612, 5380 and 5379) may also date to this period.

Bronze Age (*c* 2,200 – 750 BC)

17A.6.23 Centralised, permanent, settlement and associated agricultural practices intensify during this period with more and more land being cleared. The environment, generally, takes on a much more open aspect and field systems begin to emerge, although the regular occurrence of deer bones and antler in the archaeological record suggest that there are still significant areas of woodland. There is, generally, a picture of the widespread accumulation of colluvial material in the archaeological record at this time, presumably derived from increased agricultural activity.

17A.6.24 Material culture reflects these changes; new pottery forms emerge (Renfrew and Cherry 1986) and metal tools also emerge for the first time, although flint tools are still commonly used, albeit with changed forms (Humphrey 2003; 2007). Ritual activity also changes, the long cairns or barrows, more typical of the Neolithic period,

slowly being replaced with round barrows, these also being more common than their predecessors and seemingly having a territorial, as well as funereal, function (Roskams and Whyman 2005).

17A.6.25 During this period the coastline remains relatively static, although there are minor eastwards and westwards movements and much of the area inland of the coast would have been dominated by coastal wetland saltmarsh.

17A.6.26 Within the wider region, the most prominent area of archaeological activity appears to be at Eston Hills, approximately 2.5 km south of the Main Site. The hills contain major Bronze Age activity including numerous designated assets. The activity includes at least 39 burial mounds, 13 cairns (Vyner 1991) and over 29 examples of rock art (Brown and Chappell 2005). It is also the location of the only surviving hillfort in Cleveland, Eston Nab (NHLE1011273); a Late Bronze Age palisaded settlement and beacon which appear to overlie an earlier Bronze Age settlement. It has been subject to only minimal archaeological work and is believed to be very well preserved and thus has extremely high potential to contribute to our understanding of Bronze Age society in the region (Vyner 1989). The hillfort is a rare regional example of a settlement site from this period and the only surviving hillfort in the region. The fort occupies a prominent position on the edge of an escarpment overlooking the Tees valley, the coastline, and the North Sea beyond. Its position on the escarpment contributes to the fort's visual prominence, and a feature that can be seen from within the valley floor.

17A.6.27 In the more low-lying areas, SMR8604 comprising a small Bronze Age round barrow, is located north-west of the Hydrogen Pipeline Corridor. It was during archaeological monitoring in 2012 (Event SMR1007) and may have a level of association with a later Iron Age/Roman settlement site (SMR8603).

17A.6.28 Within the Study Area, a further three assets of this period are recorded. SMR3404 (a complete saddle quern stone), SMR4870 (the skeletal remains of horse, cattle and sheep, which show evidence of being butchered) and SMR1309 a shell midden (noted in a drainage cut) which also contained five flint tools and a clay bead. SMR3404 and 4870 lie *c.* 300 m south of the Main Site, whilst SMR1309 lies just to the west of the Hydrogen Pipeline Corridor

Iron Age (*c.* 750 BC – 43 AD).

17A.6.29 The evidence of settlement and agriculture seen in the Bronze Age period continues throughout to the Iron Age period. Cremation becomes the main burial custom and technology continues to develop and includes the emergence of the new forms of metal working. The hillfort at Eston Nab continues in use into this period – undergoing substantial expansion in the mid-5th Century BC (Tees Archaeology, 2002) and would have been an influential centre at this time.

17A.6.30 By the end of the Iron Age/start of the Roman period the lands within the Study Area begin to dry out. The cooler, wetter environment present towards the end of the Bronze Age, is slowly replaced with a warmer, drier one towards the end of the Iron Age (Tipping 2016). Generally, along the north-east coast of Britain, the coastal zone moves eastwards from it earlier westward maximum, resulting in some of the earlier

marshlands draining and drying out, whilst new marshlands became established in previously submerged areas. Locally sites such as Street House in Loftus see an increase in wetland taxa – reflecting a local increase in wetland areas. Salt production has also been recorded at this site (Sherlock and Vyner 2013) and salt making appears to become a significant industry in general at this time with salterns recorded at a number of sites along the north-east coast.

17A.6.31 During this period, this area of Britain was within the territory of the Brigantes tribe. It is believed that the Iron Age population of the Tees Valley comprised a discrete cultural group within the larger Brigantes tribe, with a cultural identify that was distinctly different to the tribes to the north and south of the valley (Sherlock 2012).

17A.6.32 SMR8603 located north-west of the Hydrogen Pipeline Corridor is an Iron Age settlement with possible Bronze Age origins (SMR8604). Archaeological excavation of the site (SMR1007) demonstrated the presence of round houses and a number of ditches which appeared to bound the settlement and divide up the agricultural land beyond it into fields. The settlement appeared to expand over time with the ditches defining it being re-dug to enlarge the enclosed area and the agricultural land beyond becoming more ordered, demonstrating increased, and more intensive use. Finds included pottery as well as evidence for pottery and metal working. The site continued in use into the Roman Period.

17A.6.33 Within the Study Area a small, enclosed area *c.*520 m to the east of the Proposed Development Site appears to indicate another small Iron Age farmstead (SMR159). Beyond these settlement areas, Iron Age evidence is restricted to a number of find spots (located to the west of the Study Area) including a bronze bracelet (SMR238), part of a beehive quern (SMR1043) and part of a statue's head (the Lazenby head, SMR1204).

17A.6.34 As a whole this evidence demonstrates that the valley and floodplain of the River Tees continued to be used for settlement and crop growing into and throughout this period.

Undated/Uncertain Prehistoric Evidence

17A.6.35 Within the Study Area there are five assets which are believed to be of a general prehistoric date, but which cannot be definitively placed into any specific period. None of these are located within the Proposed Development Site and they consist of a small quantity of animal remains, a scatter of six lithic (flint) objects (likely the partial remains of tools) and a peat deposit which contained wood fragments.

Romano British (AD 43 – 410)

17A.6.36 The Brigantes tribe, and their leader Queen Cartimandua, were supporters of the Romans during the early years following the invasion, however, this changed after AD 69. Venutius, the former husband of Cartimandua, led a successful rebellion against her and assumed control of the now anti-Roman Brigantes. The Roman Ninth Legion marched from Lincoln to face the Brigantes and Venutius and was eventually defeated following a series of campaigns between AD 71-74, with the last stand of the Brigantes posited as the Iron Age stronghold of Stanwick, near Darlington (Phillips and Rowe 2004). Aldborough (Roman *Isurium Brigatum*) was the capital city of the

Brigantes tribe during this period which became an important administrative and economic centre (Ferraby and Millet 2020)

17A.6.37 A number of Roman Roads run through Yorkshire, the primary one of which is Dere Street (Margary 8a, 8b and 8c) which ran from the legionary fortress at York, through to Cramon on the Firth of Forth near modern Edinburgh. Nearer to the Study Area is what is known now as Cade's Road (Margary 80a) which ran from Stanford Bridge (or possibly York itself according to Cade) up to the River Tees and a crossing point somewhere east of Girsby (the exact location is unknown) (The Roads of Roman Britain). The Study Area lies outside of this major road communication network. The site of a purported route, Cleveland Street, which runs from possibly Girsby to Huntcliffe signal station on the coast does, hypothetically, pass through the southern part of the Study Area, however, there is no substantive evidence to confirm the route as Roman. Approximately 2 km west of the Hydrogen Pipeline Corridor is the site of a purported Roman road running from Billingham north-west to Sedgefield, where it possibly connected to Cade's Road (Mason, 2020). The road is purported due to an association with a possible military installation or port in the Billingham or Middlesbrough area. Forts were established along there roads for defence and control of the area, none are particular close to the Study Area, Piercebridge (Roman Morbium), established in 70AD on Dere street at a crossing of the Tees (Cool and Mason 2008) is probably the closest significant fort to the Study Area, 27 km to the south-west.

17A.6.38 Salt production continued to be a major industry and contributed significantly to the area's trade. The North Yorkshire coastline continued to regress eastwards in the early Roman period with a subsequent increase in coastal wetlands. However, during the later Roman /early Medieval period (4th – 6th centuries) the coast appears to have moved westward once again (Atkinson, 1994).

17A.6.39 The clearance of land to make way for agriculture continued and agricultural practices in general seemed little changed from the late Iron Age (Willis and Carne 2004). There is general consensus in research publications that, beyond military fortifications and the main urban centres, anything which might be termed 'Romanisation' impinged but little on the wider rural landscape for the first century or so after Rome exerted its control. It appears that it is only in the late-2nd and early-3rd centuries AD that Roman administration began to make its mark (Roskams 1999). This suggests that traditional patterns of community and social organisation may have continued from the Late Iron Age into the mid – late, Roman periods. From the 3rd century onwards, there are indications that the rural landscape beyond the main routeways was changing. Within the landscape beyond the Study Area, the most significant settlements of this period would be the Roman town and villa of Ingleby Barwick *c.* 7.5 km to the south-west of the Proposed Development Site – this villa possibly being the most northerly in Roman Britain (Willis and Carne 2004) and Catcote (Hartlepool) approximately 5 km to the north-west of the Proposed Development Site (Long, C.D. 1988).

17A.6.40 Just outside of the Study Area a coin horde (SMR463) was found at Wilton Castle Ice House (1.5 km to the south). This contained 80 silver coins from the reign of Valens and a golden coin of Honorius.

17A.6.41 Six assets of this period are located within the Proposed Development Site. SMR9068, 9437, 9438, 9439, 9502 and 9523 are grouped together and located within the Hydrogen Pipeline Corridor. These all relate to a Roman settlement site at Saltholme, discovered during a programme of archaeological works undertaken in 2019 (SMR1470, 1468, 1498 and 1497). The work revealed a series of enclosures, along with pits, postholes and ditches. The settlement also contained two stone lines cist burials, the remains of three corn dries and finds including the base of a rotary quern, a trumpet brooch and pottery. The archaeological evidence demonstrated the presence of a large farmstead and agricultural activities.

17A.6.42 Within the Study Area other Roman finds include a silver denarius of Faustina II (SMR1458), a trumpet brooch (SMR4857) and Roman pottery (SMR1573 and 7201), and further Roman pottery found near Kirkleatham (SMR1801).

Early Medieval (AD 410 – 1066)

17A.6.43 Documentary evidence suggest that during this period the landscape continued to be cleared and closely settled and that sea level had reached something approaching modern levels. Pollen records would appear to support this (Davies and Turner 1979). However, it is recognised that the archaeological evidence for medieval settlement in the north-east is extremely variable. Across the region in general relatively little has been found (Frodsham 2019b). The villages of Greatham and Cowpen Bewley are not mentioned in the Bolden Book. However, the Church of St. John the Baptist in Greatham, a Grade II* listed building (1263522), has fragments of sculptured masonry, dating to the 8th and 12th centuries, built into its north aisle wall and late-12th century nave arcades which suggests a community was established at this place during the medieval period.

17A.6.44 Within the wider region, the nearest significant settlement site is Darlington (20 km to the south- west) believed to have originated as the Saxon *Burh* (a fortified, typically walled, settlement) of *Dearthingtun* in the early-11th century. Nearer to the Proposed Development, Billingham may also have early medieval origins.

17A.6.45 Significant Saxon cemetery sites are known at Darlington but also more locally at Saltburn (Gallagher 1987) and at Norton in Stockton-on-Tees, 2.4 km to the west of the Proposed Development Site (Sherlock and Welch 1992).

17A.6.46 Hartlepool originated as a monastery (Hereteu Abbey) founded in 640AD. Records exist of the Abbey until *c.*800AD, when it disappears from history (Rowe 2000). Beyond this, the majority of the evidence relating to settlement during this period is linked to place name evidence that has Anglo-Saxon and Scandinavian origins, such as Eston which derives from Anglo-Saxon for ‘settlement to the east’, Lackenby which is ‘Lochlan’s farm’ in Scandinavian, and Lazenby which translates as ‘settlement of freemen’ in Scandinavian.

17A.6.47 Archaeological evidence from this period is restricted to find spots within the Study Area (there are no assets with the Proposed Development Site). These comprise find

spots of a bone pin at South Gare (SMR4796); a ring mount near St. Cuthbert's Church in Wilton (SMR4811) and unstratified pottery sherds found in Kirkleatham (5133) during a trial trench evaluation (SMR101). Disarticulated human remains (SMR234) dating to this period were also found in Kirkleatham in 1902 during the excavation of a drain. It is also possible that 16 fragments of carved stone (SMR1270) found during the demolition of a tower at Greatham may also date to this period or to the start of the medieval period.

Medieval (1066 – 1540)

17A.6.48 Following the Norman conquest, land was divided up and placed into new ownership – lands within the Study Area being granted to the Brus family and the Abbeys at Guisborough and Whitby. The pre-exiting settlements in the area continued to grow and new villages were established often following a Norman 'blueprint' of two rows of tofts and crofts placed along a village green (as seen at Cowpen Bewley).

17A.6.49 To the east of the Tees, Kirkleatham (a village within the western edge of the Study Area of the Site) is recorded in the Domesday Book, where a population of 9.1 households is noted, putting it in the smallest 40% of settlements recorded in the Domesday Book. Despite this it became one of the principal villages at this time, with the Parish of Kirkleatham encompassing Redcar and Coatham. The town of Redcar is not mentioned in the Domesday book, appearing to have its origins as a fishing hamlet in the 14th century, involved in trade with the larger adjacent hamlet of Coatham. By the 13th century a significant port was located at Coatham and the weekly market of Kirkleatham parish was held here. Lazenby village, just to the south-west of Kirkleatham, is also recorded in Domesday as a tiny village with a population of less than one household. The population of this village (as with others in this area) only began to see notable increases in the mid-12th century when iron stone was found in the Eston Hills.

17A.6.50 The area to the north and west of the River Tees was not covered by the Domesday survey. Hartlepool continued to grow, becoming an important market town, not least due to its position as the official port of the County Palatine of Durham. The town underwent fortification in the early-14th century in anticipation of war with Robert the Bruce.

17A.6.51 The village of Greatham, which sits within the north-west corner of the Study Area, is known from documentary sources dating to 1196AD (Ekwall 1960). It was the site of Greatham Hospital founded by the Bishop of Durham in 1273 to aid the poor, although by the early-16th century it has become a "*house of entertainment for gentlemen*" (British history online 2023a). The settlement at Billingham continues to grow during this period, although it remains a very small town. Cowpen Bewley has little trace in documentary records, but the archaeological record (discussed further below) indicates that it is a good example of a planned medieval village with areas of common grazing at its centre. It is thought the name of the village may be derived from the Scandinavian 'Kuppa', a bowl-shaped vessel, and a derivation of Beaulieu, a name added by the Benedictine monks (the village being owned by the Prior of Dunham) (Cleveland Federation of Women's Institutes 1991). Stockton-on-Tees sees major growth in this period, with the manor of Stockton being built for the Bishop of

Durham in 1138, the village becoming a borough in the 13th century and a market being established in 1310. The town also began to become a centre for shipbuilding from the 15th century.

17A.6.52 Land continues to be cleared, albeit not at the same pace as earlier periods, and areas of woodland are kept, interspersed through this landscape – used for coppicing for fuel, hunting and as forage areas for animals. In general, the landscape becomes more organised and divided. Agricultural activity would have been the main economic stable of communities living within the Study Area although fishing would have been important for coastal towns and villages (such as Hartlepool, Redcar and Coatham) and salt processing also remains a major activity, taking place at Cowpen Bewley, Greatham and across the Study Area. The River Tees is a major communication and trade route at this time, with the port at Hartlepool being the main port at this time, although smaller ports such as those at Coatham would have been important for the villages south of the Tees. Industrial activity begins to emerge at some towns, such as linen production at Darlington and ship building at Stockton-on Tees.

17A.6.53 The HER records 126 Assets of this period within the Study Area of the Site. Of these, 10 are located within the Proposed Development Site (Table 17A-1). East of the River Tees, is a distinct cluster of assets focused around Cowpen Marsh. A number of these assets sit wholly or partially within the Hydrogen Pipeline Corridor. These assets comprise either salterns, used to process the brine water of the marsh into salt or mounds, usually located near a 'stell' (a pool or deep area of the numerous marshy creeks which run through the area), and mounds which are believed to have been derived from dredging of the stell and dumping of the resultant silty material.

17A.6.54 Some assets consist of both salterns and a mound or multiples of both. Some of the mounds are surrounded by low, circular embanking features (likely used to retain them) and ramps which have been trampled or cut into the mound to access the top. The mounds vary from 1 m – 4 m in height and from 5 m to 105 m in length or width (many are oval, or pear shaped rather than circular). It is not uncommon for the mounds to be re-used as building platforms (for informal buildings), as mooring points for accessing the stells and as game hides. Table 17A-1 details the assets and their location relative to the Proposed Development Site.

Table 17A-1: Salterns within or adjacent to the Proposed Development Site

SMR NUMBER	DESCRIPTION	WITHIN THE PROPOSED DEVELOPMENT SITE
8224,	Saltern	Yes
1711, 1718, 1720, 1721, 1715, 1727, 1728, 1737, 1738	Mound	Yes
1713, 1723	Saltern	No
1712, 1713, 1710, 1717, 1716, 1719, 1722, 1724, 1725, 1726, 1729,1730, 1731, 1732, 1733, 1734, 1735, 1736	Mound	No

17A.6.55 Within this cluster, asset SMR1714 is a salt mound that has been re-used as a platform for later buildings with modern re-use as a mooring place in the 'stell', which sits outside of the Proposed Development Site.

17A.6.56 Asset SMR6848 which sits at the south-west end of this group is an unusual patch of ridge and furrow lying on an island defined by several small creeks at Holme Fleet. The ridges are visible on aerial photographs and are fairly broad but straight. Further evidence for medieval ridge and furrow, as well as liming of the land was seen during trial pit excavation just north of the A1185 (SMR8905).

17A.6.57 The village of Cowpen Bewley took the traditional Norman form of two rows of properties lain out on either side of a broad green. The earth work remains of this village, including 3 tofts at the eastern end of the southern row of properties, are recorded as assets SMR604 and 624 whilst asset SMR3612, to the north of the village, appears to represent a raked at midden to the rear of a property.

17A.6.58 Wrapping around the north, east and southern edges of Cowpen Bewley a number of extensive ridge and furrow earthwork remains attest to the medieval use of the agricultural land around Cowpen Bewley. Four of these assets sit within the Hydrogen Pipeline Corridor (SMR1513, 658, 6821 and 6819), whilst the remainder sit outside (SMR1519, 6821 and 6822).

17A.6.59 Approximately 1.5 km to the south of Cowpen Bewley (and likely associated with the village) is the site of the Manor House of Belasis (SMR613). The site is recorded from 1649 but is believed to have a much earlier origin and is associated with a visible moat (SMR5156), which is located within the Hydrogen Pipeline Corridor. The Manor and its associated outbuildings were demolished in 1941 and nothing visible remains of them. The moat has been backfilled but is partially visible on modern aerial imagery.

17A.6.60 To the north of this Manor and south of Cowpen Bewley asset SMR9580 relates to three fields recorded as "Mill Hill" on tithe plans. There is no evidence on the ground or in LiDAR for any structure at this location – however it was subject to housing in 1930, which was subsequently demolished.

17A.6.61 Roughly 2.4 km to the south-west of Cowpen Bewley and just to the south, assets SMR4426 and SMR1515 represent the site of the now demolished farmstead of Salt Holme (SMR4426) and an associated large area of complex and extant ridge and furrow (SMR1515).

17A.6.62 A number of assets within and around Greatham attest to the medieval origins of this village. The village is recorded as an initial 2 row plan with a green, followed by infilling at the send of the green and a further planned row added to the north of the village (SMR602). A hospital was founded in the village in 1272 (The Hospital of God) by the Bishop of Durham to aid the poor. There are no surviving remains of this hospital which was replaced by an Almshouse in the 18th century, however the site of it is known (SMR643). The Church and Chapel of St. John the Baptist in the village date to the 12th century (SMR8732; 645; 4716) and excavations in and around the churchyard have uncovered human remains of a likely medieval date (SMR8731; 4714).

17A.6.63 Between Greatham and Billingham a number of extant ridge and furrow assets attest to the medieval agricultural use of the landscape – likely associated with medieval Billingham. This include assets SMR522, 524, 596 and 6721, this latter asset covering a particularly large area and extending beyond the Study Area.

17A.6.64 A possible mill race (SMR6861, now backfilled) has also been identified in this area, on the very western edge of the Study Area, via an earthwork survey (SMR680). It ran south-west into Billingham and may have had a dam along it (SMR6860) designed to create a water meadow or pond behind it – this is possibly identified as earthwork record SMR6856. The dam was partially destroyed by a WWII bomb in 1944. A mill is recorded in this area in documentary sources (SMR6584) its precise location is unknown, but it is likely to be associated with the race. The same earthwork survey identified a sunken lane or trackway running north from the race (SMR6859) and a fishpond a little to the north of the race (SMR1598).

17A.6.65 At the far south-west corner of the Hydrogen Pipeline Corridor, documentary evidence suggests the presence of a fishpond (SMR6865) within the area of the Wilton Complex.

17A.6.66 East of the River Tees, a further cluster of features is seen towards the north-east corner of the Proposed Development Site where a density of assets stretches along what is now a trunk road north of Lazenby. Again, these assets seem to be largely related to salt processing and 'stell' clearance and a number of them, as detailed in Table 17A-2, are located within the Hydrogen Pipeline Corridor.

Table 17A-2: Salterns within or adjacent to the Proposed Development Site

SMR NUMBER	DESCRIPTION	WITHIN PROPOSED DEVELOPMENT SITE
-	Saltern	Yes
1812	Saltern	No
-	Mound	Yes
1812, 1739	Mound	No
3759, 3760, 3751, 3752, 3753, 3754, 3755, 3756,	Salt mound	Yes
3761, 3770, 3771, 3772, 3773, 3776, 3777,3762, 3763, 3764, 3765, 3766, 3767, 3768, 3769, 3758, 3757, 3750, 3749	Salt mound	No

17A.6.67 The salt mounds are marked on the 1st edition Ordnance Survey (OS) map are now no longer extant.

17A.6.68 Loosely associated with this cluster, within the northern tip of Lazenby, asset (SMR355) sits within the Hydrogen Pipeline Corridor and is recorded as representing the deserted medieval village of West Coatham. This village is recorded in

documentary evidence from 1236, which records the village being engaged in salt production and is visible as earthwork remains in OS maps from 1884. The site is currently occupied by hardstanding with no visible ground level earthworks.

17A.6.69 To the north (north of Warreby) assets SMR4670 and 350 relate to the possible site of a former chapel at East Coatham (SMR350). The chapel is variously referred to as dedicated to St. 'Sulpitius', 'Syplyus', 'Sepulchres', 'Cyprion' or 'Sulphron' and human remains which are also believed to have been discovered associated with this site (SMR4670). However, beyond informal documentation there is no definite proof for either of these assets.

17A.6.70 Medieval Kirkleatham is recorded as asset (SMR915), which relates to the documentary evidence of the early village. A number of associated assets demonstrate its medieval history. The village is recorded as having a Church in the Domesday book, although the current church dates to 1763 and a Chancery with 12 priests was endowed in 1348, the site of which is currently not known. Assets (SMR489, 5134, 4807, 169, 1426, 1802 and 1801) relate to archaeological features associated with the medieval village (ridge and furrow and boundary ditches) and find sites of pottery and worked stone.

17A.6.71 Just to the south of Kirkleatham, asset (SMR3484) relates to partially visible earthworks relating to Yearby medieval village, which is recorded as part of Kirkleatham in the Domesday book.

17A.6.72 To the south and west of Lazenby a number of assets point to the presence of deserted medieval villages of Wilton and Lackenby and the extent of the agricultural hinterland around medieval Lazenby.

17A.6.73 Wilton is recorded in the Domesday book as consisting of 20 households. Wilton Castle (a grade II listed building NHLE1310567) is an early 19th century country house, which sits on the site of the 14th century castle of the Bulmer family (SMR466), which itself had an 11th century origin. The extant Church of St. Cuthbert at Wilton (a grade II listed building NHLE1310519, largely dating the early-19th century) appears to have 12th – 13th century origins (SMR1501, 6161, 1027). Ridge and furrow to the west of the church (SMR1582) appears to represent the agricultural hinterlands of both Wilton and Lazenby. This suggests that modern Wilton has shrunken significantly from the medieval period.

17A.6.74 South of modern Lazenby assets SMR1220, 1096 and 1507 are the remains of medieval ridge and furrow associated with agricultural land to the south of what would have been medieval Lazenby.

17A.6.75 To the south-west of Lazenby the small medieval village of Lackenby is recorded in the Domesday book as having a population of less than one household. Today this village survives as a small number of earthworks not visible from the ground (SMR4478), areas of associated ridge and furrow (SMR1082 and 372) and isolated pottery scatter find sites (SMR1803).

17A.6.76 As a whole, this evidence indicates the landscape of the Study Area was under relatively intense use during this period. A number of small to medium-sized villages and towns exist in and around the Study Area, a number of which have their origins

in earlier periods. The populace of these settlements was involved in a number of economic activities; arable farming in drier areas, and salt production in the more briny, marsh areas. A number of high-status sites are present, such as the Manor House of Belasis, Wilton and Kirkleatham, and would have represented the social, economic and political centres during this period. Cowpen Bewley, Lazenby and Greatham would also appeared to have become at least modest settlements during this period, despite the latter two being almost unknown at the end of the early medieval period.

Post Medieval (1540 – 1900)

17A.6.77 The dissolution of the monasteries (1536) and enclosure of the land (1750 onwards) would have had the biggest impact on the society during the early parts of this period. With the crown acquiring the land of the former monasteries, nunneries and friaries and with common land all but disappearing. There is little evidence for planned parliamentary enclosure within the Study Area with only Marske (1756) and Kirkleatham (1850) receiving parliamentary awards (British History online 2023b). This means that it is likely that enclosure of the Study Area was undertaken by Private Act. Mapping appears to indicate that by 1811 the majority of the Study Area was enclosed (North Yorkshire County Council (n.d.)) with common pasture and moorland only remaining around the edges of settlements such as Coatham and at the foot of the Eston Hills. With the enclosure of land farming intensified, which assisted in supporting the burgeoning industrial development of the area and the associated increase in population. Maps from the late 1800s show a large increase in the number of farms and farmsteads in the regions (such as Marsh Farmhouse and Cottage (NHLE 1160308), garden wall (NHLE 1139619) and stable and barn (NHLE 1139620).

17A.6.78 The discovery of Iron ore in the Eston Hills in 1850 created an industrial boom in the area, leading to the growth of Iron works in the area and attracting people into the region to work at the new foundries. Transport and communication (significantly rail and docks) undergo major developed to support this industry. Many of the small medieval settlements in the study see significant growth either as towns supporting this activity (e.g. Kirleatham and Greatham) or as coastal tourist resorts for the regions burgeoning population (such as Redcar and Coatham). Hand in hand with this the construction of reclamation walls and banks dry out former marshlands and mudflats, reclaiming land to be turned over to the regions industrial development and to increase its agricultural output, as well as making the River Tees more navigable and so suitable for heavy shipping.

17A.6.79 Ship building at Stockton-on-Tees flourishes during this period and a number of other associated industries also develop, such as sail and ropemaking. In 1822 the first rail of the Stockton and Darlington Railway was laid at Stockton-on-Tees, with the first ever passenger train running from Stockton-on-Tees to Shildon (via Darlington) on September 27th, 1825. As with much of the region, Stockton-on-Tees saw a large population increase in the late 1800s with the discovery of iron in the region, increasing from 10,000 in 1851 to over 50,000 by 1901.

17A.6.80 Hartlepool remains relatively small until the mid-1800s. The port at this time was small, having lost its earlier importance by the 18th century and the town (population

of 1,300 in 1831) was little more than a market town with a small port, which also attracted tourists as a seaside resort. However, a new dock was opened in 1835 and railway connecting Hartlepool to the Durham coalfields opened in 1839, and as a result its population grew to 9,227 by 1851. The construction of further new docks to the south west of the town in 1847 resulted in a new town springing up around these – West Hartlepool, which overtook the old town in terms of population by 1880. By 1901 old Hartlepool had a population of *c.*14,000, but that of West Hartlepool was around twice this size (local histories.org).

17A.6.81 Middlesborough was also created during this period. In the medieval period Middlesborough was the site of a small Benedictine priory on the south bank of the River Tees. Following the Dissolution the site became a farmstead with a population of around 25. In 1828 Joseph Pease (banker, coal mine owner and shareholder in the Stockton and Darlington Railway) decided to build a port ('Port Darlington') at the site of the farmstead to offload coal, this was built in 1829 and linked to the Stockton and Darlington Railway in 1830. A settlement was built to the east of the port to house labour. The success of the port meant that it soon became overwhelmed, and a new dock was built to the east of the earlier one, opening in 1842. By 1851 the population of the new town was 7,600. In 1853, Middlesbrough received its Royal Charter of Incorporation, giving the town the right to have a mayor, aldermen and councillors. Henry Bolckow became mayor, in 1853. Fuelled by the success of the region's iron and steel works, the town had a population of *c.* 90,000 by 1901 (Simpson 2015).

17A.6.82 To the west of the River Tees, SMR4172 represents the line of the Stockton and Hartlepool Railway – a branch line linking West Hartlepool to the main line of the Clarence Railway near Billingham. Constructed in 1839 (opening in 1841), with the purpose of moving passengers (often workers) and freight from Hartlepool to ports and industry along the River Tees, and passenger/goods from these ports and factories onwards. The line still operates a limited service today. A section of the railway line runs through part of the Hydrogen Pipeline Corridor. The railway also connected the Greatham Salt and Brine Company factory (1887) (SMR1222). The company became the Cerebros Saltworks in 1903 and ceased salt production in 1970, although it continued food production until 2007. The site was demolished in 2012 and now exists as a large area of overgrown hardstanding and rubble to the north-west of the Hydrogen Pipeline Corridor. A signal box (SMR4783) was constructed in 1889 at the site of Greatham station (SMR4586) which itself opened in 1841 opposite the Greatham Salt and Brine Company works. The station closed to traffic in 1991 and whilst the platform remains, all buildings have been demolished. The signal box (a tower with a control room at the first floor) is still in operation.

17A.6.83 To the south west of Greatham Station, further along the rail line, SMR4095 is the site of large brick and tile works (Cowpen and Greatham Brickworks). Founded in 1855 (and first seen in OS mapping of 1859) the works were involved in large scale clay extraction to the north and south of the Railway. The works closed in 1957 and the site is now below the mounds of Cowpen Bewley Country Park – although a large pond (created from one of the early clay quarry pits) still exists (Cowpen Bewley Wildlife Lake). These works were located just to the south west of Greatham Creek,

and the railway crossed this creek by means of a viaduct (constructed in 1839 and renovated in 1861). This viaduct (SMR4094) is still in use today.

17A.6.84 Another brickworks was located *c.*850 m further south along the rail track. Asset SMR9084 is the site of J. J. Lisle Steam Brickworks. The majority of the site has since been built over by the A1185 carriageway, however one of the ponds associated with the brickworks remains.

17A.6.85 As much as to the development of heavy industry, the mouth of the modern River Tees also owes its development to a programme of land reclamation which began in the 1700s. This early reclamation took the form of large earthen banks which enclosed parts of the estuary – this had the dual function of causing silt to build up behind them (creating reclaimed land) and making the Tees more navigable for vessels using it (allowing large ships to access the river and industry along it to develop). As industry developed in the area (particularly iron works) waste materials from these works were dumped in the marshlands and mudflats, raising them and creating more areas of re-claimed land. Two of these early reclamation embankments are visible within the Study Area – SMR8262 and 8683. Both are visible on tithe maps (for Cowpen Bewley – 1838 in the case of 8262 and that of Greatham – 1840 for 8636) as well as OS maps of 1859/1861. It is likely that SMR8262 is the earliest of these reclamation embankments dated to 1740, with SMR8636 of a slightly later date. Both are visible as earthworks on modern aerial imagery, and sections of both run through areas of the Hydrogen Pipeline Corridor.

17A.6.86 Slag dumped from the ironworks was used to build two sets of retaining walls, to create a small harbour for light craft, such as fishing cobbles, on the south bank of Greatham Creek, just before it runs into the River Tees (SMR4683). This harbour dates to the 1880s/90s and is now largely silted up. However, stumps of mooring posts and revetments for mooring are still visible.

17A.6.87 The site of two farmsteads is also located within the Study Area. Assets SMR8172, Thorn Tree Farm, is known from documentary evidence dated to 1828 and seen in mapping from 1861. It undergoes a number of small changes and extensions from this period until 1995 when it appears to have been largely demolished, the single structure left being demolished by 2016. Asset SMR8173, Pudding Nook, sits just outside (to the north) of the Hydrogen Pipeline Corridor. The farmstead is known from documentary evidence of 1858 and mapping of 1861. The farmstead undergoes a number of extensions from this period through to 1968 when it reaches its final form, being demolished by 1982. There are now no visible upstanding remains of either of these farmsteads, although the footprint of Thorn Tree Farm can be seen in aerial imagery.

17A.6.88 Running along the east bank of the River Tees is another reclamation wall (SMR6046). This runs from the mouth of the Tees (at a point now within the River itself) along the east bank to a point near to the modern 'Smith's Dock Road' (Easton Wharf Mooring Stage to the South Gare Breakwater). The asset is seen on mapping dated to 1895 but is now largely invisible due to modern industry, docks and modern sea defences/retaining walls. However, below ground remnants of it may survive. Sections of the route of this asset run through areas of the redline boundary of the

Site. Dotted along the wall, the 1895 OS map also records the presence of navigation lights (beacons) and mooring points. Again, these are not present today but again below ground remnants may survive. A number of these assets (SMR6050, 6051, 6056, 6057, 6058, 6059 and SMR6065) sit within the redline boundary of the Site.

17A.6.89 Further to the east, beyond the River Tees, another reclamation wall (SMR5602) is recorded on OS mapping dated to 1895 as running from Normanby Jetty to South Gare. The area is now heavily developed and only a small section of the bank remains visible.

17A.6.90 The Darlington Section of the North Eastern Railway also runs through the Study Area east of the River Tees (SMR5908). Originally the Stockton and Darlington Railway the track was built in the early 1800s (visible on mapping of 1895) to connect the Coalfields of County Durham with the docks and ironworks of Tees, moving both passengers (again often people employed in the industrial work of the area) and freight. The railway underwent a number of renovations and re-routing and changed ownership (to North East Railways) in 1863. The current, extant, arrangement of the track is still in use today and those sections which were re-routed (and so are no longer in use) are visible in the landscape as remnant embankments and earthworks.

17A.6.91 A number of tramways connected into this railway feeding the industry of the area into the rail network (SMR5708, 5715 and SMR5732). These are all visible on the OS maps of 1895, and are still visible on maps of 1955, however they are gone by 1985 and are visible today only as occasional marks in the landscape, and only where they have not been built over by modern industrial, housing and road developments.

17A.6.92 Stations were constructed along the length of the railway, the site of four of which sit within the Proposed Development Site. This includes Lazenby Station (SMR5688) constructed in 1846, closed in 1864. Eston Grange (SMR4360) constructed in 1885 and closed in 1991 (also called Grangetown), and Lackenby Station (SMR5647). This station sits *c.*600 m to the north of Eston Grange and other than the presence of a small station being marked here on the map of 1857 little is known of it. It is possible it was replaced by Eston Grange in 1885.

17A.6.93 None of these stations have extant above ground remains, however it is possible that below ground remains may still exist.

17A.6.94 This rail infrastructure was designed to feed the industry of the area with workers and products it needed (chiefly Iron ore and coal) and move the products of the works out into the wider region and to the docks for wider distribution. Remnants of these industrial activities that are present within the Proposed Development Site are described in Table 17A-3.

Table 17A-3: Features located within the Proposed Development Site

SMR ID	NAME	DESCRIPTION/COMMENT
5659	Lackenby Ironworks	Built in 1871 to the south of the trainline and likely associated with SMR5652. Seen on mapping of 1895. Now no longer visible above ground (covered in areas of modern industrial development.
5652	Spoil heap	Recorded on mapping of 1895, north of the railway and likely the result of the Lackenby Ironworks, now under the Corus Steelworks.
5658	Reservoir	A reservoir seen on mapping of 1895 and likely associated with Lackenby Steelworks (sitting within the south east extent of this former site).
5653/5654	Brickyard (5653) and Concrete works (5654)	Seen on mapping of 1857. Adjacent to and west of the Lackenby Ironworks and Lackenby Station. Possibly associated with the construction/use of the ironworks, the railway or the adjacent Lakenby Station. Recorded as a concrete works in 1895 mapping. No longer visible above ground. Likely associated with SMR5649 and 5646.
5649	'Brickfield'	Brickfield noted in mapping of 1857 – likely associated with the brickyard *c.*300 m to the north-west. Now a built up area.
5646	'Claypit'	Located *c.*500 m to the south west of 5653 and likely associated with it. Seen on mapping of 1895 where it is quite extensive. Now a built-up area
5709	Coatham Ironworks	Adjacent to and north of the railway. Constructed 1873 and visible on mapping of 1895. Consisted of two furnaces. This site, along with Redcar Ironworks (5711), was one of the most significant iron and settle works in the area. Both remained in operation until the late 1990s (under British Steel PLC) becoming part of the Corus Group in 1999. The plants struggled economically in the early 2000s and were permanently moth balled in 2015. The plants were demolished in 2022. The site is now an open brownfield site within which traces of the Ironworks are still visible.
5710	Reservoir	Associated with SMR5709, (not visible).

SMR ID	NAME	DESCRIPTION/COMMENT
5711	Redcar Ironworks	Opposite Coatham Iron Works, south of the railway. Constructed in 1874 and visible on 1895 mapping. Closed in 2015 and demolished in 2022 (see Coatham Iron works, SMR5709).
5632	Spoil heap	Visible on mapping of 1895. A small part of this just sits within the Proposed Development Site. It is likely associated with the site of the Cleveland Steel works (SMR5633, constructed 1874-1876, demolished in the late 1990s) which it sits north of (on the north side of the rail track). The site of the steelworks itself does NOT sit within the redline boundary of the Site and sits to the south of the rail track. The site of the spoil heap is now partially covered by a modern industrial development.
4048	Meggit's Pond/Issac's Pond	A dog leg pond is labelled on the OS map of 1857, which becomes Isaac's pond by 1895 when it appear to have been expanded – it is likely the site of a clay extraction pit. It sits just on the eastern edge of Proposed Development Site, the western edge of the feature just extending into the Proposed Development Site.

17A.6.95 A mill race (SMR5716) – which is, in fact, most likely a drainage channel, is recorded on the OS map of 1857. It runs north from 'Main dyke' (Kirkleatham) to 'The Fleet'. The route of this drain is now largely built over, however a small portion of it remains visible in its middle. This asset (including the still visible element) sits within the Proposed Development Site.

17A.6.96 A duck decoy pond (SMR3775) is described in 1901. It is still visible today and sits within the Proposed Development Site.

17A.6.97 Within the wider Study Area a large number of assets are present which attest to the industrial, and agricultural use of the region during this period. Cleveland steelworks (SMR5633) – located on the southern edge of the Study Area, was constructed in the mid-1800s (1874 – 1876) and is visible on the OS map of 1895. It was connected to the Iron Mines at Eston Hills (SMR1122, outside of the Study Area) which were in production from 1850 to 1949, by the Eston Branch Railway line (SMR5626). This was opened in 1851 by the mining concern Bolcklow Vaughn to transport ore from its mines. The northern end of this line sits within the Study Area. A small gasworks (SMR5628) is recorded in the western edge of the steelworks. After undergoing some expansion in the early part of the 20th century, the steelworks were demolished in the late1990s. However, areas of hardstanding remain, as do visible elements of foundations and surviving sections of two blast furnaces. The Eston Branch line is no longer extant, and much of its route has been built up. However, traces of it can still

be seen in the landscape where the ground has not been developed. The site of the gasworks is now a modern industrial development.

17A.6.98 The site of Newport Iron Works (SMR1822) also sits just within the south-west edge of the Study Area. Now entirely built over by modern industrial works, the Iron Works were in production by 1872 and are seen on mapping of 1895.

17A.6.99 Iron was not the only industry within the Study Area at this period and salt production remained important. The Greatham Salt Company has been mentioned but a number of other salt production facilities existed. Cowpen Saltworks (SMR4301) is located centrally within the Study Area, just to the west of reclamation bank SMR8262 was short lived, active from 1885 – 1916, likely due to the drying out of the surrounding marshlands.

17A.6.100 Much of the rest of the salt production activity within the Study Area tended to be focused in the remaining marshy areas on the west bank of the River Tees on a bend of the River Tees opposite what is now Middlehaven and extending north west towards Haverton Hill. Saltworks here included Tennants Saltworks (SMR1221) founded in 1885. Still in operation in 1970 the exact date of the closure of the works is not recorded but it is not present on imagery from 1985. The area of the site is currently undeveloped and imagery from 2000 shows a number of earthworks present likely associated with the works.

17A.6.101 Approximately 150 m to the north of Tennants Saltworks, the Westfield Durham Saltcompany (SMR4420) was founded in 1888, becoming the South Durham Saltworks (SMR4300) in 1891. Again, the exact date at which the site was closed is not recorded however it is present on the 1938 OS map but gone by the 1950 map. Again, the site is currently undeveloped and possible earthwork remains can be seen on imagery of 2000. Numerous 'brine pits' and 'wells' surround both works and attest to their industry.

17A.6.102 The Tees Salt works (SMR4306) to the west of Haverton was established in 1888 and demolished in 1931. It is currently a modern industrial site.

17A.6.103 All these saltworks were served by the Port Clarence Branch railway (SMR4175). This was established in 1834 and is still in use today, running through the south west edge of the Study Area.

17A.6.104 The development of settlements noted during the medieval period also continue into this time. Numerous new buildings of this period are recorded at Cowpen Bewley, Greatham and Kirkleatham. This development includes many farmsteads and domestic dwellings but also a school at Cowpen Bewley (SMR9451 – now a residential development) and a chapel (SMR644, extant), almshouse (SMR4712, redeveloped) and school (SMR8120, extant) at Greatham, where 'Gods Hospital' was also renovated (SMR4713).

17A.6.105 A hospital is also built at Kirkleatham in 1674 (SMR234, redeveloped) as is a hall in 1623 (SMR236 demolished 1956 and now redeveloped) and an associated kitchen garden (SMR4040 – boundary walls partially remain in a dilapidated state). Kirkleatham becomes an urban district in 1894 but is annexed by Redcar in 1899.

17A.6.106 Redcar and Coatham expanded significantly during this period and much of the housing at Redcar and Coatham date to this period as they became fashionable seaside resorts. Piers were built for both towns in the 1870s (although that at Coatham was almost wrecked by a shipping accident in 1898, after which point it was allowed to disintegrate).

17A.6.107 A small settlement (SMR4671) is created at Warrenby, on the northern edge of the Study Area, in 1870 for the workers of the Coatham and Redcar Ironworks. The settlement takes the form of a single street, Tod Point Road, with dwellings on either side. There was a Mission Chapel and Wesleyan Chapel. Nothing of this village now

17A.6.108 During the post-medieval period the Study Area undergoes significant change and development. The discovery of iron in the Eston Hills creates an industrial boom as ironworks develop along the shipping route of the River Tees and infrastructure in the form of railways spring up to serve this and transport the products produced. At the same time, the increase in infrastructure allows traditional industrial practices i.e., salt production, to expand and become more industrialised. This increase in industry attracts population into the area and settlements expand – some such as Hartlepool growing from little more than a hamlet to a major town, whilst new settlements such as the workers town at Warrenby are created specifically to house those coming into the area. All of this is accompanied by a changing topography as more and more land is reclaimed around the banks of the River Tees.

17A.6.109 However, there is also decline. The drying out of the marshlands reduces the available area for salt production and whilst some saltworks thrive, others such as the Cowpen works do not. The enclosure of land from the late 1700s onwards which denied people the common land previously used for growing crops and grazing would have had a significant social impact, forcing people to move from the countryside into towns to find alternative subsistence means. Issues such as this may have contributed to the collapse of small rural villages in the area, such as Lazenby and Lackeby which collapsed almost completely at some point during this period. Even the village of Wilton which saw significant new building during this period is all but abandoned by the end of the period.

Modern (1901 – Present)

17A.6.110 The first half of the 20th century is dominated by wars and the production of material need to prosecute these wars. In Teesside, these wars are represented by a continued increase in output of goods needed for the war efforts – chiefly steel and coal. This generated an increase in industrialisation and a commensurate increase in population in the area as a larger workforce was required – leading to the growth of settlements in the area. World War I left little mark on the landscape; however things are very different with WWII. Due to the strategic importance of the north east coast during the wartime, WWII military remains are well represented along the north east coast.

17A.6.111 As industry on Teesside developed the smaller companies which owned and ran the steel works in this area began to amalgamate with a smaller number of larger firms emerging in the second half of the 20th century, one of the largest of these being Dorman Long who now owned the Cotham Ironworks (SMR5709) and the Redcar

Ironworks (SMR5711) which began production in the late-19th century. These companies are nationalised into the British Steel Corporation under Labour in 1967, which was then privatised by the conservative government into British Steel Plc in 1988. Both assets are located within the Water Connections Corridor and while the site of Coatham Iron Works has been developed extensively, aerial imagery suggests that foundation remains of Redcar Iron Works survive within the Proposed Development Site.

17A.6.112 The economic climate of this period meant that lot of steel manufacturing plants (along with many other heavy industries in the UK) were struggling and a number of them closed. By the early 2000s the remaining Teesside steel works were failing and British Steel Plc merges with Netherlands based steel maker Koninklijke Hoogovens to form Corus Group. However, the company continues to struggle and despite a number of buy outs and rescue packages throughout 2007 – 2019 British Steel collapses going into insolvency in 2019. The Redcar Blast Furnace, which had been mothballed since 2015 is finally demolished in 2022, following many of the other Iron and Steel works in the area (such as the Cleveland Steelworks (SMR5633)). The site is currently an undeveloped brownfield site within which the traces of the works can be seen. It sits within the Proposed Development Site.

17A.6.113 Iron and Steel manufacture are the not the only industries to suffer in this area in the latter half of the 20th century, Shipyards such as Furness (SMR4834) and Graythorpe (SMR6227) built in the 1920s are closed by the 1970s. The Billingham Anhydrite Mine (SMR6099) follows a similar pattern. However, some companies have thrived – such as Witon international, which opened as a chemical manufacturing plant in 1956. The site is still in use today having expanded its portfolio to cope with the changing times, being involved in such things as recycling, process research and energy generation. Indeed, the area has seen recent growth in industries connected to waste processing and recycling, energy generation and specialist fabrication.

17A.6.114 During the industrial boom of the first half of the 20th century population in the area increased, to supply the demand of the industrial works. Hartlepool and Middlesborough both undergo significant growth and Billingham, which has been little more than a small market town expands massively in 1917 when the town was chosen to be site of a new chemical works. The villages of Greatham and Kirkleath continue to grow as do Coatham and Redcar. The latter two are no longer principally seaside resorts but become dormitory towns for people working in the steel industry.

17A.6.115 Along with this a number of new towns are developed (see below). However, as industry began to decline in the latter half of the 20th century, and air pollution from the area's heavy industries became more and more of a problem, a number of these workers villages became abandoned, eventually being demolished in the latter part of the 20th century. Many of the existing towns also begin to go into economic decline suffering from high unemployment rates.

17A.6.116 The vast majority of the cultural heritage assets within the Study Area, which date to this period, relate to the WWII fortification of the north east coast. The assets comprise anti-aircraft batteries, anti-landing obstacles, search light batteries, pillboxes, section posts, mortar emplacements, air raid shelters, barracks, command

posts, storage areas and bombing decoy sites. Bomb craters are also a common feature of the Study Area. Within the Study Area, 18 of the 22 assets from this period relate to WWII activity, as listed in Table 17A-4.

Table 17A-4: Second World War assets within the Study Area

SMR	DESCRIPTION
985	Large Pillbox (variant FW3 type 23). Currently extant.
3287	Type 23 Pillbox. Partially extant.
3289	Spigot mortar point, partially buried in 2010 by a footpath over the embankment within which it sits.
3602	WWII bombing decoy site (associated with 3623 and 3628) – intended to represent an aircraft landing ground or RAF satellite airfield.
3623	WWII bombing decoy site (associated with 3602 and 3628) – indented to simulate the flarepath lighting of permanent RAF stations as a lure to attack by night bombers.
3628	WWII bombing decoy site (associated with 3602 and 3623) – a fire-based decoy, fires would be lit to simulate sites already under attach, thus diverting enemy fire.
4366	WWII bombing decoy site – a fire-based decoy. Site is now a brine field.
4367	WWII bombing decoy site – a fire-based decoy. Possibly identified (as a series of concrete post) by archaeological survey in 2003.
4375	WWII bombing decoy site – a fire-based decoy. It is associated with two military buildings (SMR3288 and 6178) which sit *c.*40 m to the west – placing them beyond the redline boundary of the Site.
4684	A surviving concreate base believed to represent the raft foundation of a WWII pillbox
5267	Surviving WWII air raid shelter. Semi sunken consisting of a series of precast concrete arches jointed together to form a long trench shelter. Wooden door frame also survives.
6092	Large square WWII section post (a hardened trench emplacement). Partially extant.
6845	Possible WWII bomb crater. Visible today as a pond in Cowpen Marsh.
6902	WWII section post. Partially visible.
6903	Site of WWII section post, demolished in 1972.

SMR	DESCRIPTION
8094	Site of WWII anti-aircraft battery. Originally consisted of a four gun emplacements associated with a group of ancillary buildings to the north which would have included barracks and offices. Site has been demolished and replaced by a modern chemical works.
8223	WWII Tank Traps. Two loose tank traps were noted dumped on an area of hardstanding at Cerebos Saltworks in the early 2000s. The original location of these traps could not be ascertained.
9532	Site of WWII anti-landing obstacle built as a series of concrete posts. No longer visible.

17A.6.117 At some point in the early 1900s a spur rail line was constructed which extended from Port Clarence north towards Greatham Creek, stopping just short of the Creek (SMR8717). It is seen on A Tees Conservancy Commissioners map of 1906 and on the OS map of 1916. A Tees Conservancy Commissioners map of 1938 indicated that it was intended to extend the line northwards towards Hartlepool, however this never happened. The purpose of this line was to provide additional connectivity for the industry active in the Study Area at this time. It is unclear how active the line was before it fell out of use. Whilst heavily overgrown much of the line is still visible today.

17A.6.118 SMR6099 is the site of the Billingham Anhydrite Mine, one of the new industries founded here in the early-20th century (1928). Located just to the west of Haverton Hills (within the southern tip of the Redline boundary of the Site), the mine was entered by shafts which were sunk as deep as 260 m and accessed an extensive underground network covering several square kilometres. The plant closed in 1971 and the mine was capped in 1978 although the below ground tunnels remain open. The site currently sits as an open brownfield site, surrounded by industrial works.

17A.6.119 In 1954 a new signal box (SMR4782) was built on the Darlington Section of the North Eastern Railway (SMR5908) *c.*400 m to the north east of the (at the time extant) Eston Grange Station (SMR4360). It was updated in 1984 and is still in use today.

17A.6.120 Asset SMR8864 is slightly unusual. OS maps of 1918 show the presence of a number (possibly five) of small structures located on 'Cote Hill' a small area of raised land in Cowpen Marsh, *c.*100 m north west of Greatham Creek, which was the site of a former Saltern. These structures were thought to be house boats and/or small wooden 'cuddy houses'. The number of structures present is seen to have increased in the 1968 OS maps. This small community of people living in house boats and cabins was documented by the photographer Ian Macdonald in the 1970s and at the time consisted of 11 houseboats, three timber cabins, 8 timber 'cuddy houses' and one brick cottage. A survey of the site in 1999 found only the remains of small areas of re-claimed land, reinforced ground and the remains of post settings, mooring points and jetty fragments.

17A.6.121 The site of West Hartlepool Airport (SMR610) is located on the north west corner of the Study Area. The Airport was opened by the RAF in 1939 and continued to be used by them until 1947, after which point it continued in use as a civilian airfield until 1957. The site is now in mixed use. Areas of it appear to be open and relatively undisturbed, whilst steel works (most notably Liberty Steel Hartlepool) sit on other areas of it. Recent imagery shows that elements of the airport, including at least one of the runways, are still visible on the ground.

17A.6.122 The site of a WWII prisoner of war camp (SMR5361), which lies to the immediate east of Manor Farm, is in the south east of the Study Area. The camp was visible on aerial photographs taken in 1948 where it is seen to consist of approximately six small huts. The site was subject to geophysical survey in 1999 prior to the development of the Kirkleatham Business Park (Hale, D.N. 1999). This survey identified possible structural remains associated with the POW camp as well as a ring ditch of unknown date/function, evidence for medieval ridge and furrow activity and post medieval agricultural features. Currently the site is an open field, but development of the land to the immediate east of the site is ongoing.

17A.6.123 A prisoner of war camp for prisoners of World War I, is known to have existed at Port Clarence, just outside of the Study Area (SMR8442). The camp is listed under Accommodation of Prisoners of War as Camp (Hutted) by the War Office, Lands and Buildings Reconstruction Committee (1918). The exact location of the camp is not known but it is thought to have been located somewhere in the vicinity of the Allhusen Saltworks (SMR4421).

17A.6.124 The remaining, non-military assets, attest to the continued development of industry, transport infrastructure and settlement within the Study Area during this time.

17A.6.125 Asset SMR6227 located *c.*500 m to the north east of the northern edge of the Proposed Development Site, it site of the Graythorpe Shipyard. The site opened in 1924 on the western bank of the Tees, near its mouth. The Yard closed in 1963 when the company wound down. The site has since largely been cleared and is currently in use as a fabrication area, with only a small number of modern buildings present. As part of the construction of the shipyard, a small works settlement (Graythorpe Village – SMR8707) was built on the northern side of Tees Road *c.*350 m to the north west of the shipyard. The village consisted of several short terraces along of off Graythorpe Road, with a school, a playing field and a club. The village lasted no longer than the Yard and the settlement was cleared by the early 1980s and is now a combination of open space and industrial units.

17A.6.126 Another shipyard (Furness Ship Yard – SMR4834) was established at Haverton Hill, on the north bank of the Tees (*c.*800 m to the south of the Proposed Development Site) in 1917. Its position on the bend in the river allowed easy launching in fairly deep water near to the river mouth. The low-lying marshland was initially reclaimed with up to 14 feet of slag and ash. The yard continued in use into the 1970s when the bulk of orders were for oil carriers. The yard closed in 1979 and both the site the slipways remain empty. A blacksmiths (SMR4908) was associated with the yard and the brick buildings which housed this (to the east of the yard) still exist today and re in use as a welding and fabrication workshop. Lord Furness established Belasis Garden Village

in 1921 to house workers at the Furness Ship Yard. The village (SMR4477, located *c.*2 km to the north-west of the yard and *c.*1 km to the north-west of the Proposed Development Site). The new village took the form of a main road (Cowpen Lane) bisecting two concentric crescents on each side (Essex and Warwick Crescents to the west and Devon and Lincoln Crescents to the east). The land between the crescents was built up with back to back housing. The village initially consisted of 531 houses. The village went in to decline following the 1930s recession and the closure of the shipyard. The whole area was demolished in 1970s due primarily to the effects of industrial pollution. Today the layout of the garden village still exists but all the houses are new, the site being a suburb of Billingham/Cowpen Bewley.

17A.6.127 Cleveland Steelworks (SMR5633, located to the south-east of the Study Area, *c.* 550 m to the west of the Proposed Development Site) underwent some expansion at this period with two new Bessemer blast furnaces being built (SMR1831). Furnace number 5 was built in 1937 and closed in 1986. Furnace number 4 was built in 1991 and closed in 1993. The site closed completely in the late 1990s and is now demolished. However, the site remains undeveloped and traces of the steelworks, including traces of these furnaces, can still be seen in the ground.

17A.6.128 Dormanstown (SMR3290, located on the north-east edge of the Study Area) was built in 1917 by Dorman Long to house the workers of the Dorman Long Iron and Steel works (at this time the biggest iron and Steel company in the area). Initially the village housed 342 families and gained a school in 1926 (SMR6922 and 6923) – which is the site of the current school. All Saints Church was built in 1935 as was a Methodist chapel, with St Williams Catholic Church being completed in 1939. The village continued to grow as industry in the area developed, having a population of 4,650 in 2021.

17A.6.129 The settlement north of Haverton Hill (SMR4833) which had undergone development during the post medieval period, was focused on the junction of Cowpen Bewley Road and Haverton Hill Road. The settlement appears to have been established in the early-19th century following the construction of coal staithes at Port Clarence (SMR4182), and a forge (SMR4180) and glassworks (SMR4181) at Haverton Hill itself. The settlement was in decline by the 1850s with 27 of the 73 houses lying empty. The Glassworks closed in the 1860s creating greater poverty in the area. This was soon redressed with the building and expansion of the Port Clarence Iron Works (SMR 4183) 1853. Prosperity returned to the settlement in the 1880s with the establishment of various salt workings on this bank of the Tees. This prosperity boomed in 1917 with the construction of the Furness Ship Yard at Haverton Hill (SMR4834) and a coal depot on the southern edge of the village (SMR8796). This led to the construction of a new workers estate at Cowpen Lane/Belasis Avenue. This consisted of 564 houses and a hostel that housed 500 workers. This initial boom led to overcrowding which in the depression of the 1930s led to Haverton Hill become a slum area. Despite the revitalisation of the ship building industry following WWII the fortunes of the settlement worsened as pollution from newly established chemical industries made life unbearable. Houses became abandoned and remained empty until the wholesale demolition in the site in the 1960s. Until the early 2000s there were no dwellings at Haverton Hill, it consisted of a small number of commercial

properties only. Since this time a small housing development has sprung up the east of the village along Port Clarence Road. (Owens 1995; Cleveland Federation of Women's Institutes 1991).

17A.6.130 The modern history of Teesside is very much one of boom and bust. Early industrial development enabled by the discovery of iron ore, aided by parallel innovations (such as the advent of rail transportation) and fuelled by the demands of two World Wars creates a boom which draws significant population to the area and encourages tremendous regional growth. However, as demand for the main industrial product in the area decreases in the latter half of the 20th century, compounded by market prices, foreign competition and the political landscape in the UK, the industries decline. This creates an economic crisis for the population they supported resulting in the decline of local towns and a decrease in populations. This story is very much reflected in the archaeological record of the Study Area during this period.

17A.7 Overview of Modern Disturbance

17A.7.1 The Main Site formed part of Bran Sands historically, and slowly saw increasing levels of development from the late-19th century onwards, starting with tramways from various industries including Redcar Iron Works, transporting materials through the Site to and from Redcar Jetty.

17A.7.2 Made Ground deposits have been mapped across the entirety of the Main Site, except for the northeast extent of the Main Site. This is displayed in the 1:10,000 mapping displayed in the Groundsure report (Appendix 10A: Geology, Hydrogeology and Land Contamination Desk Based Summary Report, PEI Report, Volume III). Based on previous GIs completed across the Main Site and in the adjacent Net Zero Teesside (NZT) site to the southeast of the Main Site, extensive Made Ground deposits are anticipated. These deposits are predominantly composed of slag-dominant material, a stony waste matter separated from metals during the smelting or refining of ore – in this case from iron ore, and other waste materials that are derived as waste products from the long industrial history of the Main Site. Previous geotechnical investigations within the NZT site demonstrated that the depths of made ground varied across the site, with an average thickness of 4.7 m.

17A.7.3 Information derived from historical boreholes within the Main Site confirm the presence of Made Ground, which is described as a black sandy gravel, with inclusions of slag, concrete, black and clinker with a notable hydrocarbon/creosote odour. The deepest layer of made ground was recorded as 7 m, with an average thickness of between 4 m and 5 m across the Main Site. The Made Ground sealed deposits of sand and glacial till but deposits with an organic content were not present.

17A.7.4 The Made Ground within the Main Site derives from years of industrial waste material being dumped across the area to enable subsequent development. Recognising the impact caused by the construction of buildings and industrial structures within the Main Site, the dumping of industrial waste to consolidate and raise ground levels may have compacted any subsurface remains present but would not necessarily have removed (or truncated) them entirely. Though not recorded in the historical exploratory logs carried out across the Main Site, Blown Sands have been mapped to

close to the north of the Main Site. The Blown Sands are described in the Groundsure Report as deposits of sand that have been blown by the wind, which if present would overlie the Tidal Flat Deposits.

17A.7.5 Deposit modelling for the NZT site to the south-east of the Main Site recorded the deposit sequence beneath the Made Ground as comprising post-glacial estuarine sand between 4 m and -10 m aOD, sealing Glacial Till which was recorded between approximately -5 m aOD and -20 m aOD. It is likely that this sedimentary sequence extends into the Main Site.

17A.8 Site Walkover

17A.8.1 A site visit covering some of the Proposed Development Site was undertaken on 20 April 2023. Beyond the Proposed Development Site, the site visit included consideration of the wider setting of surrounding heritage assets. The principal areas and assets visited are described below.

Greatham and Cowpen Bewley Conservation villages

17A.8.2 The villages of Greatham and Cowpen Bewley, the cores of which are conservation areas, lie to the north and west of the Proposed Development Site. Both consist of linear villages, tightly developed around central roads. This form of development suggests both have medieval origins, with this ‘strip’ form remaining legible today. The tightly packed buildings within both settlements create an intimate and insular experience in both locations, with no meaningful longer views experienced from within either village. From within both villages, views guided along the main axis of settlement are the most prominent and include attractive views guided by a patchwork of historic buildings, as well as newer buildings built in styles that are sympathetic to the areas’ characters (Plate 17A-17A-1 and Plate 17A-2).



Plate 17A-1: View to the west from the eastern end of Cowpen Bewley, demonstrating the linear development and open green



Plate 17A-2: Typical view within Greatham, facing north-west. Note linear development enclosing and directing views

17A.8.3 Prominent buildings, mainly listed, play a strong role defining the character of both settlements, providing an element of architectural and historical interest to both conservation areas. Within Greatham, the settlement's historic connections to notable individuals are reflected by the presence of the Grade II listed Greatham Hospital (NHLE 1249889) (Plate 17A-3), Hospital Chapel (NHLE 1249890) and the impressive Grade II* Church of St. John the Baptist (NHLE 1263522). Within Greatham, these impressive institutional buildings form a distinct grouping at the village's south-west side. Lying within surroundings surrounded by mature trees, they occupy a secluded setting where longer views are obscured, creating an intimate experience of the buildings (Plate 17A-4).

17A.8.4 Within the main street, other listed buildings are experienced as a part of the wider streetscape, collectively providing a sense of the village's strip development, and the varied architectural periods which have contributed to its built environment (Plate 17A-2). Again, longer views are generally obscured and play no significant role in the appreciation of the area.



Plate 17A-3: View of Grade II listed Greatham Hospital, facing north-east, demonstrating the insular, private setting with no long-range views



Plate 17A-4: Typical view within the churchyard surrounding the Church of St. John the Baptist, illustrating secluded setting

17A.8.5 With regard to wider views, and views that introduce change as the viewer moves through the landscape, two particular views contribute to an appreciation of the setting of Greatham. On approach from the west of the village to the west of Greatham Bridge and the valley of the Greatham Beck, the village can be viewed as a linear development sitting on a low spur of ground and overlooking lower ground to the south (Plate 17A-5). Although almost entirely shrouded by tree cover, the village is marked by its prominent church tower, which, although overtopped by pylons, serves to provide a prominent visual marker that locates the village. Surrounding open farmland to the west and south continues to provide an historic functional context for this rural settlement, whilst industrial Teesside is visible to the south.



Plate 17A-5: View toward Greatham from the west of Greatham Bridge, facing south-east. Note prominent church tower amongst thick tree cover

17A.8.6 In terms of views away from the conservation area, those gained from the southern tip of the village provide the most interest in terms of appreciating the wider rural setting of the village, as well as its topographic location on higher ground, and its juxtaposed proximity to urban, industrial Teesside. The view south from the southern extent of Greatham takes in the falling ground levels which leads the eye across open farmland and a network of hedgerows which lead to the tall industrial structures of Teesside, with a network of pylons crossing the view (Plate 17A-6). Here, the Grade II* listed Transporter Bridge (NHLE 1139267) is clearly visible, set against the backdrop of the Cleveland Hills, and representing a prominent visual identifier of Middlesbrough.



Plate 17A-6: View south from Greatham village. Note Transporter Bridge at left of view with Cleveland Hills forming a visual backstop.

17A.8.7 At Cowpen Bewley a similar view is gained looking south-east from the edge of the village, along Cowpen Bewley Lane as it leaves the village southward (Plate 17A-7). Here, an open view across pasture fields containing ridge and furrow, indicative of the area's farming heritage, provides a strong experience of the historic functional setting of the village. The ridge and furrow within the fields is barely visible on the ground, but clearly present on LiDAR imagery of the area (Plate 17A-8).

17A.8.8 The prominent presence of the silhouettes of the Transporter Bridge and Roseberry Topping provide a clear visual sense of place against a strong visual backstop of the Cleveland Hills (Plate 17A-7). Views towards the village are generally obscured, or contain much modern visual clutter, providing little contribution to the significance of the conservation area.



Plate 17A-7: View south-south-east from Cowpen Bewley, across open fields containing ridge and furrow. Note Transporter Bridge and the peak of Roseberry Topping prominent in the view



Plate 17A-8: Excerpt from Environment Agency LiDAR data, showing pattern of historic ridge and furrow cultivation surrounding Cowpen Bewley

Proposed Development Site North of the Tees

17A.8.9 Much of the Proposed Development Site and Study Area north of the Tees is made up of low-lying agricultural land or reclaimed coastal saltmarsh in current or historic industrial use. No obvious views of significant heritage assets are present within the footprint of the Proposed Development Site, and limited heritage interest is represented by isolated, discrete features.

17A.8.10 At the eastern side of Seaton Carew Road, brine fields lie to the south of Greatham Creek, within an area of partially reclaimed salt marsh. Within the part of the Proposed Development Site that falls within this area, the embankment of the Greatham Creek Branch of the North Eastern Railway, built after 1897 and dismantled by 1946, survives as an upstanding earthwork. Located within shallow excavations made into the embankment, two Second World War concrete emplacements survive at NZ 50937 24965 and NZ 50940 25021.

17A.8.11 The southern-most structure is described in the Defence of Britain (DOB) archived database as a section post (DOB Ref. S0006050). A large, square, concrete structure, open at the centre, with embrasures in each face. There are eight embrasures in its east face, and presumably a similar number in the other faces, making a total of 36 embrasures (Plate 17A-9).



Plate 17A-9: Second World War section post within former railway embankment, facing south-west

17A.8.12 To the north of the section post is a small, square concrete pillbox (DOB Ref. S0006049), with a doorway and embrasure on its west side, a large embrasure in the north face and a small embrasure in its east face (Plate 17A-10, Plate 17A-11).



Plate 17A-10: Small, square pillbox at northern extent of former railway embankment, facing north-east



Plate 17A-11: View of both emplacements, facing west

17A.8.13 A number of other extant features of Second World War coastal defence survive in the surrounding area but could not be accessed due to access constraints. These include a series of emplacement features survive along the south side of Greatham Creek, and along a former coastal embankment extending south from the mouth of the Greatham Creek between NZ 51685 25492 and NZ 51550 23722. This former coastal defence embankment lies in line with the former railway embankment, suggesting the fortification of both was intended to take advantage of these fortuitously placed parallel earthworks, forming a layered line of defence with flat, open ground between.

Proposed Development Site South of the Tees

17A.8.14 South of the Tees, the site visit included the area surrounding the northern side of the existing Redcar Bulk Terminal, in the area to the east and south-east of Bran Sands. The overwhelming majority of this area is marked on historic Ordnance Survey mapping as coastal sands throughout the 19th century, with greater and greater areas being reclaimed for industrial use throughout the 20th century. The area around, and within, the current site of Redcar Bulk Terminal can be clearly seen to have been reclaimed through the dumping of infill material to raise its height above sea level. For much of the site area, this material is finished in a consistent, man-made slope at its north-western extent (Plate 17A-12), where it meets the current extent of Bran Sands at the margin of the river estuary.



Plate 17A-12: View south-west along the edge of Bran Sands, showing battered edge of made ground underlying Redcar Bulk Terminal

17A.8.15 However, where it has been eroded it is possible to note the make-up of the ground is an imported material (Plate 17A-13). The thickness of this imported material appears to be variable, between 4 and 8 m. No historic features were notable within this area of made-ground, or within the existing Redcar Bulk Terminal site, although various historic landscape features, including Second World War coastal defence emplacements, are known to exist within Coatham Dunes to the east and north-east.



Plate 17A-13: Eroded edge of made ground at Bran Sands. Note clearly imported material raising height of the area of former coastal sands

Coatham Conservation Area

17A.8.16 Coatham Conservation Area comprises the single-row settlement of East Coatham and the better-preserved parts of the mid-to late Victorian planned settlement and retains a layout which reflects the settlement's medieval origins. The buildings in the conservation area principally comprise two storey Victorian and Edwardian houses with bay windows, boundary walls and gate piers which are a prominent characteristic of the streetscape. Due to the built-up nature of the area, there are limited views out of the conservation area, but views from its western edge, framed by the linear arrangement of the buildings along York Road, do extend as far as the Proposed Development Site where the sight of industrial buildings form a backstop to views out.

Middlesbrough Transporter Bridge

17A.8.17 It was noted during the site visit that the Grade II* listed Middlesbrough Transporter Bridge (NHLE 1139267) can be seen in extensive views across parts of the Proposed Development Site and Study Area, particularly from areas north of the River Tees.

17A.8.18 These extensive views are facilitated by the low level of development around Saltholme, in an area bounded at its eastern side by Seaton Carew Road, and at its west by Cowpen Bewley Road and the A1046. Here, relatively undeveloped land extends close to Port Clarence, opening longer views of the bridge in its context, which are rarely possible from elsewhere in the Tees valley. The most significant of these views is that gained from south of Cowpen Bewley, where the bridge can be

seen in profile, against a backdrop of the Cleveland Hills and the landmark silhouette of Roseberry Topping (Plate 17A-14); features that are strongly associated with the character and history of Teesside. Views of the bridge from areas closer to Seaton Carew Road are less significant, showing the bridge end-on, and often surrounded by a wire-scape of overhead power lines.



Plate 17A-14: View along Cowpen Bewley Road facing south east, from just south of Cowpen Bewley, showing an uninterrupted view of Middlesbrough Transporter Bridge with Roseberry Topping (to the left) and the Cleveland Hills as a backstop

17A.9 Assessment of Potential

17A.9.1 The following provides a summary of the archaeological potential of each part of the Proposed Development Site based on the information collated for this DBA.

Main Site

17A.9.2 Historic map evidence shows the presence of 19th century tramways within the footprint of the Main Site. Access to this area for the site walkover has not been granted but, recognising the history of development at the Main Site, it is presumed that these features are no longer extant and exist only as records. There remains a potential for more recent industrial features to be present within the Main Site that may be of local or potential regional industrial heritage interest, but this potential is assessed to be low.

17A.9.3 The Main Site Geotechnical information for the Main Site confirms the depths of extensive made ground deposits across the site, sealing post-glacial sands and glacial till. Historically the Main Site was located in Bran Sands and the environment would not have been conducive to long-term or permanent settlement, but its resource-rich

environment would have provided excellent hunting grounds for earlier communities. There is a low potential for artefacts associated with temporary activities to be present within the Main Site, embedded within modern made ground, but it is assessed there is negligible potential for settlement archaeology to be present.

Natural Gas Connection Corridor

17A.9.4 This part of the Proposed Development Site has seen significant levels of development and ground disturbance since the late-19th century. The only record on the HER within the corridor comprises the site of the 19th century Normanby Jetty to South Gare reclamation wall (5602). The reclamation wall is no longer extant.

17A.9.5 The history of development has likely removed features relating to 19th century industrial structures. This part of the site has been occupied most recently by ancillary structures associated with the Redcar Blast Furnace, which are being demolished and as part of a separate scheme and were included in a programme of building recording. The potential for features of heritage interest to be present within the site is assessed to be negligible.

Hydrogen Pipeline Corridor

17A.9.6 Romano-British settlement archaeology has been recorded within the Hydrogen Pipeline Corridor at the site of an operational energy plant, Saltholme Statera, to the west of the A1185. It is possible that further settlement-related remains, or features relating to activity in the periphery of the settlement, are present within Hydrogen Pipeline Corridor and the potential is assessed to be medium to high.

17A.9.7 Late-19th century historic maps show the location of Redcar Iron Works (5711) and Coatham Iron Works (5709) within the northern part of the Hydrogen Pipeline Corridor. Site access has not been granted to confirm the presence or absence of remains associated with these assets, but the site walkover will be completed for the ES. Historical map evidence shows that the site of Coatham Iron Works has been developed extensively throughout the 20th century, with iterations of different industrial structures occupying the site of the former works. Aerial imagery, including LiDAR, shows no evidence of potential features associated with the former works and it is assumed that subsequent development shave removed all trace of the asset.

17A.9.8 Aerial imagery (Plate 17A-15) and LiDAR (Plate 17A-16) of the area of Redcar Iron Works shows the remains of sidings and also the remains of structures which may represent furnace bases. The degree of preservation would need to be confirmed by a walkover survey but, based on the desk-based evidence, there is a presumption that remains do exist and therefore the potential is assessed as high. The preservation level of the remains would influence their heritage value, which derives from their archaeological and historical interests, but it is assumed they would be at least of local importance.

17A.9.9 At the eastern edge of the Hydrogen Pipeline Corridor and to the south-west of Coatham Marsh is a series of medieval salt mound features that relate to salt production. The extraction of salt from seawater was a major industry in the medieval period and numerous salt mounds, identified as earthworks, have been recorded from historical maps and aerial photographs around Coatham Marsh. The salterns

have the potential to be of regional importance, and therefore medium heritage value, deriving from their archaeological and historical interest associated with salt production. However, due to the history of development and ground disturbance in this area, there is unlikely to be any subsurface remains associated with historical salt production. The potential for features to be present associated with medieval salt production is assessed to be negligible.



Plate 17A-15: Google Maps © 2023 showing the curving lines of former railway sidings and possible furnace bases circled

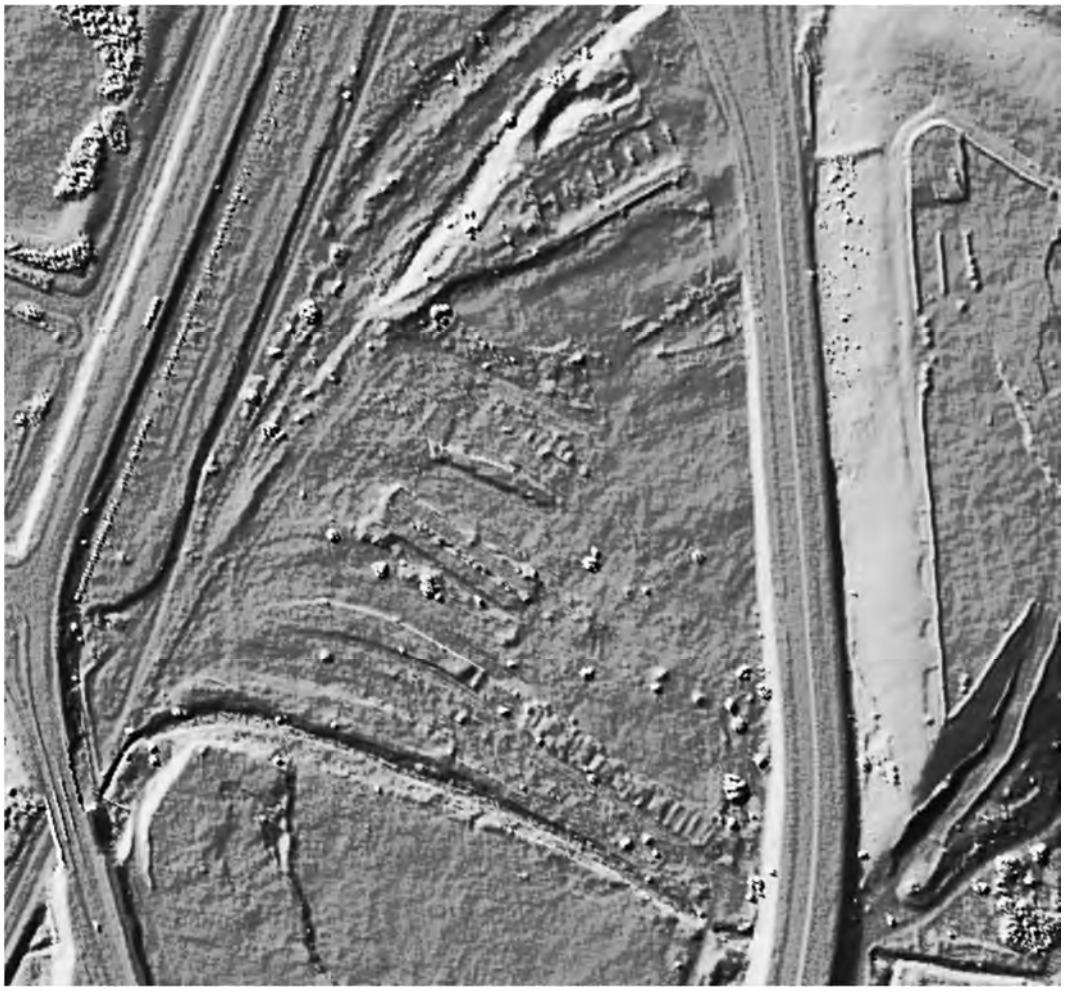

Plate 17A-16: LiDAR imagery showing extent of railway sidings and structural foundation remains of Redcar Iron Works

Electrical Connection Corridor

17A.9.10 The known heritage assets within the Electrical Connection Corridor relate to the sites of former industrial features which are no longer extant, or assets that still exist, such as Grangetown signal box (4782). The majority of this part of the site is occupied by the A1085 carriageway and railway sidings. The potential for features of heritage interest to be present within the site is assessed to be negligible.

Water Connection Corridor

17A.9.11 The site of the deserted medieval village of West Coatham (355) is located within the Water Connection Corridor. Earthworks associated with the village are visible on the OS map dated 1884, but the site has been developed extensively through the late-19th and 20th centuries and surface features are no longer present. However, depending on the extent of ground disturbance, there is a potential for deep features to be present such as wells or waterholes. The potential is therefore assessed as low.

17A.10 Next Steps

17A.10.1 The following actions will be carried out to finalise the baseline conditions for heritage assets and inform the assessment to be presented within the ES:

- additional walkover surveys of the Proposed Development Site;
- geophysical survey of suitable areas where archaeological potential has been identified, specifically the fields adjacent to the Romano-British settlement at the energy plant, Saltholme Statera, to the west of the A1185, and the fields to the north and south of Cowpen Bewley (as outlined in Chapter 17: Cultural Heritage, PEI Report, Volume I);
- stakeholder engagement will continue with archaeological advisors and conservation officers as the Proposed Development progresses to discuss the assessment findings and agree a proportionate scope of mitigation.

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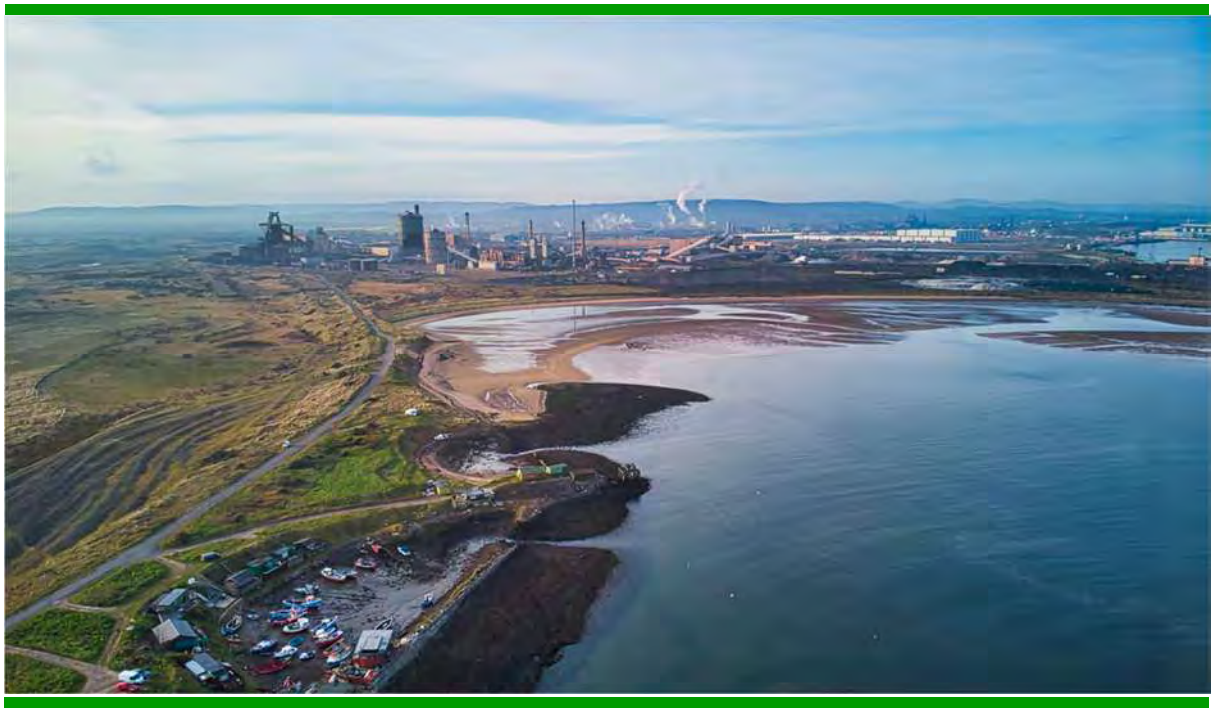
Appendix 19A: Climate Change Risk Register

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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19A.0 CLIMATE CHANGE RISK REGISTER

Table 19A-1: Climate Change Risk Register

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
CONSTRUCTION PHASE							
Increase in annual Temperature	See – increase in summer temperature	All	Refer to section - Increase in Summer Temperature	Very Unlikely	Very Low	Negligible	None
Increase in Summer Temperature	Overheating of electrical equipment	Construction plant and vehicles	Will be detailed in the CEMP. The contractor will monitor weather forecasts and plan works accordingly, protecting workers and resources from any extreme weather conditions	Very Unlikely	Very Low	Negligible	None
	Increased heat stress/heat exhaustion for workers. Poorer air	Staff, visitors on-site	As above	Unlikely	Medium	Minor	None

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
	quality from dust, wildfires. Commuting issues from wildfires.						
Increase in winter temperature	None considered	All	None considered	Very Unlikely	Very Low	Negligible	None
Increase in annual rainfall	None considered	All	None considered	Very Unlikely	Very Low	Negligible	None
Decrease in summer rainfall	None considered	All	None considered	Very Unlikely	Very Low	Negligible	None
Increase in winter rainfall	Viability of and access to sites (such as heavy rain resulting in surface water flooding of local roads, sources of power supply or inundation of sites)	Assets, facilities, roads	Will be detailed in CEMP. Measures will likely include: - Storage of topsoil and other construction materials stored outside of the 1 in 100-year floodplain to protect materials from high rainfall and flooding events	Possible	Medium	Moderate	None

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
			- Suitable storage and bunding of pollutants to protect from high rainfall events. This will be further supported by the Water Management Plan and a Site Emergency Response Plan - Laydown and welfare areas will be laid with permeable membranes to protect the Site from high rainfall and flooding events - The Contractor will monitor weather forecasts and receive Environment Agency flood alerts and plan works accordingly, protecting works and resources from any extreme weather conditions (storms, flooding)				

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
Increase in heatwaves	See – increase in summer temperatures	Assets, facilities, roads	Refer to section - Increase in Summer Temperatures	Unlikely	Low	Minor	None
	See – increase in summer temperatures	Staff, visitors on-site	Refer to section - Increase in Summer Temperatures	Unlikely	Medium	Minor	None
Increase in severity and frequency of droughts	None considered	All	None considered	Very Unlikely	Very Low	Negligible	None
Increase in storm intensity	Damage to structures/equipment resulting in repair costs, reduced functionality and/or unacceptable safety risks	Assets, facilities, roads	Will be detailed in CEMP. The Contractor will monitor weather forecasts and plan works accordingly, protecting workers and resources from any extreme weather conditions	Unlikely	Low	Minor	None
Sea level rise	See – Increase to winter rainfall	Assets, facilities, roads	Refer to section - Increase to Winter Rainfall	Very Unlikely	Medium	Negligible	None

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
OPERATIONAL PHASE							
Increase in annual temperature	See – Increase in summer temperature	All	Refer to section - Increase in Summer Temperature	Very Unlikely	Very Low	Negligible	None
Increase in summer temperature	Overheating of electrical equipment, heat damage, deformation, cracking and thermal expansion of building surfaces and pavements	Assets, facilities, roads	- Cabling will be buried underground, insulating against overheating during heatwaves - All buildings will be designed to UK standards and specifications	Possible	Medium	Moderate	None
	Impacts on the thermal comfort of building users. Increase in ambient temperature of buildings, leading to higher air conditioning requirements. Poorer air quality from dust, wildfires. Commuting issues resulting from wildfires	Staff, visitors on-site	- Detailed design of air conditioning units for offices would include an allowance for future rise in ambient temperature	Unlikely	Medium	Minor	None

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
			- All buildings would be designed to UK standards and specifications.				
	Reduced efficiency of Production Facility and operational plant.	Function of facility	The power plant is designed to operate over a large range of ambient conditions and the plant efficiency difference is less than 1% in all temperatures. Temperature change unlikely to have noticeable impact	Possible	Low	Minor	None
Increase in winter temperature	None considered	All	None considered	Very Unlikely	Very Low	Negligible	None
Increase in annual rainfall	None considered	All	None considered	Very Unlikely	Very Low	Negligible	None

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
Decrease in summer rainfall	- Water shortages - Drying out of pavement structures - Deterioration of structures or foundations due to decrease in soil moisture levels - Insufficient water for plant cooling	Assets, facilities, roads	- Alternative water sources in times of drought, reducing chances of shortages for plant function - Integration of water circuits – steam can be extracted, condensed and re-used - Buildings would utilise water efficient fixtures - All buildings would be designed to UK standards and specifications	Possible	Medium	Moderate	None
Increase to winter rainfall	- Surface water flooding and standing waters - Deterioration of structures or foundations due to increase in soil moisture levels	Built terrestrial assets, staff facilities and access routes to sites.	- Suitable storage and bunding of pollutants to protect from high rainfall events. Supported by Site Emergency Response Plan	Unlikely	Medium	Minor	None

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
	- Damage to building surfaces/ exposed utilities from increased drying/wetting and increased frost penetration - Damage to infrastructure through coastal erosion, storm surge and coastal destabilisation	Staff, contractors and visitors	- Installation of a suitable sustainable surface water drainage network and management system (SuDS) to protect to Site from high rainfall events. Supported by a Surface Water Maintenance and Management Plan - Flood Resistance and Resilience Measures to be implemented scenarios including increases in extreme rainfall, flood flow and flash flooding - All buildings would be designed to UK standards and specifications				

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
Increase in heatwaves	See - increase in summer temperature	Assets, facilities, roads	Refer to section - Increase in Summer Temperature	Unlikely	Medium	Minor	None
	See - increase in summer temperature	Staff, visitors on-site	Refer to section - Increase in Summer Temperature	Unlikely	Medium	Minor	None
	See - increase in summer temperature	Function of facility	Refer to section - Increase in Summer Temperature	Possible	Low	Minor	None
Increase in droughts	See - decrease in summer rainfall	All	Refer to section - Decrease in Summer Rainfall	Very Unlikely	Very Low	Negligible	None
Increase in storm intensity	Physical damage to marine assets	Marine assets	All infrastructure will be designed to UK standards and specifications including contingency in design for extreme water levels and waves	Very Unlikely	Very High	Negligible	None
	Damage to structures/equipment and resulting in repairs costs,	Assets, facilities, roads	The Flood Risk Assessment will consider climate change	Very Unlikely	Very High	Negligible	None

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
	reduced functionality and/or unacceptable safety risks		scenarios including increases in extreme rainfall, flood flow and flash flooding - All buildings will be designed to UK standards and specifications				
Sea level rise	See – increase to winter rainfall	Assets, facilities, roads, Staff, contractors and visitors	Refer to section - Increase to Winter Rainfall	Unlikely	Medium	Minor	None
	Physical damage to or loss of function in marine assets	Marine assets	- All infrastructure will be designed to UK standards and specifications, including contingency in design for extreme water levels and waves	Very Unlikely	Very High	Negligible	None

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
DECOMMISSIONING PHASE							
Increase in annual temperature	See – increase in summer temperature	All	Refer to section - Increase in Summer Temperature	Very Unlikely	Very Low	Negligible	None
Increase in summer temperature	Overheating of electrical equipment	Deco. Plant and equipment	Will be detailed in the DEMP	Very Unlikely	Very Low	Negligible	None
Increase in winter temperature	None considered	All	None considered	Very Unlikely	Very Low	Negligible	None
Increase in annual rainfall	See - increase in winter rainfall	All	Refer to section - Increase in Winter Rainfall	Very Unlikely	Very Low	Negligible	None
Decrease in summer rainfall	None considered	All	None considered	Very Unlikely	Very Low	Negligible	None
Increase to winter rainfall	Viability of and access to sites (such as heavy rain resulting in surface water flooding of local roads,	Assets, facilities, roads	Will be detailed in DEMP	Possible	Medium	Moderate	None

CLIMATE HAZARD TYPE	DESCRIPTION OF POTENTIAL IMPACT	RECEPTORS	PLANNED CONTROLS	LIKELIHOOD OF IMPACT OCCURRING	CONSEQUENCE OF IMPACT OCCURRING	RESILIENCE RISK LEVEL	ADDITIONAL MITIGATION MEASURES REQUIRED
	sources of power supply or inundation of sties).						
Increase to heat waves	See – increase in summer temperature	Deco. Plant and equipment	Refer to section - Increase in Summer Temperature	Very Unlikely	Very Low	Negligible	None
Increase in droughts	None considered	All	None considered	Very Unlikely	Very Low	Negligible	None
Increase in storm intensity	Damage to structures/equipment, resulting in repair costs, reduced functionality and/or unacceptable safety risks	Assets, facilities, roads	Will be detailed in DEMP	Unlikely	Low	Minor	None
Sea level rise	See – increase in winter rainfall	Assets, facilities, roads	Refer to section - Increase in Winter Rainfall	Unlikely	Medium	Minor	None

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Appendix 20A: LONG LIST OF MAJOR ACCIDENTS & DISASTERS RISK EVENTS

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



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20A.0 LONG LIST OF MAJOR ACCIDENTS & DISASTERS (MA&D) RISK EVENTS

20A.1 Introduction

20A.1.1 Taking into consideration baseline conditions, the identified construction, operational (including maintenance) and decommissioning activities which will be carried out as part of the Proposed Development, and the hazardous substances likely to be present, a long list of potential MA&D Risk Events has been prepared and is presented in Table 20A-1. This table was initially developed at the Environmental Impact Assessment (EIA) Scoping stage. It has been reviewed and updated as applicable for this Preliminary Environmental Information (PEI) Report. It now includes commentary why the Risk Event should or should not be considered further within the preliminary assessment.

Table 20A-1: Long List of MA&D Risk Events

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
Construction Hazards		
Ground instability	Y	Construction activity has the potential to cause instability and vibration resulting in ground instability/collapse/ settlement which has the potential to cause harm to workers.
Structural collapse/ accidental impact/	Y	Construction hazards can include events which have the potential for significant harm, up to and including fatal injuries to workers. These hazards include the collapse of new and existing buildings, structures and excavations. There are also hazards associated with construction traffic movements on site.
Utility strike/ unexploded ordnance (UXO) strike	Y	Construction hazards can include events which have the potential for significant harm, including fatal injuries to workers. These include contact with high voltage (HV) transmission cables (overhead and buried), contact with underground utility services including high pressure gas pipelines and UXO.

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
Release of existing ground contamination	Y	Preparatory work during construction could encounter significant quantities of contaminated ground due to the historic industrial use of the site. If this material is accidentally released to the environment, there is the potential for harm due to the proximity of the Proposed Development Site to protected sites.
Release of diesel	N	An accidental release of diesel used as fuel would be retained on site due to the small quantities present. If the release contacts with a source of ignition, the resulting fire would be relatively minor and have a low potential for serious harm.
Release of liquid concrete	N	An accidental release of liquid concrete would be contained for recovery or disposal and is unlikely to reach environmental receptors.
Operational Process Hazards		
Fire	Y	The accidental release of flammable substances could result in a fire if immediately ignited. This could result in significant harm to people onsite and potentially offsite. The presence of O_2 on site increases the risk of an on-site fire event and has the potential to intensify a fire event.
Explosion	Y	The accidental release of flammable substances could result in an explosion if the gas accumulates prior to ignition. This could result in significant harm to people onsite and potentially offsite. The presence of O_2 on site increases the risk of an on-site explosion event and has the potential to intensify an explosion event.

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
Toxic gas release	Y	Depending on concentration, the gases present at the Proposed Development (including syngas and Carbon dioxide (CO_2) have the potential for toxic effects to people. Syngas containing Carbon Monoxide (CO) is classified as a toxic gas. A major accidental release of syngas could result in significant harm to people onsite however it is unlikely that this event could have an impact at offsite receptors due to rapid dispersion.
Asphyxiant gas release	Y	At high concentrations, CO_2 can cause harm to people via asphyxiation. A major accidental release of CO_2 could result in significant harm to people on site, however, it is unlikely that this could have an impact at offsite receptors.
Environmentally harmful liquid release	N	An accidental release of aqueous ammonia or diesel which reached environmental receptors could result in harm. However, the quantity present on site will relatively minor and the impact would not reach the criteria for a MA&D.
Environmentally harmful solid release	N	An accidental release of toxic catalyst material could result in harm to the environmental or to people. As solid materials the source-receptor pathway for these materials is limited and would likely only occur as a corollary to another MA&D event involving catastrophic failure due to the multiple levels of containment of these substances.
Domino event - Industrial	Y	A major incident occurring at a site which is part of the Teesside cluster of major hazard sites could escalate and cause an impact at the Production Facility. Conversely, a major incident at the Proposed Development Site could have an impact on neighbouring facilities.

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
Nuclear accident	N	The Hartlepool Nuclear Power Station is located approximately 2 km away from the proposed development on the other side of the river Tees. This site has robust measures in place to prevent major accidents. The Proposed Development could fall within the nuclear fallout evacuation zone if a serious nuclear incident were to occur at the power station. This could potentially result in a halt of all operations at the Proposed Development; however, the design will include safety measures in the event of an extended shutdown. It is unlikely for any thermal radiation or explosion overpressure, generated by an event at the power station, to have a significant effect on the Proposed Development due to the distance. As such, this risk event is not considered further.
Operational Transportation Hazards		
Road traffic accident (dangerous goods)	N	The primary raw materials used at the Proposed Development are gaseous substances, delivered via pipeline. Ancillary materials and substances used in smaller quantities to support production will, however, be transported to the Main Site via the road network. Collisions/accidents involving road tankers delivering materials to the Main Site could result in a loss of containment of these substances which include diesel and aqueous ammonia. The quantity of these substances will typically be in order of a few tonnes and transport will be controlled via regulations for the carriage of dangerous goods. If a release occurred on the public highway, an emergency response plan as required by the regulations will limit the potential harm therefore unlikely to result in an accident with the potential for MA&D criteria.

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
		An assessment of likely significant effects arising from the transportation of hazardous loads will be carried out in the ES as described in Chapter 15: Traffic and Transport (PEI Report, Volume I).
Marine accident	N	The primary process materials for the Proposed Development will be transported to and from the Main Site via pipeline therefore marine transport is not applicable.
Other Industrial Hazards		
Electrical power supply failure	N	During operation, electrical failure or power loss can be caused by supply issues or disruption to infrastructure. Process equipment and instrumentation will be designed to fail to a safe condition and the project will install back-up power generation and uninterruptable power supplies (UPS). In an emergency event where all power supplies are lost, a flare will be provided for the safe disposal of gas.
System/utilities failures	N	Disruption to water supplies and effluent disposal may have an impact on process operations, however, are unlikely to cause harm to the environment as this will be considered within the design of the facility and the appropriate safety systems installed. The engineering design of the Proposed Development will also take into consideration the potential for the Proposed Development to have an impact on other utility users within the area. The appropriate protective systems such as electrical switching and breaking equipment will be installed.

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
Meteorological Hazards		
High windspeed	N	There is a low probability of a hurricane force wind event occurring at the Production Facility. However, major storms and gales could result in damage due to infrastructure. Storms are considered during the engineering design of buildings and structures and the appropriate engineering standards employed.
Low temperatures and heavy snow	N	The climate in the North East of England is typically mild. In the event of extreme, prolonged low temperatures and snowfall, there is the potential for snow loading on buildings and freezing liquids in pipework. Operations are unlikely to be interrupted, however, as these potential issues will be considered within the engineering design and appropriate insulation used.
High temperatures/ heatwave	N	In the event of a prolonged period of hot weather there is the potential for an impact to temperature sensitive equipment such as process cooling systems and electrical switchgear. The impact of climate change could increase potential for high temperatures. This could cause an operational upset but is unlikely to cause harm to people or the environment. These issues will be incorporated within the engineering design.
Drought	N	The Proposed Development is not expected to be vulnerable to drought conditions, as there is a low risk of interruptions to the supplies of water in this location which is near the River Tees and North Sea.

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
Electrical storms	N	Lightning could result in damage to the Proposed Development as a result of a direct strike to buildings or structures. There is also the potential for lightning to act as a source of ignition if damage occurred during the storm causing a loss of containment of flammable gases. Design engineering standards including British Standards will be incorporated by the Project for the provision of lighting protection systems on buildings and structures are well established.
Geophysical Hazards		
Earthquake	N	There is a low record of seismic activity observed in the location of the Proposed Development and severe damage as a result of an earthquake is unlikely. Protective measures for expected stresses and loadings will be incorporated within the civil and structural engineering design of the Proposed Development.
Ground stability	N	Groundworks carried out prior to construction will provide a stable site at the Main Site and within pipeline connection corridors prior to construction. The Teesside area has a low risk of landslides, ground collapse, ground compression, or sinkholes associated with site geology. Civil and structural engineering design will be carried out in accordance with industry standards.
Hydrological Hazards		
Coastal flood	Y	The Main Site is located by the North Sea coast within Flood Zone 1 (defined as having a 'low risk' of flooding from fluvial or tidal sources). Sections of the Connection Corridors are located within Flood Zone 2 and Flood Zone 3. This risk is assessed within Appendix 9A: Flood Risk Assessment

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
		(PEI Report, Volume III) and is considered a credible MA&D scenario.
Fluvial flood	Y	The Main Site is located by the River Tees coast within Flood Zone 1 (defined as having a 'low risk' of flooding from fluvial or tidal sources). Sections of the Connection Corridors are located within Flood Zone 2 and Flood Zone 3. This risk is assessed within Appendix 9A: Flood Risk Assessment (PEI Report, Volume III) and is considered a credible MA&D scenario.
Pluvial flood	Y	The Main Site and the associated connection corridors are generally at very low risk (<0.1% AEP event) of flooding from surface water. There are isolated areas of high, medium and low flood risk. This risk is assessed within Appendix 9A: Flood Risk Assessment (PEI Report, Volume III) and is considered a credible MA&D scenario.
Groundwater flood	Y	The groundwater vulnerability map places the area of the site at Medium-High risk (75% or greater chance of groundwater emergence). This risk is assessed within Appendix 9A: Flood Risk Assessment (PEI Report, Volume III) and is considered a credible MA&D scenario.
Other Natural Hazards		
Poor air quality	N	Pollution episodes are known to occur in the UK, but the Proposed Development is not expected to be particularly vulnerable to this hazard. The Proposed Development will not contribute significantly to road transport pollution in the area. Air intakes for combustion equipment will be fitted with the appropriate filtration systems to prevent damage from poor air quality. Emissions from combustion equipment will be controlled and regulated in accordance with an environmental permit.

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
		No MA&D scenarios have been identified. An assessment of likely significant effects arising from the transportation of hazardous loads will be carried out in the ES as described in Chapter 8: Air Quality (PEI Report, Volume I).
Wildfires	N	Severe wildfires are infrequent in the UK and the Proposed Development is not located in an environment particularly vulnerable to wildfire, being primarily urban/industrial.
Societal Hazards		
Malicious attacks	N	Malicious attack could include intentional violence to people, arson or other methods of destruction of property, cyber-attacks, or chemical, biological, or nuclear attacks by terrorists or other actors. These events have been known to occur at infrastructure sites in the UK. Software security will be incorporated within the process control systems and physical security measures such as fencing will be installed. As a supplier of energy, the Proposed Development will include appropriate measures as a matter of national security.
Decommissioning Hazards		
Fire/explosion	Y	A failure to de-inventory process systems which leads to the accidental release of flammable substances could result in a fire and/or explosion. This could cause significant harm to people on site. This Risk Event has occurred historically and although incidences are rare, this is considered a credible MA&D scenario.

RISK EVENT	CONSIDERED FURTHER?	COMMENTARY
Environmentally harmful solid release	Y	A failure to de-inventory process systems which leads to human exposure to toxic catalyst material. This could cause significant harm to people on site. This Risk Event has occurred historically and although incidences are rare, this is considered a credible MA&D scenario.

20A.1.2 The following risk events during Proposed Development construction have been identified as requiring further assessment:

- ground instability;
- structural collapse/accidental impact;
- utility (pipeline or electrical cable) strike/UXO impact; and
- release of ground contamination.

20A.1.3 The following risk events during Proposed Development operation have been identified for further analysis.

- fire;
- explosion;
- toxic gas release;
- asphyxiant gas release;
- domino effect; and
- flooding.

20A.1.4 The following risk event during Proposed Development decommissioning have been identified as requiring further assessment:

- fire and/or explosion.

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1.0 NON-TECHNICAL SUMMARY

1.1 Introduction

1.1.1 This is a Non-Technical Summary (NTS) of the Preliminary Environmental Information (PEI) Report that has been prepared in support of a future Development Consent Order (DCO) Application for the construction, operation (including maintenance) and decommissioning of the H2Teesside project (the Proposed Development). The Proposed Development comprises a Hydrogen Production Facility (the Production Facility) with associated works and hydrogen transport pipeline network in Teesside.

1.1.2 H2Teesside will be one of the UK's first commercial-scale (blue) hydrogen production facilities, intended to produce hydrogen as a low-carbon fuel source for both nearby industrial installations via an integrated pipeline network and for export to third-party users. The Production Facility will also also be a Carbon Capture and Storage (CCS) project with a connection to the Northern Endurance Partnership (NEP) offshore storage facility, thereby reducing carbon emissions from the use of natural gas in the production of hydrogen. H2Teesside will therefore make a significant contribution to the UK reaching its net zero greenhouse gas emissions target by 2050.

1.1.3 The Proposed Development comprises:

- an approximately 1.2 Gigawatt thermal (GWth) blue hydrogen production facility (including on-site hydrogen storage);
- carbon export, natural gas, water and wastewater, electricity, oxygen and nitrogen connections; and
- hydrogen pipeline connection to export hydrogen to a wider network of future users.

1.1.4 The NEP high-pressure compression equipment on the adjacent Net Zero Teesside (NZT) site and the associated high-pressure CO_2 Export transport pipeline and offshore Endurance CO_2 store do not form part of the Proposed Development and are being consented separately.

1.1.5 While the Proposed Development is designed for the future distribution and use of hydrogen as an energy/fuel source for third-party industrial users on Teesside, the use of this hydrogen would not form part of the DCO Application and is not considered in this PEI Report, save for considering greenhouse gas (GHG) emissions savings arising from the use of fuel provided by the Proposed Development compared to the continued use of natural gas. Third-party connections to the wider hydrogen distribution network would be the subject of separate consent applications.

1.1.6 The Proposed Development Site covers a wide area located within the administrative boundaries of Redcar and Cleveland Borough Council (RCBC) to the south of the River Tees (South Bank and Dormanstown wards) and in both Stockton-on-Tees Borough Council (STBC) and Hartlepool Borough Council (HBC) to the north of the River Tees (Billingham South ward and Fens & Greatham and Seaton wards, respectively). A

portion of the Proposed Development Site south of the River Tees lies within the area covered by the South Tees Development Corporation (STDC) masterplan site within the Teesworks industrial zone.

1.1.7 The final Proposed Development Site boundary for the purposes of the DCO Application (including land for the connection corridors and temporary land required during construction), will be refined through ongoing studies and taking into account responses to the statutory consultation.

1.1.8 The location of the Proposed Development Site is shown in Plate 1.

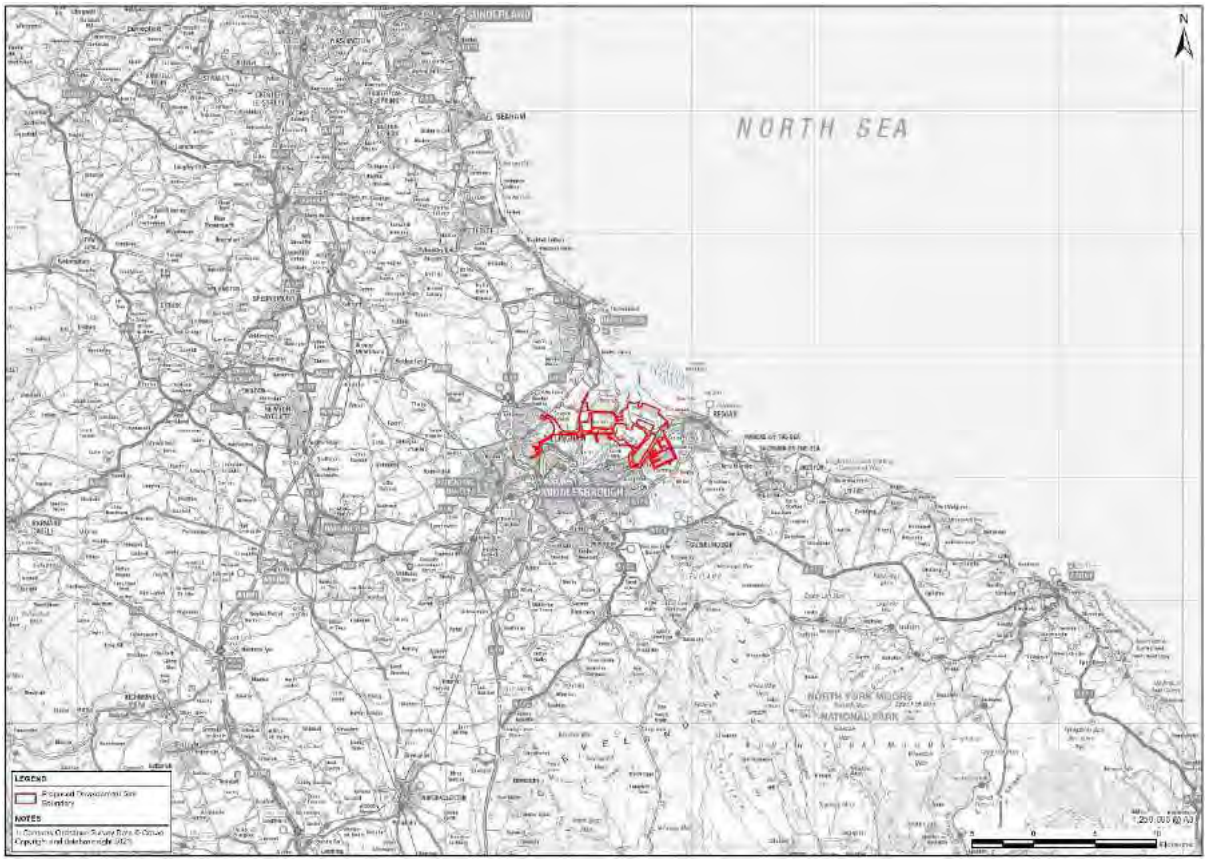


Plate 1: Proposed Development Site Location

1.1.9 Further information on the Proposed Development can be found in Chapter 4: Proposed Development (PEI Report, Volume I) and on the project website[1].

1.1.10 The PEI Report has been prepared to comply with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (referred to as 'the EIA Regulations'). Environmental Impact Assessment (EIA) is a systematic process used to predict the negative (adverse) or positive (beneficial) effects of a proposed development.

1.1.11 The PEI Report presents:

- a description of the Proposed Development, including information on the Proposed Development Site and its design, size and other relevant features;

[1] https://www.bp.com/en_gb/united-kingdom/home/where-we-operate/reimagining-teesside/h2teesside/about-h2teesside.html

- information on the reasonable alternative sites, technologies and layouts that have been considered and the main reasons for the options chosen;
- an assessment of the likely impacts and significant environmental effects of the construction, operation (including maintenance) and decommissioning of the Proposed Development based on the preliminary environmental information available at the time of writing; and
- measures that are proposed to avoid, prevent, or reduce, or if possible, offset, such likely significant adverse effects.

1.1.12 The purpose of this NTS is to describe the Proposed Development and provide a summary in non-technical language of the key findings of the PEI Report.

1.1.13 The PEI Report is to provide suitable information to statutory consultees at an appropriate stage of the design, to allow for feedback or concerns to be addressed and the Proposed Development design amended as necessary.

1.1.14 An Environmental Statement (ES) would be submitted with the DCO Application for the Proposed Development. The ES would present full details of the environmental effects associated with the Proposed Development. The PEI informs and is structured similarly to the ES but is not intended to be a draft ES or equivalent.

1.2 The Applicant

1.2.1 H2 Teesside Ltd, a bp company, is 'the Applicant' for the Proposed Development.

1.2.2 H2 Teesside Ltd is to be the lead developer and operator for the Hydrogen Production Facility and hydrogen pipelines which would support the decarbonisation of natural gas used for industrial applications in Teesside.

1.2.3 The Proposed Development will export carbon (as CO_2) via the CO_2 Export Corridor NEP facilities on the adjacent NZT site. The captured CO_2 would be compressed to high pressure by NEP to "dense phase" for transportation by a new pipeline to the NEP Endurance store beneath the North Sea. The onshore infrastructure required for compression and export (the high-pressure compression plant and CO_2 export pipeline) is subject to a separate consent, through the NZT DCO Project (for which a decision on whether a DCO has been granted is expected in the second half of 2023). The conditioned and compressed CO_2 would be transported offshore by NEP for storage at the Endurance underground store beneath the North Sea located approximately 145 km to the east/south-east of the Proposed Development Site. Geological storage and offshore CO_2 transportation would be managed and operated by NEP and would also be subject to separate consents.

1.3 The Development Consent Order

1.3.1 The Applicant intends to submit an application to the Secretary of State (SoS) for Energy Security and Net Zero under Section 37 of the Planning Act 2008 (the Planning Act), seeking a DCO for the Proposed Development. A DCO is required for the Proposed Development as the SoS has made a direction under Section 35 of the

Planning Act to designate it as a project which must be consented via a DCO. It is currently anticipated that the DCO Application will be submitted in 2024.

1.3.2 Subject to it being granted by the SoS, the DCO will provide the necessary authorisations and consents for the construction, operation (including maintenance) and decommissioning of the Proposed Development. If granted the DCO would contain a number of 'Requirements' to secure mitigation measures and govern how the construction and operation of the Proposed Development can proceed - 'Requirements' are referred to at various points in this NTS.

2.0 ASSESSMENT METHODOLOGY

2.1 EIA Methodology

2.1.1 The assessment presented in the PEI Report follows a standard EIA methodology, which is summarised below.

2.1.2 The objective of the EIA process is to determine the changes (referred to as 'impacts') that may occur to the environment as a result of the Proposed Development. Example impacts include increases in traffic, increased noise, or a change in the composition of the air around the Proposed Development. The changes are compared to 'baseline' environmental conditions. This baseline is defined as conditions which are either current without the Proposed Development (the existing baseline) or would be expected, based on suitable estimates, to occur in future without the Proposed Development taking place (the future baseline). The EIA process identifies potentially sensitive 'receptors' (and resources) that may be affected by these changes, such as local residents, protected sites, local flora and fauna, water, land and defines the extent to which these receptors may be affected by the predicated changes. Where the extent of these effects exceeds a certain threshold, defined by the amount of change and the sensitivity of a given receptor to change, the receptor is predicted to experience a 'significant effect'.

2.1.3 Where possible, the EIA uses standard methodologies, based on legislation, defined standards, and accepted industry criteria. These are set out in detail in each technical chapter of the PEI Report (Volume I).

2.1.4 Effects on receptors can be adverse, neutral (neither positive nor negative), or beneficial. They can also be temporary (not expected to last beyond construction e.g. noise from construction plant) or permanent (expected to last following completion of construction e.g. the views of the finished Proposed Development). Effects can also have different durations including short-term (those associated site site-preparation and construction), medium-term (those that extend into the operational phase for a few months or years), or long-term (those that last for the duration of the operational phase).

2.1.5 For the purpose of the PEI Report, adverse and beneficial effects are described as being potentially 'significant' or 'not significant'. Where the EIA predicts a significant adverse effect on one or more receptors, mitigation measures are identified where possible to avoid or minimise the effect, or to reduce the likelihood of it happening. The use of such mitigation would be secured through requirements included within the draft DCO or through other legislation and consenting regimes (e.g., protected species licences).

2.1.6 Details of the EIA process and assessment methodology are provided in Chapter 2: Assessment Methodology (PEI Report, Volume I).

2.2 EIA Scoping (Selection of Environmental Topics to be Assessed)

2.2.1 EIA scoping is a process that is designed to identify relevant topics that should be included in the EIA and reported in the PEI Report and the subsequent ES. An EIA

Scoping Report and a request for an EIA Scoping Opinion under Regulation 10 of the EIA Regulations was submitted to the Planning Inspectorate (the Inspectorate) and relevant consultees to allow them to comment on the extent and approach to the environmental assessments to be undertaken.

2.2.2 A Scoping Opinion was received from the Inspectorate on 17th May 2023 and is presented within Appendix 1B: Scoping Opinion in PEI Report, Volume III. In compliance with the Scoping Opinion, the PEI Report and the subsequent ES would include assessments of the following environmental topics:

- Air Quality;
- Surface Water, Flood Risk and Water Resources;
- Geology, Hydrogeology and Contaminated Land;
- Noise and Vibration;
- Ecology and Nature Conservation (including Aquatic Ecology);
- Ornithology;
- Marine Ecology;
- Traffic and Transport;
- Landscape and Visual Amenity;
- Cultural Heritage;
- Socioeconomics and Land-Use;
- Climate Change;
- Major Accidents and Natural Disasters;
- Materials and Waste;
- Human Health; and
- Cumulative and Combined Effects.

2.2.3 Following the completion of the EIA Scoping Report and the publication of the Inspectorate's Scoping Opinion, the environmental information for a DCO is reported as follows:

- the PEI Report is prepared to inform consultation with the public and other stakeholders about the Proposed Development, based on the preliminary environmental information available at the time of the consultation; and
- the ES is then prepared to accompany the DCO Application and includes the EIA of the Proposed Development, taking account of any design evolution that has taken place as well as feedback received during consultation.

2.3 Consultation

2.3.1 The Planning Act requires the Applicant to carry out pre-application consultation on their DCO proposals. This includes consultation on the PEI Report to enable

consultees to develop an informed view of the potential likely significant effects of the Proposed Development, based on preliminary findings of the environmental assessments undertaken at this time. With this, consultees can provide informed comment on the Proposed Development, the assessment process, and preliminary findings prior to the preparation of the ES.

2.3.2 Consultation with key stakeholders has been ongoing and will continue following the publication of the PEI Report, during the EIA and in preparation of the ES to support the DCO Application. The design of the Proposed Development and the EIA will take into consideration comments received through consultation on the PEI Report.

2.3.3 The PEI Report has been prepared to meet the requirements of Regulation 12(2) of the EIA Regulations. In accordance with Regulation 12(2)(b), the PEI Report presents:

> *"the information referred to in Regulation 14(2) which […] is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)".*

2.4 The PEI Report Structure

2.4.1 The format of the PEI Report is outlined below and largely reflects the proposed format of the final ES:

- Chapters 1 – 2: an introduction to the PEI Report and the Environmental Impact Assessment methodology;
- Chapters 3 – 6: a description of the surrounding area, the Proposed Development and construction methodology and timescales and a description of need for the Proposed Development and the potential alternatives considered;
- Chapter 7: a summary of relevant legislation and planning policy;
- Chapters 8 – 22: preliminary assessments of the likely significant effects of the Proposed Development in relation to the environmental topics scoped into the EIA;

2.4.2 Chapter 23: preliminary assessment of the potential for cumulative and combined effects to occur as a result of the Proposed Development. Volumes II and III of the PEI Report comprise the figures and technical appendices respectively, that accompany each chapter of the PEI Report Volume I.

2.4.3 This NTS forms Volume IV of the PEI Report.

3.0 PROPOSED DEVELOPMENT

3.1.1 The Proposed Development is described in Chapter 4: Proposed Development of the PEI Report (Volume I) and comprises the construction, operation (including maintenance) and decommissioning of an approximately 1.2 GWth (Phase 1 - 600 MWth and Phase 2 - 600 MWth) Carbon Capture and Storage (CCS) enabled Hydrogen Production Facility (the Production Facility). The Proposed Development also comprises the following elements:

- The Hydrogen (H_2) Production Facility itself (including on-site H_2 storage);
- hydrogen export pipelines to allow for export of hydrogen fuel to offtakers in Teesside (Hydrogen Pipeline Corridor);
- an Air Separation Unit (ASU) located on the Main Site, to supply oxygen (O_2) and nitrogen (N_2) for hydrogen production (or alternatively O_2 and N_2 supply pipelines for the H_2 production process if required;
- carbon dioxide (CO_2) capture and compression facilities and CO_2 export pipeline to the adjacent NEP facilities (CO_2 Export Corridor), natural gas pipeline to supply fuel for the supply of gas to the Production Facility (Natural Gas Connection Corridor), and an electricity grid connection to provide power to the Proposed Development (Electrical Connection Corridor);
- water supply and treatment infrastructure and wastewater treatment and disposal infrastructure (Water Connections Corridor);
- other utilities connections, telecommunications, and other associated and ancillary infrastructure, and temporary construction and laydown areas.

3.1.2 The Production Facility, carbon capture and compression facilities and associated infrastructure would be located on the 'Main Site', as referred to in the PEI Report.

3.1.3 Captured CO_2 would be compressed for export via a short CO_2 export connection pipeline to the NEP CO_2 gathering system on the adjacent NZT site. The Proposed Development Site only includes the CO_2 export connection so far as it is required to join the NEP carbon export pipeline. Any further infrastructure required for CO_2 export is subject to a separate consent associated with the NZT Project.

3.1.4 The Proposed Development Site boundary and the Main Site are shown in Annex A (Figure 4-2: Parts of the Proposed Development Site, PEI Report, Volume II) as are the locations of the indicative Connection Corridors within the Proposed Development Site boundary.

3.1.5 Access to the Main Site is expected to be via the existing Teesworks access road from the A1085 Trunk Road, via the former Redcar Steelworks entrance or alternatively via the Lackenby Steelworks entrance. Travelling south-west from the Main Site access, the A1085 Trunk Road provides a link to the A1053 Tees Dock Road, which in turn connects to the A174 to the south and the A66 to the north.

3.1.6 At the end of its design life, decommissioning of the Proposed Development would see the removal of all above ground equipment down to ground level and the ground

remediated, to enable future re-use. It is assumed that all underground infrastructure would remain in place; however, all connection and access points would be sealed or grouted to ensure disconnection.

3.1.7 A Decommissioning Environmental Management Plan (DEMP) would be produced and agreed pursuant to a DCO Requirement. The DEMP would consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed.

4.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

4.1 Proposed Development Site Details

4.1.1 The Proposed Development Site encompasses approximately 1,350 hectares (ha). This would be refined as the DCO Application progresses with the final layout being determined through studies of constraints and discussions with relevant stakeholders.

4.1.2 Details of the Proposed Development Site are presented in Chapter 3: Description of the Existing Environment (PEI Report, Volume I.)

4.1.3 The Main Site has an area of approximately 91 ha. However, the layout of the Proposed Development has not yet been confirmed and it is not anticipated that all this land would be required.

4.1.4 The Main Site comprises former industrial land that was used for steel production as part of the Redcar Steelworks. Previous industrial buildings and infrastructure that remained on the site have either been demolished or in the process of being dismantled. Therefore, demolition of the existing infrastructure has not been assessed as part of the EIA as it does not form part of the Proposed Development.

4.2 Potential Sensitive Receptors

4.2.1 Environmental receptors (and resources) have been identified within and outside the Proposed Development Site boundary and are described in more detail in Chapter 3: Description of the Existing Environment (PEI Report, Volume I). Distances are provided as the shortest distance between the receptor and the closest point of the boundary of the Proposed Development Site (or Main Site, if specified).

4.2.2 Key receptors for each topic have been identified as part of the assessment process and details are included in the relevant technical chapters (Chapters 8 – 23, PEI Report, Volume I). The key receptors for the Proposed Development are described below.

Residential

4.2.3 There are no residential receptors within the Proposed Development Site.

4.2.4 The nearest residential receptor to the Main Site is Marsh House Farm/Marsh Farmhouse which is located approximately 1.3 km to the east.

4.2.5 The nearest residential settlements to the Main Site are the town of Redcar (approximately 2.6 km to the east), including the borough of Dormanstown (approximately 1.3 km to the south-east). The main residential areas in the vicinity of the Proposed Development are shown on Figure 3-1: Environmental Constraints within 1 km of the Proposed Development Site Boundary (PEI Report, Volume II).

Air Quality

4.2.6 There are no Air Quality Management Areas (AQMAs) within the Proposed Development Site, the nearest being over 20 km away.

Hydrology and Flood Risk

4.2.7 The River Tees (a Main River) discharges to the North Sea via the Tees Estuary at Tees Mouth and is located approximately 0.9 km to the west of the Main Site. The Proposed Development Site includes proposed crossings under the River Tees for the Hydrogen Pipeline Corridor.

4.2.8 Other watercourses within 1 km of the Main Site include:

- Greatham Creek (a Main River), a tributary of the River Tees located 4 km west of the Main Site;
- Dabholm Gut which is a man-made tidal inlet located approximately 0.7 km south of the Main Site;
- The Fleet located approximately 0.8 km east of the Main Site; and
- The Mill Race located approximately 0.9 km south-east of the Main Site.

4.2.9 There are numerous other waterbodies within the Proposed Development Site, including ordinary watercourses, localised drains, pools/surface waterbodies, and areas of marshy ground.

4.2.10 Designated bathing waters 'Redcar Coatham' are located immediately north of the Proposed Development Site and 'Seaton Carew North Gare' Bathing Water is situated immediately north of the Study Area.

4.2.11 The Main Site is considered to be at low risk of flooding from both tidal and fluvial sources due to being located in Flood Zone 1. There are areas within the Proposed Development Site boundary, including the Hydrogen Pipeline, Water and Electrical Connections Corridors that are within Flood Zone 2 (medium risk) and Flood Zone 3 (high risk) parts of which are protected by flood defences in parts of North Tees.

4.2.12 Tidal flood risk is considered the greatest risk to the north of the Tees Estuary. However, there are Ordinary Watercourses that could pose a fluvial flood risk to small sections of the Hydrogen Pipeline Corridor, predominantly where the connection corridor crosses a watercourse or drain.

4.2.13 There are several tidal defences in proximity to the Proposed Development Site including floodwalls and flood banks. These defences are routinely inspected for potential defects by the Environment Agency.

Geology/Hydrogeology

4.2.14 The site is generally underlain by Made Ground which overlies superficial deposits (Tidal Flat Deposits, Glacio-lacustrine deposits and Glacial Till) and underlain by bedrock (which may comprise Mercia Mudstone Group, Penarth Group (mudstone), Redcar Mudstone or Sherwood Sandstone).

4.2.15 The Superficial Tidal Flat Deposits underlying the Proposed Development Site are classified by the Environment Agency as Secondary Aquifers, the Redcar Mudstone Formation is classified as Secondary undifferentiated Aquifer, and the Mercia Mudstone bedrock is classified as Secondary B aquifer.

4.2.16 A small section of the Proposed Development Site (within the Hydrogen Pipeline Corridor) is located within a Nitrate Vulnerable Zone (NVZ). The Main Site is located over 5 km south-east of the nearest aquifer Source Protection Zone (SPZ). There are no Drinking Water Protected Areas, Drinking Water Safeguard Zones (Surface Water and Groundwater) or groundwater, potable water or surface water abstraction licences located within 1 km of the Proposed Development Site.

Noise and Vibration

4.2.17 The Marsh House Farm at Warrenby is the closest Noise Sensitive Receptor o the Proposed Development Site and is a single residential dwelling within an industrial setting. Areas of public/private amenity close to the Proposed Development Site are mainly located to the north around Coatham. In addition, birds within the Teesmouth and Cleveland Coast SSSI, SPA and Ramsar site may also be sensitive to noise and vibration.

Ecology and Nature Conservation

4.2.18 Within 15 km of the Proposed Development Site there are a number of statutory designated ecological sites including:

- three Special Protection Areas (SPAs);
- three Special Areas of Conservation (SAC);
- two Ramsar sites;
- twenty Sites of Special Scientific Interest (SSSI); and
- three National Nature Reserves (NNRs).

4.2.19 There are areas of the Proposed Development Site that pass within the boundaries of four of these designated ecological sites including:

- Teesmouth and Cleveland Coast SPA;
- Teesmouth and Cleveland Coast Ramsar site;
- Teesmouth and Cleveland Coast SSSI; and
- Teesmouth NNR.

4.2.20 There are thirteen Local Nature Reserves (LNRs) within 5 km of the Proposed Development Site, one of which, Cowpen Bewley Woodland Country Park LNR, is partially located within the Proposed Development Site boundary.

Traffic and Transport

4.2.21 Access to the Main Site is expected to be via the existing Teesworks access road from the A1085 Trunk Road, via the former Redcar Steelworks entrance or alternatively via the Lackenby Steelworks entrance. Travelling south-west from the Main Site access, the A1085 Trunk Road provides a link to the A1053 Tees Dock Road, which in turn connects to the A174 to the south and the A66 to the north.

4.2.22 The Tees Valley Railway Line runs approximately 0.9 km south-east of the Main Site. This line passes through the Proposed Development Site and is operated by Northern

Rail. The Redcar British Steel railway station on the Tees Valley line is located to the south of the Main site and is currently mothballed.

4.2.23 There are no Public Rights of Way (PRoW) within the Main Site. The England Coast Path, a National Trail, runs approximately 1.3 km east of the Main Site. The Teesdale Way Long Distance Route runs adjacent to the Main Site along its northern boundary.

Landscape and Visual Amenity

4.2.24 The Proposed Development Site is located within the Tees Lowlands National Character Area (NCA). This forms a broad, open plain dominated by the meandering lower reaches of the River Tees and its tributaries, with wide views to distant hills. The large conurbation around the Lower Tees and Teesmouth contrasts with the rural area to the south and west, which is largely agricultural in character.

4.2.25 There are no Landscape Character Designations covering the industrial complexes along the banks of the River Tees, including the Proposed Development Site. However, the RCBC's 'Landscape Character Supplementary Planning Document' (March 2010) notes that this industry has a strong influence on neighbouring landscape character areas.

Cultural Heritage

4.2.26 There are no designated heritage assets within the Main Site.

4.2.27 There are 59 listed buildings within 5 km of the Main Site. The closest being three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, 'Garden Wall South of Marsh Farmhouse', and 'Barn and Stable Circa 10 Metres North West of Marsh Farmhouse') located approximately 1.3 km to the east of the Main Site at Warrenby.

4.2.28 There are four conservation areas within 5 km of the Main Site as follows:

- Coatham Conservation Area, Redcar, located approximately 2.5 km to the east;
- Kirkleatham Conservation Area, located approximately 3.8 km to the south-east;
- Seaton Conservation Area, located approximately 4.6 km to the north-west; and
- Wilton Conservation Area located approximately 5 km to the south-east.

4.2.29 There are no Scheduled Monuments, World Heritage Sites, Registered Parks and Gardens, Registered Battlefields or Heritage Coasts within 5 km of the Main Site.

5.0 CONSTRUCTION PROGRAMME AND MANAGEMENT

Construction Programme

5.1.1 The Proposed Development construction programme is currently anticipated to commence shortly after the DCO is granted in 2025. Construction is expected to last for approximately 6 years, taking place in two phases, with overall construction expected to be completed by the end of 2030.

5.1.2 Construction of Phase 1 of the Proposed Development is expected to last for 32 – 36 months years from 2025 to 2028.

5.1.3 Phase 2 of the Proposed Development would include the infrastructure required for a second hydrogen production unit; on-site storage; supporting utilities; and the remaining Hydrogen Pipeline Connections. Early enabling works for Phase 2 may overlap with commissioning for Phase 1 (Q1 2028). However, there is not expected to be an overlap of the main construction phases with the main civils works for Phase 2 beginning after Phase 1 construction is completed (Q2 2028). Phase 2 construction is expected to be completed by the end of 2030.

5.1.4 Each environmental assessment topic within the PEI Report identifies and assesses the reasonable 'worst case' construction scenario for that topic, where relevant.

Construction Activities

5.1.5 Proposed Development construction activities would include:

- establishment of temporary construction laydown areas (including storage, site offices, welfare facilities, secure fencing and gates, and car parking);
- earthworks to prepare the site;
- construction of foundations which may require piling for key structures;
- erection of buildings and structures (including the Hydrogen Production Facility and ancillary units);
- installation of utilities and utility connections (electrical, natural gas, and water connections);
- construction of the CO_2 Export Corridor and Hydrogen Pipeline Corridor; and
- commissioning (testing) of the installation prior to operation.

5.1.6 The Applicant will appoint contractors to undertake the construction phase of the Proposed Development.

5.1.7 A Framework Construction Environmental Management Plan (CEMP) will be prepared as part of the ES to support the DCO Application. It will set out the key measures to be employed during construction to control and minimise the impacts on the environment. A final CEMP will be prepared by the contractor prior to the start of construction. The submission, approval, and implementation of this final CEMP would be secured by a Requirement of the draft DCO.

6.0 NEED, ALTERNATIVES AND DESIGN EVOLUTION

6.1.1 The EIA Regulations state that an ES should include a description of reasonable alternatives studied by an applicant and the main reasons for selecting the chosen development, accounting for environmental effects.

6.1.2 Chapter 6: Need, Alternatives and Design Evolution in the PEI Report (Volume I) provides this information in respect of the Proposed Development, at this preliminary stage. In summary, alternatives have been considered during the evolution of the Proposed Development, including:

- alternative technologies;
- alternative sites;
- alternative layouts and design options within the Proposed Development Site; and
- connection corridor construction methodologies.

6.1.3 Different technologies have been evaluated to identify the preferred option for delivering a CCS enabled blue hydrogen production facility. Two potential technologies, one which involves ATR based reforming and another which utilises a proprietary Low Carbon Hydrogen technology, are now being considered. It is expected that one of these technologies would be selected as the EIA progresses based on factors including capacity, scalability, cost, technology readiness level, energy efficiency, associated emissions, safety, and capture rate. Justification for this selection would be outlined in the ES.

6.1.4 Two Main Site options, Main Site A (the Foundry) and Main Site B (Redcar Bulk Terminal) were considered for site location. The sites are in proximity to each other, and both provide proximity to both existing and potential future users of low carbon hydrogen and to NEP infrastructure for CO_2 export and offshore storage. Both Main Site options can be connected to required infrastructure (including natural gas, water and electrical) and both are considered sufficiently remote from any safety sensitive receptors.

6.1.5 Main Site A is deemed the most appropriate location for the Main Site given its location directly adjacent to the NEP onshore facilities thereby simplifying the CO_2 Export pipeline corridor routing. This site also presents an opportunity for locating other proposed bp projects adjacent to the Proposed Development Site.

6.1.6 Alternative layouts within the Main Site are being evaluated in terms of the configuration of structures and buildings, and the design of the Proposed Development. Alternative options for routing of the Hydrogen Pipeline, Natural Gas, 'other gases' (O_2 and N_2), Electrical and Water and Wastewater Connection Corridors are also still being evaluated and refined. Options in respect of water and wastewater management are also still under consideration. The Proposed Development includes an appropriate degree of flexibility to allow for the future selection of these options.

6.1.7 Alternative construction methodologies for connection corridors that are being considered include trenchless crossings, below ground open trench, the installation

of new or existing above ground support structures, and the repurposing and reuse of existing pipelines (where possible). This is subject to ongoing design work, discussions with landowners and statutory consultees, and is being informed by environmental sensitive receptors and constraints and surveys.

6.1.8 To ensure a robust assessment, a maximum built 'envelope' (also referred to as the 'Rochdale envelope') has been defined to accommodate this necessary flexibility and to enable the EIA to consider the 'worst case' of potential design elements.

6.1.9 The overall design and construction methodology of the Proposed Development has been identified and developed following the above approach, taking into account environmental effects alongside other factors such technical and commercial availability. The design of the Main Site elements and the connection routings within the Connection Corridors will continue to evolve following consultation. The final Rochdale Envelope design will be reported in the ES that will be submitted as part of the DCO Application.

7.0 SUMMARY OF ENVIRONMENTAL EFFECTS

7.1 Introduction

7.1.1 The likely significant environmental effects of the Proposed Development are described within the PEI Report (Volume I). This section provides a summary of the overall findings of the PEI Report.

7.1.2 An assessment of the environmental impacts and effects of the Proposed Development during its construction, operation (including maintenance) and decommissioning has been completed for each of the topics that have been scoped for inclusion within the EIA.

7.1.3 It is envisaged that the impacts and effects of the eventual decommissioning of the Proposed Developments are likely to be comparable to, or less than, those for construction activities and may be similarly controlled. As such, the commentary below as related to construction phase effects is also considered to be applicable to the decommissioning phase.

7.2 Air Quality

Introduction

7.2.1 Chapter 8: Air Quality (PEI Report, Volume I) presents the findings of a preliminary assessment of potential air quality effects on human health and ecological receptors as associated with the Proposed Development.

7.2.2 There are no AQMAs identified in the area with the potential to be affected by the Proposed Development.

7.2.3 Baseline air quality conditions have been evaluated through a review of local authority air quality management reports, Defra published data and other sources. Monitoring has also been conducted in the air quality study area to supplement available data.

7.2.4 The air quality assessment uses screening tools and computer models to predict the dispersion of air emissions from the Proposed Development and its associated traffic movements. These predict concentrations of pollutants in ambient air which are compared to national air quality standards where available, or other appropriate levels as agreed with regulators. Further air quality modelling will be undertaken during the EIA and reported in the ES.

Effects During Construction

7.2.5 During construction, air quality effects could arise due to:

- construction dust emissions on human and ecological receptors; and
- construction traffic emissions.

7.2.6 An evaluation of construction dust arisings concluded that there could be a low to medium impact on human health and a high impact on ecological receptors resulting in potentially adverse (significant) effects. However, it is considered that through the

implementation of mitigation measures included within the CEMP, effects of dust on sensitive receptors would not be significant.

7.2.7 Despite there being some sensitive human receptors along roads where construction traffic would be present, effects of construction traffic on air quality are predicted to be not significant.

Effects During Operation

7.2.8 A preliminary operational assessment for the Production Facility has predicted that air quality effects on human health receptors are not significant. As the design progresses and when additional information becomes available, further air quality modelling would be undertaken during the EIA.

7.2.9 Subject to further air quality modelling, it is predicted that air quality effects on nearby ecological receptors during the operation of the Proposed Development are likely to be significant. This would need to be further evaluated during the EIA and will be considered in further detail in Chapter 12: Ecology and Nature Conservation and the Habitat Regulations Assessment.

7.2.10 Operational phase traffic flows are below applicable screening criteria. Therefore, significant air quality effects from traffic emissions are not anticipated.

7.3 Surface Water, Flood Risk and Water Resources

Introduction

7.3.1 Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I) presents the findings of a preliminary assessment of likely significant effects of the Proposed Development on the surface water environment (including inland, transitional, and coastal surface waters), flood risk and water resources. The scope of the assessment includes water quality, water resources, hydro-morphology, flood risk and drainage.

7.3.2 A summary of surface water bodies within the water environment study area, and flood risk for the Proposed Development Site is outlined in Section 4 of this NTS.

Effects During Construction

7.3.3 During construction, water environment effects could include:

- temporary impacts on surface water quality;
- temporary impacts on the hydromorphology of watercourses;
- potential impacts on groundwater resources and local water supplies and potentially the baseflow to watercourses;
- potential increase in surface water runoff leading to an impact on flood risk;
- increased risk of groundwater flooding or recharge as a result of below ground installations; and
- alteration in fluvial and overland flow paths.

7.3.4 As a worst case, it is assumed that there would be open cut installation across several watercourses for the connection corridors. The proposed open cut methodology has been assessed as having a localised and potential temporary Moderate adverse (significant) effect on the hydromorphological status of Belasis Beck, which is a watercourse of high importance for morphology. This effect would be temporary with the watercourse morphology expected to recover. This will be reassessed during the EIA once further details on watercourse crossing construction methodologies (e.g., using trenchless technologies) are known.

7.3.5 With the implementation of mitigation measures through the CEMP and associated Water Management Plan (WMP), no other significant effects during Proposed Development construction have been identified. The WMP will include an outline of responsibilities with regard to water management, required water quality monitoring, pollution prevention measures, training requirements for construction workers with regard to the water environment, an outline of likely relevant permissions and consents required, and a Pollution Incident and Response Plan.

Effects During Operation

7.3.6 During operation, water environment effects could arise due to:

- impacts on receiving water features from pollutants;
- changes in water quality from operational discharges;
- potential nutrient enrichment of ponds located adjacent to the Main Site;
- potential increase in volume and rate of surface water runoff leading to an impact on flood risk;
- increased local demand for potable water supply; and
- water quality impacts on receiving water features from an increase in foul drainage.

7.3.7 Changes in water quality within the Tees Coastal waterbodies from operational discharges have been predicted to have a potential moderate adverse (significant) effect due to the very high importance of these receptors for water quality. This will be re-evaluated during the EIA when more details regarding effluent quality and water treatments are available. If required, mitigation measures would then be identified.

7.3.8 With the implementation of a Surface Water Drainage Strategy, a Pollution Prevention Plan, Emergency Response Plan, a Surface Water Maintenance and Management Plan and measures outlined in the Preliminary Flood Risk Assessment, no other significant effects are predicted for surface water, flood risk or water resources during Proposed Development operation.

7.4 Geology, Hydrogeology and Contaminated Land

Introduction

7.4.1 Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I) presents the findings of a preliminary assessment of significant effects from the Proposed Development on geology, hydrogeology and contaminated land. Consideration has been given to geology (superficial soils and bedrock), geological and hydrogeological designations, soils and agricultural land classification, land contamination and minerals.

7.4.2 A desk-based assessment of available information and relevant interpretive reports of previous ground investigation (GI) works have been used to define the baseline conditions and thereafter the potential effects associated with the Proposed Development on ground conditions. Further confirmatory intrusive GIs will be undertaken to determine the need for further risk-based assessment and to inform the Proposed Development detailed design.

Effects During Construction

7.4.3 Potential impacts on ground conditions during the construction phase include:

- creation of new contaminant linkages;
- mobilisation of existing contaminants;
- changes to hydrogeological regimes (e.g. during dewatering activities); and
- changes to surface water quantity and quality.

7.4.4 With appropriate design of the Proposed Development Site construction activities and with the implementation of appropriate construction mitigation measures to be detailed in the CEMP, no significant adverse effects are anticipated.

Effects During Operation

7.4.5 During operation, potential impacts on ground conditions could arise due to impacts to soil quality, groundwater and watercourses as a result of accidental spills from the handling or leakage of fuels, lubricants, stored chemicals and process liquids.

7.4.6 With appropriate operational management of the Proposed Development in accordance with the Environmental Permit and the DCO, no significant adverse effects are anticipated.

7.5 Noise and Vibration

Introduction

7.5.1 Chapter 11: Noise and Vibration (PEI Report, Volume I) presents the findings of a preliminary assessment of the potential noise and vibration effects from the Proposed Development.

7.5.2 Potential noise sensitive receptors (NSRs) have been identified around the boundary of the Proposed Development Site. Ambient sound measurements have been undertaken and noise levels during construction and operation of the Proposed

Development have been predicted. As construction activities are currently unknown, predicted construction noise levels have been based on construction methods used for similar energy and pipeline projects. National standards have been applied to determine whether there is the potential for significant effects without further mitigation measures being applied.

7.5.3 The assessment has also considered the potential for vibration effects. No significant vibration is expected from construction activities at the Main Site; however construction impacts are likely to be higher as a result of works within the Connection Corridors due to their proximity to receptors.

Effects During Construction

7.5.4 During construction, effects could arise due to:

- noise and vibration from construction works; and
- potential changes in road traffic noise.

7.5.5 Unmitigated effects from construction on noise levels at nearby NSRs have been estimated and effects classified which has identified the following:

- potential major and moderate adverse (significant) effects have been predicted at NSRs H1 (Manor House Farm, Cowpen Bewley) and H4 (Seal Sands Office) respectively as a result of trenchless crossing for the Hydrogen Pipeline during the daytime;
- during evenings and weekends, potential major adverse (significant) effects have been predicted due to open cut trenches at H1 during construction of the Hydrogen Pipeline Corridor and at H6 (58 Broadway West, Redcar) during construction of the Electrical Connection Corridor;
- during evenings and weekends, potential major or moderate adverse (significant) effects have been predicted at NSRs H1, H5 (Marsh House Farm, Warrenby) and H6 as a result of trenchless workings for the Hydrogen Pipeline and/or Water Connections Corridors;
- at night-time, construction activities at the Main Site are predicted to have potential moderate adverse (significant) effects on NSRs H5 and H6;
- at night-time, potential major and/or moderate adverse (significant) effects have been identified at NSRs H1, H2 (Cresswell Road, Grangetown), H5 and H6 as a result of open cut trench workings for the Hydrogen Pipeline, Water Connections, and Electrical Connection Corridors;
- at night-time, potential Major adverse (significant) effects have been identified at NSRs H1, H5 and H6 as a result of trenchless crossing for the Hydrogen Pipeline and Water Connections Corridors.

7.5.6 However, the potential significant noise effects as detailed above are unmitigated. Noise control measures would be implemented through the Final CEMP and best practice construction methods would be used to reduce noise effects. Where significant construction effects are predicted, additional noise-control equipment

such as jackets on pneumatic drills, acoustic covers on compressors, shrouds on piling rigs and cranes would be implemented. The use of temporary barriers or screens can also provide additional mitigation. With these measures and further measures to be identified through further assessment during the EIA, noise effects during construction are anticipated to be reduced to levels that are not significant.

7.5.7 No significant noise effects have been predicted as a result of construction traffic.

7.5.8 There is potential for some vibration effects to cause annoyance to occupants of residential receptors during construction of connection corridors resulting in a Moderate adverse (significant) effect at NSRs H1 and H4. Measures to control vibration such as avoiding the use of vibratory equipment within proximity to NSRs, will be detailed in the CEMP, such that significant effects are not anticipated. Further consideration will be given to potential vibration effects and an assessment reported in the ES.

Effects During Operation

7.5.9 Potential moderate adverse (significant) effects during the daytime and major/moderate adverse (significant) effects during the night-time have been predicted at H5 during the operation of the Proposed Development.

7.5.10 With the placement of limits on noise emissions from plant and equipment at source, in addition to screening or orientating plant within the Site away from sensitive receptors, operational noise levels are anticipated to be reduced such that significant effects would be avoided. Sound reductions required to mitigate operational sound will be considered further as the Production Facility design progresses and will be presented in the ES.

7.6 Ecology and Nature Conservation (including Aquatic Ecology)

Introduction

7.6.1 Chapter 12: Ecology and Nature Conservation (including Aquatic Ecology) (PEI Report, Volume I) presents the findings of a preliminary assessment of the potential significant effects from the Proposed Development on terrestrial and aquatic ecological features (habitats and protected species, including bats).

7.6.2 The assessment of likely significant effects has taken a precautionary approach and presents a worst-case scenario as surveys to inform the assessment are currently ongoing, and the Proposed Development design is still being developed. Effects will be re-evaluated during the EIA following the definition of site-specific mitigation measures.

Effects During Construction

7.6.3 During construction, ecological effects could be generated due to the following:

- direct or indirect habitat loss/modification;
- loss of functionally linked land to statutory designated sites;
- direct harm from noise and visual disturbance of species;

- physical or chemical pollution resulting in degradation of habitats;
- changes in air quality from construction dust;
- changes in hydrology;
- changes in water quality (chemical or physical) of watercourses resulting from their crossings (open-cut or otherwise) or a pollution event or mobilisation of sediment;
- crossing or culverting of watercourses; and
- encroachment of machinery, compaction of soil, or a pollution event resulting in damage.

7.6.4 The Proposed Development construction works will be undertaken in a manner that aims to avoid impacts to ecological receptors – this includes the use of trenchless technologies where possible, using existing infrastructure, implementation of the CEMP, and the presence of an Environmental or Ecological Clerk of Works during the construction works.

7.6.5 Nevertheless, at present, the preliminary assessment indicates that the Proposed Development construction activities have the potential to generate a range of potentially significant adverse effects on a range of ecological habitats, including designated and non-designated sites, as well as protected species. This is a precautionary assessment before taking into consideration site-specific mitigation and habitat management measures. Such measures are being developed in consultation with Natural England and other stakeholders and would be reported in the ES. As such, it is anticipated that predicted ecological effects to be reported in the ES will be less than those presented in Chapter 12: Ecology and Nature Conservation (PEI Report, Volume I).

Effects During Operation

7.6.6 During operation, potentially significant adverse effects could be generated due to:

- loss of functionally linked land to statutory designated sites;
- noise and visual disturbance of species within statutory designated sites; and
- changes in air quality at statutory and non-statutory designated sites.

7.6.7 The Proposed Development includes measures that aim to minimise impacts upon ecological receptors. This includes avoidance of sensitive ecological habitats, appropriate lighting design, and optimisation of the Proposed Development's stack height. Detailed dispersion modelling of emissions to air will be undertaken during EIA to determine potential impacts on ecological features and design mitigation measures (such as stack height considerations whilst balancing other impacts). Further mitigation would be provided within the ES following completion of surveys and Proposed Development design.

7.6.8 The creation of new habitats as associated with the Proposed Development design has the potential to deliver some potentially significant beneficial effects – this

includes effects on open mosaic habitat on previously developed land, ponds and other habitats of local or above importance.

7.6.9 Biodiversity Net Gain (BNG) consists of a new obligation on all planning permissions and DCOs to improve the environment by at least 10% as a compulsory planning condition; details are set out in the Environment Act 2021, sections 98 and 99, therefore the Applicant will aim to achieve BNG as part of the habitat creation associated with the Proposed Development.

7.7 Ornithology

Introduction

7.7.1 Chapter 13: Ornithology (PEI Report, Volume I) presents the findings of a preliminary assessment of the potential significant effects associated with the Proposed Development on ornithological features (breeding and wintering birds).

7.7.2 The Proposed Development Site is located within the Teesmouth and Cleveland Coast SPA/Ramsar site and the Teesmouth and Cleveland Coast SSSI.

Effects During Construction

7.7.3 During construction, ornithological effects could be generated due to the following:

- temporary habitat losses and functionally linked land resulting in losses of breeding, roosting and/ or feeding habitats;
- noise and visual disturbance of non-breeding and breeding birds and their dependent young;
- degradation of habitats used by feeding and breeding birds from physical or chemical pollution from emissions of dust and/or particulates and chemical spills to groundwater and/or water;
- increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats of breeding birds and/or loss of nests;
- morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used by birds;
- destruction of breeding bird nests, eggs and young; and
- changes in air quality resulting in changes to habitat structure, with resulting effects on nesting and feeding habitats.

7.7.4 The Proposed Development construction works will be undertaken in a manner that aims to avoid impacts to birds. This includes implementation of the CEMP, and the presence of an Environmental or Ecological Clerk of Works during construction.

7.7.5 The preliminary assessment indicates that without the specification of further site-specific mitigation measures, Proposed Development construction activities have the potential to generate a range of potentially significant adverse effects on ornithological features, including birds using designated and non-designated sites. This is a precautionary assessment before taking into consideration site-specific mitigation and habitat management measures. Such measures will be developed in

consultation with Natural England and other stakeholders and reported in the ES. As such, it is anticipated that predicted ornithological effects to be reported in the ES would ill be less than those presented in Chapter 13: Ornithology (PEI Report, Volume I).

Effects During Operation

- During operation, without mitigation, effects on ornithological features could arise due to permanent habitat losses including within statutory and non-statutory designated sites, adversely affecting breeding, roosting and feeding species;
- permanent losses of functionally linked land to statutory and non-statutory designated sites adversely affecting breeding, roosting and feeding species;
- noise and visual disturbance causing displacement of birds and brood failures;
- changes in air quality as a result of process emissions and vehicular traffic causing degradation of habitats;
- increased surface water runoff and flood risk resulting in degradation of nesting and feeding habitats and/or loss of nests;
- chemical contamination of Tees Bay marine waters resulting from process wastewater discharges and effects on fish and other prey stocks used as a foraging resource by birds; and
- morphological and hydrological effects on surface waters resulting in dewatering of wetland habitats used by birds.

7.7.6 The Proposed Development includes measures that aim to minimise impacts on birds and their habitats. This includes avoidance of sensitive ecological habitats, appropriate lighting design, and optimisation of the Proposed Development's stack height. Detailed dispersion modelling of emissions to air will be undertaken during the EIA to determine potential impacts on ornithological features and design mitigation measures (such as stack height considerations whilst balancing other impacts).

7.7.7 At present the preliminary assessment indicates that without the specification of further site-specific mitigation measures, Proposed Development operation has the potential to generate a range of potentially significant adverse effects upon ornithological receptors, including birds using designated and non-designated sites. This is a precautionary assessment before taking into consideration site-specific mitigation and habitat management measures. Such measures would be developed in consultation with Natural England and other stakeholders and reported in the ES. As such, it is anticipated that predicted ornithological effects to be reported in the ES will be less than those presented in Chapter 13: Ornithology of this PEI Report.

7.8 Marine Ecology

Introduction

7.8.1 Chapter 14: Marine Ecology (PEI Report, Volume I) presents the findings of a preliminary assessment of the potential significant effects associated with the Proposed Development on marine ecology.

7.8.2 The Proposed Development is situated within the Teesmouth and Cleveland Coast SPA/Ramsar/SSSI and the Teesmouth NNR which are in place, in part, for the protection of seals, providing refuge at important haul-out sites.

7.8.3 A number of protected or notable marine animal species have been identified as present, or potentially present, within the marine ecology study area. These include harbour porpoise, minke whale, bottlenose dolphin and white-beaked dolphin, grey seal and harbour (or common) seal. In addition, several protected or notable migratory and commercial fish species have been identified.

Effects During Construction

7.8.4 During construction, potential impacts to marine ecological receptors include:

- indirect impacts upon marine ecology from changes in water quality as a result of polluted surface water runoff;
- impacts on hauled-out or surfaced seals from changes in airborne soundscape and visual cues.

7.8.5 The Proposed Development construction works will be undertaken in a manner that aims to avoid and minimise effects upon marine ecology. This includes the selective use of trenchless technologies for watercourse crossings, specified construction hours, controlled use of construction lighting and other measures to be detailed in the CEMP. With the implementation of such measures, and due to the temporary and short-term nature of potential construction impacts, both direct and indirect effects upon marine ecology predicted to be not significant.

Effects During Operation

7.8.6 No potential impacts to marine ecology receptors have been identified during the Proposed Development operational phase and as such there is no potential for any potentially significant effects.

7.9 Traffic and Transport

Introduction

7.9.1 Chapter 15: Traffic and Transport (PEI Report, Volume I) identifies the potential effects of the Proposed Development on traffic and transport in the surrounding area. The assessment considers the predicted number of vehicle movements generated during the construction and operation of the Proposed Development, and the sensitivity (including pedestrian and cyclist safety) and capacity of the local road network.

Effects During Construction

7.9.2 The additional traffic due to the Proposed Development construction activities would result in small, temporary increases in traffic flows, including Heavy Goods Vehicles (HGVs), on the roads leading to the Main Site and Connection Corridor areas north and south of the River Tees. However, due to the low sensitivity of the road links used, and the volume of associated traffic, no significant effects are expected.

7.9.3 Notwithstanding this, traffic management measures would be implemented during the construction of the Proposed Development to minimise traffic impacts on the local road network. These measures include:

- implementation of a Construction Worker Travel Plan (CWTP);
- the appointed construction contractor to assess the potential for implementing construction worker minibuses and car sharing options (to be included in the CWTP);
- implementation of a Construction Traffic Management Plan (CTMP) to control the impact of HGVs on the local road network during construction; and
- working with suppliers to ensure that materials classified as hazardous that are being brought to the Proposed Development Site are transported in compliance with applicable regulations.

7.9.4 The construction contractor would also review options for the use of rail and water transport when sourcing construction materials. The contractor would review the use of rail travel for construction staff accessing the Proposed Development Site using the existing Redcar British Steel railway station (currently mothballed).

Effects During Operation

7.9.5 Once operational, the Proposed Development would employ up to 130 full-time staff who would work shifts at the Main Site. During infrequent periods of periodic maintenance this could increase. Due to the very low traffic flows to be generated during operation, Proposed Development operation would not generate any significant transportation effects. A Travel Plan for the operational Production Facility would be prepared and agreed with the Local Planning Authority (LPA) prior to operations commencing.

7.10 Landscape and Visual Amenity

Introduction

7.10.1 Chapter 16: Landscape and Visual Amenity (PEI Report, Volume I) presents the findings of a preliminary assessment of the potential effects of the Proposed Development on landscape character and visual amenity.

7.10.2 The study area for landscape and visual effects includes areas where it is considered that there is potential for significant direct or indirect effects on landscape character or sensitive views due to the construction/decommissioning or operation of the Proposed Development.

7.10.3 The assessment is based on the largest possible dimensions for the Proposed Development and on a worst-case flare stack height of up to 100 m above ground level. There is anticipated to be either a single flare stack or two stacks (one per phase) in the Proposed Development.

Effects During Construction

7.10.4 Although construction activities associated with the Proposed Development would impact several landscape receptors, impacts would be temporary and experienced in the context of other large-scale industrial developments. Therefore, no significant effects are predicted to landscape character during Proposed Development construction.

7.10.5 The assessment indicates that construction activities have the potential to generate temporary moderate adverse (significant) effects at two selected viewpoints, one of which is recreational (viewpoint 7 - England Coast Path, Warrenby) and one which is recreational and residential (viewpoint 8 - Redcar seafront). This is due to their proximity to the Main Site and limiting intervening vegetation. It is considered that such effects are difficult to mitigate due to the proximity of these viewpoints to the Proposed Development and the scale of the associated structures.

7.10.6 Although construction activities would be visible from other visual receptors, they would be viewed in the context of an area containing a high number of large-scale industrial structures. For some viewpoints, such as Viewpoint 3 – Teesmouth National Nature Reserve, England Coastal Path and Viewpoint 5 – South Gare Breakwater, low level construction activities would be screened by intervening landform and vegetation.

Effects During Operation

7.10.7 Although the Proposed Development will introduce additional built development and infrastructure to a number of landscape receptors, this would occur within the context of previous and existing similar development. Therefore, no significant effects are predicted to landscape character during the operation of the Proposed Development.

7.10.8 The assessment indicates that moderate adverse (significant) effects are expected at one recreational viewpoint (Viewpoint 7 – England Coast Path, Warrenby) during operation. This is due to the proximity of the viewpoint to the Main Site and the prominence of structures associated with the Proposed Development. No significant visual effects are expected at residential receptors during Proposed Development operation.

7.10.9 For some visual receptors, such as Viewpoint 3 – Teesmouth National Nature Reserve, England Coastal Path and Viewpoint 14 – Viewpoint at Saltholme Wildlife Reserve and Discovery Park (RSPB), the majority of low-level structures on the Main Site would be screened by intervening landform and vegetation. Although larger structures, stacks and plumes associated with the flare would be visible, this would be in the context of existing large-scale industrial structures within the wider view.

7.11 Cultural Heritage

Introduction

7.11.1 Chapter 17: Cultural Heritage (PEI Report, Volume I) presents the findings of a preliminary assessment of the potential effects to cultural heritage assets which comprise archaeology, built heritage and historic landscape as associated with the Proposed Development. A summary of cultural heritage receptors is outlined in Section 4 of this NTS.

7.11.2 A number of mitigation measures have been incorporated into the design and construction methodologies of the Proposed Development, to avoid impacts to known or unrecorded heritage assets. During the construction period these include:

- refining connection corridor routes where practicable;
- use of existing pipeline infrastructure and established corridors where practicable;
- siting much of the Hydrogen Pipeline Connection in an existing above ground pipeline racking network;
- use of trenchless technologies, including horizontal directional drilling (HDD) or a micro-bored tunnel (MBT) for the Hydrogen Pipeline and other connection corridors;
- use of brownfield sites or existing hard standing areas, where practicable within the Proposed Development Site for construction laydown areas.

Effects During Construction

7.11.3 Features relating to a Romano-British settlement have been recorded within the Hydrogen Pipeline Corridor and there is potential for additional features relating to this settlement to extend into the Hydrogen Pipeline Corridor. These previously unrecorded remains have the potential to be of low to medium heritage value. Due to being underground within the vicinity of the settlement, construction of the Hydrogen Pipeline Corridor has the potential to result in the permanent loss of such remains – this would result in a major adverse (significant) effect if left unmitigated. No other potentially significant cultural heritage effects have been identified.

7.11.4 Given the above, a programme of archaeological evaluation and mitigation will be undertaken, consisting of excavation and recording which will be carried out prior to the start of construction. The archaeological investigation will be carried out in accordance with a Written Scheme of Investigation agreed (WSI) with relevant archaeology officers and local authorities. A protocol will also be included in the CEMP that will include procedures for the reporting, protection and management of unexpected archaeological discoveries. With the implementation of the proposed mitigation, no significant residual effects upon heritage assets are expected.

Effects During Operation

7.11.5 Operation of the Proposed Development would not have any impacts upon buried archaeological remains. The Proposed Development will represent a new component

into an existing industrial landscape. However, its inclusion within the visual setting of existing heritage assets would not result in significant changes to these asset's setting or value. As such, no potentially significant cultural heritage effects have been identified during the operation of the Proposed Development.

7.12 Socioeconomics and Land-Use

Introduction

7.12.1 Chapter 18: Socioeconomics and Land-Use (PEI Report, Volume I) presents the findings of a preliminary assessment of the potential effects of the Proposed Development on employment, local businesses and the local population. The assessment takes into account the demographics of the area surrounding the Proposed Development Site.

7.12.2 The design of the Proposed Development aims to minimise potential socioeconomic impacts by:

- minimising impacts on any PRoW that cross the Proposed Development Site;
- use of construction methods that minimise local disruption, including methods for the hydrogen pipeline crossing under the River Tees.

Effects During Construction

7.12.3 A total of 675 net construction jobs are expected to be generated during the Proposed Development construction phase, of which 506 are expected to be within the Middlesbrough and Stockton area. Construction employment created by the Proposed Development construction phase is predicted to have a moderate beneficial (significant) short-term effect on local employment.

7.12.4 No potentially significant effects are predicted associated with wider socioeconomic impacts to agricultural and industrial land, PRoW, private assets, education and community facilities, development land, temporary workers accommodation, or demographic effects and community disruption.

Effects During Operation

7.12.5 A total of 61 net operational jobs are expected to be generated during the Proposed Development operation, with 46 of these estimated to be filled by residents of the Middlesbrough and Stockton area. This would result in a minor beneficial effect (not significant).

7.12.6 No significant socioeconomic effects are expected during Proposed Development operation.

7.13 Climate Change

Introduction

7.13.1 Chapter 19: Climate Change (PEI Report, Volume I) presents the findings of a preliminary assessment which considers the potential effects of the Proposed Development on the climate and the effect of future climate change on the Proposed Development and the surrounding environment.

7.13.2 The assessment includes:

- Lifecycle greenhouse gas (GHG) impact assessment (the potential effect the Proposed Development may have on GHG emissions and therefore climate change); and
- Climate change resilience assessment (the resilience of the Proposed Development to future projections for climate change).

7.13.3 Due to the preliminary nature of this assessment, it is not currently possible to undertake a full in-combination climate change impacts assessment (the combined effect of the Proposed Development and climate change on surrounding receptors). However, during the EIA, the assessment will identify the likely in combination impacts and effects. The results will be presented in the ES.

GHG Assessment

7.13.4 The receptor for GHG emissions associated with the Proposed Development is the global climate.

7.13.5 GHG emissions associated with the Proposed Development have been examined for their significance against the UK Carbon Budgets. The preliminary assessment indicates that the GHG emissions from hydrogen production and distribution are Minor to Moderate adverse. However, when looking at the ability of the hydrogen produced to enable a transition to a lower carbon economy, the Proposed Development has a net benefit due to the reduced carbon emissions when compared to use of natural gas or diesel.

Climate Change Resilience

7.13.6 The potential impacts and effects of projections for climate change on the Proposed Development have been assessed, taking into account resilience measures that have been incorporated into the Proposed Development design.

7.13.7 With mitigation measures embedded in the Proposed Development design, no significant resilience risks have been identified as these are deemed sufficient to reduce the likelihood or consequence of an impact occurring from projected climate hazards.

7.14 Major Accidents and Disasters

Introduction

7.14.1 Chapter 20: Major Accidents and Disasters (MA&Ds) (PEI Report, Volume I) presents the findings of a preliminary assessment which considers the MA&Ds that have the potential to arise during the construction, operation (including maintenance) and decommissioning of the Proposed Development.

7.14.2 Major accidents are incidents such as fires and explosions that could result in serious harm to people. They also have the potential to cause widespread damage to property and the environment. Disasters can be naturally occurring events, such as earthquakes, landslides and flooding. The impact of MA&Ds can be very significant, but the likelihood of their occurrence is generally low.

7.14.3 There are a number of sites regulated by the Control of Major Accidents Hazard (COMAH) Regulations 2015 within 5 km of the Proposed Development Site. Together these sites form a 'domino group' where the risks or consequences of a major accident may be increased due to the proximity of the sites to each other. There are also a number of sensitive receptors which could be vulnerable to MA&D risks. These include private residences, community and local economic receptors, the historical and cultural environment, the water environment, designated ecological sites, and infrastructure and the built environment.

7.14.4 The Proposed Development is anticipated to be an Upper Tier COMAH (defined as facilities that store, handle, or process significant quantities of hazardous substances) installation due to the substances that would be present on-site. This status will be reviewed as the design develops. Appropriate COMAH notifications, with supporting risk assessments and a Major Accident Prevention Plan, would be submitted to the relevant authorities for approval prior to construction.

Effects During Construction

7.14.5 Credible scenarios for construction phase risk events include:

- ground instability;
- structural collapse/accidental impact;
- utility (pipeline or electrical cable) strike/unexploded ordnance (UXO) impact; and
- release of ground contamination existing within the Main Site given the legacy of its historical industrial use.

7.14.6 Best practice industry codes, standards and methods will be used during the Proposed Development construction phase. Construction methods and site clearance works would be informed by ground investigation work, while a CEMP would be in place to control the potential environmental impacts related to the construction works. Consultation would also be carried out with appropriate stakeholders such as National Grid Gas Transmission and the Environment Agency in relation to working close to live pipelines.

7.14.7 With these mitigation measures in place, all assessed credible scenarios during the construction phase have been assessed as having a tolerable level of risk, and thus residual effects are considered not significant.

Effects During Operation

7.14.8 During operation, effects could arise due to:

- fire caused by loss of containment of flammable gas;
- explosion;
- toxic gas release;
- asphyxiant gas release;
- domino effect (to and from neighbouring facilities); and

- flooding.

7.14.9 The design of the Proposed Development take into account industry standards and potential MA&Ds risks during operation to ensure these risks are minimised to an acceptable level. This includes for example fire detection and protection measures, gas detection and pressure monitoring, and locating electrical equipment above predicted flood levels. Hazardous Substances Consent would be obtained from the local planning authority (RCBC) who would consult with the HSE.

7.14.10 With regards to a potential 'domino effect', it is a requirement of the COMAH Regulations that neighbouring upper tier sites should review and update their off-site emergency plans and safety reports to consider the potential impact of domino sites. As such, the existing safety precautions at neighbouring industrial sites would mitigate the risk of domino effects occurring. The Cleveland Emergency Planning Unit (CEPU) provides an emergency planning service to ensure local authorities are prepared to respond to emergencies and to support emergency services and the community.

7.14.11 It is considered that all MA&D risk events (following the implementation of defined mitigation measures) identified during the operation of the Proposed Development would be tolerable as they have been reduced to a level that is As Low As Reasonably Practicable ('the ALARP principle'). As the Proposed Development design is still in development, further mitigation measures would be defined and reported in the ES.

7.15 Materials and Waste

Introduction

7.15.1 Chapter 21: Materials and Waste (PEI Report, Volume I) presents the findings of a preliminary assessment of the potential effects associated with the use of materials and waste production. The materials and waste assessment considers the consumption of key construction materials and the generation and management of waste during the construction, operation (including maintenance) and decommissioning of the Proposed Development.

7.15.2 The baseline has been determined taking into account the following:

- national (UK or GB) and regional consumption/sales for key construction materials (steel, aggregates, asphalt and concrete);
- Mineral Safeguarding Areas (MSAs) and allocated/safeguarded mineral and waste sites;
- landfill void capacity in Yorkshire and the Humber and the North East (non-hazardous and inert landfill void capacity), and England (hazardous landfill void capacity); and
- waste received at relevant hazardous waste management facilities nationally.

7.15.3 Construction and operational waste arisings have been estimated and as a reasonable worst-case it has been assumed that all waste would be sent to landfill.

Effects During Construction

7.15.4 During construction, effects could arise due to:

- changes in demand for materials; and
- changes in available landfill void capacity.

7.15.5 Potential effects arising from changes in demand for materials are not considered to be significant.

7.15.6 During construction, waste is expected to arise due to excavations and construction of the Proposed Development. Some waste materials arising from excavation works have the potential to be contaminated such that the material would be classed as hazardous. If such material was disposed to hazardous waste landfill, this has the potential to have a moderate adverse (significant) effect. In practice, a proportion of contaminated material from the Proposed Development could be non-hazardous and/or likely to be sent to a waste management facility rather than being disposed to landfill, reducing the overall quantities of waste for disposal and associated effects.

7.15.7 No other significant adverse residual waste effects resulting from the construction of the Proposed Development have been identified.

7.15.8 A further assessment of potential material and waste effects would be undertaken and reported in the ES when further details of construction material requirements and potential waste arisings are available.

Effects During Operation

7.15.9 During operation, effects could arise due to:

- changes in available landfill void capacity; and
- changes in available hazardous waste management facility capacity.

7.15.10 Operational waste from the Proposed Development would comprise waste from site offices and waste from the Production Facility (including thermal reclamation waste) processes which may be hazardous waste. Amine storage would be appropriately bunded and accidental spills would be cleaned and go to a separate closed drainage system. From here, it would be recovered and recycled for use within the process, or otherwise taken off-site by tanker to a specialist treatment plant.

7.15.11 The main waste types and quantities of operational waste are not yet confirmed. However, based on worst case assumptions, no significant adverse material and waste effects resulting from the operation of the Proposed Development have been identified.

7.16 Human Health

Introduction

7.16.1 Chapter 22: Human Health (PEI Report, Volume I) identifies the potential effects of the Proposed Development upon human health, taking into account information from other technical assessments that are relevant to human health.

7.16.2 The assessment considers potential effects on the health and wellbeing of those communities likely to be impacted by the Proposed Development in the Hartlepool, Redcar and Cleveland, and Stockton-on-Tees districts and Teesside.

7.16.3 The Proposed Development incorporates embedded mitigation measures that aim to avoid any significant human health effects, including (but not limited to):

- mitigation measures as detailed in Chapter 8: Air Quality, Chapter 11: Noise and Vibration, Chapter 15: Traffic and Transportation, Chapter 18: Socioeconomics and Land Use and Chapter 19: Climate Change (PEI Report, Volume I);
- construction works to be undertaken in accordance with the CEMP;
- the Production Facility would require an Environmental Permit and would comply with this under the Environmental Permitting (England and Wales) Regulations 2016.
- a DEMP would be prepared which would consider in detail all potential environmental risks during Proposed Development decommissioning.

7.16.4 Electromagnetic Field (EMF) effects must be controlled in accordance with the Control of Electromagnetic Fields at Work Regulations 2016, which sets out how employers must make and implement action plans to ensure compliance with the defined exposure limits. It is likely that all electrical and control system cables would be installed below ground or at ground level with no new overhead transmission lines proposed. Therefore, it is considered that with appropriate Proposed Development design, significant effects on human health associated with EMFs would be avoided. This would be further assessed during the EIA and reported in the ES.

Effects During Construction

7.16.5 The mitigation measures as detailed above reduce environmental effects during the construction of the Proposed Development which in turn mitigate the effects on the local community and existing facilities from a human health perspective. As such, no significant effects on human health have been identified during construction.

Effects During Operation

7.16.6 The mitigation measures proposed in other technical assessments to reduce effects from the operation of the Proposed Development on the environment would in turn mitigate the effects on the local community and existing facilities from a human health perspective. As such, no significant effects on human health have been identified during the operation of the Proposed Development.

7.17 Cumulative and Combined Effects

7.17.1 Chapter 23: Cumulative and Combined Effects (PEI Report, Volume I) describes the approach for the assessment of cumulative and combined effects as a result of the Proposed Development.

7.17.2 The assessment of Cumulative and Combined Effects will include:

- cumulative effects: these occur when the environmental impacts of the Proposed Development interact with those associated with other planned projects and developments located within a realistic geographical scope where environmental impacts could act together to result in a greater significance of effect on environmental resources and/or receptors; and
- combined effects: these are effects resulting from a single development (i.e., the effects of the Proposed Development) on any one receptor that may collectively cause an effect or effects of greater significance on environmental resources and/or receptors.

7.17.3 There are several developments in the vicinity of the Proposed Development that have the potential to generate cumulative impacts in association with the Proposed Development. Chapter 23: Cumulative and Combined Effects (PEI Report, Volume I) has established a long list of potential developments which will be further updated during the EIA.

7.17.4 A detailed assessment of the cumulative and combined effects will take place during the EIA and reported in the ES.

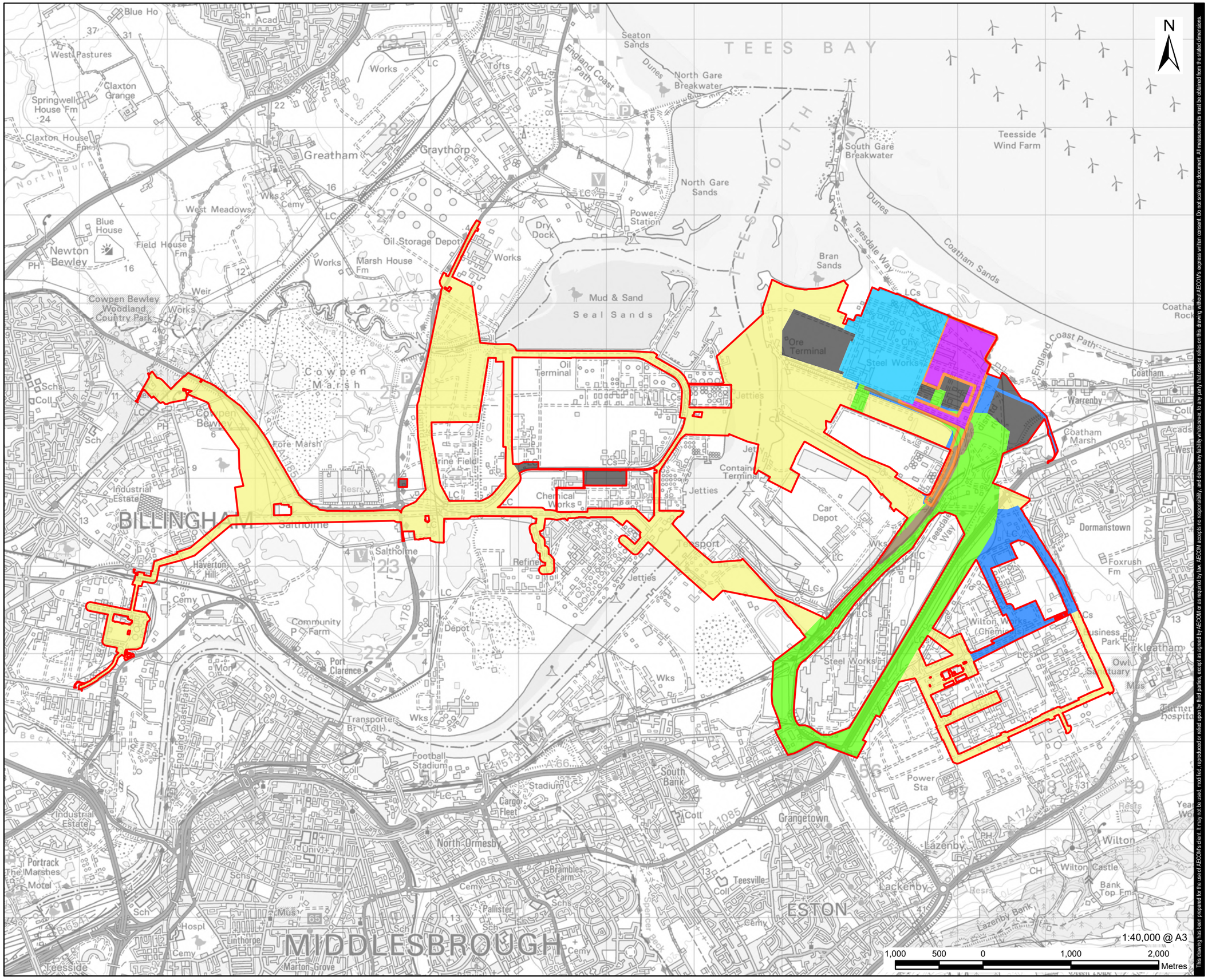
8.0 SUMMARY AND CONCLUSIONS

8.1.1 This NTS and the associated PEI Report present a preliminary assessment of the potential environmental effects of the Proposed Development based on the design and information at the time of writing (August 2023). Following statutory consultation, further assessments will be undertaken during the EIA to inform the ES for the DCO Application, and which would also take account of responses to this consultation.

8.1.2 Potential environmental impact avoidance, design and mitigation measures have been identified to mitigate and control environmental effects during construction, operation (including maintenance) and decommissioning of the Proposed Development. These will be reviewed and refined, and additional mitigation provided where necessary, and presented in the ES.

ANNEX A – FIGURE 4-2: PARTS OF THE PROPOSED DEVELOPMENT SITE

Revision: 0 Drawn: MAB Checked: AD Approved: KS Date: 2023-08-04
Filename: \\na.aecomnet.com\ifs\EMEA\Bristol-UKBRI2\Legacy\UKBRI2FP001\VOL1\BE\Projects\Environmental\General\GIS\Projects\H2 Teesside\02_Maps\PEIR\H2Teesside_PEIR_ProposedDevelopment.aprx



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PROJECT

H2Teesside DCO

APPLICANT

H2 Teesside Limited

CONSULTANT

AECOM Limited
100 Embankment,
Cathedral Approach,
Manchester, M3 7FB
www.aecom.com

LEGEND

- Proposed Development Site Boundary
- Main Site
- CO_2 Export Corridor
- Electrical Connection Corridor
- Hydrogen Pipeline Corridor
- Indicative Temporary Construction Laydown Areas
- Natural Gas Connection Corridor
- Other Gases Connection Corridor (O_2 and N_2)
- Water Connection Corridor

NOTES

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ISSUE PURPOSE

PEI Report

PROJECT NUMBER

60689030

FIGURE TITLE

Parts of the Proposed Development Site

FIGURE NUMBER

Figure 4-2

APPENDIX 11.1: FIRST CONSULTATION – EXAMPLE EMAILS TO LOCAL POLITICAL REPRESENTATIVES

[redacted]

From: info h2teesside <info@h2teesside.net>
Sent: 23 September 2023 16:16
To: [redacted]
Subject: H2Teesside - statutory consultation

This Message Is From an Untrusted Sender
You have not previously corresponded with this sender.

Report Suspicious

Dear [redacted]

I am writing to you in your capacity as Chair of Billingham Town Council as we have recently launched a statutory consultation for our H2Teesside project – a proposed blue hydrogen facility.

The Town Council will have received a formal consultation letter via post and email which provides information on the statutory consultation. Residents within Billingham will have received this leaflet: https://www.bp.com/content/dam/bp/country-sites/en_gb/united-kingdom/home/h2teesside/h2teesside-statutory-consultation-leaflet.pdf

We're holding public consultation events at St Aidan's Church Hall in Billingham on Monday 25th September and Friday 6th October, but wanted to offer the Town Council the opportunity to meet with the project team separately, either at one of your meetings or a separate meeting.

Please let us know if this would be of interest.

Kind regards,

H2Teesside project team

[redacted]

From: info h2teesside <info@h2teesside.net>
Sent: 23 September 2023 16:23
To: [redacted]
Subject: H2Teesside - statutory consultation

This Message Is From an Untrusted Sender
You have not previously corresponded with this sender.

Report Suspicious

Dear [redacted]

I am writing to you in your capacity as Chair of Greatham Parish Council as we have recently launched a statutory consultation for our H2Teesside project – a proposed blue hydrogen facility.

The Parish Council will have received a formal consultation letter via post and email which provides information on the statutory consultation. Residents closest to the project will have received this leaflet: https://www.bp.com/content/dam/bp/country-sites/en_gb/united-kingdom/home/h2teesside/h2teesside-statutory-consultation-leaflet.pdf

We're holding a number of public consultation events as detailed in the leaflet, but wanted to offer the Parish Council the opportunity to meet with the project team separately, either at one of your meetings or a separate meeting.

Please let us know if this would be of interest.

Kind regards,

H2Teesside project team

[redacted]

From: [redacted]
Sent: 07 September 2023 18:45
To: [redacted]
Subject: FW: H2 Teesside Development Consent Order

Follow Up Flag: Follow up
Flag Status: Flagged

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Report Suspicious

From: [redacted]
Sent: Thursday, September 7, 2023 5:34 PM
To: [redacted]
Subject: Re: H2 Teesside Development Consent Order

Hello [redacted]

Yes please I'd like to be included with this briefing and could you please send a TEAMS invite.

Kind regards
[redacted]
Kirkleatham Ward
[redacted]

From: [redacted]
Sent: Thursday, September 7, 2023 3:38:41 PM
To: [redacted]
Subject: H2 Teesside Development Consent Order

WARNING: This email came from outside of the organisation. Do not provide login or password details. Always be cautious opening links and attachments wherever the email appears to come from. If you have any doubts about this email, contact ICT.

Dear [redacted]

Thank you for attending one of our HyGreen Teesside consultation events in June, I hope you found the event useful. We are currently working through the responses to the consultation and finalising our design with a view to submit a planning application for HyGreen Teesside in November.

You may remember that in addition to the green hydrogen facility, we are also progressing plans for H2Teesside, a blue hydrogen facility. H2Teesside aims to be one of the UK's largest blue hydrogen production facilities, delivering economic growth for Teesside and the domestically produced low carbon hydrogen that the UK needs. This is a

separate project that requires a different type of consent, known as a Development Consent Order under the Planning Act 2008.

We are planning to launch a statutory consultation for H2Teesside on Thursday 14th September to gain feedback from the public and stakeholders before submitting our application for development consent. We will be sending the attached leaflet to local residents in your ward to inform them of the consultation and how they can get involved, as well as additional publicity such as adverts in local newspapers.

We would like to invite you to an online briefing for local elected members on **14th September at 18:00**. During this briefing, members of our team will deliver a presentation explaining our proposals for H2Teesside, the purpose of the consultation and the anticipated timescales for the project. There will also be an opportunity to ask questions after the presentation. If you would like to join this session, please let me know and I will arrange for the meeting invite to be sent to you.

Please do not hesitate to contact me should you have any questions.

Kind regards,

[redacted]
Government Affairs Manager | BP plc

1 Saint James's Square, London, SW1Y 4PD
[redacted]

We have recently updated our terms and conditions for all our services, including making some important updates to our privacy notices. To find out more about how we collect, use, share and retain your personal data, visit: www.redcar-cleveland.gov.uk/dataprivacy If you wish to stop receiving emails and unsubscribe from this Council email account, then please reply to this email and let us know. We will need your name and address to amend our records. If we must contact you in the future, we will write to your postal address.

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APPENDIX 11.2: FIRST CONSULTATION – PRESS/MEDIA RELEASE

Posted on 21st September 2023 by Katie — Leave a comment

BP launches consultation on H2Teesside



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capacity of 1.2 GW. Like grey hydrogen, companies such as BP make blue hydrogen using natural gas, but most of the usual carbon emissions will be captured and sequestered in underground reservoirs. The produced low-carbon hydrogen will then be used in hard-to-electrify industries, such as the steel industry and long-distance haulage.

During the consultation, BP will invite feedback from the community about its preliminary project design. The company will then incorporate this into the final design, before applying for permission to construct and manage the plant. The consultation will officially end when midnight strikes on October 27.

BP's UK head of hydrogen, Matt Williamson, said the company was helping the country and Teesside in particular to decarbonise its transport and industry by supporting hydrogen, adding:

> *"H2Teesside is a key part of our plans to help build the region into the UK's leading hydrogen hub. We've been greatly encouraged by the interest from the community and stakeholders in our recent consultation on HyGreen Teesside and we are now looking forward to hearing people's views on these proposals."*

At TrAchem, we include BP's lubricant range, such as Castrol Magnatec and Castrol Hysol, among the many products we offer, so consult our expert team to explore which products will best suit your application.

Category: **Energy**

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EIA predicts rising oil prices in fourth quarter →

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Six-week consultation on bp proposals for H2Teesside

15th September 2023

LEVEL UP THE NORTH | BUSINESS | ECONOMY | INDUSTRY | JOBS AND CAREERS | TECHNOLOGY | NORTH EAST | REDCAR | TEES VALLEY



Teesworks - home of H2Teesside *(Image: bp)*

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Why this ad?

H2Teesside aims to be one of the UK's largest blue hydrogen production facilities, targeting 1.2GW of hydrogen production by 2030, equating to over 10% of the UK Government's hydrogen target of 10GW by the same year.

Blue hydrogen is obtained from natural gas and uses carbon capture and storage technology to prevent carbon emissions from entering the atmosphere. It can play a crucial role in helping carbon intensive sectors decarbonise, particularly in industries that are difficult to electrify.



The project could support around 1300 jobs (both direct and indirect) during the construction phase, and up to 130 jobs during the operational phase, as well as approximately 600 broader supply chain roles.

The consultation will run until 23:59 on 26 October, and follows on from bp's recent consultation on the sister project, HyGreen Teesside. bp will share its initial design for the facility with the community and invite feedback, before finalising the design and preparing an application for consent to build and operate the facility.

Matt Williamson, UK head of hydrogen at bp, said: "We're backing hydrogen to help Teesside and the UK decarbonise its industry and mobility. H2Teesside is a key part of our plans to help build the region into the UK's leading hydrogen hub. We've been greatly encouraged by the interest from the community and stakeholders in our recent consultation on HyGreen Teesside and we are now looking forward to hearing people's views on these proposals."

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The consultation materials and further information is available on the H2Teesside website **www.h2teesside.co.uk**.

The public information events will take place on the following dates:

Thursday 21st September 15:00 - 19:00 Seaview Business Centre, Redcar, TS10 1AZ

Saturday 23rd September 13:00 - 17:00 Seaview Business Centre, Redcar, TS10 1AZ

Monday 25th September 15:00 - 19:00 St Aidan's Church Hall, Billingham, TS23 2DF

Thursday 28th September 18:00 Webinar – register at **www.h2teesside.co.uk**

Thursday 5th October 15:00 - 19:00 Inspire2Learn, South Bank, TS6 9AE

ADVERTISING

Friday 6th October 15:00 - 19:00 St Aidan's Church Hall, Billingham, TS23 2DF

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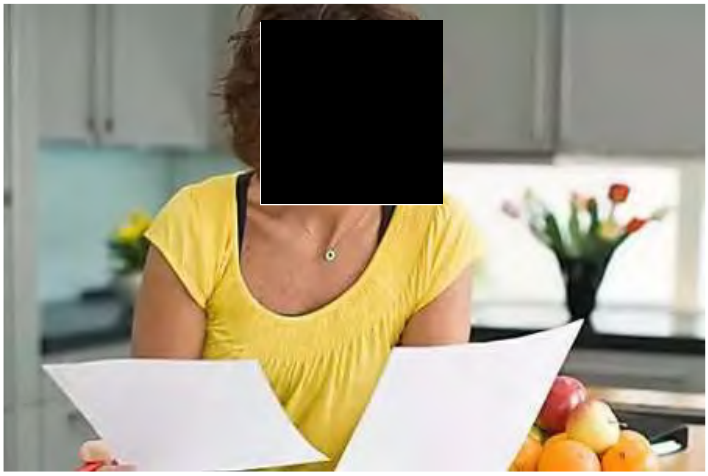

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bp launches community consultation on blue hydrogen project on Teesside

- The H2Teesside consultation will run for six weeks.
- H2Teesside, with its sister project HyGreen Teesside, could play an essential role in decarbonising industry and heavy transport and help the region become the leading UK hydrogen hub.
- bp is holding a series of events where the public can have their say on project plans.

bp has today launched a six-week consultation on their proposals for H2Teesside, a facility which will produce blue hydrogen and enable large scale decarbonisation of local industry.

H2Teesside aims to be one of the UK's largest blue hydrogen production facilities, targeting 1.2GW of hydrogen production by 2030, equating to over 10% of the UK Government's hydrogen target of 10GW by the same year.

Blue hydrogen is obtained from natural gas and uses carbon capture and storage technology to prevent carbon emissions from entering the atmosphere. It can play a crucial role in helping carbon intensive sectors decarbonise, particularly in industries that are difficult to electrify.

The project could support around 1300 jobs (both direct and indirect) during the construction phase, and up to 130 jobs during the operational phase, as well as approximately 600 broader supply chain roles.

The consultation will run until 23:59 on 26 October 2023. It follows on from bp's recent consultation on sister project, HyGreen Teesside. bp will share its initial design for the facility with the community and invite feedback, before finalising the design and preparing an application for consent to build and operate the facility.

Matt Williamson, UK head of hydrogen, bp, said: "At bp, we're backing hydrogen to help Teesside and the UK decarbonise its industry and mobility. H2Teesside is a key part of our plans to help build the region into the UK's leading hydrogen hub. We've been greatly encouraged by the interest from the community and stakeholders in our recent consultation on HyGreen Teesside and we are now looking forward to hearing people's views on these proposals."

The consultation materials and further information is available on the H2Teesside website www.h2teesside.co.uk. The public information events will take place on the following dates:

Date	**Timings**	**Location**
Thursday 21st September	15:00 - 19:00	Seaview Business Centre, Redcar, TS10 1AZ
Sat 23rd September	13:00 - 17:00	Seaview Business Centre, Redcar, TS10 1AZ
Mon 25th September	15:00 - 19:00	St Aidan's Church Hall, Billingham, TS23 2DF
Thurs 28th September	18:00	Webinar – register at www.h2teesside.co.uk

Thursday 5th October	15:00 - 19:00	Inspire2Learn, South Bank, TS6 9AE
Friday 6th October	15:00 - 19:00	St Aidan's Church Hall, Billingham, TS23 2DF
Thursday 12th October	15:00 - 19:00	TunedIn, Redcar, TS10 5BJ

Enquiries

bppress@bp.com
bpteesside@kekstcnc.com

About bp

bp intends to invest up to £18 billion in the UK's energy system by the end of 2030, demonstrating bp's firm commitment to the UK, and helping the country to deliver on its bold ambitions to boost energy security and reach net zero. As one of the largest oil and gas producers in the UK, bp intends to continue investing in North Sea oil and gas, while driving down operational emissions. bp is also in action on a range of lower carbon energy investments in the UK, which are expected to bring jobs and develop new skills and capabilities.

- ENDS -

APPENDIX 11.3: FIRST CONSULTATION – SOCIAL MEDIA POSTS

14:41 4G

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@bp_UK

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Last week marked a major milestone for our blue hydrogen project - H2Teesside - as we launched our consultation 👏 The facility aims to be one of the UK's largest blue hydrogen production facilities & we're excited for feedback from #Teesside locals 💬
h2teesside.co.uk



10:47 am · 18 Sep 2023 · **805** Views

1 Quote **4** Likes

AA twitter.com

14:41 4G

Log in Sign up

bp United Kingdom
@bp_UK

Follow

Public consultations for H2Teesside - our proposed blue hydrogen project on #Teesside - are continuing throughout October 💬 It's been great talking to locals about our plans in the region & we're looking forward to the remaining events 👍 Read more at: h2teesside.co.uk



2:30 pm · 3 Oct 2023 · **583** Views

1 Repost **3** Likes

AA twitter.com

APPENDIX 11.4: FIRST CONSULTATION – CONFIRMATION OF MAIL OUT OF CONSULTATION LEAFLET

[redacted]

From: [redacted]
Sent: 14 September 2023 13:44
To: [redacted]
Cc:
Subject: RE: Job - 14th September

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No problem, thank you!

[redacted] | **Key Account Manager**

[redacted] www.lboxcomms.com

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From: [redacted]
Sent: Thursday, September 14, 2023 1:39 PM
To: [redacted]
Cc: [redacted]
Subject: RE: Job - 14th September

Excellent, thank you for confirming.
I have chased the PO, not sure why it is taking so long – my apologies.

From: [redacted]
Sent: 14 September 2023 13:38
To: [redacted]
Cc: [redacted]
Subject: RE: Job - 14th September

Hi [redacted]
I can confirm that this has been completed the mailing went out on Tuesday.
I look forward to receiving the PO.

Kind regards,

[redacted] | Key Account Manager

[redacted] www.lboxcomms.com
A Lbox Communications, Richmond Bridge House, 419 Richmond Road, Richmond, TW1 2EX, UK

From: [redacted]
Sent: Thursday, September 14, 2023 1:20 PM
To: [redacted]
Cc: [redacted]
Subject: RE: Job - 14th September

Hi [redacted]

Hope you are well. Just wanted to check the leaflets were issued okay?

I'm still chasing the PO number from our accounts – apologies for the delay.

[redacted]

From: [redacted]
Sent: 08 September 2023 11:27
To: [redacted]
Cc: [redacted]
Subject: RE: Job - 14th September

I will do!
Have a nice time off.

Kind regards,

[redacted] | Key Account Manager

[redacted] | W www.lboxcomms.com
A Lbox Communications, Richmond Bridge House, 419 Richmond Road, Richmond, TW1 2EX, UK

From: [redacted]
Sent: Friday, September 8, 2023 11:24 AM
To: [redacted]
Cc: [redacted]
Subject: RE: Job - 14th September

That's great, thanks Iwona.

I'm going on A/L as of this evening, but if you need any support, or have any questions, please speak to Jon in my absence.

Kind regards,

[redacted] BA (Hons)
Senior Consultant, Stakeholder Engagement, Consultation and Communications Team
[redacted]

AECOM
The Colmore Building
Colmore Circus Queensway
Birmingham, B4 6AT, United Kingdom
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From: [redacted]
Sent: 08 September 2023 10:58
To: [redacted]
Cc: [redacted]
Subject: RE: Job - 14th September

Hi [redacted]

I am good thank you, indeed probably last weekend with nice weather so I am looking forward to it.
I hope you are well also.

I can confirm that all is in progress, the materials have been printed and all is undergoing enclosing now.

Kind regards,

[redacted] **| Key Account Manager**

[redacted] W www.lboxcomms.com
A Lbox Communications, Richmond Bridge House, 419 Richmond Road, Richmond, TW1 2EX, UK

From: [redacted]
Sent: Friday, September 8, 2023 10:08 AM
To: [redacted]
Cc: [redacted]
Subject: Job - 14th September

Hi [redacted]

Hope you're well and are looking forward to the weekend.

Just wanted to check in that everything is still on track!

Thanks,
[redacted]

[redacted] BA (Hons)
Senior Consultant, Stakeholder Engagement, Consultation and Communications Team
[redacted]

AECOM
The Colmore Building
Colmore Circus Queensway
Birmingham, B4 6AT, United Kingdom
[redacted]
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APPENDIX 11.5: FIRST CONSULTATION – POSTER

H2Teesside poster A4 CMYK 31/08/2023 15:10

H2 Teesside

bp

Statutory consultation

Have your say on our proposed new blue hydrogen production facility

At bp we're backing hydrogen and carbon capture and storage to help Teesside and the UK decarbonise its industry. As part of that commitment, we're planning a new blue hydrogen production facility in Teesside which will provide low carbon energy.

We're holding a statutory consultation on our proposals from 14 September 2023 to 26 October 2023. Here's how you can find out more about our proposals:

View our consultation page and virtual consultation room: www.h2teesside.co.uk

Register at www.h2teesside.co.uk for our webinar on 28 September 2023 at 18:00

Come and meet the project team at one of our consultation events:

Venue	Dates and times		Address
Seaview Business Centre, Redcar	Thursday 21st September Saturday 23rd September	15:00 – 19:00 13:00 – 17:00	Turner Street, Redcar, TS10 1AZ
St Aidan's Church Hall, Billingham	Monday 25th September Friday 6th October	15:00 – 19:00 15:00 – 19:00	Tintern Ave, Stockton-On-Tees, Billingham, TS23 2DF
Inspire2Learn, South Bank	Thursday 5th October	15:00 – 19:00	South Bank, Normanby Road, Middlesborough, TS6 9AE
TunedIn, Redcar	Thursday 12th October	15:00 – 19:00	Majuba Road, Redcar TS10 5BJ

Visit one of these venues to view our consultation documents on a publicly accessible computer:

Information point	Opening Times
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 09:00 to 18:00; Thursday 09:00 to 17:00; Friday 09:00 to 18:00; Saturday 09:30 to 12:30
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday, Tuesday and Wednesday 08:30 to 18:00; Thursday 08.30 to 20:00; Friday 08:30am to 18:00; Saturday 09.30 to 16:00
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 09:00 to 17:00; Fridays 09:00 to 16:30

How to have your say

Online Fill in our response form at www.h2teesside.co.uk

In person: Fill in a hard copy response form at one of our consultation events

Post: Write to us or send your response form to **FREEPOST H2Teesside**

Email: Write to us or send your completed response form to info@h2teesside.net

Please submit your feedback by **23:59 on 26 October 2023**

Venue	Address	Confirmed
25K Community Centre	Ayton Dr, Redcar TS10, UK	Y
Blackhall Community Centre	Hesleden Rd, Blackhall Colliery, Hartlepool TS27 4LG	Y
Blackhall Library	14 Middle St, Blackhall Colliery, Hartlepool TS27 4EA	Y
Brotton Library	Linden Rd, Brotton, Saltburn-by-the-Sea TS12 2SJ	Y
Dormanstown Library	3 Farndale Square, Redcar TS10 5HQ	Y
Egglescliffe Community Centre	Durham Ln., Eaglescliffe, Stockton-on-Tees TS16 0EH	Y
Eston Leisure Centre	Normanby Rd, South Bank, Middlesbrough TS6 9AE	Y
Fishburn Youth and Community Centre	Butterwick Rd, Fishburn, Stockton-on-Tees TS21 4ED	Y
Horden Library	Sunderland Rd, Darlington Ave, Horden, Peterlee SR8 4PF	Y
Ingleby Barwick Community Hall	Haresfield Way, Beckfields Ave, Thornaby, Stockton-on-Tees TS17 0YL	Y
International Community Centre	7 Abingdon Rd, Middlesbrough TS1 2DP	Y
Laburnum Library	338 Laburnum Rd, Redcar TS10 3QR	Y
Loftus Community Hub CIC	Loftus West Road Social Club, West Rd, Loftus, Saltburn-by-the-Sea TS13 4RG	Y
Loftus Library	Hall Grounds, Loftus, Saltburn-by-the-Sea TS13 4HJ	Y
Marske Library	Windy Hill Ln, Marske-by-the-Sea, Redcar TS11 7BL	Y
Middleton St George Community Centre	Station Rd, Middleton St George, Darlington DL2 1JG	Y
Redcar Leisure Centre	Ridley St, Redcar TS10 1TD	Y
Redcar Library	Redcar and Cleveland House Kirkleatham Street Redcar TS10 1RT United Kingdom	Y
Saltburn Library	Windsor Rd, Saltburn-by-the-Sea TS12 1AT	Y
Sedgefield Community Association	Ceddesfield Hall, Rectory Row, Sedgefield, Stockton-on-Tees TS21 2AE	Y
Skelton Library	4 Coniston Rd, Skelton-in-Cleveland, Saltburn-by-the-Sea TS12 2HP	Y
Stokesley Leisure Centre	Great Broughton Road, Stokesley, Middlesbrough TS9 5JJ	Y
Trimdon Grange Community Association	Salters Ln, Trimdon Grange, Trimdon Station TS29 6PB	Y

APPENDIX 11.6: FIRST CONSULTATION – PUBLIC WEBINAR PRESENTATION

H2Teesside

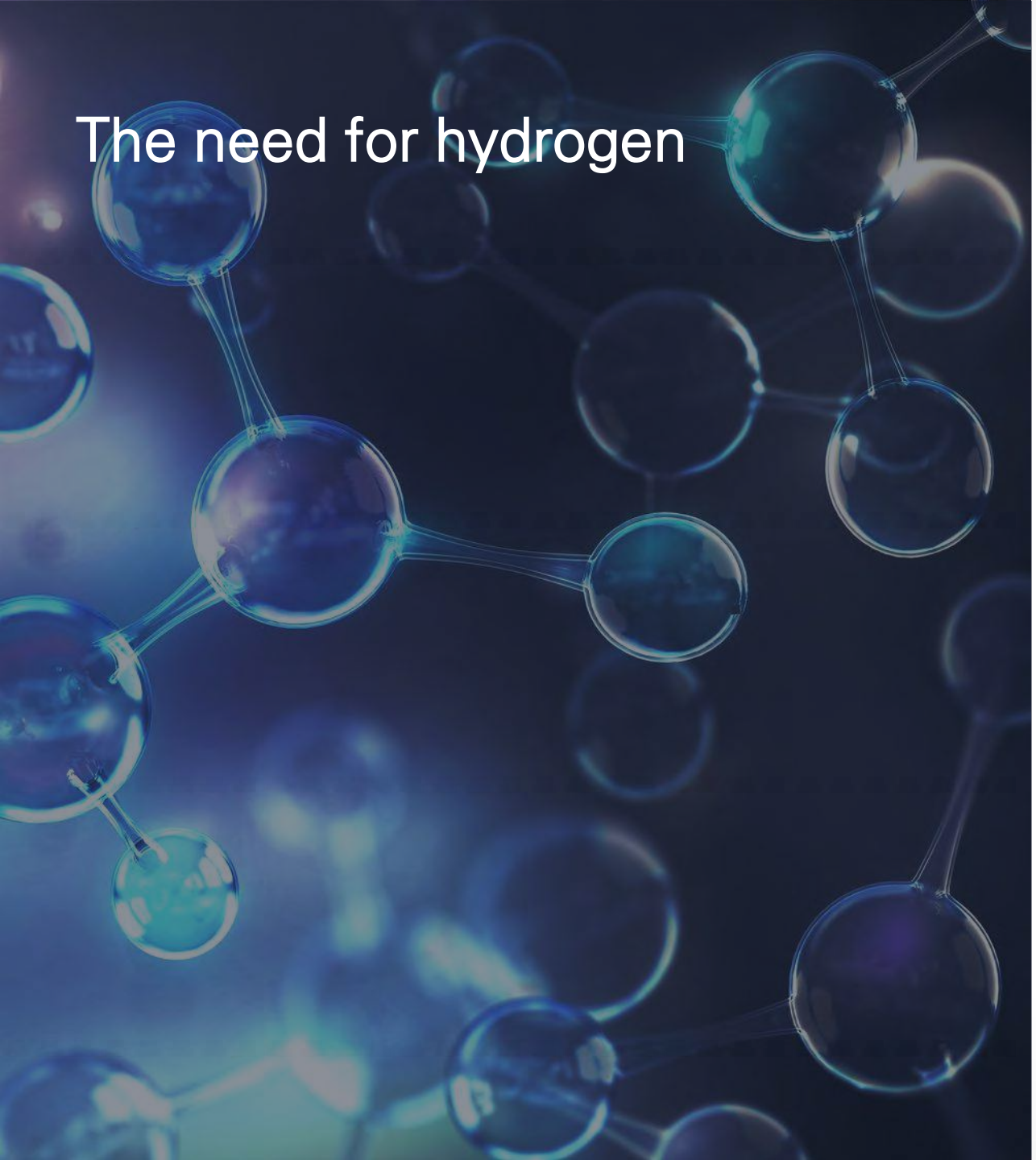
Statutory consultation Webinar

Thursday 28th September - 18:00



Agenda

1. Welcome & housekeeping
2. Hydrogen and Teesside
3. H2Teesside proposals
4. Preliminary Environmental Information
5. The planning process and consultation
6. Benefits for Teesside
7. Q&A



The need for hydrogen

- Hydrogen is the **number one industrial decarbonization solution**, generating energy intensity that electricity cannot match.
- The UK government has made a legally binding commitment to reaching **Net Zero by 2050**.
- Low carbon blue hydrogen produced at **H2Teesside** will help surrounding industrial companies meet their commitments to reducing their greenhouse gas emissions by switching from natural gas, and support the decarbonisation of Teesside's industry.

bp on Teesside

Teesside has all the attributes of a world-class clean hydrogen hub – the right natural resources, concentrated demand, hydrogen storage and pipelines, ample access to carbon capture, utilisation and storage (CCUS), and people with the skills that we need.

Alongside H2Teesside, our Teesside activity includes:

Northern Endurance Partnership

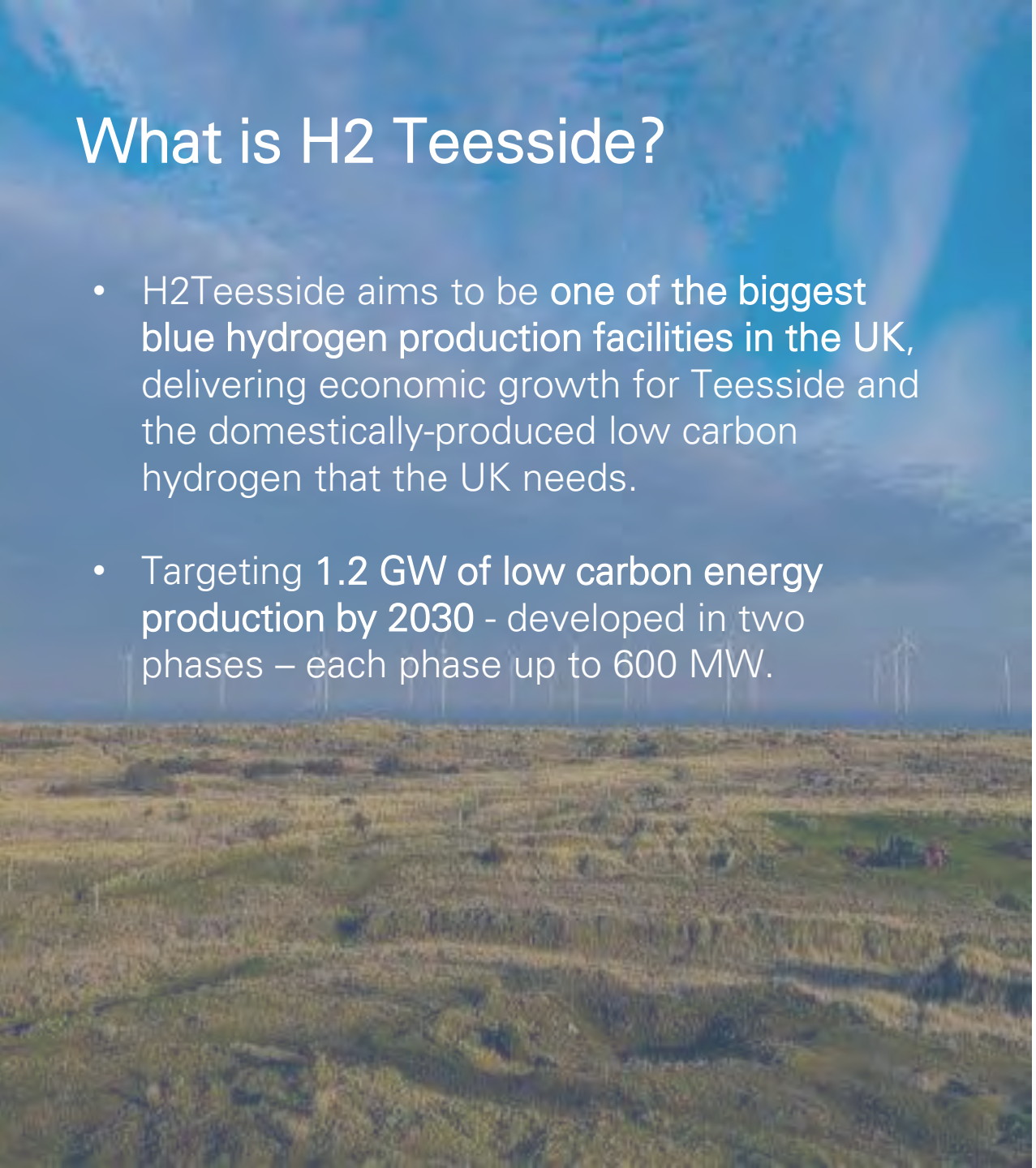
Operator of the Northern Endurance Partnership

Net Zero Teesside

Lead developers of NZT Power

HyGreen Teesside

Developing HyGreen Teesside

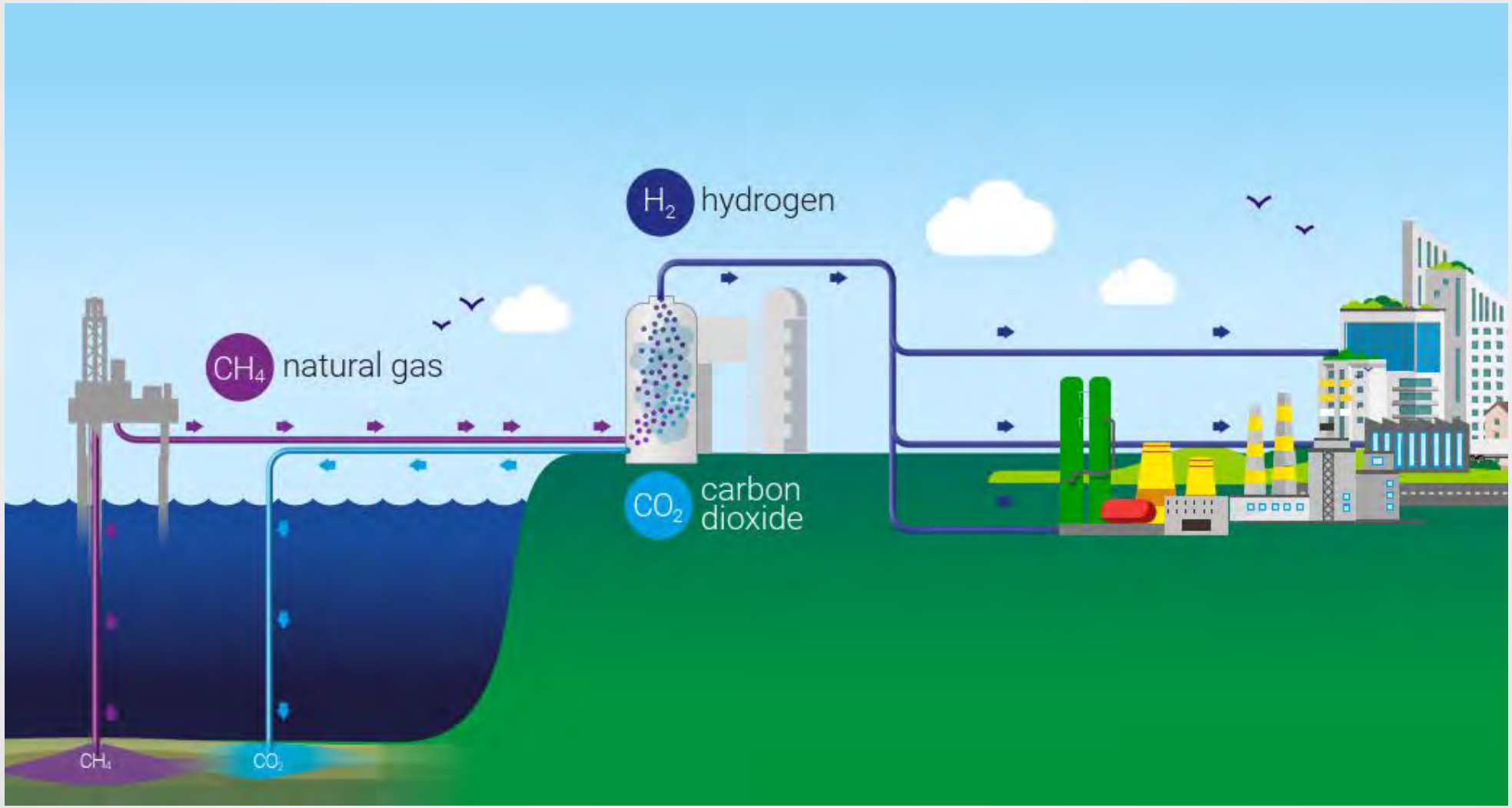


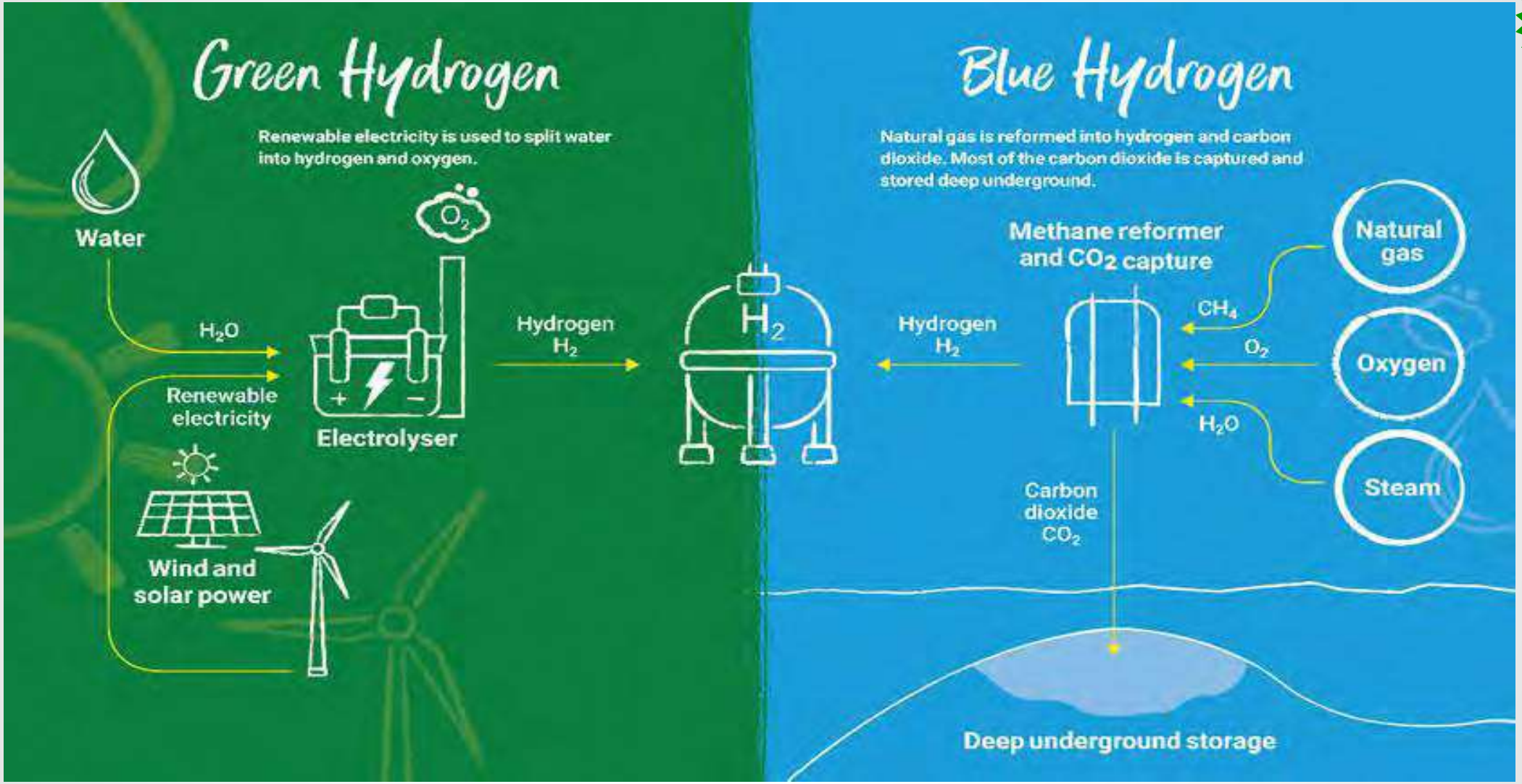
What is H2 Teesside?

- H2Teesside aims to be **one of the biggest blue hydrogen production facilities in the UK**, delivering economic growth for Teesside and the domestically-produced low carbon hydrogen that the UK needs.
- Targeting **1.2 GW of low carbon energy production by 2030** - developed in two phases – each phase up to 600 MW.

- H2Teesside could deliver **over 10% of the UK Government's target of developing 10 GW of hydrogen** production by 2030.
- Capturing emissions from H2Teesside will **store two million tonnes of CO_2 per year**, equivalent to the emissions produced by heating one million households in the UK.
- We're seeing strong interest from potential industrial users (known as offtakers) for hydrogen from H2Teesside to help decarbonise industry.

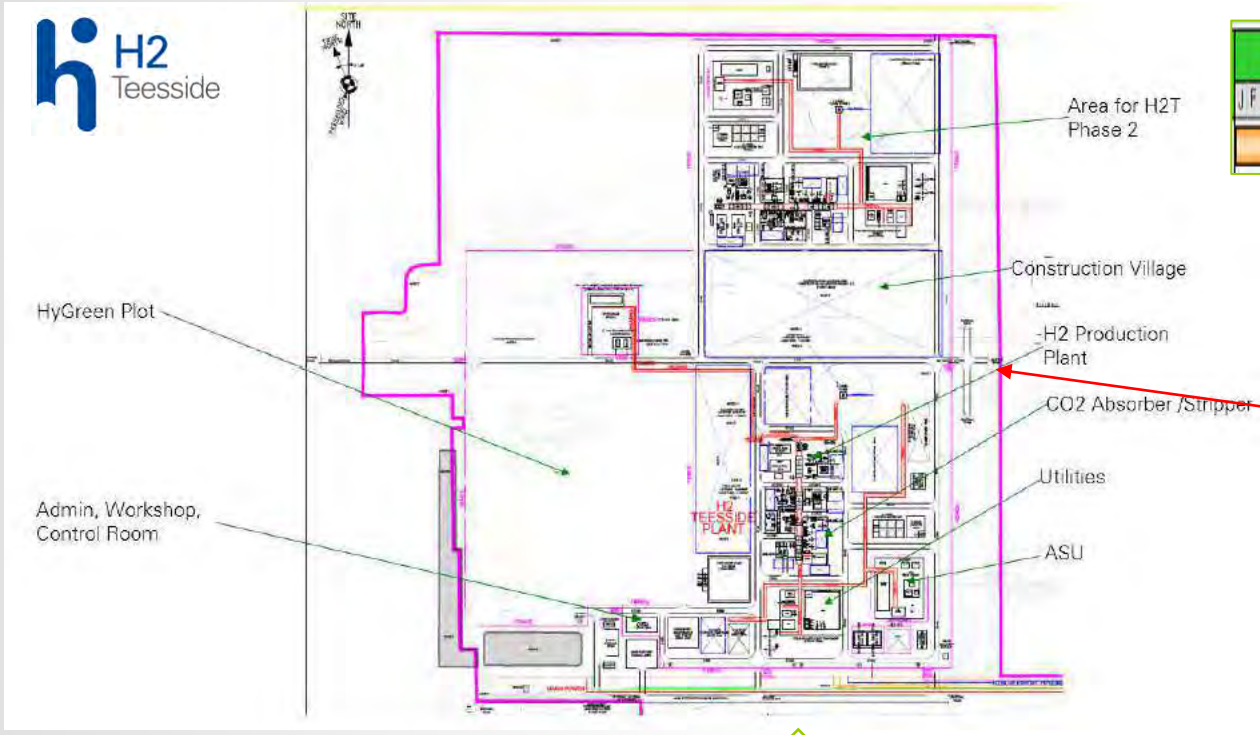
Producing blue hydrogen

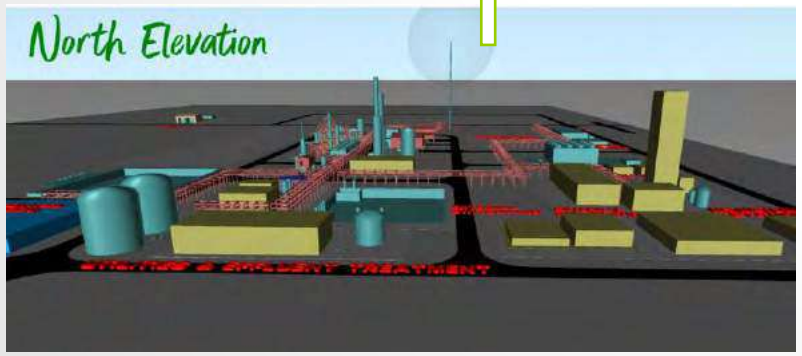



Green Hydrogen
Renewable electricity is used to split water into hydrogen and oxygen.
Water
O_2
H_2O
Renewable electricity
Electrolyser
Hydrogen H_2
Wind and solar power
H_2
Blue Hydrogen
Natural gas is reformed into hydrogen and carbon dioxide. Most of the carbon dioxide is captured and stored deep underground.
Methane reformer and CO_2 capture
Hydrogen H_2
CH_4
O_2
H_2O
Natural gas
Oxygen
Steam
Carbon dioxide CO_2
Deep underground storage

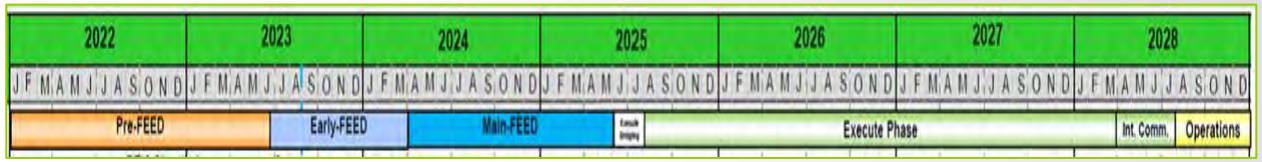
The H2Teesside project

Preliminary Hydrogen Plant Layout





Phase 1 Timeline



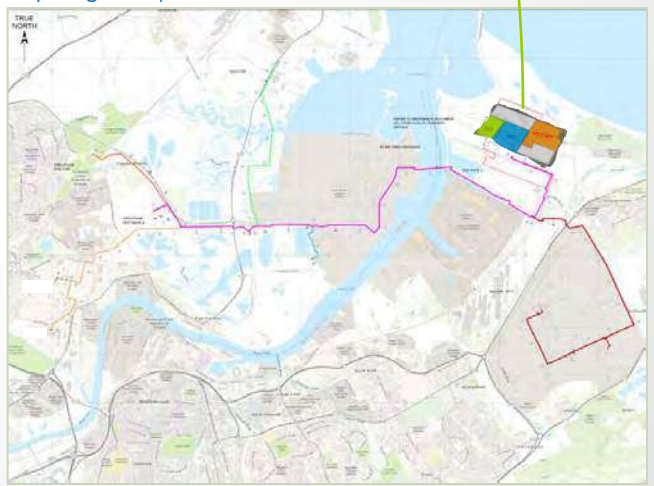
Approval ▲ Construction

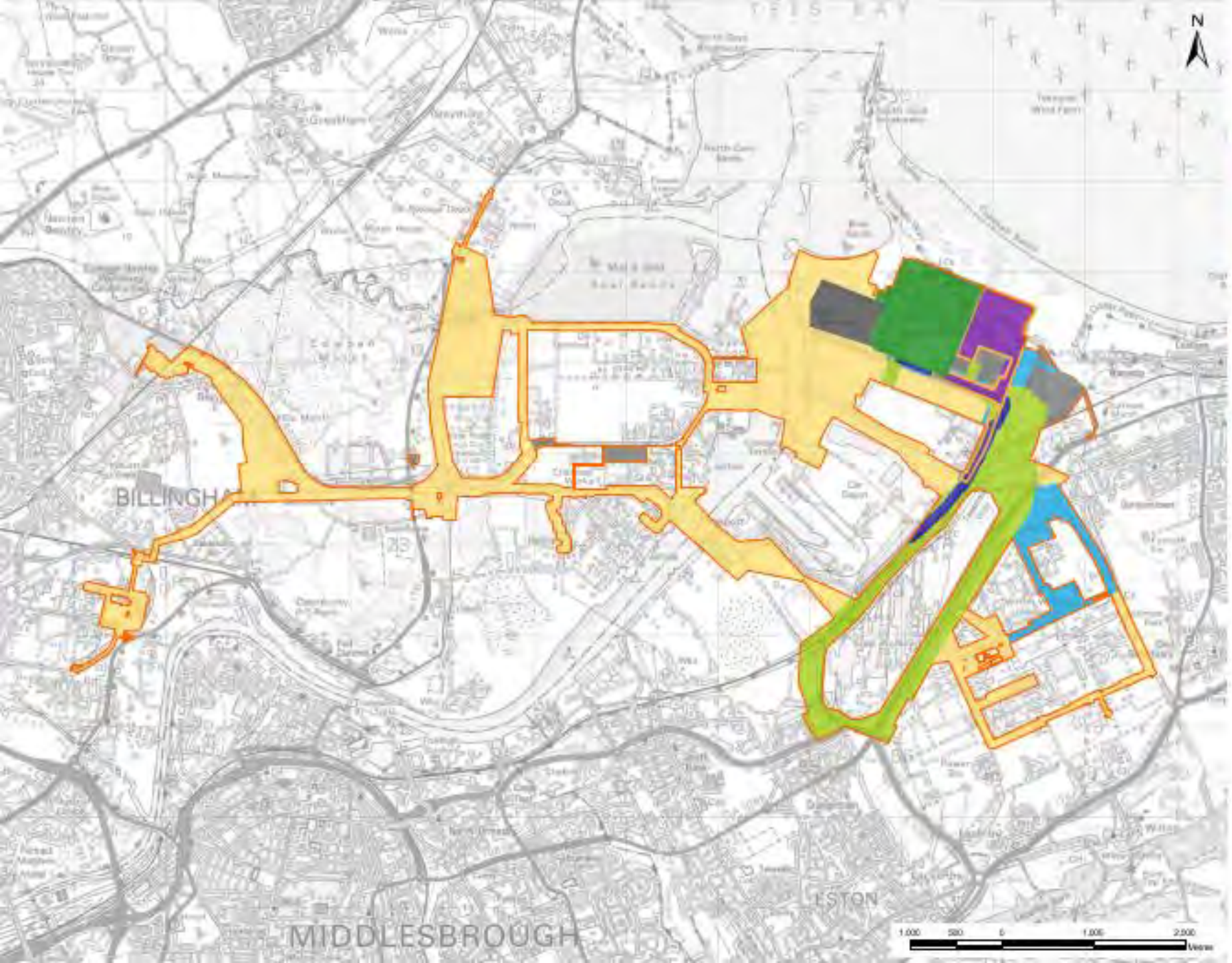
Hydrogen Plant



&

Hydrogen Pipeline





- Proposed development site boundary
- Main site
- CO_2 export corridor
- Electrical connection corridor
- Hydrogen pipeline corridor
- Indicative temporary construction laydown area
- Natural gas connection corridor
- Other gases connection corridor (O_2 and N_2)
- Water connection corridor

H2 Teesside

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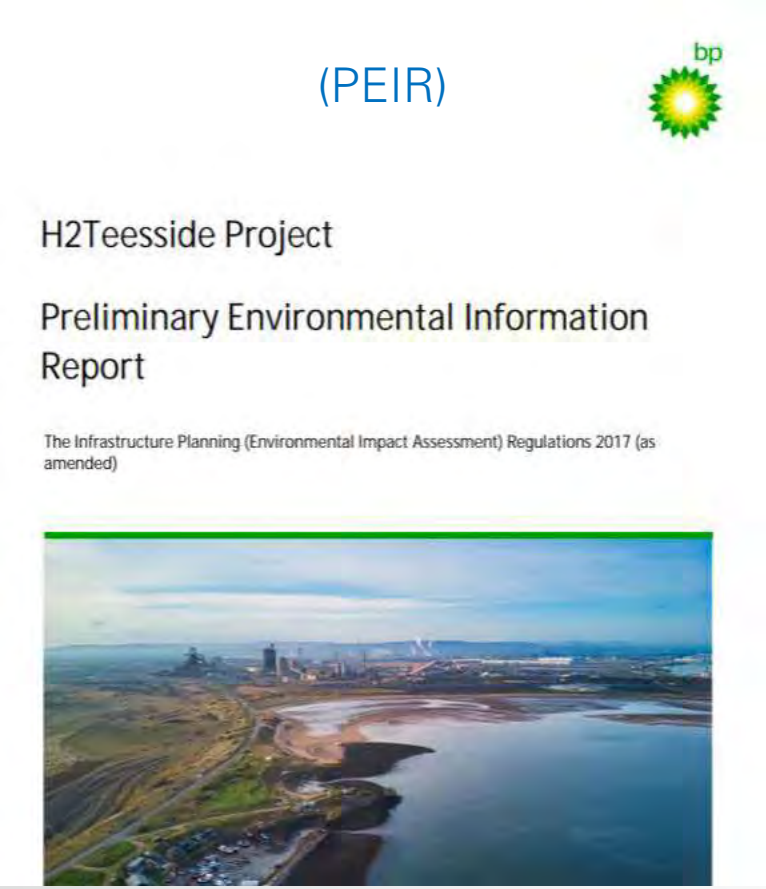
Preliminary Environmental Information



- An Environmental Impact Assessment (EIA) is being undertaken to consider the potential effects of H2Teesside on the environment and to develop measures to avoid or reduce those effects (mitigation)
- The EIA has been informed by a Scoping Opinion received from the Planning Inspectorate in May 2023.
- We have developed a Preliminary Environmental Information Report (PEIR) which sets out the potential environmental effects of H2Teesside across several different topics, based on the preliminary assessment work we've done to date.
- The PEIR is available to view as part of this consultation and will be updated to form an updated EIA within the Environmental Statement which will accompany the DCO application.

DCO Application Process

- The Secretary of State for Energy Security and Net Zero has directed that H2Teesside is a project of national significance which should be consented through a type of planning consent called a Development Consent Order (DCO).
- Secretary of State for Energy Security and Net Zero ultimately responsible for deciding whether development consent should be granted.
- Local Authorities play a key role in the process.

EIA Scoping Opinion
17 May 23

Statutory consultation
14 Sept – 26 Oct

Have regard to consultation responses, prepare DCO application

Submit DCO application
Early 2024



PEIR Submitted

Timeline – application onwards

Early 2024	We plan to submit our Development Consent Order application to the Planning Inspectorate. They will review the application to determine whether it should be accepted for examination and will invite Interested Parties to submit representations.
Mid 2024	Six month examination period starts.
Late 2024	The Planning Inspectorate will conclude their examination of our DCO application.
2025	The Secretary of State will announce their decision as to whether to grant development consent for H2Teesside.
	Subject to the DCO application being granted, construction of H2Teesside is planned to commence in 2025.
2028	It is planned that H2Teesside would start commissioning by 2028.

Statutory consultation

- Consultation is a key part of the DCO process.
- Our statutory consultation will run from 14 September to 26 October.
- We'll review all consultation responses and prepare a Consultation Report showing how we have considered the feedback received and any changes made as a result.



Find out more and get involved

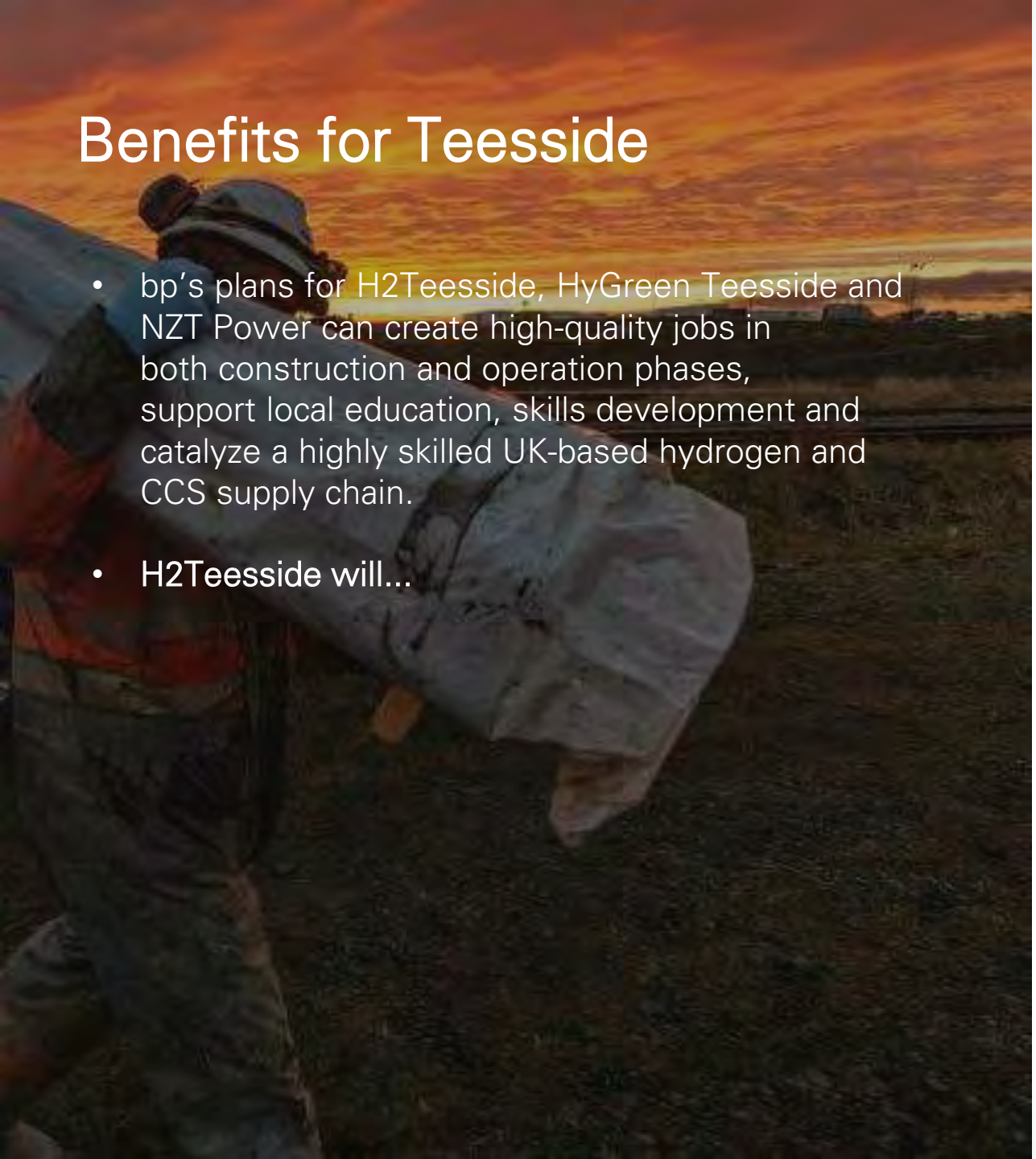
Online – www.h2teesside.co.uk

In-person consultation events

Public webinar



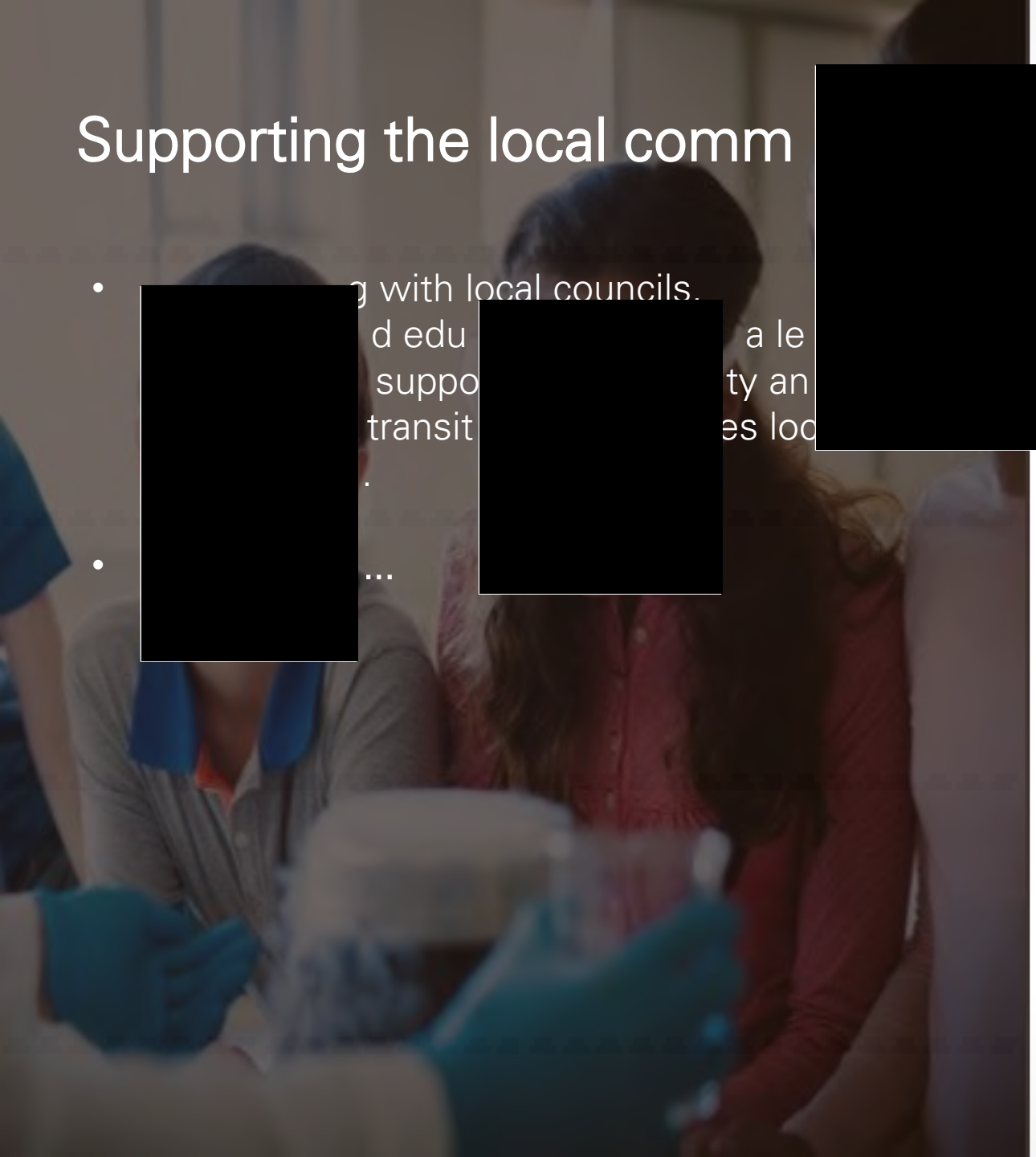
The team can be contacted at 0800 0803028, info@h2teesside.net or FREEPOST H2Teesside if anyone needs help accessing our consultation.



Benefits for Teesside

- bp's plans for H2Teesside, HyGreen Teesside and NZT Power can create high-quality jobs in both construction and operation phases, support local education, skills development and catalyze a highly skilled UK-based hydrogen and CCS supply chain.
- H2Teesside will...
  - **Support economic development and regeneration** in the Teesside area, strengthening Teesside's development into the UK's leading hydrogen hub.
  - Support the development of a **highly skilled UK-based hydrogen supply chain.**
  - Help safeguard jobs in existing local industries, by helping Teesside **decarbonise its industry and attract new businesses to the region.**
  - **Support approximately 1300 jobs** (direct and indirect) during its construction phase. It will also support up to 130 permanent jobs once both phases are operational.
  - Assist with the **regeneration of the former steelworks site.**

Supporting the local comm



- g with local councils.
  d edu a le
  suppo ty an
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  .
- ...

- Investing £19.5 million in social investment programmes including community education and skills initiatives with aims to reach more than 5,000 people.
- Supporting the development of the new Clean Energy Education Hub at Redcar & Cleveland College, which also includes funding a Clean Energy Technician scholarship programme which offers 21 students the chance to earn while they learn on a two-year engineering programme.
- Expanding our collaboration with the Skills Builder Partnership to support schools in Teesside to help primary school students to build essential future life skills.
- Supporting local communities to participate in and benefit from the energy transition to net-zero in Teesside.

Questions



Contact us or join us at an event:

0800 0803028

info@h2teesside.net

FREEPOST H2Teesside

Date	Timings	Location
Thursday 21st September	15:00 - 19:00	Seaview Business Centre, Redcar, TS10 1AZ
Saturday 23rd September	13:00 - 17:00	Seaview Business Centre, Redcar, TS10 1AZ
Monday 25th September	15:00 - 19:00	St Aidan's Church Hall, Billingham, TS23 2DF
Thursday 28th September	18:00	Webinar – register at www.h2teesside.co.uk
Thursday 5th October	15:00 - 19:00	Inspire2Learn, South Bank, TS6 9AE
Friday 6th October	15:00 - 19:00	St Aidan's Church Hall, Billingham, TS23 2DF
Thursday 12th October	15:00 - 19:00	TunedIn, Redcar, TS10 5BJ

APPENDIX 11.7: FIRST CONSULTATION – VIRTUAL CONSULTATION ROOM LANDING PAGE


bp
11. Have your say
H2 Teesside
Have your say
Please submit your feedback by 26 October 2023
START HERE
H2 Teesside
bp
1. Welcome
Welcome
2. Introduction
3. Capturing carbon
Submit feedback
H2 Teesside
Consultation materials
Preliminary Environmental Information
Plans & maps
by digital AECOM

APPENDIX 11.8: FIRST CONSULTATION – INFORMATION BOARDS AND QUESTION AND ANSWER DOCUMENT.

Welcome

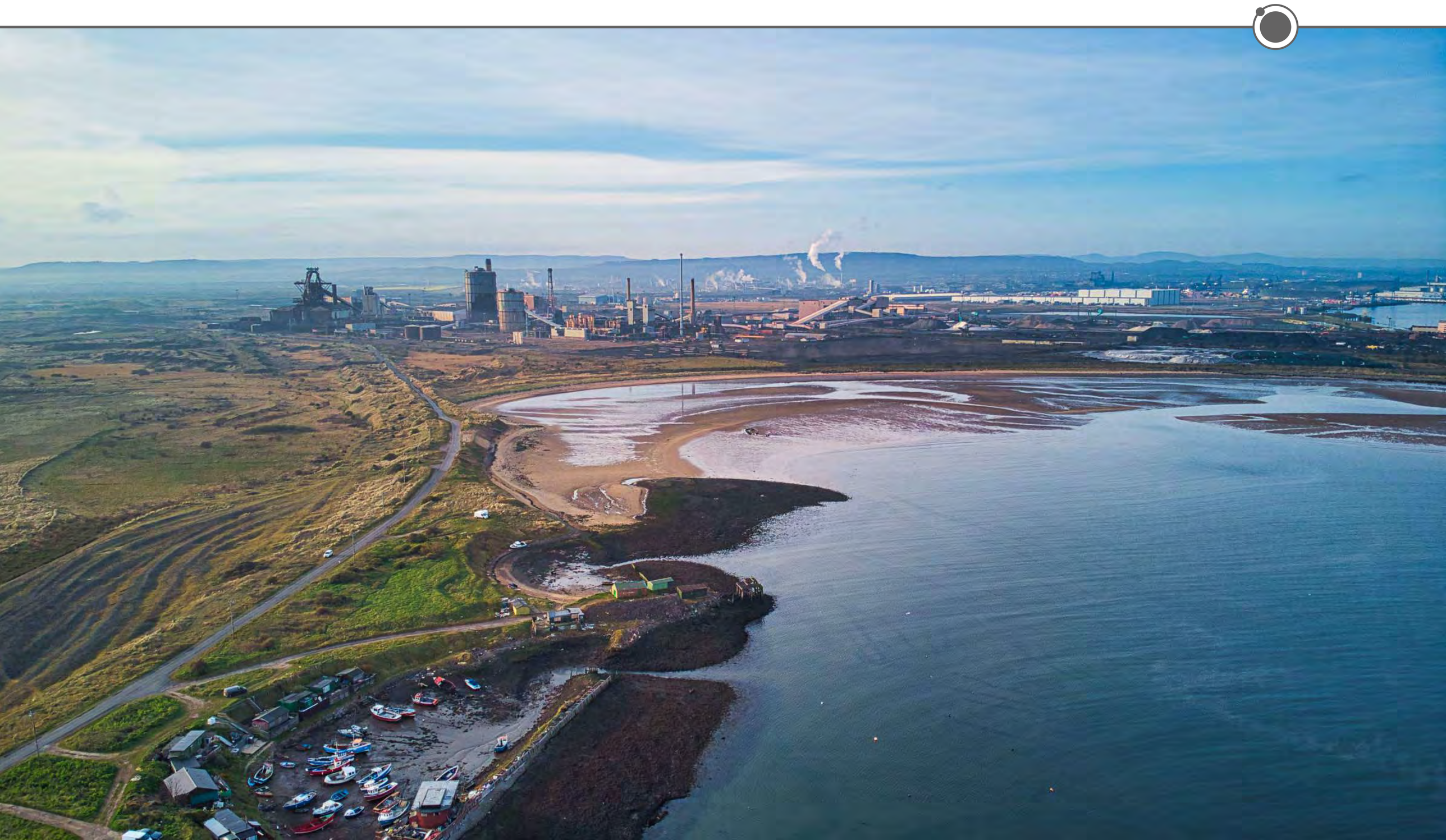
At bp, we're taking action through transformative projects that will help us to achieve our net zero ambitions.

We're backing hydrogen with carbon capture and storage to help decarbonise industry in Teesside and the UK.
As part of this, we're proposing to build and operate H2Teesside – a blue hydrogen production facility on Teesside.

Hydrogen is set to play an essential role in decarbonising industries in the UK, particularly those that are difficult to electrify.

H2Teesside aims to be one of the biggest blue hydrogen production facilities in the UK, delivering economic growth for Teesside and the domestically-produced low carbon hydrogen that the UK needs.

Along with its sister project HyGreen Teesside and a number of other proposed projects in the area, H2Teesside can strengthen Teesside's development into the UK's leading hydrogen hub, creating new high-quality jobs, supporting local education and skills development and kick-starting a highly-skilled UK-based hydrogen supply chain.



H2 Teesside

bp

H2Teesside is a proposed large-scale blue hydrogen production facility, to be located on derelict industrial land on Teesside.

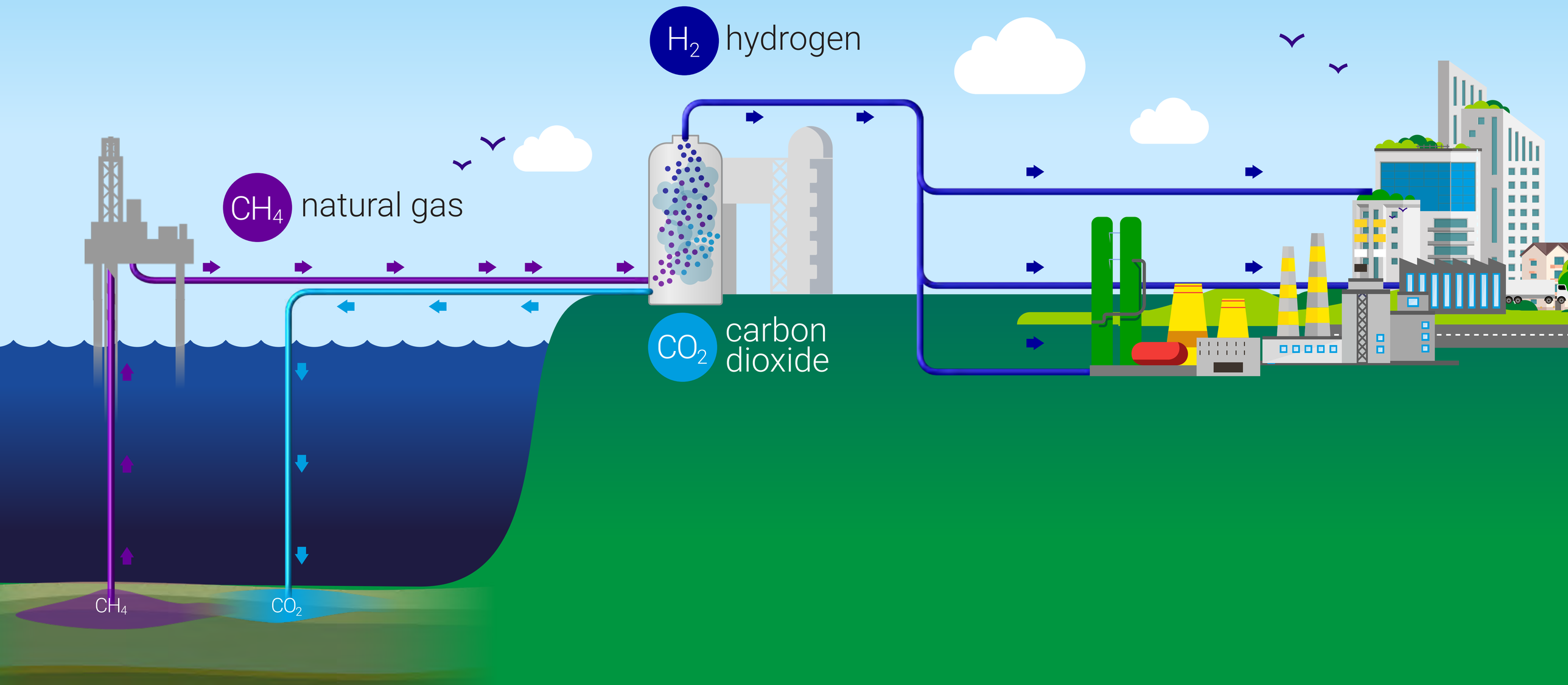
Low carbon hydrogen can help us get to net zero:

- It can play an essential role in decarbonising industries that are difficult to electrify – for example chemicals production or as feedstock for fertiliser production.
- Blue hydrogen, integrated with carbon capture and storage, can provide the scale and reliability required for industrial processes.
- It can also be used as a low-carbon fuel for power generation.
- Hydrogen can also help to decarbonise transport, such as heavy-duty fleets.

Hydrogen will be key to a net zero future, but does not occur in sufficient quantities in nature. This means it must be produced through industrial practices.

What is Blue Hydrogen?

- Blue hydrogen, sometimes referred to as carbon capture and storage enabled low carbon hydrogen, is hydrogen that is obtained from natural gas (methane).
- H2Teesside will convert methane in natural gas into CO_2 and H_2.
- At least 95% of the CO_2 produced as part of this process will be captured and stored permanently beneath the North Sea, preventing it from entering the atmosphere.
- H2Teesside will capture and send for storage approximately two million tonnes of CO_2 per year.



H2 Teesside

bp

Capturing carbon

Carbon Capture and Storage (CCS) is the term for a group of technologies that remove CO_2 from sources such as industrial processes and power plants, transport it – most often by pipeline – and then securely store it. These technologies remove the majority of CO_2 emissions at source.

CO_2 is compressed, transported, and injected into rock formations. These rock formations have interconnected pores where the CO_2 becomes trapped and locked in place, preventing it from being released into the atmosphere.

H2Teesside and CCS

The CO_2 captured by H2Teesside will be sent for secure long-term storage to the **Endurance store**, located approximately 145km off the coast of Teesside under the North Sea, via the **Northern Endurance Partnership pipeline**.

The Northern Endurance Partnership (NEP) is the CO_2 compression, transportation and storage project which will deliver the onshore and offshore infrastructure needed to capture carbon from a range of emitters across Teesside and the Humber and transport it to the Endurance store.

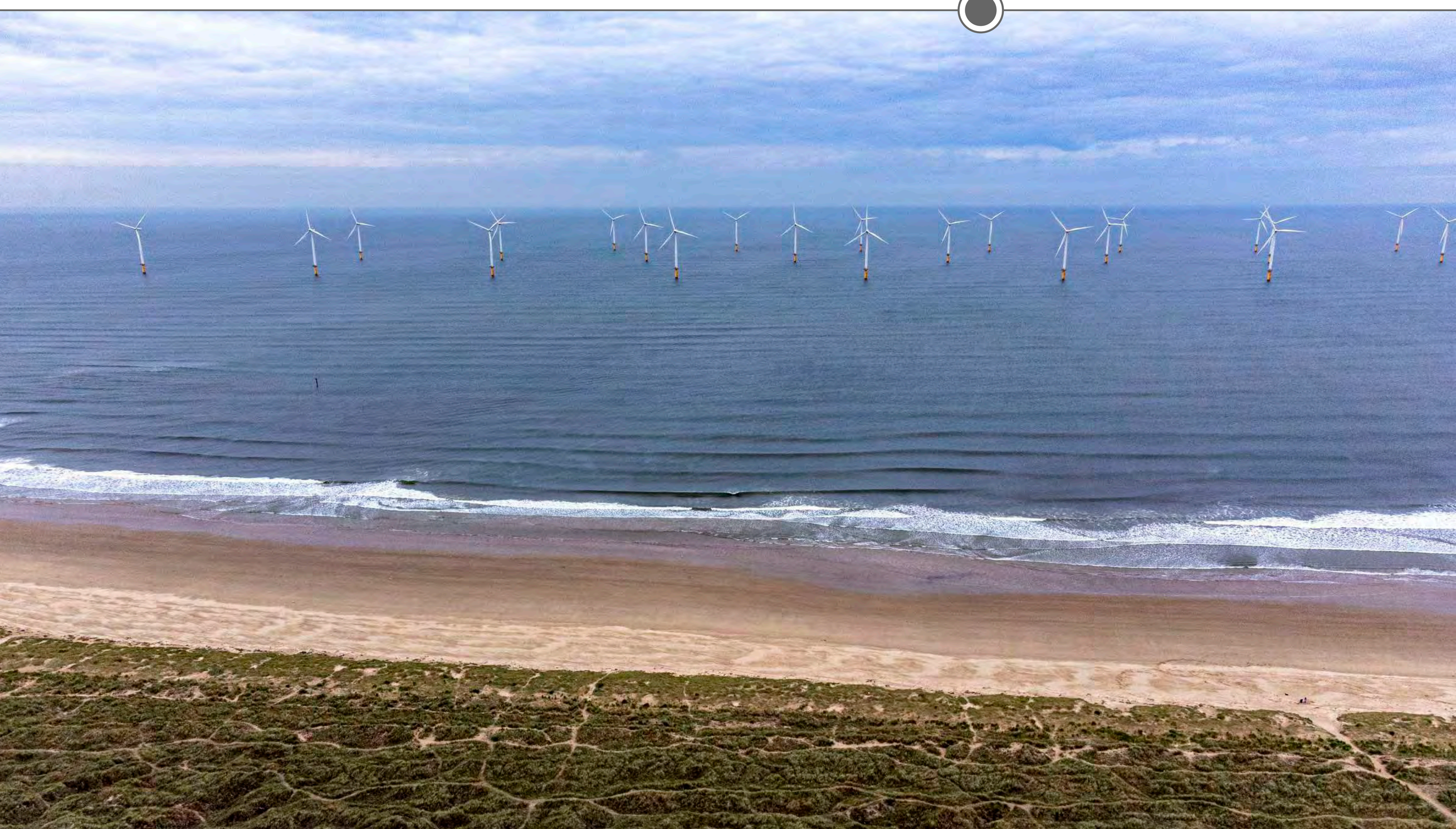
The Endurance carbon store is the name of a geological feature – a saline aquifer – under the North Sea. It has the capacity to store 450 million tonnes of CO_2.

Why blue hydrogen?

In the UK Hydrogen Strategy (published August 2021), the UK Government set out an approach to support green hydrogen and blue hydrogen in parallel, aiming to enable the rapid growth of the sector while bringing costs down.

Producing green hydrogen relies on the availability of a sufficient, reliable supply of low carbon electricity, produced via methods such as wind and solar power. The current scale at which renewable and low carbon energy is produced, presents significant challenges to producing green hydrogen at an industrial scale, in the timescales in which it is required.

Blue hydrogen is being promoted as a necessary and low cost option, which can make use of existing infrastructure across the Teesside region, advancing the UK's energy transition.



H2 Teesside

bp

Why Teesside?

Teesside has a long and proud history of industrial activity, ranging from steelmaking to chemicals. The region continues to play a key role in UK industry today, with Teesside's leading industrial businesses contributing millions of pounds to the local and UK economy each year.

Key to achieving the UK government's commitment to net zero by 2050 will be ensuring carbon intensive sectors in areas like Teesside, which accounts for around 5% of the UK's industrial emissions, are able to decarbonise.

The Teesside industrial cluster is a tightly packed area, making it a great location to decarbonise effectively and efficiently. Low carbon blue hydrogen produced at H2Teesside will help surrounding industrial companies meet their commitments to reducing their greenhouse gas emissions, and support the decarbonisation of Teesside's industry.

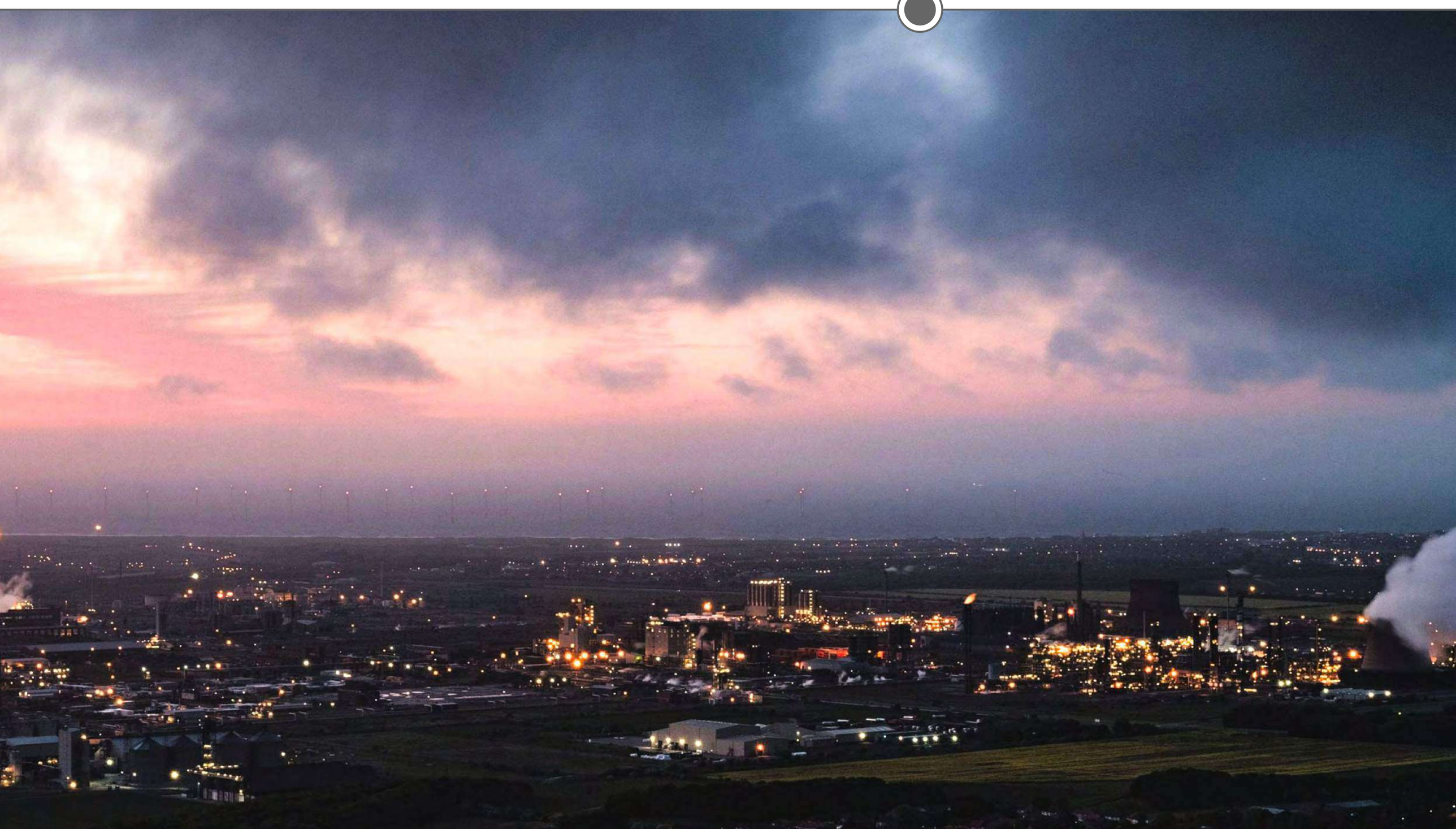
We're seeing strong interest from potential industrial users (known as offtakers) for hydrogen from H2Teesside to help decarbonise industry.

Developing a world-class hydrogen and CCS hub

Teesside is already a UK energy hub, with access to gas from UK gas fields and offshore wind supply, helping ensure national energy security. H2Teesside along with its sister project HyGreen Teesside and other proposed projects in the area can help Teesside become the UK's leading hydrogen hub.

H2Teesside could deliver over 10% of the UK Government's target of developing 10GW of hydrogen production by 2030.

The low carbon hydrogen produced by bp's projects on Teesside will play an important role in delivering on the country's bold ambitions to boost energy security.



H2 Teesside

bp

The project site

Land at the former Redcar Steelworks will contain the main blue hydrogen production facility and ancillary infrastructure.

The pipeline and connection corridors

To allow the facility to operate and connect to hydrogen offtakers, a number of pipeline connections need to be developed. These consist of five main connections, corridors for which have been identified:

Hydrogen export pipeline: This pipeline network would be used to transport hydrogen to potential offtakers across the Tees valley.

Natural gas supply connection: This pipeline would be used to transport natural gas from the existing national gas transmission network to the production facility.

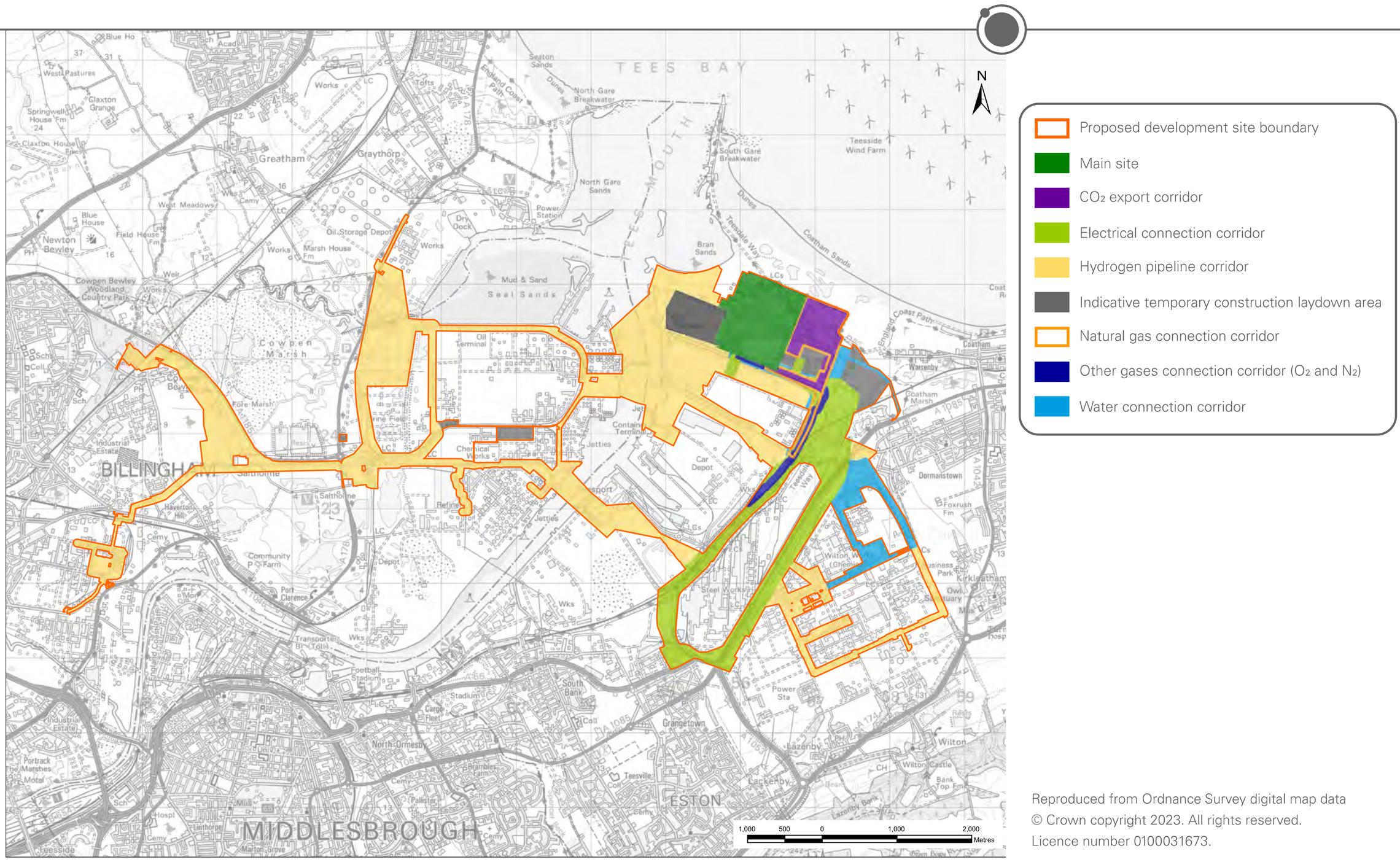
Electrical Connection: These connections would bring electrical power to the production facility.

Water connection: These connections would be used to supply water to the production facility and to discharge treated waste water from the production facility.

CO_2 export connection: This pipeline would be used to transport CO_2 captured at H2Teesside, to the NEP development to the east. Compression, transportation and geological storage of CO_2 from H2Teesside will be managed and operated by NEP and is not part of the H2Teesside project.

Land will also be required for construction working areas and compounds, and accesses by land and water. Other connections (such as for other gases) may also be required.

Please note that these corridors, which are shown on the plan below, are areas that our pipelines and connections would be placed within. As we continue to engage with stakeholders and progress our design, we will refine and reduce these areas accordingly.



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Making blue hydrogen

Step 1

Natural gas would be transported to the main site via a pipeline, where it will be pre-reformed with steam over a catalyst bed, to break down the methane to carbon oxides (CO/CO_2) and hydrogen (H_2).

Step 2

This gas, known as syngas, would then be reformed further using pure O_2 and more steam in an Auto Thermal Reformer (ATR).

Step 3

After cooling, the syngas would be reacted in water-gas shift reactors, to generate H_2 and CO_2.

Step 4

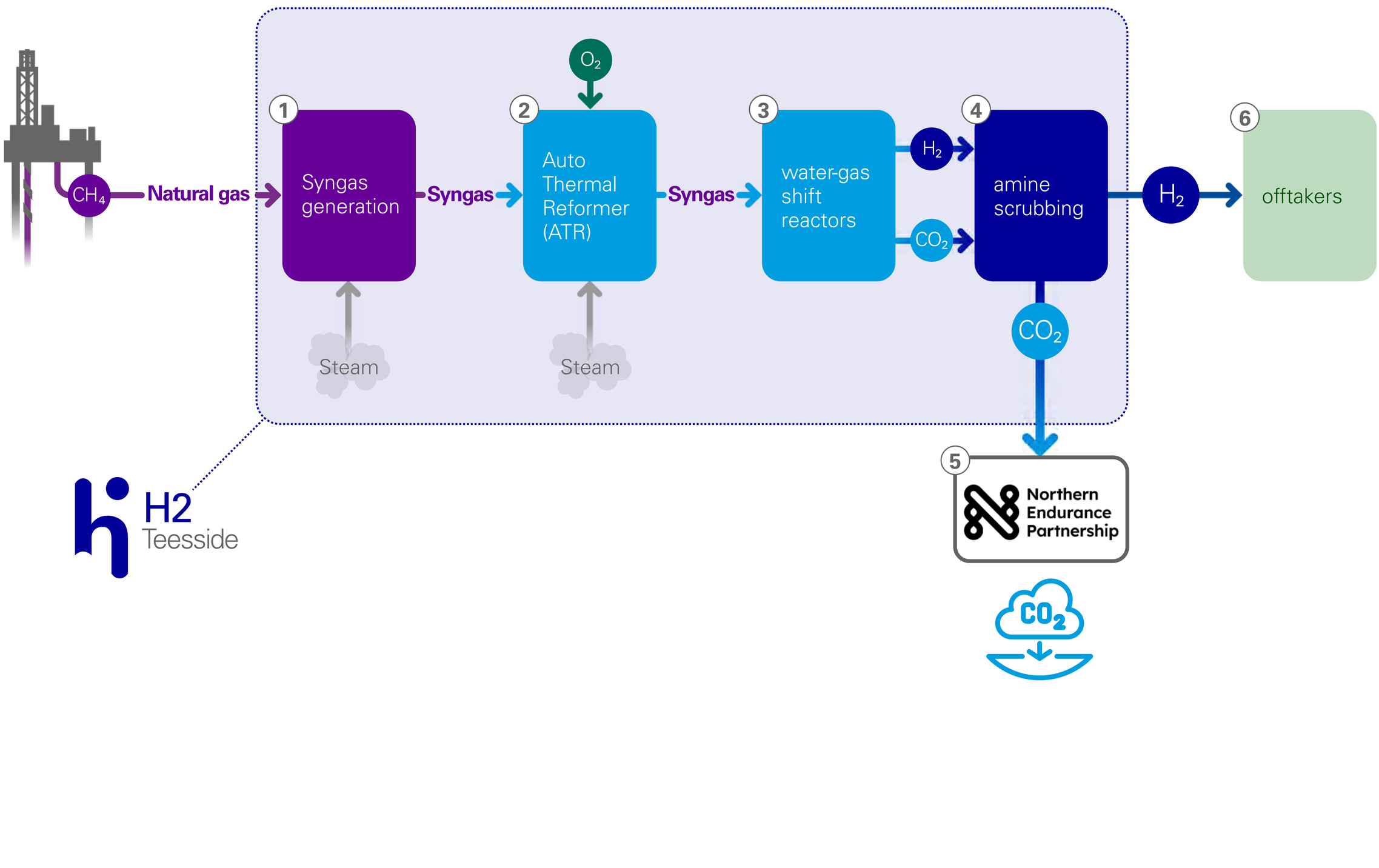
The CO_2 would be removed from the gas via scrubbing with amine, which will be regenerated to yield a CO_2 stream.

Step 5

This CO_2 would be compressed, dehydrated and then exported utilising NEP infrastructure on the Net Zero Teesside site to the east of the Main Site. The captured CO_2 will be further compressed by NEP to be in dense phase for transportation and will be exported using infrastructure to the NEP Endurance store beneath the North Sea. The infrastructure required for export and storage is subject to a separate consent.

Step 6

The resulting low carbon H_2 would be purified and compressed and conditioned, before exporting to potential offtakers, via the new proposed hydrogen pipeline system.



H2 Teesside

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Preliminary Environmental Information

We are undertaking an Environmental Impact Assessment (EIA) that enables us to understand and assess the potential effects of the construction and operation of H2Teesside on local communities and the environment. It will also help us identify the ways impacts can be avoided or reduced.

The findings of our EIA will be presented in a document known as an Environmental Statement (ES), which will be submitted as part of our Development Consent Order application. To help inform this consultation, we have undertaken a preliminary assessment of the likely significant effects and details can be found in the Preliminary Environmental Information Report.

What is a Preliminary Environmental Information Report?

The Preliminary Environmental Information Report (PEIR) details our initial environmental assessment, the potential environmental effects of H2Teesside and the mitigation measures we propose to take. 'Significant effects' is a technical term, which is used in EIA to identify environmental factors that require further assessment. Identifying a 'significant effect' in the PEIR does not mean it will definitely happen. By identifying them at this stage, we can explore opportunities to manage the potentially significant effects.

Find out more

- View the 'Preliminary Environmental Information' section of our Consultation Brochure for a summary of each topic.
- Read the PEIR Non-Technical Summary that provides a shorter summary of the PEIR using less technical language.
- View the full Preliminary Environmental Information Report (PEIR).

These documents are available to view at our events or online at www.h2teesside.co.uk



H2 Teesside

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Minimising disruption

As with any large project, we understand there may be some disruption during the construction stage, and we'll be seeking to minimise this wherever possible.

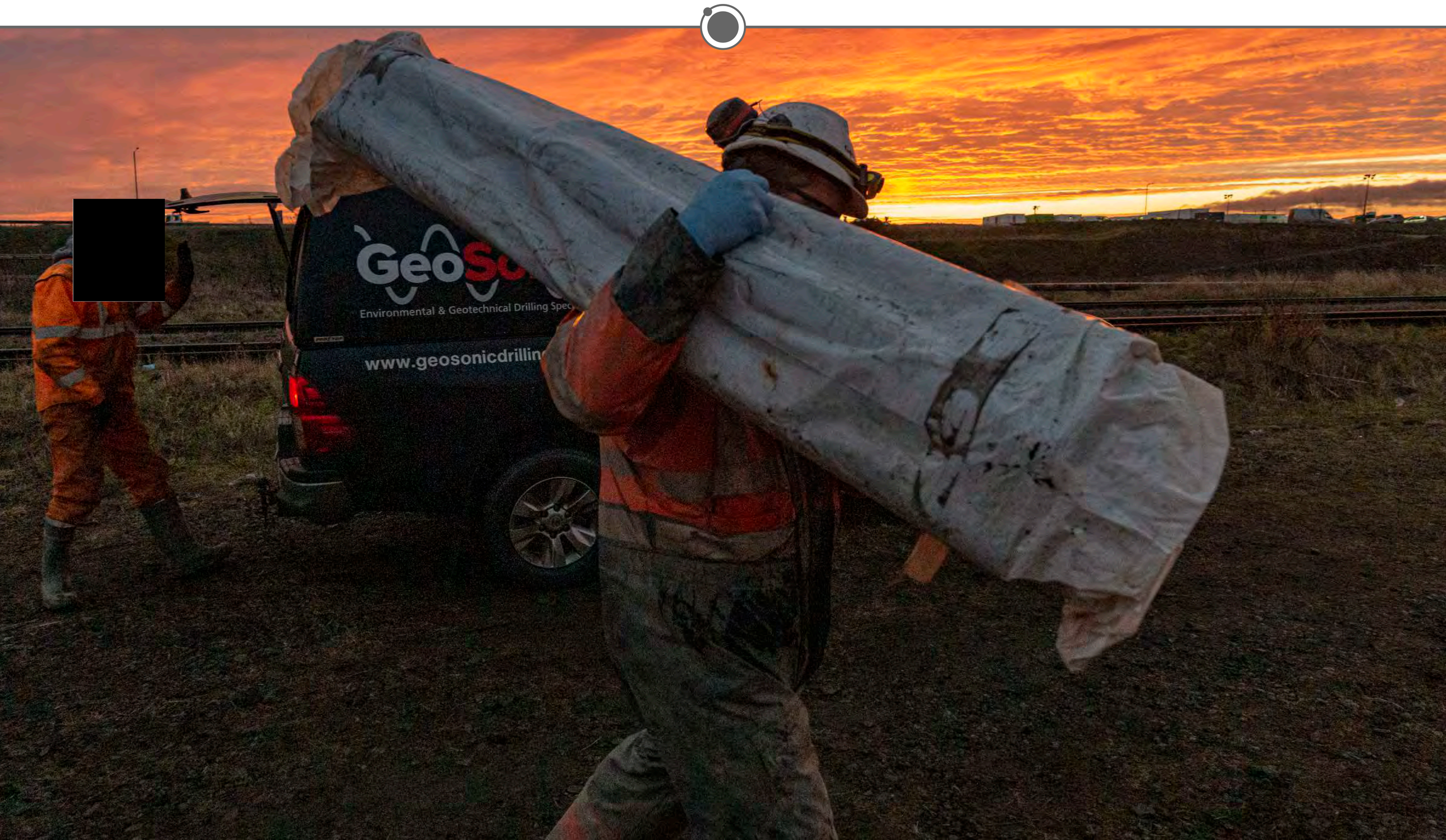
A Construction Environmental Management Plan (CEMP) will be produced as part of the DCO, which would ensure that any adverse effects of construction on the environment and local communities are minimised. The CEMP establishes a framework, within which an appointed contractor will plan, implement, and deliver environmental management, mitigation and monitoring requirements during construction.

Examples of controls and procedures in the CEMP would include:

- Measures to minimise noise and vibration, such as using quiet and low vibration equipment, acoustic barriers and considering construction methodology to reduce noise levels where possible.
- Measures for protection of any sensitive/protected species that may be encountered during construction works, to ensure compliance with relevant legislation and best practice.
- Measures to control and limit dust, such as using wheel washing for vehicles entering and leaving construction sites, and the use of road sweepers to remove any material from local roads.
- Minimising visual disturbance by ensuring temporary site lighting is only used where necessary for safety and security.

In addition to the CEMP, we will also prepare a Construction Traffic Management Plan which will set out measures to reduce the impact of traffic during the construction period, such as specifying haulage routes to keep construction traffic on the most suitable roads.

The final routeing for the project connections and the construction methodology will take account of existing apparatus and pipelines, and we will seek to avoid and manage any potential conflicts.



H2 Teesside

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Benefits for Teesside

We believe our proposals have the potential to deliver significant benefits to Teesside and the local community.

H2Teesside will:

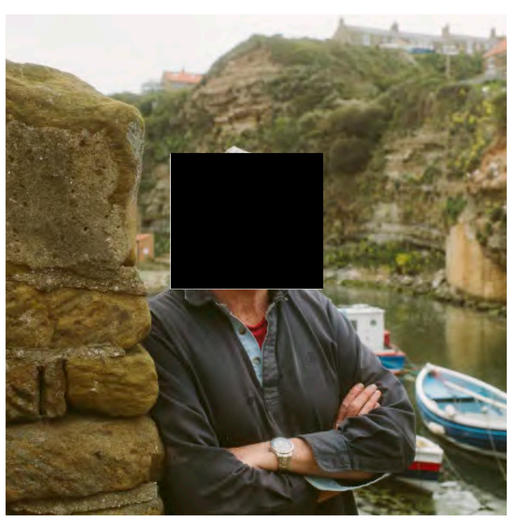
- Support economic development and regeneration in the Teesside area, strengthening Teesside's development into the UK's leading hydrogen hub.
- Support the development of a highly skilled UK-based hydrogen supply chain.
- Help safeguard jobs in existing local industries, by helping Teesside decarbonise its industry and attract new businesses to the region.
- Support approximately 1300 jobs (direct and indirect) during its construction phase. It will also support up to 130 permanent jobs once both phases are operational.
- Assist with the regeneration of the former steelworks site.

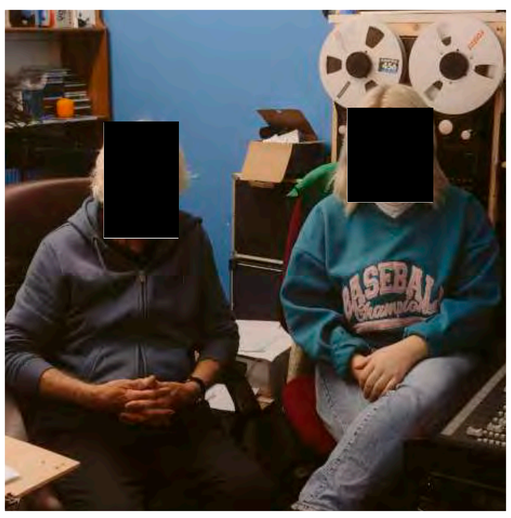
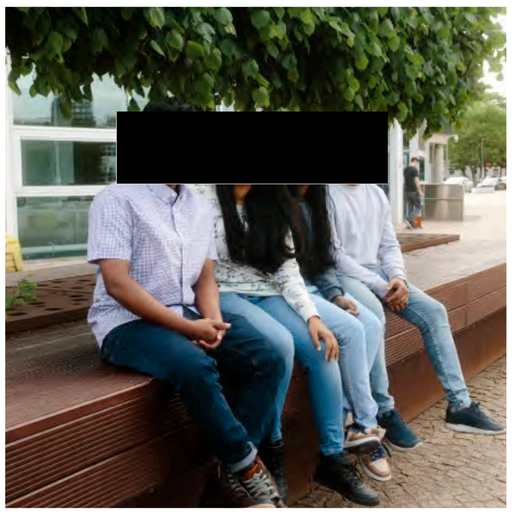
Investing in green skills

We're working with local authorities and educational institutions to create a legacy in the region. This includes:

- Investing in green skills by launching a **dedicated skills programme for H2Teesside**. The programme will provide £19.5 million in funding and aim to reach more than 5,000 people, inspiring the next generation of talent, ensuring local people benefit from job opportunities and seeding knowledge and innovation.
- Supporting the development of the new **Clean Energy Education Hub at Redcar & Cleveland College**.
- Supporting the **Redcar & Cleveland College Teesside Clean Energy Technician scholarship programme** which will offer 20 school leavers the chance to earn while they learn on a bespoke two-year engineering programme.
- Expanding our collaboration with the **Skills Builder Partnership** to support schools on Teesside. The programme brings together educators, employers and skills-building organisations around a shared approach to building the essential skills for success.







H2 Teesside

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The planning process

The Secretary of State for Energy Security and Net Zero has directed that H2Teesside is a project of national significance which should be consented through a type of planning consent called a Development Consent Order (DCO).

We therefore need to make an application for a DCO to the Planning Inspectorate who are responsible for administering the application process on behalf of the Secretary of State, who is ultimately responsible for deciding whether development consent should be granted.

Consulting local communities and stakeholders before applying for a DCO is a key part of the process. This current consultation is known as a statutory consultation and is your opportunity to comment on our proposals so we can consider your feedback as we finalise the project and the DCO application.

When we submit our application, the Planning Inspectorate will review it and determine whether it meets the requirements to be accepted for examination. If it does, one or more planning inspectors, known as the Examining Authority, will be appointed to examine the application. Anyone with an interest in the application can register to take part in the process and make representations in writing or at a hearing.

Following the examination process, the Examining Authority will prepare a report setting out a recommendation as to whether development consent should be granted. The Secretary of State will then consider this recommendation and make the final decision on whether to grant development consent.



2023

We're holding our statutory consultation on our proposals for H2Teesside.

2024

We plan to submit our Development Consent Order application to the Planning Inspectorate. They will review the application to determine whether it should be accepted for examination and will invite Interested Parties to submit representations.

Six month examination period starts.

2025

The Planning Inspectorate will conclude their examination of our DCO application.

The Secretary of State will announce their decision as to whether to grant development consent for H2Teesside.

Subject to the DCO application being granted, construction of H2Teesside is planned to commence in 2025.

2028

It is planned that H2Teesside would start commissioning by 2028.

H2 Teesside

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Have your say

We want to hear your views on our proposals for H2Teesside.
You can respond to this consultation in the following ways:

Online Fill in our online response form at **www.h2teesside.co.uk**

In person Fill in a hard copy response form at one of our consultation events.

Post Write to us or send your response form to **FREEPOST H2Teesside**

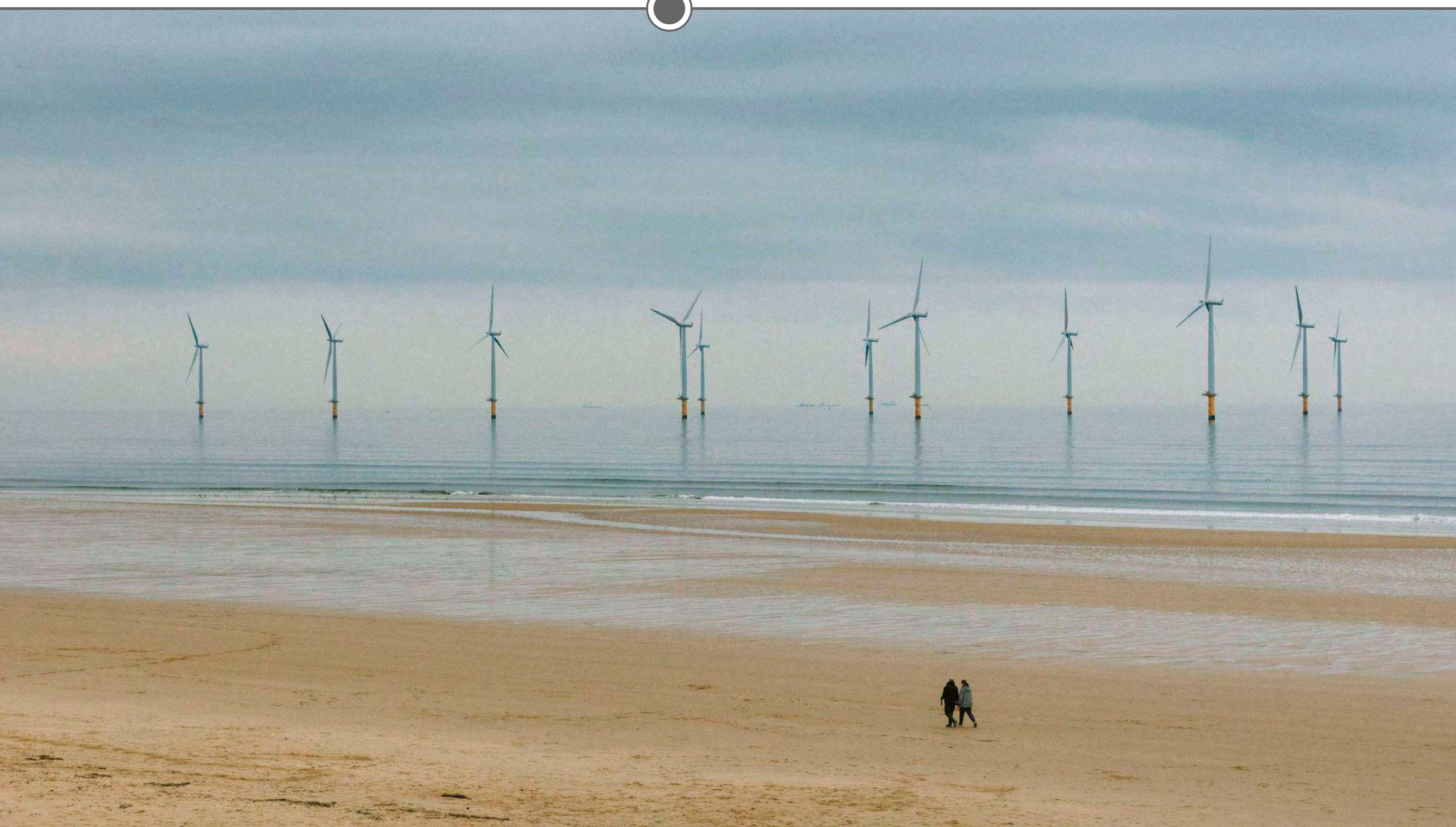
Email Write to us or send your completed response form to **info@h2teesside.net**

Please submit your feedback by 26 October 2023

Next steps

Once the consultation closes on 26 October 2023, we'll review all feedback and have regard to it in finalising the design of H2Teesside and our DCO application.

We'll set out a summary of the responses and share how your feedback has helped shape our proposals in a Consultation Report which will be submitted as part of our DCO application.



H2Teesside

Statutory Consultation – Questions and Answers

We've created this document to answer some of the most commonly asked questions about H2Teesside.

If you have any questions that are not answered, you can contact our project team by email at info@h2teesside.net or by phone on 0800 0803028.

What is H2Teesside?
H2Teesside is a proposed large-scale blue hydrogen production facility in the Tees Valley. It aims to be one of the largest blue hydrogen production facilities in the UK. The development is targeting up to 1.2 Gigawatt (GW) of hydrogen production across the two phases of development.

What is blue hydrogen?
Blue hydrogen, or CCUS-enabled hydrogen, is hydrogen that is extracted from natural gas, but the vast majority of CO2 produced during this process is captured and stored permanently.

Green hydrogen, commonly defined as electrolytic low carbon hydrogen, is made by water electrolysis using renewable and low-carbon electrical power sources such as solar and wind.

Electrolysis is the process by which an electric current is passed through a substance to effect a chemical change. In this case, splitting water molecules (H2O) into hydrogen (H2) and oxygen (O2).

Why is blue hydrogen needed? Can't you produce green hydrogen instead?
In the UK Hydrogen Strategy (published August 2021), the UK Government set out an approach to support green hydrogen and blue hydrogen in parallel, aiming to enable the rapid growth of the sector while bringing costs down.

Producing green hydrogen relies on the availability of a sufficient, reliable supply of low carbon electricity, produced via methods such as wind and solar power. The current scale at which renewable and low carbon energy is produced presents significant challenges to producing green hydrogen at an industrial scale, in the timescales in which it is required.

Blue hydrogen is being promoted as a necessary and low cost option, which can make use of existing infrastructure across the Teesside region, advancing the UK's energy transition.

Who will use the hydrogen produced at H2Teesside?
We're seeing strong interest from potential industrial users (known as offtakers) for hydrogen from H2Teesside to help decarbonise industry. H2Teesside can supply a diverse range of customers, those already established in Teesside as well as new businesses attracted to this low carbon hydrogen produced at scale.

Where will the carbon be stored?
The CO_2 captured by H2Teesside will be sent for secure long-term storage to the Endurance store, located approximately 145 km off the coast of Teesside under the North Sea, via the Northern Endurance Partnership pipeline.

The Northern Endurance Partnership (NEP) is the CO_2 compression, transportation and storage project which will deliver the onshore and offshore infrastructure needed to capture carbon from a range of emitters across Teesside and the Humber and transport it to the Endurance store. The Endurance carbon store is the name of a geological feature – a saline aquifer – under the North Sea. It has the capacity to store 450 million tonnes of CO_2.

How safe is the use of hydrogen?
Safety is bp's number one priority and as part of our project proposals we have developed a Design Hazard Management Plan. This plan identifies, confirms and assesses the hazards related to the project, and ensures that there are processes in place to manage these hazards appropriately, during the operation of H2Teesside.

bp has been operating hydrogen production plants within our refineries for many decades. It will use its years of experience to ensure that H2Teesside is operated strictly in line with its operating management system, to ensure that there is zero harm to people and the environment.

What is the planning process for the project? Who will make the ultimate decision on whether H2Teesside should go ahead?
The Secretary of State for Energy Security and Net Zero has directed that H2Teesside is a project of national significance which should be consented through a type of planning consent called a Development Consent Order (DCO).

We need to make an application for a DCO to the Planning Inspectorate who are responsible for administering the application process on behalf of the Secretary of State, who is ultimately responsible for deciding whether development consent should be granted.

What will you do with my feedback?
Once the consultation closes on 26 October 2023, we'll review all feedback and have regard to it in finalising the design of H2Teesside and our DCO application.

We'll set out a summary of the responses and set out how your feedback has helped shape our proposals in a Consultation Report which will be submitted as part of our DCO application.

APPENDIX 11.9: FIRST CONSULTATION – EVENTS PHOTOGRAPHS


H2
Teesside
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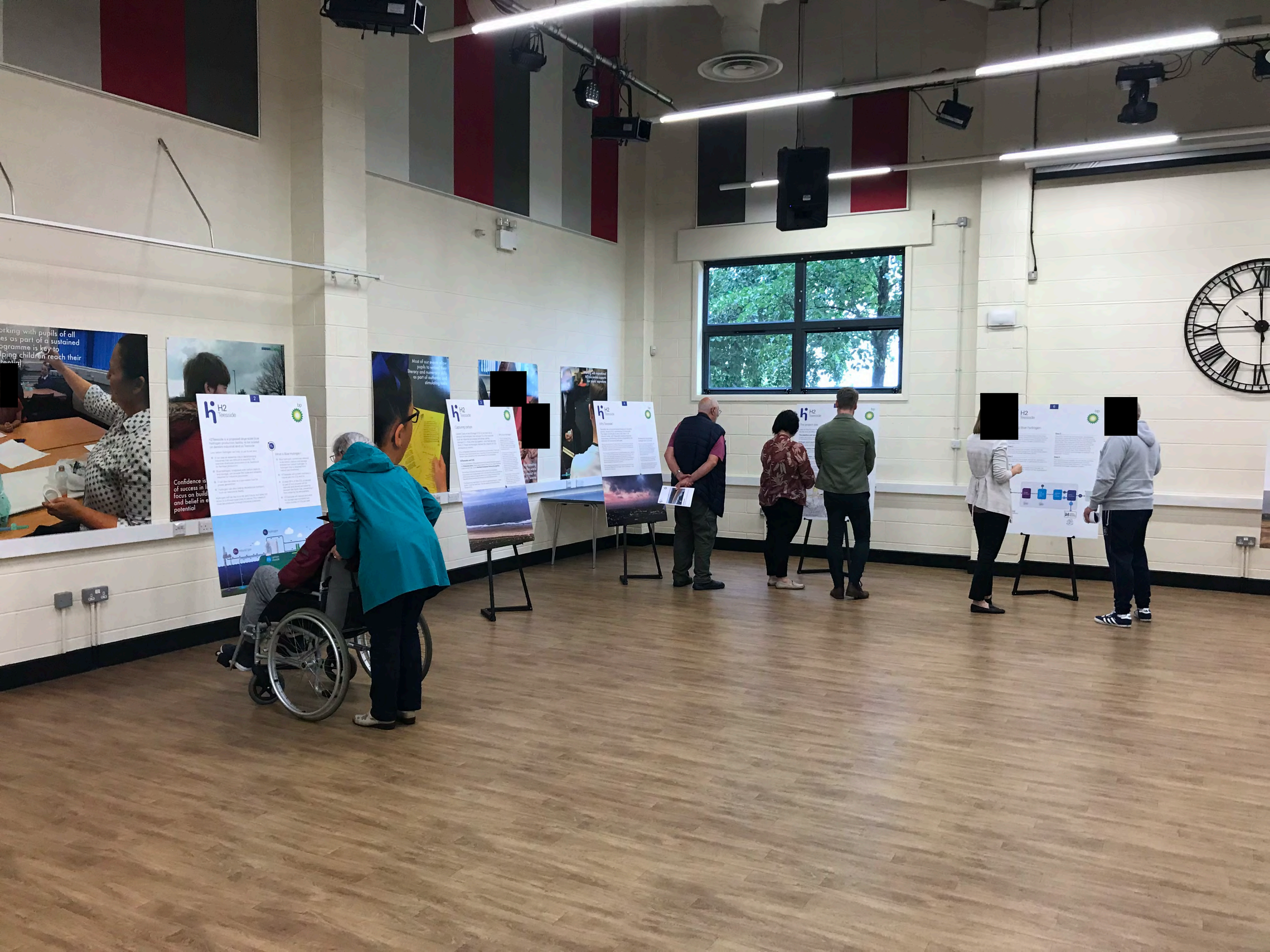
Fire exit


Fire exit


H2 Teesside
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Confidence is
of success in l
focus on build
and belief in e
potential


H2
Push bar to open




Welcome
Push bar to open

APPENDIX 11.10: FIRST CONSULTATION – SCREENSHOTS OF PROJECT WEBSITE

H2Teesside

As one of the UK's largest low carbon hydrogen production facilities, H2Teesside aims to bring jobs, customers, and investment to Teesside.

We've launched our statutory consultation on proposals for H2Teesside. The consultation runs from 14 September 2023 until 26 October 2023.

Click here to visit our consultation page, find out more and have your say.

The Project

Consultation

About H2Teesside | Project Partners | Consultation | Consultation Feedback Form

Consultation events | Webinar registration | Documents | Preliminary Environmental Information Report

Thank you for taking the time to find out more about our proposals for H2Teesside – a blue hydrogen production facility on Teesside.

The purpose of this statutory consultation is to understand the views of the local community and stakeholders on our proposals. It is known as a statutory consultation because there are certain requirements we must meet in line with the planning process for H2Teesside.

This is your opportunity to comment on our proposals, so we can consider your feedback as we finalise our plans and prepare our application for development consent to construct and operate H2Teesside.

This is your opportunity to comment on our proposals, so we can consider your feedback as we finalise our plans and prepare our application for development consent to construct and operate H2Teesside.

We've created a virtual consultation room which allows you to view all of the materials available at our in-person events and leave your feedback.

View our virtual consultation room

Consultation events

We're holding a series of face-to-face events where you can view our consultation materials and speak to members of the team.

Date	Timings	Location
Thursday 21st September	15:00 - 19:00	Seaview Business Centre, Redcar, TS10 1AZ
Saturday 23rd September	13:00 - 17:00	Seaview Business Centre, Redcar, TS10 1AZ
Monday 25th September	15:00 - 19:00	St Aidan's Church Hall, Billingham, TS23 2DF
Thursday 28th September	18:00	Webinar – register at www.h2teesside.co.uk
Thursday 5th October	15:00 - 19:00	Inspire2Learn, South Bank, TS6 9AE
Friday 6th October	15:00 - 19:00	St Aidan's Church Hall, Billingham, TS23 2DF
Thursday 12th October	15:00 - 19:00	TunedIn, Redcar, TS10 5BJ

Documents

We've produced a range of consultation documents to help you find out more and have your say. You can view and download these documents here:

- Statutory Consultation Brochure PDF / 1.1 MB
- Statutory Consultation Leaflet PDF / 500 KB
- Statement of Community Consultation PDF / 4.7 MB
- Question and Answer Document PDF / 174.9 KB
- Section 47 and 48 Notice PDF / 197.9 KB
- Site Boundary and Development Areas Plans PDF / 2.7 MB

Preliminary Environmental Information Report

- Preliminary Environmental Information Report – Non-technical summary
- Preliminary Environmental Information Report
- Preliminary Environmental Information Report – Figures
- Preliminary Environmental Information Report - Appendices

If you need paper copies or alternative formats of any of these documents, please contact us via the details at the bottom of this page.

If you need paper copies or alternative formats of any of these documents, please contact us via the details at the bottom of this page.

Have your say

We want to hear your views on our proposals for H2Teesside. You can respond to the consultation in the following ways:

Online - Fill in the response form here

Post - Write to us or send a completed copy of the response form to FREEPOST H2Teesside

In person - Fill in the response form and hand it in at one of our consultation events

Email - Write to us or send a completed copy of the response form to info@h2teesside.net

Please submit your feedback by **23:59 on 26 October 2023.**

Get in touch

You can get in touch with us in the following ways:

Email: info@h2teesside.net

Phone: 0800 0803028

BP p.l.c.

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APPENDIX 11.11: FIRST CONSULTATION – FEEDBACK FORM

H2Teesside feedback form A4 4pp CMYK 1 13/09/2023 10:12

4. Other feedback

Do you have any other comments on our proposals?

5. About you

The following questions are optional. This information will help us update you on the outcome of the consultation and the next stages of H2Teesside. **If you would prefer your comments to be anonymous, you can only provide your postcode to allow us to understand where you live in relation to the proposals.**

A. Name

C. Email address

B. Address and postcode

D. Are you responding on behalf of an organisation, business or campaign group?
(if yes, please state which organisation)

How would you describe your interest in the project? (Please tick as many that apply)

- ◯ **Statutory consultee**
- ◯ **Local resident**
- ◯ **Local elected representative**
- ◯ **Member of interest group** (please state)
- ◯ **Landowner**
- ◯ **Local business owner**
- ◯ **Other** (please state)

Privacy notice

Any comments received will be analysed by the H2Teesside Limited (the Applicant) and any appointed agent of the Applicant, and copies may be made available in due course to the Secretary of State, Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy.

Printed on paper stock produced from 100% recovered fibre certified to FSC® standards

H2 Teesside

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Statutory consultation
Feedback form

Let us know your views

Thank you for taking the time to share your views with us on our proposals for H2Teesside.

The purpose of this consultation is to understand the views of the local community and stakeholders on our proposals. We'll review all feedback and have regard to it in finalising the design of H2Teesside and our application for development consent.

More information

We've produced a range of consultation documents to help you find out more and have your say. You can view copies of the documents at:

www.h2teesside.co.uk

Consultation events where the documents will be on display and members of the project team will be available to answer questions.

Document inspection venues where copies of the consultation documents can be viewed on a publicly accessible computer.

The project website includes details of the consultation events, the document inspection venues and a copy of the Statement of Community Consultation. These can also be obtained by calling **0800 0803028** or writing to using the contact details provided below.

How to give us your views

You can respond to this consultation in the following ways:

Online fill in an online version of this form at **www.h2teesside.co.uk**

Freepost send your completed form to **FREEPOST H2Teesside**

Fill in this form and hand it in at one of our consultation events.

Email Send your response to **info@h2teesside.net**

If you are unable to provide feedback through the channels above, please call us on **0800 0803028** to discuss alternative ways of giving your feedback.

The closing date for responses is **23:59 on 26 October 2023**

14 September to 26 October 2023 **Have your say in this form**

H2Teesside feedback form A4 4pp CMYK 2 13/09/2023 10:12

1. Our proposals

Do you support our aims to help Teesside decarbonise its industry?

◯ Strongly support ◯ Support ◯ Neither support nor oppose ◯ Oppose ◯ Strongly oppose

Do you support our proposals for H2Teesside?

◯ Strongly support ◯ Support ◯ Neither support nor oppose ◯ Oppose ◯ Strongly oppose

Please use the space below to tell us more about why you gave these responses:

Do you have any comments on our proposed blue hydrogen production facility?
You can find information on our proposed hydrogen production facility on page 8 of our consultation brochure.

Do you have any comments on our proposed pipeline and connection corridors?
You can find information on our proposed pipeline and connection corridors on pages 9 and 10 of our consultation brochure.

2. Minimising our impact

Do you have any comments on the Preliminary Environmental Information Report, its Non-Technical Summary or the environmental mitigation measures proposed in these documents?

As part of our application for development consent we will be producing an Outline Construction Traffic Management Plan and a Framework Construction Environmental Management Plan.

Is there anything you would like us to consider as part of this?
For more information see page 19 in our consultation brochure.

3. Local community benefits

We are committed to bringing benefits to the local community as we develop H2Teesside and we have presented some of our plans for the local community on page 20 of our consultation brochure.

Do you have any comments on our plans, or any further ideas or suggestions on how we could support the local community?

APPENDIX 11.12: FIRST CONSULTATION – FEEDBACK FORM RESPONSES

How could feedback be provided/deadline for comments

The consultation materials advised the local community that feedback on the Proposed Project could be provided by the following means:

Post: freepost to H2Teesside;

E-mail: info@h2teesside.net;

Website: www.h2teesside.co.uk; or

Providing feedback at the public consultation events.

The consultation materials clearly stated that the deadline for the receipt of responses was 23:59 26 October 2023, therefore providing people with a period of longer than 28 days from the start of the consultation to respond.

Response to the Consultation

Over the First Consultation period and its four public exhibition events, a total of 60 feedback form responses were received. Of these, 5 hardcopy comments forms were received via FreePost or from events exhibition events and 55 digital forms were submitted online. The feedback form asked five questions each containing several parts. The responses received to these questions are detailed below.

1. **Our proposals**

Q1 – Do you support our aims to help Teesside decarbonise its industry?

Question 1 firstly asked respondents 'Do you support our aims to help Teesside decarbonise its industry?'. 8 respondents answered 'Support' and 36 respondents answered 'Strongly support'. 2 respondents answered 'Oppose' and 6 respondents answered 'Strongly oppose'. 5 respondents answered, 'Neither support nor oppose'. Table 1.1 below provides a breakdown of how respondents answered – please note that a total of 57 responses were received from 60 Comments Forms.

Table 1.1: Q1 – Number of Responses Received

RESPONSE	NUMBER OF RESPONSES
Strongly support	36
Support	8
Strongly oppose	6
Oppose	2
Neither support nor oppose	5

Q2 – Do you support our proposals for H2Teesside?

The second part to Question 1 subsequently asked 'Do you support our proposals for H2Teesside?' 20 respondents answered 'Strongly support'. Of these respondents, all of them responded with 'Strongly support' to Part 1.

5 respondents answered 'Support'. Of these respondents, 2 responded with "Strongly support" and 3 responded with "Support" to Part 1.

20 respondents answered 'Strongly support' and 6 respondents answered 'Support'.1

2 respondents answered 'Strongly oppose', 2 respondents answered 'Oppose' and 6 respondents answered 'Neither support nor oppose'. Of these respondents, 9 of them answered 'Support' or 'Strongly Support' to part 1. The remaining respondents answered this question with text.

Of the 5 respondents who answered ‘Neither support nor oppose’ to the part 1, 2 respondents answered ‘Strongly Oppose’, 1 respondent answered ‘Oppose’, 1 respondent answered ‘Neither support nor oppose’ again and 1 respondent answered with duplicated text.

Table 1.2 below provides a breakdown of how respondents answered – please note that 45 responses were received from 60 Comments Forms with an additional 9 text responses received. In total, 54 responses were received.

Table 1.2: Q2 - Number of Responses received

RESPONSE	NUMBER OF RESPONSES
Strongly support	20
Support	5
Strongly oppose	12
Oppose	2
Neither support nor oppose	6

Please use the space below to tell us more about why you gave these responses:

The third part to Question 1 gave respondents an opportunity to explain their responses to the previous part. A total of 49 responses were received providing different explanation. Overall, a total of 28 responses contained positive comments, 14 contained negative concerns and 7 contained neutral themes.

The responses to this question have been categorised into Positive topics/themes, shown in Table 1.3, Negative topics/themes in Table 1.4 and neutral topics/ themes in Table 1.5. Table 1.6 provides a list of positive, neutral, and negative example questions received.

Table 1.3: Q2 - Positive Comment Topics/Themes received about the Project and Consultation

POSITIVE TOPICS/THEMES	NUMBER OF RESPONSES
Employment opportunities	14
Decarbonising industry / net zero objectives	8
Investment / Business opportunities in Teesside	4
Provision of industrial development in Teesside	1

Table 1.4: Q2 - Negative Comment Topics/Themes received about the Project and Consultation

NEGATIVE TOPICS/THEMES	NUMBER OF RESPONSES
Disagree with the need for the Project	2
Inadequate consultation	2
Safety concerns with hydrogen gas	2
Carbon Dioxide emissions form the Proposed Development	1
Diversion of investment in better decarbonisation technologies	1

Table 1.5: Q2 - Neutral Comment Topics/Themes received about the Project

OTHER TOPICS/THEMES	NUMBER OF RESPONSES

Impact on domestic energy prices and domestic Hydrogen heating	2
Clarification of 'secure long term offshore Storage'	1
Impact on property values	1
Impacts on Cowpen Bewley	1

Table 1.6: Q2 - Examples of Positive, Negative and Neutral Comments/ Questions Received

	EXAMPLE QUESTION/ COMMENTS
Positive	*"British steel put teesside on the world map, however the decline in the steel industry here has taken its toll, this proposed development will be a great asset to teesside's industrial heritage and portfolio of great investment and business development."* *"After the losses of other industry to the area it is very welcome to see new investment in decarbonising methods coming to Teesside. I believe hydrogen must be an important part of decarbonisation of both transport and industry, not everything can go electric. What better place than the previous iron works to build a plant to help power the future."* *"The area is underfunded and needs an influx of development and jobs, this will provide it and work towards bringing Redcar and the area back to its seaside town it was in the 60s."* *"Not only would it be good to have the land brought back to life, it will support more jobs that are needed within this area, it would be nice to have things going on in and around us."* *"I strongly support the cause to decarbonise industry."*
Neutral	*Can you guarantee that we will not pay anymore in prices than the gas is in the future. Will the price of our gas meter rental go down.* *"Secure long-term storage under the sea needs to be qualified."*
Negative	*"Nobody has been to see the residents in their homes I am 73."* *"it seems your trying to steamroll this thro with or without our consent"* *"This project seems ill concieved and probabaly driven by political rather than economic reasons."* *"I am concerned that the use of Hydrogen in the wider community is not well understood, and i am concerned about safety in particular. This has not been well publicised, and I am concerned that it will lead to being used for domestic use without my knowledge or consent and we will be treated as lab rats."* *"A hydrogen facility is open to computer and/or human error which could result in the whole area being wiped out."*

	"Producing hydrogen from natural gas is however not a long term solution and money directed this way can often be better used for developing or deploying existing technologys that can last more or less forever." *"As I live in Cowpen Bewley, I would like to know what impact the construction and the running of the pipeline on village life and property."*

Q3– Do you have any comments on our proposed blue hydrogen production facility?

The fourth part to Question 1 gave respondents an opportunity to comment on the Proposed Development's Blue Hydrogen Production Facility. A total of 31 responses were received identifying different issues. Overall, a total of 14 responses contained positive comments, 11 contained negative concerns and 6 contained neutral themes (primarily comprised of requests for clarification) were received.

The responses to this question have been categorised into Positive topics/themes, shown in Table 1.7, Negative topics/themes in Table 1.8 and neutral topics/ themes in Table 1.9. Table 1.10 provides a list of positive, neutral, and negative example questions received.

Table 1.7: Q3 - Positive Comment Topics/Themes received about the Project and Consultation

POSITIVE TOPICS/THEMES	NUMBER OF RESPONSES
Use of former steelwork site and existing infrastructure	4
Use of local companies to provide building materials	1
Carbon capture	2
Employment opportunities	1
Blue hydrogen being the future	1

Table 1.8: Q3 - Negative Comment Topics/Themes received about the Project and Consultation

NEGATIVE TOPICS/THEMES	NUMBER OF RESPONSES
Critical of the location of the Proposed Development	2
Consultation will not impact the Development	1
Disagree with need for Blue Hydrogen Facility	1
Disagree with use of hydrogen for industrial heating	1

Table 1.9: Q3 - Neutral Comment Topics/Themes received about the Project

OTHER TOPICS/THEMES	NUMBER OF RESPONSES
Clarification of 'secure long term offshore Storage'	1
Impacts of Water consumption and discharge	1
Clarification of noise impact	1

Table 1.10: Q3 - Examples of Positive, Negative and Neutral Comments/ Questions Received

	EXAMPLE QUESTION/ COMMENTS
Positive	*"This is a great area to build the facility. It has a lot of infrastructure already in place."* *"I believe the object of this entire project is for a low carbon footprint but in terms of deliverable via hydrogen but also in terms of using local companies to support such as British steel, Tata and of course ourselves as SMR reformer tube manufactures. We believe being able to supply the tubes made here in Teesside to produce the blue hydrogen that we ultimately can use to drive the next major step towards our decarbonisation is a truly circular story and something we locals could be proud of."* *"Again it's nice to have the land used to support many people with work that can only be a good thing, we also need to have more of these sites across the country to help build our industry and to help make the future a better place by using or and adapting carbon cap."* *"All new industry is most welcome and is to be encouraged for the future."*
Neutral	*"Why does the facility need both a freshwater connection and a discharge for treated water? Is the treated water not clean enough to be reused in the facility, and if it is too dirty, why do you discharge it into the environment?* *There is no water shortage in sight in our region according to Anglian Water, but in our rapidly changing environment, should there ever be a shortage, what are the plans? Specifically who will reduce water usage first, households or h2teesside? Does h2teesside pay for freshwater usage, how much, compared to households and other industial water usage?"* *"The outline maps of the Main Site show it bordering/crossing the Teesdale Way route. Is there any provision for protection of this public byway?"* *"Given the use of natural gas, and the new implementation of carbon capture, if the carbon capture proves to be unreliable, too expensive, or otherwise does not perform what will become of the project? Will it be cancelled or allowed to run without carbon capture? Also, given the interim status of 'blue' hydrogen, does this not give the plant a much shorter lifespan, being ovetaken by greener alternatives in a short space of time?"*
Negative	*"It doesnt matter what we say you will go ahead.Why are we the only area that has been picked to test this"* *"Until it happens down south I don't want it"* *"Secure long-term storage under the sea needs to be qualified"* *"ii doubt other major countries or economies are taking this gung ho approach giving them bigger advantage in trade making our products more costly than theirs"* *"Regarding hydrogen usage it should not be used for heating (residential or industrial) as this would be more co2 intensive than directly using electricity on average from 2029 as you wrote in your documents. About half of hydrogen usage worldwide currently goes to refineries but those should mostly close in the coming decades (I think years but I am realistic that many*

	do not want that). Their products get burned after usage, either directly as fuel or a bit later as e.g. plastics. H2Teesside should in this case not try to sell the h2 to residential heating as compensation, producing 70gco2eq or more per kwh. Direct electricity would be more efficient, heat pump would be 3 or more times as efficient, with higher initial investment than direct electricity. *I see the case for using h2 for npk fertiliser production. There it should be noted that in the long term nitrogen fertiliser should be reduced because currently worldwide about double the N is used as the border for stable ecosystems is. ("The science suggests that a safe level of nitrogen use would be about 25% of current production." https://earthbound.report/2013/06/11/planetary-boundaries-2-nitrogen/ "The planetary nitrogen boundary has been substantially transgressed" https://www.nature.com/articles/s43016-021-00366-x).*

Q4 – Do you have any comments on our proposed pipeline and connection corridors?

The fifth part to Question 1 gave respondents an opportunity to comment on the Proposed Development's Pipeline and connection corridors. A total of 26 responses were received identifying different issues. Of these, 5 responses contained positive comments, 10 contained negative comments and 11 contained neutral comments.

Table 1.11: Q4 - Positive Comment Topics/Themes received about the Project and Consultation

POSITIVE TOPICS/THEMES	NUMBER OF RESPONSES
Utilisation of existing industrialised areas	1
Necessary requirement for the Project	1

Table 1.12: Q4 - Negative Comment Topics/Themes received about the Project and Consultation

NEGATIVE TOPICS/THEMES	NUMBER OF RESPONSES
Pipeline safety	5
Environmental impact	1
Heritage and archaeology concern	2

Table 1.13: Q4 - Neutral Comment Topics/Themes received about the Project

OTHER TOPICS/THEMES	NUMBER OF RESPONSES
Pipeline location	4

Table 1.14: Q4 - Examples of Positive, Negative and Neutral Comments/ Questions Received

	EXAMPLE QUESTION/ COMMENTS
Positive	*"This is obviously a requirement for this project and is necessary."* *"Billingham i believe is one of the first corridors that will become available with Blue hydrogen and is also the home of Paralloy and our foundries. if this corridor comes online first then that would enable us to become one of the first maybe the first foundry in the UK to fully decarbonise."* *"Supporting the project for decarbonising the Teeside industry."*

	"Makes sense to utilise the previous areas of industrialisation."
Neutral	*"Yes, why cant the pipeline be located north of the A1185 and then under the railway line and after that south of the A1185 direct to the Cowpen gas hub?"* *"The decision of where to deposit dredged (capital) material from Phase 1 of the South Bank I.e. landfill or Tees Bay C out at sea, relied on a number of sediment tests and CEFAS action levels (https://assets.publishing.service.gov.uk/media/5a8198e0ed915d74e6233203/Appendix_B_Action_Levels.pdf). Only when CEFAS action level 2 was exceeded would sediments be sent to landfill. The problem with this approach, however, is that over half of the determinants don't have an action level 2 assigned. What other limits are you going to use therefore, to avoid a toxic response from benthic organisms during the construction of the Hydrogen Pipeline and other gas/ utility connection corridors?"* *"Yes you intend to run pipes through fields of Cowpen Bewley Village as above a conservation area. I believe you could route along A1185 and under railways into gas works without [unsure on word] so."* *"As long as the road to the South Gare is not compromised."*
Negative	*"pipelines can develop leaks, which could lead to a hydrogen explosion."* *"Again huge pipe lines affecting our en"[vironment?]* *"As a resident of Cowpen Bewley Heritage Conservation Village. I object to the pipe corridor route deviating away from the Seal Sands A1185 as proposed behind heritage properties in Cowpen Bewley Heritage Conservation Village. This route runs approximately 43 metres behind my property (The Bullpens) on conservation agricultural land with archaeology in situ. (i.e. Tudor field drains and rig and furrow Saxon fields). Surely a alternative route can be made not behind the Heritage Conservation Village such as -- Routing it below ground alongside the Seals Sands A1185 embankment and crossing the railway at the A1185 road bridge and into the woodland park utilising the fire breaks in the trees for a direct route to the Cowpen Bewley gas service works. This would reduce the impact on the heritage village/properties/livestock and any archaeological damage."* *"I address specifically the routing of the proposed H2 pipeline near the village of Cowpen Bewley. There are a number of issues related mainly to safety I would wish to raise.* *a) The proposed routing lies very close to the rear of properties in the village. The resolution of the maps provided in print or online unfortunately does not allow an assessment of the prevailing distances other than the line would be "close" to residential properties.* *b) There does not seem to be any clear recommendation for an "exclusion zone" around high pressure H2 pipelines. It is noted also that regulations for safe use and pipeline transport of hydrogen remain in a state of flux [1,2]. It is reasonable to assume that safety regulations and recommended practice will become tighter as the H2 economy expands. This is discussed further below.* *c) Representatives from H2Teesside attended a Residents' Association meeting in Cowpen Bewley on Oct 16th. They unfortunately provided misleading information. They stated that there was no risk of explosion, rather only fire/flames. This is incorrect.* *i. According to the well-established explosion triangle an ignition source is required for fire / explosion. Given the routing of the proposed*

	pipeline the most likely ignition source would be an electrical or gas fitting in the nearby residential properties. *ii. As evidence, there is a growing register of hydrogen related safety incidents [3]* *d) I have not seen any indication that dispersion calculations have been completed for multiple scenarios to instil any confidence that hydrogen / air mixtures in the flammable range (4-75%) could not approach residential dwellings or outbuildings, hence a source of ignition in the event of a leak.* *i. Such delayed explosions of hydrogen are a well known phenomenon [4]* *ii. While some sensors are able to determine catastrophic loss of containment, I do not believe smaller egress rates are detectable in a long pipeline.* *iii. There does therefore not seem to be any reasonable mitigation against persistent low-level leaks, which bearing in mind the notoriety of hydrogen [1] is concerning given the previous points* *e) A study has however evaluated a recommended exclusion distance for H2 refuelling stations of 35m [5], noting however some caveats. Among these are that delayed ignition (allowing the form of a flammable cloud) can significantly exacerbate this, extending the radius of the 1 percentile fatality distance.* *f) A number of sources [1,2] indicate that current safety guidelines and regulations for pipelines are largely based on considerations for methane / natural gas that they may not be adequate to address the risks of a hydrogen network, and indeed that the safety implications of more widespread transportation and storage of hydrogen are not yet well understood. This should mean that a conservative approach to design and routing is taken, applying reasonable design margins in the case of, specifically in the present context, proximity t residential dwellings.* *g) There would appear to be other options for routing the pipeline in the vicinity of Cowen Bewley, such as north of the railway or A1185 that would increase the distance and present natural protective barriers.* *In conclusion a hydrogen pipeline incurs a number of risks. It would be reasonable to assume that at this stage detailed safety assessments have not yet been completed. It is difficult to understand, given the risks and safety issues highlighted above, why the preferred route passes so close to residential properties. I would urge you therefore to reconsider this aspect of the pipeline routing and move it to a safer distance from the residents."*

2. Minimising our impact

Q5 – Do you have any comments on the Preliminary Environmental Information Report, its Non-Technical Summary or the environmental mitigation measures proposed in these documents?

The first part to Question 2 gave respondents an opportunity to comment on the PIER, NTS or proposed environmental mitigation within the statutory consultation documents. A total of 14 responses were received providing different explanation. Overall, a total of 4 responses contained positive comments, 3 contained negative concerns and 7 neutral themes (primarily comprised of requests for clarification) were received.

The responses to this question have been categorised into Positive topics/themes, shown in Table 2.1, Negative topics/themes in Table 2.2 and neutral topics/ themes in Table 2.3. Table 2.4 provides a list of positive, neutral, and negative example questions received.

Table 2.1: Q5 - Positive Comment Topics/Themes received about the Project and Consultation

POSITIVE TOPICS/THEMES	NUMBER OF RESPONSES
Robustness	1

Table 2.2: Q5 - Negative Comment Topics/Themes received about the Project and Consultation

NEGATIVE TOPICS/THEMES	NUMBER OF RESPONSES
Disturbance to local residents	1
Unnecessary need for hydrogen	1

Table 2.3: Q5 - Neutral Comment Topics/Themes received about the Project

OTHER TOPICS/THEMES	NUMBER OF RESPONSES
Clarification about all environmental impact considerations	2
Request for more trees in the development	1
Clarification about compensation for damage and scope of remediation	1

Table 2.4: Q5 - Examples of Positive, Negative and Neutral Comments/ Questions Received

	EXAMPLE QUESTION/ COMMENTS
Positive	*“it sounds robust”* *“With the demolition and clearance of the steelworks there is a giant building site already BP will just be an addition to this and should be accepted.”*
Neutral	*“I’d like to see more trees as part of the development”* *“Not sure this is the correct box but, the vibration and noise will be an issue, has this been assessed with regards to vibration on the foundations (or lack of), on the old village housing stock?* *The noise during construction especially when 24hr working alongside lighting etc What mitigation is being employed?”*

Negative	*"It does not make very clear that the project still needs Natural Gas as an input: with the extraction and environmental costs this entails."* *"Until London have this type of energy then leave Redcar alone"*

Q6 – We will be producing an Outline Construction Traffic Management Plan and a Framework Construction Environmental Management Plan. Is there anything you would like us to consider as part of this?

The second part to Question 2 gave respondents an opportunity to state if there is anything they would want to be considered in the Outline Construction Traffic Management Plan (OCTMP) and Framework Construction Environmental Management Plan (Framework CEMP). A total of 18 responses were received providing different explanation. Overall, a total of 2 responses contained positive comments, 4 contained negative concerns and 12 contained neutral themes (primarily comprised of requests for clarification) were received.

The responses to this question have been categorised into Positive topics/themes, shown in Table 2.5, Negative topics/themes in Table 2.6 and neutral topics/ themes in Table 2.7. Table 2.8 provides a list of positive, neutral, and negative example questions received.

Table 2.5: Q6 - Positive Comment Topics/Themes received about the Project and Consultation

POSITIVE TOPICS/THEMES	NUMBER OF RESPONSES
Necessary development	1

Table 2.6: Q6 - Negative Comment Topics/Themes received about the Project and Consultation

NEGATIVE TOPICS/THEMES	NUMBER OF RESPONSES
Existing weight limit in village unsuitable for heavy plant	1

Table 2.7: Q6 - Neutral Comment Topics/Themes received about the Project

OTHER TOPICS/THEMES	NUMBER OF RESPONSES
Measures to minimise disruption	1
Access to the South Gare	2
Construction vehicle routing and arrangements near Cowpen Bewley	1
Absence of information	1
Contamination during construction	1

Table 2.8: Q6 - Examples of Positive, Negative and Neutral Comments/ Questions Received

	EXAMPLE QUESTION/ COMMENTS
Positive	*"Residential areas are unlikely to be affected apart for those around the perimeter of the site."* *"Again, this will be necessary and will indeed require more traffic throughput."*

Neutral	*"Not sure if this is connected but important that public retain access to the South Gare."* *"Suggest this is widely published to prevent inconvenience."* *"During the Construction phase, land to be developed will have an amount of contaminated surface soil removed, the subsurface capped and then covered by clean material. Can you explain how you are going to prevent contaminants below the cap from contaminating the ground waters/ aquifers which could then affect sensitive ecosystems in the Tees Estuary and/ or coastline immediately adjacent? Vibrations ranging from minor disturbances, such as local traffic, to major ones - explosive demolitions - will no doubt have adverse effects on subsurface movement and promote such contamination."*
Negative	*"Minimise disruption"* *"What is the access and egress to the site near Cowpen Bewley?* *Where will the welfare cabins be?* *There is a 7.5 tonne limit on the village roads accept for access, this is for delivery only and not a full scale construction site, also the roads are not suitable for heavy plant."* *"Our experience of traffic management and routing during major construction projects is not good, with construction-material HGVs passing through residential areas irrespective generally with the driver having been misdirected by the site representatives. Plans need to implemented, communicated and monitored. I would hope to see detail of these aspects in future proposal documentation"*

3. Local community benefits

Q7 – Do you have any comments on our plans, or any further ideas or suggestions on how we could support the local community?

Question 7 gave respondents an opportunity to provide any further comments on the plans or any further suggestions for supporting the local community. A total of 28 responses were received providing different explanation.

The responses to this question have been categorised into themes, shown in Table 3.1, Table 3.2 provides a list of topics received.

Table 3.1: Comment Topics/Themes suggested

THEMES	NUMBER OF RESPONSES
Local employment / apprenticeship opportunities.	13
Business opportunities for local companies	1
The Proposed Development is not wanted by the community	1
Redevelopment of Redcar sea front and town centre	1
Improvement of local transport infrastructure	1
Support / grants for community groups and charities	1
Compensation on disruption	1

Table 3.2: Examples of Themes suggested

	EXAMPLE COMMENTS
Comment	*"Offer local school leavers a better opportunity to progress into a career in the proposed development, rather people from outside the area to ensure a good standard of life for there future, teesside needs it"* *"Apprenticeships and good quality jobs"* *"Please ensure local companies are given a fair chance to bid and participate in the construction and ongoing operation of this project."* *"Help booster the infrastructure, the business and supporting of such things like roads, cycle ways, traffic lights as the increased traffic comes in car park built"* *"Plenty of charities you could support"*

4. Other feedback:

Question 8 gave respondents the opportunity to provide any further comments on the Project. A total of 21 responses were received providing different explanation. Overall, a total of 6 responses contained positive comments, 3 contained negative concerns and 12 contains neutral themes (primarily comprised of requests for clarification) were received.

The responses to this question have been categorised into Positive topics/themes, shown in Table 4.1, Negative topics/themes in Table 4.2 and neutral topics/ themes in Table 4.3. Table 4.4 provides a list of positive, neutral, and negative example questions received.

Table 4.1: Positive Comment Topics/Themes received about the Project and Consultation

POSITIVE TOPICS/THEMES	NUMBER OF RESPONSES
Support investment in Teesside	1

Table 4.2: Negative Comment Topics/Themes received about the Project and Consultation

NEGATIVE TOPICS/THEMES	NUMBER OF RESPONSES
Abandon the Project	1
Nuisance	1
Access	1
Conservation	1

Table 4.3: Neutral Comment Topics/Themes received about the Project

OTHER TOPICS/THEMES	NUMBER OF RESPONSES
Clarification on air quality emissions	1
Request lower domestic energy prices	1

Table 4.4: Examples of Positive, Negative and Neutral Comments/ Questions Received

	EXAMPLE QUESTION/ COMMENTS
Positive	*"I'm all for it, good to see investment in the area"* *"All in all this has to be good for the area and the country as a whole. You have my full support"* *"I've felt for a while that hydrogen is the way forward, yes it's different but it's cleaner than any existing fuels. I feel proud that Teesside is leading the way."*
Neutral	*"Do you have any emissions to the air? Is there for example a stream with low contents of co2 or amine (don't know if you use it or the word is correct) to the atmosphere? Do you use a big stack for it (I have no concerns about its appereance, only want to know what is going on). Which pollutants or co2 or amine are in your wastewater before and after treatment? Will there remain access to the southern point where the Tees meets the North Sea? I want that access to remain."* *"We should get consideration and cheaper tarriffs seeing as how you want us to be guinea pigs"* *"I see that the footprint of your plant and the Carbon Capture facility, actually covers current roads and footpaths to the South Gare. There's no mention of this in your documents. I just want to make sure they are retained for access to South Gare.* *I have a little worry about storing CO2. Could it be released as a result of*

	earthquakes or some other unknown disaster. What would be the effect of a massive release of CO2."
Negative	*"shelve [it] we didn't vote for this at election time "* *"I Do not want hydrogen"* *"As a resident of Cowpen Bewley Conservation Village if the route proposed goes ahead behind properties at Cowpen Village my concerns are -* *1. Access which has not been established and works traffic to and from the site affecting the village in general which has a 7.5 ton limit in place.* *2. Nuisance noise while work takes place as well as stress to livestock.* *3. Who is responsible for damage to heritage buildings if vibration causes any damage to sensitive historic buildings.* *4. Additionally i would like to know if any other residential buildings are as close to the actual pipeline as proposed in other areas in Teesside.* *5. Is any additional periodic pressure releases planned to be made at Cowpen Gas Service works as this would certainly effect the Heritage Conservation Village with noise pollution as well as effecting nature ,and causing stress to livestock. (Additionally they is a working graveyard close by the works which should be considered)* *6. Is their any service compounds ,structures/ signage after completion of project to remain seen within the village conservation boundaries ?.* *7. I would expect all conservation rules will be adhered too while work takes place and after, as do the residents .* *8. The Impact on property values and sales. Has any assessment been made and is any funding for compensation available.?"* *"Do you have any emissions to the air? Is there for example a stream with low contents of co2 or amine (don't know if you use it or the word is correct) to the atmosphere? Do you use a big stack for it (I have no concerns about its appereance, only want to know what is going on). Which pollutants or co2 or amine are in your wastewater before and after treatment? Will there remain access to the southern point where the Tees meets the North Sea? I want that access to remain."*

5. About You:

Question 9 sought further information on respondents and to classify. Parts A, B and C asked for personal information which has not been reproduced in this document.

Part D asked respondents if they are responding on behalf of an organisation, business or campaign group? A total of 3 respondents responded positively. The organisations they responded on behalf were Alfanar Energy Limited, promoter of the Lighthouse Green Fuels project; Tees River research group; and, Paralloy Limited.

Q10 – How would you describe your interest in the project?

The fifth part of Question 5 asked respondents to describe their interest in the project from the following options:

- Statutory Consultee
- Local Resident
- Local Elected Representative
- Member of Interest group (please state)

- Landowner
- Local Business Owner
- Other (please state)

60 respondents answered this question. A total of 62 responses were received. Of these, 1 respondent answered ‘Statutory Consultee’; 53 respondents answered ‘Local Resident’, no respondents answered ‘Local Elected Representative’, 2 respondents answered ‘Landowner potentially impacted by the project’, 3 respondents answered ‘Local Business Owner’, and 4 respondents answered ‘Other’ including 1 respondent that answered ‘aware of notices in local press’. Table 5.1 sets out the breakdown of each respondent’s interest in the project.

Table 5.1 – Responses received about Respondents’ Interest in the Project

Statutory Consultee	**Local Resident**	**Local Elected Representative**	**Landowner potentially impacted by the project**	**Local Business Owner**	**Other**
1	53	0	1	3	4, including 1 stated “aware of notices in local press”

APPENDIX 12.1: FIRST CONSULTATION – COMBINED SECTION 42, 47 AND 48 NOTICE AND PUBLISHED NOTICES

THE H2TEESSIDE PROJECT

The Planning Act 2008 – Sections 42, 47 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

NOTICE OF PUBLICATION OF A STATEMENT OF COMMUNITY CONSULTATION AND NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), whose registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application (the 'Proposed Application') to the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').

2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.

3. In accordance with Section 47(6) of the PA 2008, this notice publicises where and when the Statement of Community Consultation (SoCC) can be inspected. The SoCC sets out how the Applicant will undertake its consultation on the Proposed Application. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

    - Mid-point – 454538 524086
    - North – 451524 526936
    - East – 458780 521588

- South – 456998 520748
- West – 446938 521612

5. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.

6. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:

   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. hydrogen storage;
   g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.

10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Documents

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.

12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.

13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.

14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.

15. The consultation on the proposed application will take place between **14 September and 26 October 2023**.

16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk

17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge.

Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	**Opening Times**
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

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H2 Teesside Limited

14 September 2023

FISHING NEWS

14 September 2023 £3.50 THE VOICE OF THE INDUSTRY SINCE 1913 fishingnews.co.uk

'UNPRECEDENTED' SILENCE FROM MINISTER

SEE PAGE 3

'Unfair and unworkable'

PART OF THE UK pelagic fleet was in court last week, arguing that new provisions in their licence conditions, increasing the proportion of catches they must make into Scotland, to the benefit of fishing communities, were unfair.

Their lawyers argued that the new conditions are not justified under the Fisheries Act, were the result of unsafe consultation processes, and infringed European human rights legislation – arguments robustly refuted by lawyers acting for the Scottish government.

Full story on page 2

9 770015 303212 37

Seraphim launched in Middlesbrough

Seraphim PD 170, the latest new twin-rigger for the North East Scotland fleet, emerged from Parkol Marine Engineering's Middlesbrough fabrication hall on 29 August to be lowered into the Tees.

Continued on page 3



▲ **Andy Buchan (left) and Josh Buchan (centre) and their family were in Middlesbrough to celebrate the launch of their new vessel.**



▲ **The new Seraphim is lifted into the Tees.** *(Photos: Paul Armstrong/The Artistic Lens)*

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Transducer options
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THE H2TEESSIDE PROJECT, THE PLANNING ACT 2008 – SECTIONS 42, 47 AND 48, THE INFRASTRUCTURE PLANNING (APPLICATIONS: PRESCRIBED FORMS AND PROCEDURE) REGULATIONS 2008 – REGULATION 4, THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 – REGULATION 13

NOTICE OF PUBLICATION OF A STATEMENT OF COMMUNITY CONSULTATION AND NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), whose registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application (the 'Proposed Application') to the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. In accordance with Section 47(6) of the PA 2008, this notice publicises where and when the Statement of Community Consultation (SoCC) can be inspected. The SoCC sets out how the Applicant will undertake its consultation on the Proposed Application. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   - Mid-point – 454538 524086
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   - South – 456998 520748
   - West – 446938 521612
5. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
6. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. hydrogen storage;
   g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
7. 7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
8. 8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.
10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Documents

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.
12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.
13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.
14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
15. The consultation on the proposed application will take place between **14 September and 26 October 2023.**
16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk
17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge.
    Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

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Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

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H2 Teesside Limited

14 September 2023

Lloyd's List

Daily Briefing

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LEAD STORY:
Sovcomflot transfers tankers to new non-sanctioned entity

WHAT TO WATCH:
Greed driving London brokers fixing ships for the dark fleet

Shipping won't get to choose its alternative fuel, Shell says

MSC bids for stake in Hamburg terminal operator

ANALYSIS:
Stopford: Shipping won't get 'a sniff' of green fuel

OPINION:
Don't underestimate the challenge of continual professional recruitment

MARKETS:
Frangou launches bid to acquire remainder of Navios Holdings

Winter tanker spike capped by production cuts and Iranian oil

China's NewNew Shipping Line to add up to 10 more boxships on northern sea route

Globus continues eyeing secondhand deals although modern ships 'scarce'

IN OTHER NEWS:
Take decarbonisation baby steps with LNG, says SEA-LNG chairman

Box shipping sector ready for container tracking

ABS sets up global electrification centre in Singapore

Sovcomflot transfers tankers to new non-sanctioned entity



RUSSIAN TANKER GIANT Sovcomflot has started to transfer vessels from its sanctioned Dubai-based operation, SUN Ship Management, into a newly created company called Oil Tankers (SCF) Management.

The new entity, also registered in Dubai, now controls a total of 18 ships that, until last month, were registered to and managed by SUN Ship Management.

Both Sovcomflot and SUN Ship Management are subject to US, UK and EU sanctions and asset freeze orders, however, the shift in registered ownership effectively puts a fleet of beneficially owned Sovcomflot vessels under the control of a UAE-based operation that is not currently sanctioned by any jurisdiction.

According to Sovcomflot, the transfers are part of an internal reorganisation that will see vessels continue to be reallocated to different technical supervision teams "depending on the trading geography, clients portfolio, vessels' age and commodities transported".

"This corresponds to SCF's historical mode of operations with several technical managers working under respective recognized brands. Each of them contributes to safety and quality of fleet's performance in line with highly rated SCF Group's united standard," Sovcomflot told Lloyd's List in a statement.

While the transfer has happened openly, with the Indian Register of Shipping confirming that the shift in registration will see the vessels enter into their books from tomorrow, the move has already raised concerns within the European Commission which had only recently targeted the same vessels under SUN Ship Management's control.

THE H2TEESSIDE PROJECT

The Planning Act 2008 – Sections 42, 47 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

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H2 Teesside Limited

14 September 2023

THE GAZETTE
LONDON GAZETTE

CONTAINING ALL NOTICES PUBLISHED ONLINE ON 14 SEPTEMBER 2023

PRINTED ON 15 SEPTEMBER 2023 | NUMBER 64173
PUBLISHED BY AUTHORITY | ESTABLISHED 1665
WWW.THEGAZETTE.CO.UK

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ENVIRONMENT & INFRASTRUCTURE

ENVIRONMENTAL PROTECTION

THE H2TEESSIDE PROJECT
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f. hydrogen storage;
g. CO capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO ;
h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.

10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Documents

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.

12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.

13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.

14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.

15. The consultation on the proposed application will take place between **14 September and 26 October 2023**.

16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk

17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	Opening Times
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net
Post: Freepost H2TEESSIDE
Telephone: Freephone 0800 080 3028
Project Website: www.h2teesside.co.uk

20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**. Responses received after this date may not be considered.

22. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited
14 September 2023 (4434600)

TRANSPORT

HS2

HIGH SPEED RAIL (WEST MIDLANDS - CREWE) ACT 2021
COMPULSORY PURCHASE (VESTING DECLARATIONS) ACT 1981
TO: PERSONS HAVING A RELEVANT INTEREST IN THE LAND DESCRIBED IN THE SCHEDULE HERETO

1. The High Speed Rail (West Midlands - Crewe) Act 2021 ("the High Speed Rail Act") received Royal Assent on 11 February 2021.

2. The Secretary of State for Transport (the "Acquiring Authority") is authorised under section 4 of the High Speed Rail Act to exercise powers under section 4(1) of the High Speed Rail Act to acquire compulsorily so much of the land within the limits of the High Speed Rail Act as may be required for Phase 2a purposes[1].

3. By virtue of section 4(4) of the High Speed Rail Act, the Compulsory Purchase (Vesting Declarations) Act 1981 ("the 1981 Act") applies as if the High Speed Rail Act were a compulsory purchase order.

4. Pursuant to section 3A of the 1981 Act[2] before making a general vesting declaration ("GVD") under section 4 of the 1981 Act the Acquiring Authority shall, in a notice which is (a) given to every person with a relevant interest in the land with respect to which a declaration is to be made (other than a mortgagee who is not in possession); and (b) published in the London Gazette, include the particulars in section 3A(3) of the 1981 Act[3].

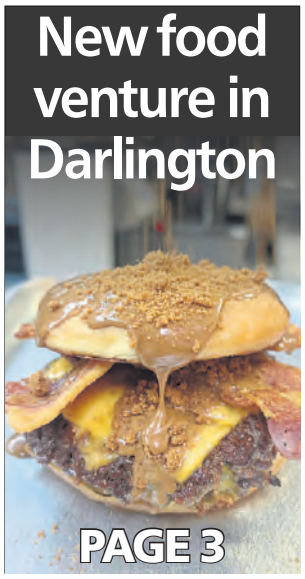
5. Notice is hereby given pursuant to Section 3A of the 1981 Act[4] of the Statement of the Effect of Parts 2 and 3 of the 1981 Act which provides an explanation of the process for and the effect of a GVD in respect of the land described in Schedule 1 hereto.

SCHEDULE 1
Borough of Stafford

(1) Plot No.	(2) Description
127653	All interests in 1716.06 square metres, or thereabouts, of agricultural land (Eccleshall Road)
127654	All interests in 146.37 square metres, or thereabouts, of outbuilding, garden, hardstanding and hedgerow (Little Micklow Farm)
127982	All interests in 141207.82 square metres, or thereabouts, of agricultural land, ponds, copse, access tracks, hedgerows and public footpath (Stone Rural 32) (Walton Heath Farm)
127983	All interests in 884.28 square metres, or thereabouts, of agricultural land (Walton Heath Farm)
127985	All interests in 12567.86 square metres, or thereabouts, of agricultural land, access tracks, pond, copse and public footpath (Stone Rural 32), (Walton Heath Farm)
127986	All interests in 94796.21 square metres, or thereabouts, of agricultural land, copse, ponds, hedgerows and access tracks (Walton House Farm)
127987	All interests in 1979.16 square metres, or thereabouts, of agricultural land, garden and hedgerow (Walton Heath Farm)

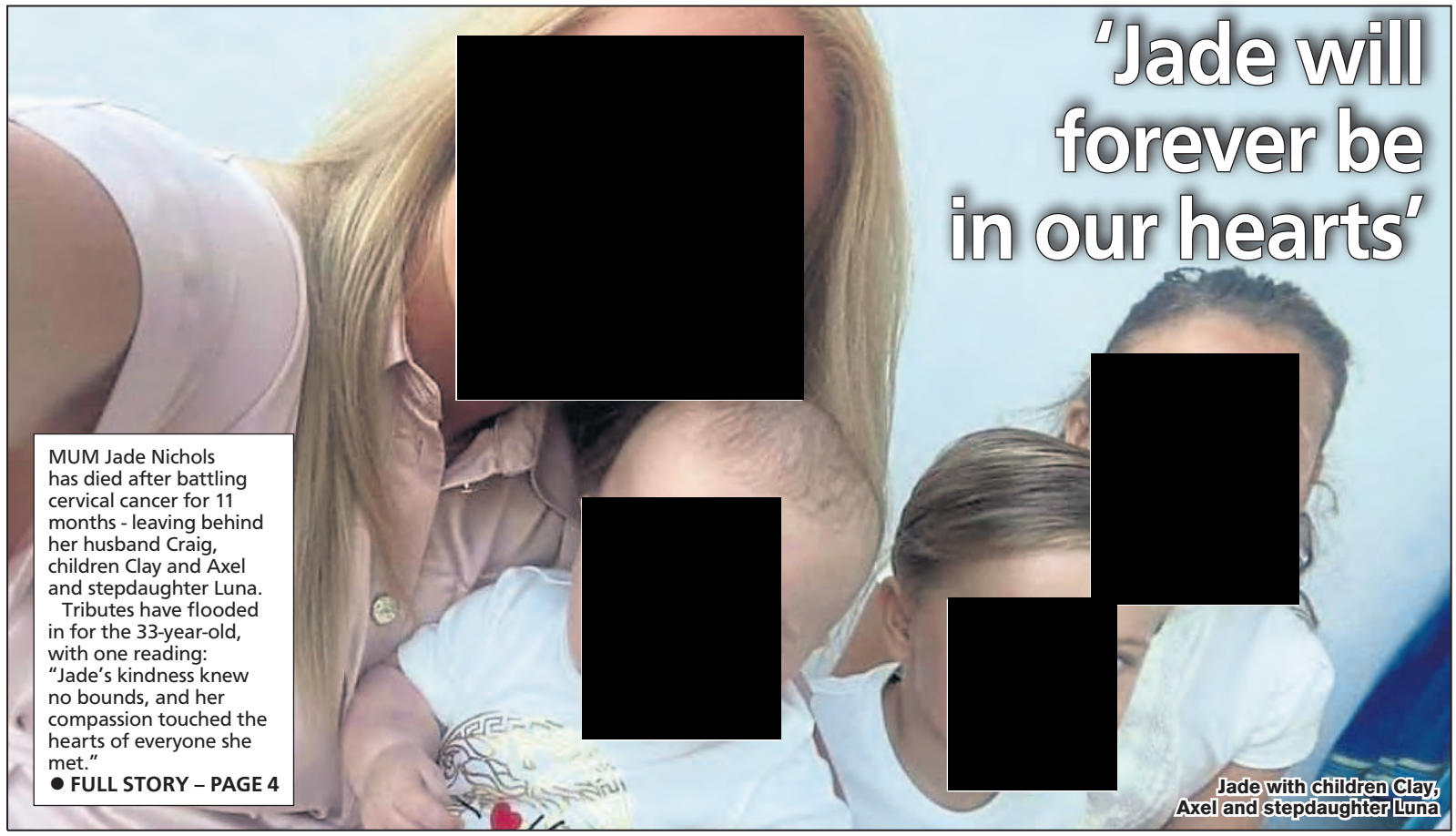
The Northern Echo

£1.05 The Northern Echo reaches 82% of adults in Darlington every month* THE GREAT DAILY OF THE NORTH THURSDAY, SEPTEMBER 14, 2023









'Jade will forever be in our hearts'

MUM Jade Nichols has died after battling cervical cancer for 11 months - leaving behind her husband Craig, children Clay and Axel and stepdaughter Luna.

Tributes have flooded in for the 33-year-old, with one reading: "Jade's kindness knew no bounds, and her compassion touched the hearts of everyone she met."

● FULL STORY – PAGE 4

Jade with children Clay, Axel and stepdaughter Luna

Council facing huge black hole

■ Durham County Council must make £12m in budget savings – and consider increasing council tax

■ Local authority is facing 'unavoidable pressures' as leaders warn 'incredibly difficult decisions' to be made

FULL STORY – PAGE 6 | ECHO COMMENT PAGE 14



October Open Events

- Check out our amazing facilities
- Talk to staff and students
- Find out more about QE

Wednesday 4th October 5.00 to 7.30pm
Tuesday 10th October 5.00 to 7.30pm
Thursday 26th October 5.00 to 7.30pm

QE
Vane Terrace | Darlington | DL3 7AU
01325 461315
qe@qeliz.ac.uk | www.qeliz.ac.uk

THE H2TEESSIDE PROJECT

The Planning Act 2008 – Sections 42, 47 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

NOTICE OF PUBLICATION OF A STATEMENT OF COMMUNITY CONSULTATION AND NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), whose registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application (the 'Proposed Application') to the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. In accordance with Section 47(6) of the PA 2008, this notice publicises where and when the Statement of Community Consultation (SoCC) can be inspected. The SoCC sets out how the Applicant will undertake its consultation on the Proposed Application. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   - Mid-point – 454538 524086
   - North – 451524 526936
   - East – 458780 521588
   - South – 456998 520748
   - West – 446938 521612
5. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
6. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. hydrogen storage;
   g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.
10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Documents

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.
12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.
13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.
14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
15. The consultation on the proposed application will take place between **14 September and 26 October 2023.**
16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk
17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge. Anydetails you provide to us via emailor telephone will be subject to ourPrivacy Notice: http://h2teesside.co.uk/privacy
18. Paperand digitalcopies ofthe SoCC and SoCCNotice and digital copies ofthe ConsultationDocumentswillalso be available to viewfree ofcharge atthe following inspection locationsuntil26 October 2023:

Inspection Location	Opening Times
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday9am to 5pm; Friday 9am to 6pm;Saturday9.30am to 12.30pm;Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday& Wednesday 8.30am to 6pm;Tuesday &Thursday 8.30am to 8pm; Friday8.30am to 6pm;Saturday 09.30am to 4pm;Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays9am to 4.30pm;Saturday and Sunday closed

How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: **www.h2teesside.co.uk**

20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023.** Responses received after this date may not be considered.
22. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited
14 September 2023

TRAFFIC & Roads

national highways

ROAD TRAFFIC REGULATION ACT 1984 - SECTION 14
THE A1 TRUNK ROAD
(BURGHAM TO WEST MOOR)
(TEMPORARY RESTRICTION AND PROHIBITION OF TRAFFIC)

NOTICE IS HEREBY GIVEN that National Highways Limited intends to make an Order on the A1 Trunk Road and carriageway, in the County of Northumberland, to enable carriageway resurfacing works to be carried out in safety.

The works are expected to start on Saturday 6 October 2023 for 7 weeks, or until completed.

The effect of the Order will be, between 8pm and 6am, at times during the works to:

(i) impose a temporary 10mph speed restriction on the A1 northbound and southbound carriageway from 400 metres north of Helm Junction to 225 metres north of West Moor Junction, a distance of 2685 metres. The 10mph speed restriction will only apply when, for safety reasons, traffic has to be escorted through the works by a highway maintenance vehicle;

(ii) ban vehicles from entering or leaving the A1 carriageway as described in (i).

During the closures suitably signed alternative routes will be available.

It will also be necessary, for 24 hours a day, for the duration of the works, to:

(iii) impose a temporary 40mph speed restriction on the A1 northbound and southbound carriageway from 450 metres south of Helm Junction to 1115 metres north of West Moor Junction, a distance of 4425 metres;

(iv) close the laybys adjacent to the above lengths of carriageway as described in (i);

(v) impose an overtaking ban, on the A1 carriageway as described in (i).

Traffic management will be in force 24 hours a day and traffic signs will indicate the extent of the restrictions (which will not apply to emergency service vehicles or special forces vehicles) and prohibitions (which will not apply to emergency service vehicles or vehicles being used in connection with the said works or for winter maintenance or traffic officer purposes). Access will be maintained at all times to premises and property which are accessible from, and only from, the A1. The Order comes into force on 6 October 2023 and has a maximum duration of eighteen months.

The contact for any further information about this notice is Adam Hughes, telephone: 0300 470 2593, e-mail: info@nationalhighways.co.uk

RICHARD FOXTON, National Highways, 2 City Walk, LEEDS, LS11 9AR.

national highways

ROAD TRAFFIC REGULATION ACT 1984 - SECTION 14
THE A1(M) MOTORWAY (JUNCTION 51)
(TEMPORARY PROHIBITION OF TRAFFIC)

NOTICE IS HEREBY GIVEN that National Highways Limited intends to make an Order on the A1(M) Motorway, in the County of North Yorkshire, to enable Kerb works to be carried out in safety.

The works are expected to start on Monday 9 October 2023 for 1 night, or until completed, and will take place between 8pm and 6am.

The effect of the Order will be to close the A6055 from its junction with the A1(M) (Leeming Bar) southwards for a distance of 43 metres; during which times a suitable signed alternative route will be available.

Traffic signs will indicate the extent of the prohibition (which will not apply to emergency service vehicles or vehicles being used in connection with the said works or for winter service maintenance or traffic officer purposes). The order comes into force on 8 October 2023 and has a maximum duration of 18 months.

The project manager for this scheme is Michael Mccormack. For enquiries please contact the National Highways Customer Contact Centre on 03001235000 or info@nationalhighways.co.uk

RICHARD FOXTON, National Highways, 2 City Walk, LEEDS LS11 9AR.

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The Gazette

teessidelive.co.uk TRUSTED NEWS SINCE 1869 InYourArea.co.uk Thursday, September 14, 2023 £1.55

DON'T MISS A THING! SIGN UP FOR OUR NEWSLETTERS

SCAN ME

TeessideLive
WWW.TEESSIDELIVE.CO.UK/SIGNUP







HAVOC ON OUR STREET

PAGE 5

PUPILS TO BE TAUGHT IN TENT

By ALEX O'LEARY

CHILDREN are set to be taught in marquees as the RAAC crisis hit their Middlesbrough school. Kader Academy, in Acklam, is having to transport pupils to other schools, but some will temporarily be taught in a marquee.

PAGE 4



The marquee for three year groups has been erected in the grounds of Kader Academy



LIVING THE DREAM

BORO NEWCOMER IN CONTENTION FOR PLACE: SPORT



CLIFF TRAMWAY'S AWARD

PAGE 3

SAVE 50%* ON YOUR GAZETTE

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Pot Noodle Chicken and Mushroom Instant Noodles 90g: Clubcard Price £7.78/kg, regular price £13.33/kg, ends 03/10. Available in the majority of larger stores and online. Excludes Express and Whoosh. Clubcard/app required. Delivery charges and some exclusions may apply.

Public Notices

Planning

THE H2TEESSIDE PROJECT
The Planning Act 2008 - Sections 42, 47 and 48
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 - Regulation 4
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 - Regulation 13
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   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
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   g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.
10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Document

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.
12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.
13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.
14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
15. The consultation on the proposed application will take place between **14 September and 26 October 2023**.
16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk
17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	Opening Times
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:
    Email: info@h2teesside.net
    Post: Freepost H2TEESSIDE
    Telephone: Freephone 0800 080 3028
    Project Website: www.h2teesside.co.uk
20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**. Responses received after this date may not be considered.
22. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited
14 September 2023

STOCKTON ON TEES BOROUGH COUNCIL

I give notice that the following application(s) have been made to Stockton on Tees Borough Council:-

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) (ENGLAND) ORDER 2015 Notice Under Article 15

Siting of 75MW (2hr) Battery Energy Storage Facility with associated infrastructure, 2.4m palisade security fencing, security lighting and formation of a new vehicular access at Land North Of Household Waste Recycling Centre, Belasis Avenue, Billingham, by Max Design Consultancy - 23/1634/FUL

Members of the public may inspect copies of the application, plans and other documents submitted with the application(s) via our web site at www.stockton.gov.uk or alternatively, if you do not have access to the internet please contact Planning Development Services on 01642 526022. Anyone who wishes to make a representation about any of the above applications should write to Planning Services, Municipal Buildings, Church Road, Stockton on Tees. TS18 1LD or online at https://www.stockton.gov.uk/planningapplication or email: planningdevelopmentservices@stockton.gov.uk by 5 October 2023

Please Note: Any comments received, applications forms, plans and/or any other documentation submitted will be made available for inspection on-line by visiting our web site at www.stockton.gov.uk.
For a large print version of this advert please contact 01642 526067
Simon Grundy Planning Services Manager
On behalf of: Stockton on Tees Borough Council
Date : 14 September 2023

Traffic & Roads

national highways

ROAD TRAFFIC REGULATION ACT 1984 - SECTION 14
THE A66 TRUNK ROAD (WARRENER LANE TO MOOR ROAD) (TEMPORARY 50 MILES PER HOUR SPEED RESTRICTION)

NOTICE IS HEREBY GIVEN that National Highways Limited has made an Order on the A66 Trunk Road, in the County of North Yorkshire, to enable local authority works to be carried out in safety.

The works are expected to start at 8am on Monday 18 September 2023 for 4 weeks, or until completed.

The effect of the Order will be to impose, 24 hours a day, at times during the works, a temporary 50mph speed restriction on the A66:

(i) eastbound carriageway from 30 metres east of Warrener Lane junction to 250 metres east of Moor Road junction, a distance of 3420 metres; and

(ii) westbound carriageway from 700 metres east of Hargill junction to 140 metres east of Warrener Lane junction, a distance of 3710 metres.

Traffic management will be in force 24 hours a day and traffic signs will indicate the extent of the restrictions (which will not apply to emergency service vehicles or special forces vehicles). The Order comes into force on 17 September 2023 and has a maximum duration of eighteen months.

The contact for this scheme is Michael McCormack. For enquiries please contact the National Highways Customer Contact Centre on 03001235000 or info@nationalhighways.co.uk

RICHARD FOXTON, National Highways, 2 City Walk, LEEDS, LS11 9AR.

REDCAR AND CLEVELAND BOROUGH COUNCIL
CHAPEL STREET, LAZENBY (TEMPORARY PROHIBITION OF DRIVING) ORDER 2023

The Council has made an Order under the Road Traffic Regulation Act 1984 as amended because works are being or are proposed to be executed on or near the length of road specified below.

The effect of the Order will be to prohibit any vehicle from proceeding in the lengths of road specified in the schedule below. Access will be available to residents' properties within the closure. Local diversions will be in operation.

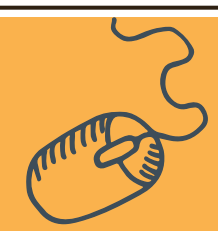
The Order came into operation on 8.9.23 and remain in operation for 18 months, although it is envisaged that the works will be completed within 10 working days.

SCHEDULE

Chapel Street, Lazenby from outside number 11 to the junction with New Row, Lazenby.

J Sampson, Managing Director, Redcar and Cleveland House, Kirkleatham Street, Redcar TS10 1RT

marketplacelive.co.uk



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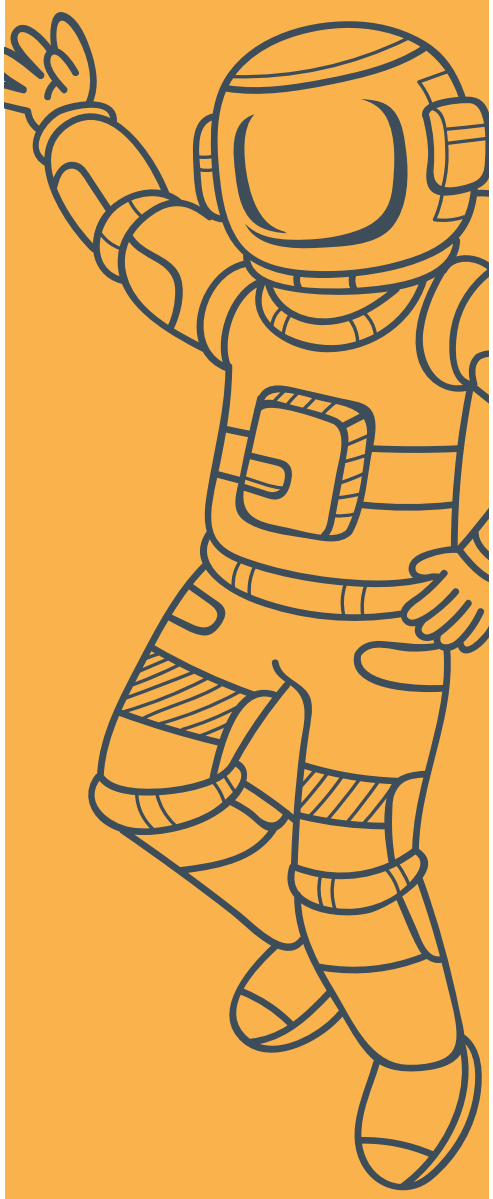

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Your local place to buy and sell

Thursday 14 September 2023 *** telegraph.co.uk No 52,359 £3.00

‘I feel sorry for Harry Maguire – it is time to drop him for his own good’

Jamie Carragher, Sport



BRITAIN’S BEST QUALITY NEWSPAPER

The Daily Telegraph

Starmer plots deal to take EU migrants

Labour believes sharing burden of asylum seekers is only way to fix small boats crisis

By **Charles Hymas**
HOME AFFAIRS EDITOR

A LABOUR government would accept migrants from Europe as part of a proposed deal with the EU to try and stop the small boats crisis.

The party is considering taking a share of asylum seekers reaching Europe as part of a deal where the bloc would take back migrants who illegally come to the UK across the Channel.

Senior party figures believe Britain is only likely to secure a returns deal, enabling it to deport Channel migrants, if it offers to share the burden of asylum seekers reaching the continent.

The plan emerged as Sir Keir Starmer, the Labour leader, arrived last night in The Hague to visit Europol, the EU agency for law enforcement co-operation, before a trip to see Emmanuel Macron, France’s president, next week.

Speaking in the Netherlands before talks, he said Labour would treat people smugglers like terrorists by giving the National Crime Agency (NCA) expanded powers to freeze their assets and place restrictions on their movement.

With immigration set to be a key battleground in the run-up to the election, Sir Keir aims to offer an alternative to the Government’s Rwanda scheme by redirecting its £140 million funds into a new cross-border NCA unit. He said Labour would drop the Conservatives’ plans to ban cross-Channel migrants from claiming asylum in Britain.

Sir Keir is also expected to set out plans tomorrow on how the party will reduce the asylum backlog and end the use of hotels, which cost £6 million a day to house 50,000 migrants. The moves are a challenge to Rishi Sunak, the Prime Minister, who made stopping the boats one of his five pledges.

The Government has claimed success by cutting Channel crossings by 20 per cent this year but more than 23,000 migrants have still reached the UK so far in small boats.

Rwanda flights have been grounded, pending the outcome of a Supreme Court ruling on their legality, and the EU has so far spurned any post-Brexit returns agreement with the UK.

It emerged yesterday that Sir Keir will meet Mr Macron at the Élysée next week as he “tests the waters” with France. It is believed Sir Keir requested the meeting and France agreed to protect the “strategic nature” of its relationship with Britain, whoever is in charge after the next general election.

It is thought a possible returns deal may be discussed. Sir Keir’s spokesman said: “The detail of those conversations will follow but it is clear that having a returns agreement is an essential part of being able to deal with the backlog and reduce the hotel bill.”

Asked about the possibility of taking a share of Europe’s migrants as a quid pro quo for a returns agreement, the spokesman said: “The exact way it would operate would have to be [up] for negotiation. The UK will always want to be a country that takes people through safe and legal routes as we have done most recently when it comes to Afghanistan and Ukraine, for example.”

Labour sources told *The Daily Telegraph* a scheme to take migrants from Europe would be tightly managed.

Party sources believe that if a returns agreement could be negotiated, it could “collapse” the people smugglers’ business model as migrants would know they faced deportation back to the country from which they came, where their asylum claim would be processed.

Last night, government sources seized on the plan as “open borders by the backdoor”. A source said: “Finally we get to see Sir Keir Starmer’s plan for illegal migration – he’ll make it legal.

“He’ll ignore the will of the British people to cut numbers, and instead cut a deal with the EU that would commit us to taking our ‘fair share’ of however many illegal migrants enter Europe.”

Reports: Page 12
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Duke and Duchess reunited



CHRIS JACKSON/GETTY IMAGES

The Duke and Duchess of Sussex pose with children at the Merkur Spiel-Arena in Düsseldorf during day four of the Invictus Games. The Duchess arrived late at the games on Tuesday, saying she had to spend time getting their ‘little ones settled at home’, but received a rapturous welcome as she got into the spirit of the competition. *Report: Page 5*

Schools need trans guidance, ministers told

By **Louisa Clarence-Smith** *and* **Catherine Lough**

THE Children’s Commissioner has criticised the Government for delaying transgender guidance for schools.

Dame Rachel de Souza told *The Daily Telegraph* there was “real confusion” in schools around how to respond to children questioning their gender identity, with head teachers forced to come up with their own policies.

Trans guidance for schools in England was promised before the end of the summer term but has been delayed by a Cabinet disagreement over the need for a law change to ban children from changing gender pronouns at school.

The delay means schools are in limbo over whether they can stop boys who identify as girls from using girls’ lavatories or joining girls’ sports teams.

The commissioner’s comments come as she begins the “Big Ambition” campaign today, to hear from children ahead of the next general election, and warns ministers that it is “shortsighted to neglect the needs of children” who continue to suffer from the impact of pandemic lockdowns.

Dame Rachel said: “I’m disappointed that the guidance isn’t out. We need that guidance.

“I think this has got to be one of the most challenging issues for heads, because it’s a fast-emerging issue and I think nobody feels that they don’t want to support any individual or any child, but they also feel strongly about needing clarity over safeguarding issues. As a head teacher, I could not give your child a spoon of medicine without your permission, and we know that in the absolute best-case scenario, parents, children and schools need to work together really closely, and at the moment I think there’s real confusion, so we need those guidelines.”

> ‘I think this has got to be one of the most challenging issues for head teachers’

The Cabinet is understood to be split on whether a law change is needed to ban so-called “social transitioning” – where children are treated as if they are the opposite gender – in schools. Rishi Sunak is said to be fearful of Tory splits on the issue being exposed if he attempts to change equality legislation.

Parents have said schools affirmed their child’s preferred gender pronouns without their consent and without first obtaining clinical or medical advice.

A government spokesman said: “Given the complexity and sensitivity of the issue, we’re taking the time to make sure any guidance we provide is as clear as possible.

“We’ve been repeatedly clear about the importance of biological sex and we advise that schools and colleges proceed with caution – prioritising the safeguarding and wellbeing of all children and involving parents in decisions relating to their child.”

British-made missiles used in strike on Russian submarine

By **Joe Barnes** *and* **James Kilner**

BRITISH-MADE Storm Shadow missiles were used in a Ukrainian strike that damaged a Russian submarine and ship at a naval port in Crimea.

Russian sources claimed a volley of 10 missiles and three unmanned naval drones were launched, in what appeared to be Kyiv’s most ambitious attack on the port city of Sevastopol since the start of the war.

Its defence ministry claimed seven of the missiles had been shot down and the unmanned drones had been destroyed.

But Ukrainian and British sources were reported as confirming the Storm Shadow missiles had successfully landed, in a strike that damaged one of Moscow’s most formidable submarines.

The vessel, believed to be an improved Kilo-class attack submarine, was hit in the overnight attack on Sevastopol, which also damaged a Russian amphibious landing ship. “Unfortunately, three Storm Shadow missiles reached their target. The landing ship ‘Minsk’ and the submarine ‘Rostov-on-Don’, which were in dry dock, received varying degrees of damage,” the Russian Rybar Telegram channel reported.

Mykola Oleshchuk, the head of the Ukrainian Air Force, appeared to confirm that Storm Shadow missiles were used in the strike when he praised his pilots for their “excellent combat work”. Storm Shadows are fired from Ukrainian fighter jets and have the longest range of all the missiles in Ukraine’s arsenal.

Since May they have been used to strike Russian supply depots and command posts behind the front lines.

Video showed large explosions and fires around the Sevmorzavod Shipyard in Sevastopol, which is used to repair Russian warships.

It had previously been identified as the base for Russia’s forthcoming programme to build maritime attack drones.

Mikhail Razvozhayev, the Russia-installed governor of Crimea, said air defence systems shot down seven of 10 Ukrainian missiles. Three marine drones

Continued on Page 2

HMRC ‘failing taxpayers’ as thousands of staff shun office

By **Harry Brennan** *and* **Noah Eastwood**

THOUSANDS of HMRC staff are routinely failing to show up at the office even for one day a week as customer service falls to “unacceptable levels”.

As many as two in five HM Revenue and Customs workers did not go into the office at all in some of the tax authority’s regional offices in the year to March, figures obtained under Freedom of Information laws show.

It is the latest evidence of civil servants increasingly shunning the office to work remotely and comes despite post at the tax office going unanswered for months and call waiting times exceeding 20 minutes on average. It is likely to add to concerns in Whitehall about slumping productivity, as the Paymaster General pushes to get more mandarins back to their desks.

The revelations follow a separate Freedom of Information disclosure that showed hundreds of council staff were working abroad.

Sir Jacob Rees-Mogg, the former Cabinet Office minister, said: “It is increasingly clear that working from home leads to poorer public services. HMRC, which used to have a reasonable reputation, is failing taxpayers as its staff neither toil nor spin.”

In HMRC’s Northern Ireland office about two in five employees routinely failed to go into the office at all, the figures suggested, with 59 per cent of staff – 1,100 workers – going into the Belfast office at least once a week on average.

In its Cardiff centre, 39 per cent of staff shunned the office, with only 2,400 showing up at least once a week on average in the last year.

Chris Etherington of the tax firm RSM, which obtained the figures, said that the low levels of office attendance would “feel like salt in the wound” of taxpayers who have been grappling with delays and communication issues.

A spokesman for HMRC said: “Our advisers answer the same number of calls on average whether they are in the office or not.”

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ISSN-0307-1235

NEWS

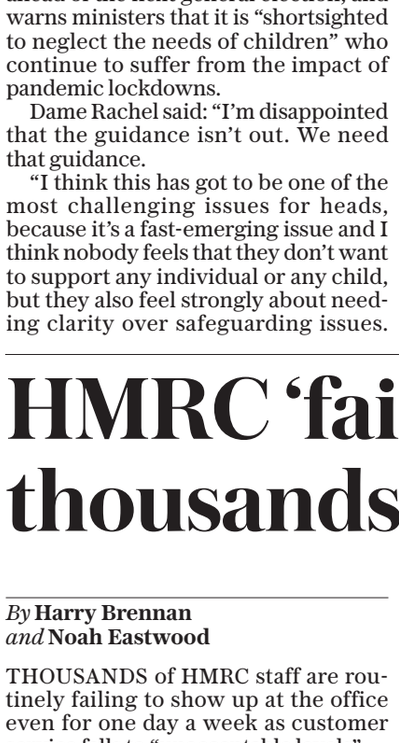
First dog-fox cross in world found in Brazil

The world’s first confirmed dog-fox hybrid has been found in Brazil. The animal was hit by a car in 2021 but veterinary hospital staff could not decide if it was a fox or dog. The female animal’s unusual characteristics piqued the interest of scientists, who analysed its genes, revealing its mother was a pampas fox and its father a domestic dog. Academics called it “Dogxim” as a merger of “dog” and “xim” from *Graxaim-do-camp,* the Portuguese name for the pampas fox.
Page 3

NEWS

Population decline is ‘positive for economy’

Population growth has led to a decline in living standards, the chief forecaster of the Government’s spending watchdog has said. Prof David Miles, of the Office for Budget Responsibility, has said rather than having a negative effect, shrinking populations could be positive for the world’s richest nations. In an academic paper falling birth rates, the economist concluded that “the economic impacts are likely, on balance, to be positive”, leading to a higher quality of life.
Page 4



NEWS

ChatGPT diagnosis as good as A&E doctors

ChatGPT is as good as A&E doctors at diagnosing patients, a study has suggested, with researchers saying that it could be used to cut waiting times. The study in the Netherlands compared the accuracy of diagnoses made by the language model, which is powered by AI, with those made by medics. Physicians’ notes on symptoms and examinations from 30 patients who visited an emergency department last year were entered into ChatGPT versions 3.5 and 4.0.
Page 6

BUSINESS

BP culture questioned after Looney’s exit

BP’s board was last night facing questions over the company’s culture and its handling of whistleblower complaints after the shock resignation of Bernard Looney, the chief executive. Mr Looney, 53, resigned on Tuesday after misleading the board about personal relationships with colleagues. The announcement took investors by surprise. However, industry sources claimed it had been “common knowledge” that Mr Looney had had relationships with colleagues.
Page 17

Court & Social

Court Circular

BALMORAL CASTLE
September 13th
The King this morning visited Scalan Seminary and Mills, Ballindalloch, and was received by His Majesty's Lord-Lieutenant of Banffshire (Mr Andrew Simpson), the Acting Co-Secretary of Scalan Association (Mrs Patricia Nisbet) and Mr David Toovey (Treasurer).

His Majesty viewed the North and South Mills and received a briefing on the history of the Mills and an overview of the restoration project and the wider estate context by Mr Mark Johnston (Head Ranger, Glenlivet Estate), Mr Ian Innes (Builder, Project Restoration Team) and Mr Gordon McGillivray (local historian), before meeting volunteers and representatives of organisations involved with the conservation work and subsequently, having been received by the Acting Chairman of Scalan Association (Father Colin Stewart), touring the Seminary.

The King later visited Tomintoul and Glenlivet Discovery Centre and Museum, 43 the Square, Tomintoul, Ballindalloch, and was received by the Chairman of Tomintoul and Glenlivet Development Trust (Mrs Elizabeth Smith).

His Majesty, escorted by the Chairman, toured the Centre and Museum and met members of staff, before viewing the Tomintoul Coat.

Afterwards, The King proceeded on foot to Tomintoul Village Store, meeting local shopkeepers and members of the community.

His Majesty, having been received by Brigadier Hugh Monro (Vice Lord-Lieutenant of Banffshire), subsequently visited the pupils of Tomintoul Primary School, followed by a visit to a local affordable housing project at Auld School Close, Tomintoul.

The King this evening attended Beating Retreat by Balaklava Company, The Argyll and Sutherland Highlanders, 5th Battalion The Royal Regiment of Scotland at Balmoral Castle and subsequently attended a Reception given by the Guard Commander (Major Robert Weir).

KENSINGTON PALACE
September 13th
The Prince of Wales this morning visited Mates in Mind at a construction site in West London was received by Colonel Jane Davis (Vice Lord-Lieutenant of Greater London).

The Princess of Wales, Joint Patron, the Royal Foundation of the Prince and Princess of Wales, this morning held an Early Years Meeting at Windsor Castle.

ST JAMES'S PALACE
September 13th
The Duke of Edinburgh, Colonel-in-Chief, The Royal Dragoon Guards, this afternoon received Major General Timothy Hyams (Colonel).

His Royal Highness, Colonel-in Chief, The Queen's Royal Hussars, received Brigadier Nicholas Cowley (Colonel).

The Duchess of Edinburgh this morning attended a Gender and Climate Change Meeting at the Foreign, Commonwealth and Development Office, King Charles Street, London SW1.

Her Royal Highness, Royal Colonel, The Queen's Own Yeomanry, this afternoon received Major General Timothy Hyams (Colonel).

ST JAMES'S PALACE
September 13th
The Princess Royal this afternoon attended the Department for Business and Trade's Northern Ireland Business Summit at the International Conference Centre Belfast, 2 Lanyon Place, Belfast, and was received by Mrs Anne McGregor (Deputy Lieutenant of the County Borough of Belfast).

Her Royal Highness, Patron, International Sheep Dog Society, later attended the World Sheep Dog Trials at Gill Hall Estate, Lurgan Road, Dromore, and was received by His Majesty's Lord-Lieutenant of County Down (Mr Gawn Rowan Hamilton).

The Princess Royal subsequently unveiled a Royal British Legion Community Bench in Dromore Square, Dromore, and was received by Mrs Catherine Champion (Vice Lord-Lieutenant of County Down).

Her Royal Highness this evening attended the Department for Business and Trade's Northern Ireland Business Summit Reception at Hillsborough Castle.

KENSINGTON PALACE
September 13th
The Duke of Gloucester, Patron, the Cultura Trust, and The Duchess of Gloucester this morning attended a briefing on the Barnard Castle Project at Raby Castle, Staindrop, Darlington, and were received by His Majesty's Lord-Lieutenant of County Durham (Mrs. Susan Snowdon).

Their Royal Highnesses this afternoon visited the "Rising Project" at Raby Castle, Staindrop, Darlington.

The Duke of Gloucester, Patron, Cathedrals in Pilgrimage, and The Duchess of Gloucester, Royal Patron, Cathedral Music Trust, later visited Durham Cathedral.

ST JAMES'S PALACE
September 13th
The Duke of Kent, President, this evening attended a Lecture at the Royal United Services Institute for Defence and Security Studies, 61 Whitehall, London SW1.

Today's birthdays

Miss Amanda Barrie, actress, is 88; **Mr Renzo Piano,** architect, is 86; **Lord Willoughby de Broke**, 85; **Mr Martin Adamson,** Chairman, Associated British Foods, 2002-09, 84; **Prof Sir Ian Kennedy, KC**, Chairman, Independent Parliamentary Standards Authority, 2009-16, 82; **Mr Peter Luff,** Director-General, Royal Commonwealth Society, 1997-2001, 77; **Prof Duncan Haldane,** physicist; joint winner, 2016 Nobel Physics Prize, 72; **Mr Paul Allott**, cricketer, Lancashire, 1978–1992; England, 1981-85, and commentator, 67; **Mr Kepler Wessels,** former South Africa cricket captain, now commentator, 66; **Mr James Saunders Watson**, Lord-Lieutenant for Northamptonshire, 62; and **Mr Grant Shapps, MP**, Secretary of State for Defence, 55.

Today is the anniversary of the death of the first Duke of Wellington in 1852.

Forthcoming marriages

Mr A.J.B.L. Rose and Miss E.K. Shiach
The engagement is announced between Archie, son of Mr and Mrs Patrick Rose, of Cutsey, Somerset, and Emily, younger daughter of Mr and Mrs Neil Shiach, of Old Catton, Norfolk.
Online ref: WO015625

Mr J.A.R. Muir and Miss F.K.P. Budd
The engagement is announced between James Alexander Reid, younger son of Mr and Mrs Ian Muir, of Ballathie, Scotland, and Frances Karen Pascua, only daughter of Mr and Mrs Tim Budd, of Sherborne, Dorset.
Online ref: WO015284

Bridge news

The first of three weekends of the English Premier League has taken place, **writes Julian Pottage, Bridge Correspondent**. On the first weekend Division 1 played at Richmond Bridge Club while Division 2 played at the Young Chelsea BC and Division 3 played at Coventry BC.

The leaders after the first weekend are as follows:

Division 1

1st Team Black (Andrew Black, David Gold, Andrew McIntosh, Thomas Paske, Simon Cope and Peter Crouch) 87.89 VPs.

2nd Hinden (John Atthey, Graham Osborne, Neil Rosen, Frances Hinden and Chris Jagger) 81.79 VPs.

3rd Knottenbelt (Maggie Knottenbelt, Michael Byrne, Kieran Dyke, Ben Handley-Pritchard and Ed Jones) 77.64 VPs.

Division 2

1st Lee (Stephen Lee, Gad Chadha, Graham Orsmond, Ben Ritacca, Francois Picard and Nicolas Leprovost) 86.22 VPs.

2nd Nettleton (Ian Draper, Thomas Rainforth, Diana Nettleton, Anne Rosen and Joe Sivayogan) 75.08 VPs.

Division 3

1st Comfortably Numb (Marcia Green, Heather Dhondy, Joe Fawcett, Alastair Gidman and Ollie Burgess) 101.11 VPs.

2nd Miller (Robert Miller, Ufuk Cotuk, Tugrul Kaban and David Eddleston) 80.91 VPs.

The second weekend takes place in the middle of October and the third weekend at the start of November.

ONE HUNDRED YEARS AGO

The Daily Telegraph.

LONDON, FRIDAY SEPTEMBER 14, 1923

MILITARY COUP IN SPAIN.

BARCELONA SEIZED

A military revolution broke out in Spain on Wednesday night. The immediate scene of the revolt is Barcelona, which for several years past has been a hotbed of Communism and revolutionary and separatist propaganda, and the scene of almost innumerable murders and other outrages, the perpetrators of which have for the most part escaped punishment. The leader of the rising, which, it is explained, is not directed against the Throne, but rather against the present Cabinet under the Marquis de Alhucemas, is the Captain-General (Military Governor) of Barcelona. He has declared martial law, seized the post and telegraph office, and apparently intends to take over the whole administration of the district. There seems reason to believe, however, that the movement will spread to other great centres, as the heads of the military junta have made no attempt to disguise their line of conduct should certain circumstances arise.

Closely connected with the existing upheaval are the Moroccan campaign and the Nationalist movement in Catalonia (of which Barcelona is the capital), for what may be described as Home Rule. In regard to the former question recent telegrams from our correspondent in Spain have made it clear that a grave division of opinion existed in the Cabinet as to whether the operations against the Riffs should be pursued with energy or whether the Spanish efforts should be confined to holding the line already occupied. Supporters of the latter plan feared a repetition of the terrible disaster sustained by the army in the summer of 1921, when it was totally defeated with a loss of some 10.000 men killed, several thousands of prisoners, and a great deal of its munitions and supplies. Eventually three dissident Ministers resigned, including the Minister of Finance, who objected to the huge outlay which would be entailed by further active operations in Morocco.

The following telegrams from Reuter's correspondents reached us yesterday:

RISING AT BARCELONA.

BARCELONA. THURSDAY.

As a result of the proclamation by the Captain-General, Primo de Rivers, attacking the Government and announcing the decision of the military authorities to take over power, the Central Telephone Office has been occupied.

A hasty meeting of the Cabinet has been summoned at Madrid.

It is expected that martial law, which has practically been in force since early this morning, will be proclaimed at any moment. The military authorities have set up a censorship. It is stated that the garrisons at Madrid, Saragossa, and Seville are loyal to the movement.

A communiqué which has been issued states that proceedings are to be instituted against the Minister for Foreign Affairs and the President of the Council, and a government set up under the military authorities. Telephone communications have been cut by the military. The communiqué states that the movement is loyal to the King, as it is directed against the Government.

BARCELONA, THURSDAY (LATER).

Martial law was declared here this morning.

Acting on the orders of the Captain-General, Primo de Rivera, General Lossada has taken over the administration of the Province of Barcelona, dispossessing the present Governor. The military have also seized power in the Catalan provinces, and apparently without encountering any difficulty. The military authorities have not yet occupied the municipal,, provincial, and communal offices. The police, the Civil Guard, and other public authorities seem to have acquiesced in the new order of things.

ARMY LEADER'S MANIFESTO.

MADRID, THURSDAY.

The sitting of the Cabinet which was held in connection with the proclamation issued by the Captain-General of Barcelona lasted til the early hours of this morning, when the following statement was issued to the Press:

The Captain-General of Barcelona last night proclaimed, on his own responsibility, a state of siege in that district, seized the communications, and invited other districts to support his action. In order to explain this step, he published a manifesto to the country, declaring that the army called upon the Sovereign to save Spain, and asking for the dismissal of the present Ministers. In certain districts it appears that military forces are disposed to concur in this attitude of rebellion.

The Cabinet is in permanent session, and will maintain its position, which it will abandon only under force, should the promoters of this sedition decide to follow up their policy, with all its consequences. The King will arrive at Madrid to-day.

According to some of the newspapers, the garrison of San Sebastian has imprisoned Senor Alba, the Minister for Foreign Affairs, whilst others express the belief that the Minister has succeeded in crossing into France.

Bridge Hand

Fingers burned

By **Tom Townsend**

Dealer East — **Game All**

	♠ Q ♥ 10 9 3 2 ♦ J 7 5 2 ♣ 10 9 7 5	
♠ K J 8 6 3 ♥ 7 4 ♦ Q 4 ♣ K 8 4 2	N W E S	♠ 7 5 4 2 ♥ A K J 8 5 ♦ 9 6 ♣ J 3
	♠ A 10 9 ♥ Q 6 ♦ A K 10 8 3 ♣ A Q 6	

West	North	East	South
		pass	2NT(1)
pass	pass	dble(2)	pass
pass	pass	pass	

(1) 20-21 in principle, balanced
(2) For West's weaker major

Contract 2NT doubled
Declarer South
Opening Lead ♥7

MANY players jest about a double on the sequence 2NT-pass-pass. Dummy is sure to be weak on this auction, sometimes entryless. If declarer has no source of tricks, and is forced to lead repeatedly from hand, he will often end up two or three tricks light.

Few actually double, because it's not really a sensible move. More often than not, dummy does have an entry, enabling a critical finesse. One slip by the defence, or a favourable lie for declarer, and 2NT will come home. In general, at least at teams and rubber bridge, thin doubles into game are best avoided. They're not justified by the IMP (or total points) odds.

Our deal is from the Bermuda Bowl in Marrakech. Fortunately for those just visiting, the world championships finished a week before the earthquake.

Switzerland played Norway towards the end of the round-robin phase. Both teams were safely qualifying. At stake were picking rights for the knockouts.

North-South for Norway were Geir Helgemo and Tor Eivind Grude. (Tor Helness has retired.) East-West for Switzerland were the erstwhile top Dutch pair, Sjoert Brink and Bas Drijver. With 19 points, a five-card suit and good spots, Grude (South) stretched to open 2NT. Drijver passed as did Helgemo, hoping not to have missed 4♥.

Now Brink (East) tried a double, a sporting effort to say the least. This was lead-directing, akin to a double of 1NT-3NT, requesting a lead of opener's weaker major. Some play it as for specifically a spade. All passed and Drijver led the ♥7. In the other room, with the ♦Q falling, 2NT had made nine on a spade lead – but undoubled.

Brink took the ♥K at trick one, and switched to the ♠7 (top of nothing) to the ♠9 and ♠K. Drijver switched back to the ♥4, to the ♥A and ♥Q. Now a second spade beats the contract, provided the defenders are careful with their spade spots. East must keep all his spades on the run of the diamonds. West, known to hold the ♣K as East passed as dealer, must throw two clubs and keep the ♠3. Only thus can they untangle all their winners, and avoid West being endplayed.

Brink, alas, cashed his ♥J at trick four, establishing dummy's ♥10. Now South had eight tricks. Eleven IMPs to Norway.

Norway 2NT doubled and made, N/S +690
Switzerland 2NT plus one, N/S +150

Chess

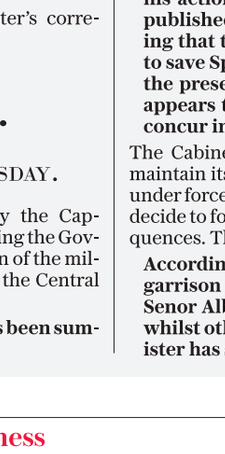
Carlsen's cruise control

By **Malcolm Pein**

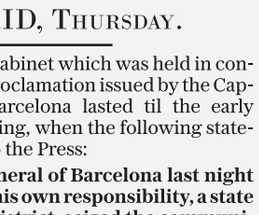
MAGNUS Carlsen's winning streak continued, as he defeated Alireza Firouzja in the final of the Julius Baer Generation Cup to secure his third victory on the $2million Champions Tour, and augment his winnings with the $30,000 first prize. Carlsen is odds-on favourite to win the Champions Chess Tour a third time at the concluding event in Toronto in December. His opponents will include Hikaru Nakamura, Nodirbek Abdusattorov, Fabiano Caruana and Wesley So.

Carlsen's victory followed on from his triumphs at the Grand Chess Tour Rapid and Blitz in Zagreb and at the FIDE World Cup in Baku, the latter being the only major prize the 16th world champion had never won. Subsequently Carlsen tweeted: "Chess, completed it."

Carlsen was not at his best in the final, coming through 3-2 with victory in Armageddon.



A Firouzja – M Carlsen
Closed Sicilian
1.e4 c5 2.Nf3 e6 3.b3 a6 4.g3!? d5 5.exd5 exd5 6.Bg2 Nf6 7.0–0 Be7 8.d4 0–0 9.Nc3 Nc6 10.Na4 cxd4 11.Nxd4 Bg4 12.Ne2? (Terrible, 12.Nxc6 bxc6 13.Qd4 is quite playable) **12...Re8 13.f3** (A sad necessity if 13.Bb2 Rc8 14.h3 Bxe2 15.Qxe2 b5 16.Nc3 Ba3) **13...Bd7 14.Be3 b5 15.Nac3 Rc8 16.Bf2 Ba3! 17.Rb1 Nb4 18.Re1** (The c2-pawn cannot be defended, and Carlsen's missed a great chance here. What was it? See board left) **18...h5 19.Qd2 Nxc2 20.Qxc2 b4 21.Qd3 bxc3 22.Nxc3 Rxe1+ 23.Rxe1 Bb4 24.Bd4 Qa5 25.Re3 Bxc3 26.Bxc3 Qxa2 27.h3 Qxb3**



28.g4 (28.Bxf6 Qxd3 29.Rxd3 gxf6 30.Rxd5 = is not an option for White in an Armageddon game; Carlsen forces simplification anyway) **28...Qc4 29.Qd2 d4 30.Bxd4 Qc1+ 31.Qxc1 Rxc1+ 32.Kh2 Rc2 33.Re7 Bb5 34.Re1 Nd5 35.Be5 f6 36.Bd6 Ne3 37.Rxe3 Bf1 38.Kg3 Rxg2+ 39.Kf4 Rd2 40.Bc5 Rd5 41.Re8+ Kh7 42.Bf8 g5+ 43.Kg3 Rd2 44.f4 h4+ 45.Kf3 Bxh3 46.Be7 Bg2+ 47.Ke3 Rd1 48.Kf2 h3 49.Bxf6 gxf4 50.Be5 Rd2+ 51.Ke1 f3 52.Re7+ Kg8 53.Kxd2 f2 54.g5 f1Q 55.g6 Qf2+ 56.Kd3 Qf5+ 0–1**

Answer:

18...d4! 19.Qxd4 Nxc2; 18...d4! 19.Bxd4 Bf5 20.Bf2 Bxc2 21.Qxc8 Rxc8) 20...Qxf6 21.Nc4 Bxe4 22.fxe4 Red8!; 18...d4 19.Ne4 Nxe4 20.fxe4 Nxc2 21.Rf1 Bg4 22.h3 Bxe2 23.Qxe2 d3 24.Qf3 d2 25.Rbd1 avoids immediate material loss, but is completely lost.

Announcements

Email: announcements.ads@telegraph.co.uk **Book online:** announcements.telegraph.co.uk

Births

SOUTAR.—On 14th September 2022, to Imogen (née Harris) and William, a son, Frederick Charles George, a brother for Henry.
Online Ref: WO015728

Deaths

BETTINSON.—Anthony Edward (Tony) died on 16th August 2023. Adored and loving husband of Susie and devoted and loving father of James, Louise and Henry. A private family funeral has taken place.
Online Ref: WO015612

BIRCHER.—Richard Charles passed away at home on 31st August 2023, aged 76 years. Loving husband and father. Enquiries to E. White and Son (Taunton) Ltd, F/D. Tel: 01823 272183.
Online Ref: WO015703

HODGE.—Ralph Noel Hodge CBE. 'An Engineer in Search of Success'. 1st November 1934 – 1st September 2023. Passed away peacefully at home, with his wife by his side, aged 88 years. A much loved husband, brother, father and grandfather. He will be greatly missed by his family and friends. A Service of Thanksgiving will take place on Thursday 21st September at Blacon Crematorium at 11.20 a.m. Family flowers only please. If you would like to make a donation in Ralph's memory they may be sent in aid of Parkinson's UK c/o Charles Stephens Funeral Directors. Tel: 0151 645 4396.
Online Ref: WO015635

HOPKINSON.—Anthony Erik died at home on 7th September, aged 88, after a long illness. Beloved husband of Sylvia (née Fordham), father to Francis, Christina and Edward, grandfather of 5. Private funeral. Donations, if desired, to: www.parkinsons.org.uk
Online Ref: WO015709

LEATHERBY.—James, Commander Royal Navy, DL (retired). After a short illness, passed away peacefully at Derriford Hospital, Plymouth on 27th August 2023, aged 70 years. Will be greatly missed by all his family and friends. Service of Thanksgiving at Holy Cross Church, Newton Ferrers, Plymouth on 27th September 2023, 2 p.m. Enquiries to James Brothers Funeral Directors, Leeds House, Colebrook Road, Plymouth PL7 4AA. Tel: 01752 881419.
Online Ref: WO015741

MALONE.—Zilia Pelham (née Thorman) aged 90 died peacefully at Yeovil Hospital on 3rd September 2023. Mum to Molly, Patrick and Fergus. Her Funeral will be held at 2 p.m. at St Mary's Church, Bruton, Somerset on 6th October.
Online Ref: WO015562

ROSS.—Christine died peacefully at home on 6th September 2023, aged 99 years. Memorial service to be held at a later date.
Online Ref: WO015724

RUSSELL STONEHAM.—Colin. Loving father and grandfather died peacefully after a short illness on 5th September. Thanksgiving Service at 11.30 a.m. on 26th September at St Nicholas Church, Baulking, Oxon SN7 7QE.
Online Ref: WO015650

SHERIDAN-YOUNG.—Dagmar (née von Rexroth). 9th May 1940 - 8th September 2023. Beloved mother to Lainey, extremely proud Granny to Inigo and loyal friend to many. A powerful force of nature who epitomised grace and elegance. A Celebration of her life will be held at Arundel Town Hall on 21st October 2023 between 2.30 p.m. to 4.30 p.m. Donations via the link: https://togetherinmemory.pancreaticcancer.org.uk/InMemory/Lainey-and-Inigos-fund-in-loving-memory-of-Dagmar-our-beloved-Mummy-and-Granny
Online Ref: WO015719

STEVENS.—Charles A. LLB LLM, Lecturer in Law at De Montfort University died on 29th August 2023 aged 67 years. All enquiries to E M Dorman Funeral Directors, Uppingham. Tel: 01572 823976.
Online Ref: WO015722

Personal

Text for the day

THE LAWS of the LORD are right, and those who obey them are happy. The commands of the LORD are just and give understanding to the mind.
Psalm 19.8 (GNB)

General personal

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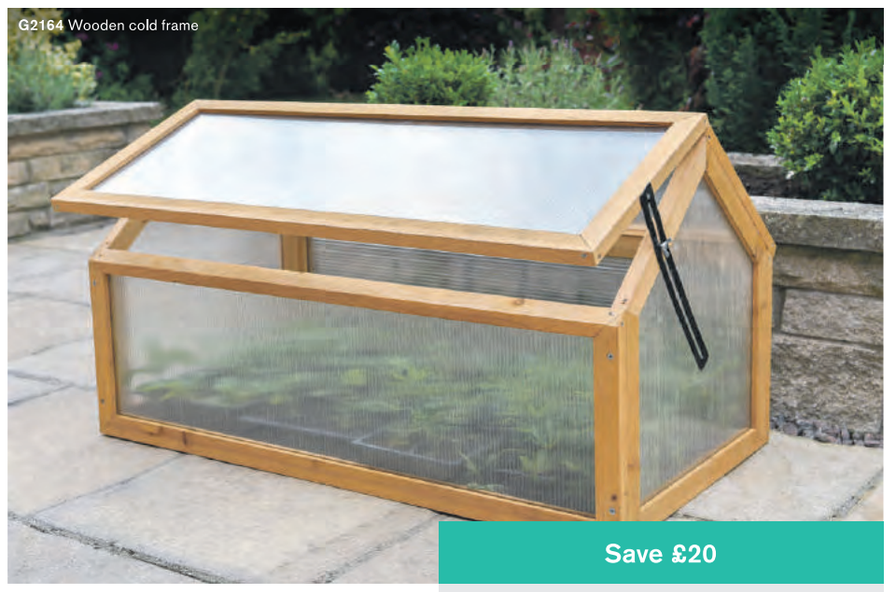

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Public notices

THE H2TEESSIDE PROJECT
The Planning Act 2008 - Sections 42, 47 and 48
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 - Regulation 4
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 - Regulation 13
NOTICE OF PUBLICATION OF A STATEMENT OF COMMUNITY CONSULTATION AND NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), whose registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application (the 'Proposed Application') to the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. In accordance with Section 47(6) of the PA 2008, this notice publicises where and when the Statement of Community Consultation (SoCC) can be inspected. The SoCC sets out how the Applicant will undertake its consultation on the Proposed Application. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   - Mid-point - 454538 524086
   - North - 451524 526936
   - East - 458780 521588
   - South - 456998 520748
   - West - 446938 521612
5. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
6. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. hydrogen storage;
   g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.
10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Document

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.
12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.
13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.
14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
15. The consultation on the proposed application will take place between **14 September and 26 October 2023**.
16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk
17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	Opening Times
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:
    Email: info@h2teesside.net
    Post: Freepost H2TEESSIDE
    Telephone: Freephone 0800 080 3028
    Project Website: www.h2teesside.co.uk
20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**. Responses received after this date may not be considered.
22. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited
14 September 2023

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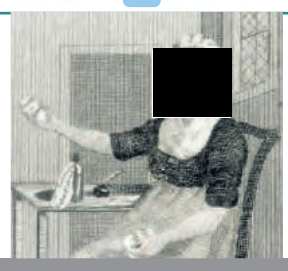
Castle hits market for £6.95m **Page 45**



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White Horse
Book tells of county landmark
Page 7

More inside

THE leader of Conservative-led North Yorkshire Council has pledged to uphold a zero tolerance approach to bullying amid claims a councillor resigned her seat after being harassed by Tory colleagues.
Full story – Page 2

A PROJECT to improve the riverside in the historic heart of Stokesley has been given the seal of approval by Rishi Sunak.
Full story – Page 3

A POP-UP Syrian restaurant in Northallerton raised more than £2,200 for the Turkey-Syrian Earthquake Appeal.
Full story – Page 5

THE mother of eight-year-old Joshua Slater, who died in a collision with a 4x4 last week, said he was a "bundle of joy".
Full story – Page 6

NATIONAL park custodians have approved a proposal to erect a 25m-high telecommunications mast at a prominent site beside the Cleveland Way.
Full story – Page 6

FILM fans are being offered the chance to see behind the scenes at the historic Ritz Cinema in Thirsk this weekend.
Full story – Page 8

THE Swaledale Mountain Rescue Team has embarked on its latest search – for a volunteer to join the board as a trustee.
Full story – Page 15

ISSN 2516-5348



Cheers as housing scheme is rejected

By Stuart Minting
Local Democracy Reporter

A PLAN to build a housing estate across a popular greenfield site has been roundly rejected after 18 months of mounting tensions over the scheme.

North Yorkshire councillors yesterday unanimously refused Zetland Estates' plan for 32 homes over a popular open space on Richmond's western boundary at Hurgill Stables, off Westfields.

Opposition to the development had seen more than a thousand signatures added to a petition and a protest during a site visit by councillors last week. Yesterday the packed meeting room at Mercury House in Richmond erupted into cheers and applause as delighted residents shook hands and embraced each other.

After the meeting, former mayor of Richmond, Councillor Clive World, said residents hoped to be able to buy the land from Zetland Estates, to keep it as pasture in perpetuity, and that a crowdfunding campaign could be launched to raise the funds.

The meeting had heard officers recommending the plan be approved, after concluding it would cause less than substantial harm to Richmond's conservation area and that its merits, such as the provision of quality housing close to the town centre, outweighed its negative impacts. An agent for the developer told the meeting building the estate on the 4.6-acre site would have a positive trickle down effect on the local economy at a time of instability. Zetland Estates, of which the Marquess of Zetland's son, the Earl of Ronaldshay is a director, had claimed the development would "transform the lives of many" while providing "a transition to energy efficient building practices on a larger scale".

He said the applicant wanted to build a development that respected its context and that the scheme would deliver much-needed affordable housing as well as a 23 per cent biodiversity net gain, well above the required amount.

●**Continued on page 3**



Precision ploughing at Hunton Steam Gathering
Picture: ANDY BURNS

Ploughing ahead

ORGANISERS say the weekend's Hunton Steam Gathering beat all previous events for entries and attendance figures.

Aided by the hot weather, Saturday was the busiest ever day for the fair, held in Hunton, between Bedale and Leyburn.

Crowds enjoyed live bands, a vintage tractor ploughing competition, showman's engines "Dreadnought" and "Perseverance The Second" and Howards original steam gallopers.

●**Full story – Page 4**

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Alcohol & Licensing | Probate & Trustee | Contract & Tender | Other

OTHER

Licensing Act 2003 Notice of application to VARY a Premises Licence

Co-operative Group Food Limited have applied to vary the premises licence at **Co-op**, 102-106 Fulthorpe Avenue, Darlington DL3 9XT. The application is to vary the times when the supply of alcohol may take place Monday-Sunday to 06:00-23:00 and to remove embedded restrictions prohibiting supply of alcohol on certain days at various times. Anyone wishing to make a representation may do so in writing to The Licensing Officer, Darlington Borough Council, The Town Hall, Feethams, Darlington DL1 5QT Or by email to licensing@darlington.gov.uk by 9 October 2023. The application may be inspected during opening hours or www.darlington.gov.uk It is an offence knowingly or recklessly to make a false statement in connection with an application and is punishable by a fine of any amount on summary conviction for the offence.

ward hadaway LLP

PROBATE & Trustee

MARGARET ELLIS (otherwise Robson)(Deceased)
Pursuant to the Trustee Act 1925 any persons having a claim against or an interest in the Estate of the above named, late of Mount Vale Care Home, Yafforth Road, Northallerton DL7 8UE formerly of 39 Sowerby Road Thirsk, YO7 1HU, who died on 22/05/2023, are required to send written particulars thereof to the undersigned on or before 16/11/2023, after which date the Estate will be distributed having regard only to the claims and interests of which they have had notice.
ECCLES HEDDON LLP,
24A Market Place, Thirsk YO7 1LB

DENYS RICHARD HARKER (otherwise Dennis Richard Harker)(Deceased)
Pursuant to the Trustee Act 1925 any persons having a claim against or an interest in the Estate of the above named, late of Scar Barn Langthwaite Richmond, DL11 6RE, who died on 26/11/2022, are required to send written particulars thereof to the undersigned on or before 16/11/2023, after which date the Estate will be distributed having regard only to the claims and interests of which they have had notice.
TILLY BAILEY & IRVINE ,
8 Newgate, Barnard Castle, DL12 8RE

PLANNING

NOTICE IS HEREBY GIVEN THAT Darlington Borough Council has received the following Planning Applications:

LISTED BUILDING CONSENT IN A CONSERVATION AREA

23 West Green, Heighington, NEWTON AYCLIFFE, DL5 6PE (23/00834/FUL)
Demolition of existing conservatory, erection of a replacement single storey rear extension, clad in render and incorporating 2 no. roof lights, replacing pebble dash render with white through colour render on existing elevations, repainting existing windows and replacement of front door with composite door.

PLANNING PERMISSION IN A CONSERVATION AREA LIKELY TO AFFECT THE SETTING OF A LISTED BUILDING

Devonport Hotel, 16 - 18 The Front, Middleton One Row, Darlington, DL2 1AS (23/00777/FUL)
Application submitted under Section 73 of the Town and Country Planning Act 1990 for the variation of condition 1(approved plans) attached to planning permission 20/00258/FUL dated 27 July 2020 (Change of use to form outdoor paved seating area to front and installation of ventilation/extraction equipment to side elevation (Part retrospective Application - outdoor paving area) to permit the relocation of extraction equipment from the side elevation to the internal roof area.

Pavement Outside 43-45 High Row, DARLINGTON (23/00092/FUL)
Installation of 1 no. BT Street Hub incorporating 75" LCD advert screens to replace existing BT booths.

DEVELOPMENT IN A CONSERVATION AREA

11 Woodland Terrace, Darlington DL3 9NT (23/00810/FUL)
Removal of existing conservatory and decking, erection of part two storey, part single storey rear extension incorporating roof lights together with the installation of solar panels to new extension south-west roof slope and existing rear roof of main dwelling

A copy of the applications and plans are available online at www.darlington.gov.uk/PA

Any representations should quote the planning reference number and reach us no later than 6 October 2023

Friday 15 September 2023

North York Moors National Park Authority Planning Notice, 15 September 2023
Affects a Conservation Area: NYM/2023/0469, Mr A Fishburn, 103 Aldenham Road, Guisborough, demolition of existing attached garage and construction of part single and two storey side extension (resubmission following appeal dismissal APP/W9500/D/22/3291875).
NYM/2023/0503, Mr Gary William and Mrs Belynda Jayne Howes, Huntsville, 7 High Street, Swainby, construction of two storey extension to form annexe accommodation together with alterations and construction of balcony and re-rendering of dwelling.
The application(s) may be inspected on our website www.northyorkmoors.org.uk. Comments must be sent by 6 October 2023 via online form, post to The Old Vicarage, Bondgate, Helmsley, York, YO62 5BP or by email (planning@northyorkmoors.org.uk). Mr C M France, Director of Planning

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THE H2TEESSIDE PROJECT
The Planning Act 2008 – Sections 42, 47 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

NOTICE OF PUBLICATION OF A STATEMENT OF COMMUNITY CONSULTATION AND NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), whose registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application (the 'Proposed Application') to the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. In accordance with Section 47(6) of the PA 2008, this notice publicises where and when the Statement of Community Consultation (SoCC) can be inspected. The SoCC sets out how the Applicant will undertake its consultation on the Proposed Application. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   - Mid-point – 454538 524086
   - North – 451524 526936
   - East – 458780 521588
   - South – 456998 520748
   - West – 446938 521612
5. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
6. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. hydrogen storage;
   g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.
10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Documents

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.
12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.
13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.
14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
15. The consultation on the proposed application will take place between **14 September and 26 October 2023.**
16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk
17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	Opening Times
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How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net
Post: Freepost H2TEESSIDE
Telephone: Freephone 0800 080 3028
Project Website: www.h2teesside.co.uk

20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023.** Responses received after this date may not be considered.
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H2 Teesside Limited
15 September 2023

The Northern Echo

£1.05 The Northern Echo reaches 82% of adults in Darlington every month* THE GREAT DAILY OF THE NORTH THURSDAY, SEPTEMBER 21, 2023

‘IT’S NONSENSE’

Concerned residents assured lorries and tractors will not be banned PAGE 2



‘Decent and honest local cooking and baking’ PAGE 28



Officers from Cleveland Police were called to two properties in South Bank, Middlesbrough Pictures: TERRY BLACKBURN

Two women found dead

TWO people have died and four people have been arrested following two incidents in Middlesbrough.

Officers from Cleveland Police were called to a property in South Bank on Monday, and police say the body of a woman was found inside the building.

This was followed by another incident at around 10.30am on Tuesday, that saw officers called to a report of a sudden death elsewhere in South Bank where a second woman had died.

Enquiries into both deaths are continuing.

● FULL STORY - PAGE 5



Blackburn 1 Sunderland 3 PAGE 47

‘We won’t take a backward step’

- North East reacts to PM’s plan to water down green energy commitments
- Tees Valley Mayor Houchen says region fully committed to green industry
- But Labour call reforms ‘betrayal of Teesside communities, industry, and our environment’

STORY AND REACTION – PAGE 4 | ECHO COMMENT – PAGE 14

Nuffield Health

Free hospital open event

At Nuffield Health Tees Hospital

Join us for an informative free hospital open event to explore current trends and future innovations in hip and knee replacements with surgeon Mr Manju Ramappa.

Wednesday 27 September 2023 at 6:30pm

Scan the QR code or visit nuffieldhealth.com to book now. Alternatively, call 0300 131 1423.

THE H2TEESSIDE PROJECT

The Planning Act 2008 – Sections 42, 47 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

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    Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

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Email: **info@h2teesside.net**
Post: **Freepost H2TEESSIDE**
Telephone: **Freephone 0800 080 3028**
Project Website: **www.h2teesside.co.uk**

20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**. Responses received after this date may not be considered.
22. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited
21 September 2023

TRAFFIC & Roads

national highways

ROAD TRAFFIC REGULATION ACT 1984 – SECTION 14
THE A19 TRUNK ROAD
(MURTON TO EASINGTON)
(TEMPORARY RESTRICTION AND PROHIBITION OF TRAFFIC)

NOTICE IS HEREBY GIVEN that National Highways Limited has made an Order on the A19 Trunk Road, in County Durham, to enable resurfacing works to be carried out in safety.

The works are expected to start at 8pm on Sunday 24 September 2023 for 1 month, or until completed.

The effect of the order will be, between 8pm and 6am, at times during the works, to close the A19;

(i) southbound carriageway from the exit slip road at Cold Hesledon Interchange to the entry slip road at Easington Interchange, a distance of 4460 metres;
(ii) southbound entry slip road at Cold Hesledon Interchange; and
(iii) southbound exit and entry slip roads at Easington Interchange.

During the closures suitably signed alternative routes will be available at all times.

It will be necessary to, for 24 hours a day, from Sunday 24 September 2023, to:

(iv) impose a temporary 50mph speed restriction on the A19 southbound carriageway from the exit slip road at Cold Hesledon to the entry slip road at Easington Interchange, a distance of 4460 metres;
(v) close the layby adjacent to the A19 southbound carriageway approximately 640 metres south of the A182 Cold Hesledon Interchange overbridge;
(vi) close the layby adjacent to the A19 southbound carriageway approximately 700 metres north of the Hall Walks overbridge;

Traffic management will be in force 24 hours a day and traffic signs will indicate the extent of the restrictions (which will not apply to emergency service vehicles or special forces vehicles) and prohibitions (which will not apply to emergency service vehicles or vehicles being used in connection with the said works or for winter maintenance or traffic officer purposes). The Order comes into force on the 23 September 2023 and has a maximum duration of eighteen months.

The contact for any further information about this notice is Mike Morgan, e-mail: info@nationalhighways.co.uk

RICHARD FOXTON, National Highways, 2 City Walk, LEEDS, LS11 9AR.

TOWN & COUNTRY PLANNING ACT 1990
PLANNING (LISTED BUILDINGS & CONSERVATION AREAS) ACT 1990

The following applications are required to be advertised under the above Acts:

1. Internal secondary glazing to windows Old Farm Cottage School Aycliffe Lane School Aycliffe 23/02595
2. Ground solar PV South Causey Inn Causey Road Causey Stanley 23/02574
3. Change of use to bar/restaurant at g/floor, 5 flats at 1st floor, rooftop extensions & external terraced areas 69 & 71 Newgate Street Bishop Auckland 23/02375
4. Alterations to shop front & Retrospective Consent for 1 non-illuminated sign 34 Front Street West Auckland 23/02048 & 23/02049
5. Conversion of studio to live/work unit & garage to residential accommodation. Hunter House Edmundbyers 23/01834
6. Variation of Conditions revising siting & design, materials, landscaping, manure management plan, CCTV, lighting & access/parking pursuant to 21/02625. Pole Tree Farm Wear Bank Wolsingham 23/02552
7. Repointing of dwelling & replacement roof slate 4A Rectory Lane Wolsingham 23/02662
8. Extensions & alterations to house, conversion & extension to outbuilding to form annex 36 North End Sedgefield 23/02482

View applications at www.durham.gov.uk/planning. Representations should be made by **12 October 2023** & will be recorded online. Signatures, phone numbers & e-mail addresses will be removed.

Durham County Council

M Kelleher
Head of Planning & Housing
21 September 2023

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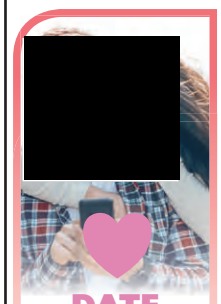
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POLICE FORCE MOVED OUT OF SPECIAL MEASURES



By STUART ARNOLD

CLEVELAND Police has been moved out of effective special measures after further improvements were made.

The force had been subject to enhanced monitoring by the police inspectorate after a 2019 report saw it graded as inadequate in all areas.

On being moved out of special measures, Cleveland Police Chief Constable Mark Webster said: "We will not lose sight of the fact there is still much more to be done."

FULL STORY: PAGE 5









Public Notices

Planning

THE H2TEESSIDE PROJECT
The Planning Act 2008 - Sections 42, 47 and 48
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 - Regulation 4
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 - Regulation 13
NOTICE OF PUBLICATION OF A STATEMENT OF COMMUNITY CONSULTATION AND NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), whose registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application (the 'Proposed Application') to the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. In accordance with Section 47(6) of the PA 2008, this notice publicises where and when the Statement of Community Consultation (SoCC) can be inspected. The SoCC sets out how the Applicant will undertake its consultation on the Proposed Application. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   - Mid-point - 454538 524086
   - North - 451524 526936
   - East - 458780 521588
   - South - 456998 520748
   - West - 446938 521612
5. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
6. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with up to two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. hydrogen storage;
   g. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   h. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   i. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
7. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
8. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

9. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. The Project is therefore 'EIA development' for the purposes of the EIA Regulations and an ES will form part of the proposed application for development consent.
10. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary.

The SoCC and Consultation Documents

11. The Applicant has a duty under Section 47 of the PA 2008 to consult people living within the vicinity of the land to which H2Teesside relates about the Project prior to applying for development consent. Section 47(1) requires an applicant for development consent to prepare a statement (a 'Statement of Community Consultation' or 'SoCC') setting out how they propose to consult people living within the vicinity of the land to which their proposals relate. Section 47(7) requires the applicant to carry out the consultation in accordance with the proposals set out within the SoCC.
12. The Applicant has consulted the relevant local authorities on the SoCC in accordance with Section 47(1) of the PA 2008.
13. Section 47(6) of the PA 2008 requires an applicant for development consent to make the SoCC available for inspection by the public in a way that is reasonably convenient for people living in the vicinity of the land to which the project relates. In accordance with Section 47(6) this notice confirms when and how a copy of the SoCC, that has been prepared by the Applicant, can be inspected.
14. Additionally, in accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
15. The consultation on the proposed application will take place between 14 **September and 26 October 2023**.
16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk
17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge.

Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	Opening Times
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net
Post: Freepost H2TEESSIDE
Telephone: Freephone 0800 080 3028
Project Website: www.h2teesside.co.uk

20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023**. Responses received after this date may not be considered.
22. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited
21 September 2023

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STOCKTON ON TEES BOROUGH COUNCIL

I give notice that the following application(s) have been made to Stockton on Tees Borough Council:-

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) (ENGLAND) ORDER 2015
Notice Under Article 15

Outline application with all matters reserved for the erection of industrial units for light industrial, general industrial and storage and distribution uses with ancillary office floorspace. at Land North Of 4, Fleck Way, Teesside Industrial Estate, by Lichfields - 23/1704/OUT

Members of the public may inspect copies of the application, plans and other documents submitted with the application(s) via our web site at www.stockton.gov.uk or alternatively, if you do not have access to the internet please contact Planning Development Services on 01642 526022. Anyone who wishes to make a representation about any of the above applications should write to Planning Services, Municipal Buildings, Church Road, Stockton on Tees. TS18 1LD or online at https://www.stockton.gov.uk/planningapplication or email: planningdevelopmentservices@stockton.gov.uk by **12 October 2023**

Please Note: Any comments received, applications forms, plans and/or any other documentation submitted will be made available for inspection on-line by visiting our web site at www.stockton.gov.uk.
For a large print version of this advert please contact 01642 526067
Simon Grundy Planning Services Manager
On behalf of: Stockton on Tees Borough Council
Date : 21 September 2023



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Public Notices

ENVIRONMENT AGENCY

New bespoke application for an environmental permit under the Environmental Permitting (England and Wales) Regulations 2016

We've received an application for a permit from **EPR/ZP3309LW/A001.**
Permit number:
Regulated facility type: 5.1 A(1) b) THE INCINERATION OF NON-HAZARDOUS WASTE IN AN INCINERATION OR CO-INCINERATION PLANT WITH A CAPACITY EXCEEDING 3 TONNES PER HOUR
Regulated facility address: Tees Valley Energy Recovery Facility, Grangetown Prairie, Land east of John Boyle Road, Grangetown, Redcar, TS6 6TY
The application includes; (1) the completed application form, (2) a non-technical summary, (3) a summary of the management system, (4) an environmental risk assessment, (5) proposed operating techniques, including an assessment of best available techniques, (6) management plans to address any key risks, (7) modelling and monitoring of any significant emissions to air, land or water, (8) a report on the condition of the site, (9) raw material usage; (10) measures for energy efficiency; (11) measures for avoiding waste production;
How to view and comment on the application
The application can be viewed on Citizen Space using the link below.
If you have any comments send these by **31/10/2023.**
Comments can be made: online: https://consult.environment-agency.gov.uk/psc/ts6-6ty-fcc-environment-limited via email: pscpublicresponse@environment-agency.gov.uk, Please quote the application number in any correspondence. For advice about how to make a representation or if you are unable to make a representation via e-mail please call 03708 506 506.
The Environment Agency will normally put any comments it receives on the public register. This includes your name but not your personal contact details. Please tell us if you do not want your response to be public.
The privacy notice for permit applicants/operators can be viewed at https://www.gov.uk/guidance/environmental-permits-privacy-notice

Probate & Trustee

WILLIAM ROGER TURNER (Deceased)
Pursuant to the Trustee Act 1925 any persons having a claim against or an interest in the Estate of the above named, late of 5 Farndale Road, Nunthorpe, Middlesbrough, TS7 0HT, who died on 24/07/2022, are required to send written particulars thereof to the undersigned on or before 22/11/2023, after which date the Estate will be distributed having regard only to the claims and interests of which they have had notice.
FREERS ASKEW BUNTING SOLICITORS,
19/25 Baker Street, Middlesborough, GB, TS1 2LF

SUSAN ANNE BAXTER (Deceased)
Pursuant to the Trustee Act 1925 any persons having a claim against or an interest in the Estate of the above named, late of 46 Knapton Avenue, Billingham, TS22 5DJ, who died on 20/07/2021, are required to send written particulars thereof to the undersigned on or before 22/11/2023, after which date the Estate will be distributed having regard only to the claims and interests of which they have had notice.
FREERS ASKEW BUNTING SOLICITORS,
19/25 Baker Street, Middlesborough, GB, TS1 2LF

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Perfect properties
Georgian gem on the market **Page 45**



NORTH YORKSHIRE edition serving Richmond, the Dales, Northallerton, Thirsk, Bedale, Stokesley and Great Ayton



More inside

NORTH YORKSHIRE'S housing boss has criticised Government proposals to relax planning rules in national parks, saying if approved they would have a similar impact to ending the North York Moors and Yorkshire Dales as protected landscapes.
Full story – Page 2

A COMMUNITY has rallied round to rescue and reopen a village pub after its sudden closure last month.
Full story – Page 3

A LAW graduate who drove more than 100 miles after drinking has been jailed for causing the death of a much loved wife and mother on the A1(M) at Leeming Bar.
Full story – Page 4

RESIDENTS have called for a moratorium on a string of development proposals, including a Rolls Royce factory, surrounding Scotch Corner until a masterplan for the area can be drawn up.
Full story – Page 5

AMID warnings of a public toilet crisis with more than half of all loos in the UK closed down, Northallerton Town Council has opened new facilities in the High Street.
Full story – Page 7

LARGE-SCALE mosaics of local scenes and themes which have been a two-year project for Osmotherley village hall are being unveiled at an event next week.
Full story – Page 10

ISSN 2516-5348 38
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Shock as allotments land is put up for sale

By Jan Hunter
News Correspondent

ALLOTMENT holders have spoken of their shock after the land housing their plots was put up for sale.

A "for sale" board appeared at a side entrance to the site on Guisborough Road, Great Ayton, on September 13.

The land is leased from the Marwood Estate by Great Ayton Parish Council. The day after the sale board went up, a notice from the parish council was placed on the "for sale" sign stating the freeholder of the allotments and adjoining grass paddock intended to place it on the open market, with bids requested on or before 12pm on October 20.

The notice continued: "Great Ayton Parish Council lease the land from the private freeholder on a self-renewing and annual basis (April to April) that continues until either party terminates it, after having given proper agreed notice. Any sale will complete with the parish council lease interest in place, and this means that the allotments will continue to be available certainly for the allotment year October 2023/2024 and we hope well beyond that time.

"Ultimately, as has always been the case, the longer-term future of this land may change but that would be subject to due process including planning and would take quite some time. At the present the council are monitoring the situation and will engage with any new owners in the event of a sale going through and will communicate any new information as it arises."



A for sale sign has gone up beside the allotments at Guisborough Road, Great Ayton

The 18.18 acres of land is being sold through Fordy Marshall, which states that parts offer "potential for longer term residential development, subject to planning". The firm is seeking offers over £445,000 for the whole lot, or split between the 10.34 acres containing the allotments for offers over £250,000, and the 7.84 acres of grassland for offers over £195,000.

The potential sale has left residents shocked, with many voicing their upset on a community Facebook page. One commenter wrote: "I first came to the allotments with my Dad when I was three. I'm now 81 and still keep hens and grow vegetables, fruit and flowers. The allotments need to be kept for local people." Another said: "The allotments are a community hub where people look out for each other. They were a lifesaver during lockdown."

Resident David Mason said: "Historically the Allotments Act 1922 provided allotment holders with some security of tenure by setting out specific periods of notice for ending a tenancy. Landlords could only end an allotment garden tenancy by giving the allotment holder a minimum of six months' notice. This was increased to 12 months by the Allotments Act 1950. In the Allotments act of 1925, the consent of the Secretary of State is needed for the disposal of allotment land for other purposes, and there must be adequate provision for the displaced holders, unless such provision is unnecessary or impractical."

An extraordinary meeting of the parish council was due to take place last night at Great Ayton Discovery Centre to discuss the issue.

●**Continued on page 5**

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THE H2TEESSIDE PROJECT

The Planning Act 2008 – Sections 42, 47 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

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The Project

4. The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 1,350 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
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   b. a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
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The SoCC and Consultation Documents

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15. The consultation on the proposed application will take place between **14 September and 26 October 2023.**
16. The SoCC and SoCC Notice, and the Consultation Documents (which comprise the PEIR, a Non-Technical Summary to the PEIR, Consultation Brochure, Consultation Leaflet and other documents relating to the Project, including plans and maps showing the nature and location of the Project), are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 26 October 2023. The SoCC and SoCC Notice and Consultation Documents will also be available to view free of charge at the consultation events being held during September and October 2023. Details of where and when the consultation events are taking place can be found on the Project Website: www.h2teesside.co.uk
17. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the SoCC and Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the SoCC and Consultation Documents free of charge.

    Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
18. Paper and digital copies of the SoCC and SoCC Notice and digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 26 October 2023:

Inspection Location	Redcar and Cleveland House,
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

19. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

20. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
21. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 26 October 2023.** Responses received after this date may not be considered.
22. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited

22 September 2023

DARLINGTON BOROUGH COUNCIL
ROAD TRAFFIC REGULATION ACT 1984
(TEMPORARY PROHIBITION OF TRAFFIC AND CLEARWAY) 2023
BLACKWELLGATE, GRANGE ROAD & CONISCLIFFE ROAD, DARLINGTON

Darlington Borough Council intend, has made an Order under the provisions of Section 14(1) of the Road Traffic Regulation Act, 1984, as amended, the effect of which will be:

To temporarily introduce no stopping at any time (clearway) and the prohibition of the driving of vehicles on the following roads:

SKINNERGATE
From its junction with Coniscliffe Road northwards for 15metres
It is anticipated that the closure will be effective between 1900hours and 0700hours only.

BLACKWELLGATE
From its junction with Coniscliffe Road eastwards to the western boundary of 40 Blackwellgate
An alternative route will be signed via Houndgate, Feethams, Victoria Road, West Street.
It is anticipated that the closure will be effective between 1900hours and 0700hours only.

CONISCLIFFE ROAD
From its junction with Skinnergate westwards to its junction with Hogarth Court
An alternative route will be signed via Blackwellgate, Houndgate, Feethams, Victoria Road, West Street.

GRANGE ROAD
From the north side of Northumberland Street junction northwards to its junction with Coniscliffe Road
An alternative route will be signed via Northumberland Street and West Street.

CONISCLIFFE ROAD
From its junction with Hogarth Court westwards to the junction with West Street
An alternative route will be signed via Blackwellgate, Houndgate, Feethams, Victoria Road, West Street.
Works to be carried out in phases as described above.

And to temporarily suspend the One Way on Northumberland Street from its junction with West Street eastwards to its junction with Grange Road and to implement One Way from its junction with Grange Road westwards to its junction with West Street to allow traffic to travel in the opposite direction as part of a diversion route.

The Order is necessary to allow highway refurbishment works.
The maximum duration of the temporary restrictions under this Order is 18 months commencing from 2nd October 2023, it is anticipated that the restrictions will be effective for 3 months.
Dated: 22nd September 2023
D. Winstanley
Group Director of Services
Town Hall
Darlington
DL1 5QT

DARLINGTON BOROUGH COUNCIL
ROAD TRAFFIC REGULATION ACT 1984
(TEMPORARY PROHIBITION OF TRAFFIC AND CLEARWAY) ORDER 2023
WALWORTH ROAD, HEIGHINGTON

Darlington Borough Council intend, not less than seven days from the date of this notice to make an Order under the provisions of Section 14(1) of the Road Traffic Regulation Act, 1984, as amended, the effect of which will be to temporarily introduce:

1. no stopping at any time (clearway); and
2. the prohibition of the driving of vehicles

on the following road, to allow road surfacing works:

WALWORTH ROAD
From its junction with A68 north eastwards to the southern boundary of Deneville
An alternative route will be signed via A68, A6072, Coatsay Moor Lane, Darlington Road, South View, Millbank and vice versa.
The maximum duration of the temporary restrictions under this Order is 18 months commencing from 9th October 2023, it is anticipated that the restrictions will be effective for 1 week.
Dated: 22nd September 2023
D. Winstanley
Group Director of Services
Town Hall, Darlington DL1 5QT

DARLINGTON BOROUGH COUNCIL
ROAD TRAFFIC REGULATION ACT 1984
(TEMPORARY PROHIBITION OF TRAFFIC AND CLEARWAY) ORDER 2023
STAINDROP ROAD, DARLINGTON

Darlington Borough Council intend, not less than seven days from the date of this notice to make an Order under the provisions of Section 14(1) of the Road Traffic Regulation Act, 1984, as amended, the effect of which will be to temporarily introduce:

1. no stopping at any time (clearway); and
2. the prohibition of the driving of vehicles

on the following roads, to allow road patching works:

STAINDROP ROAD
From the west side of Waterside junction westwards to the east side of the access road to The Mowden PH
An alternative route will be signed via B6279 Staindrop Road, B6275, A67, Carmel Road North and vice versa.
Access to residents only when works allow.
The maximum duration of the temporary restrictions under this Order is 18 months commencing from 28th October 2023, it is anticipated that the restrictions will be effective for 9 days.
Dated: 22nd September 2023
D. Winstanley
Group Director of Services
Town Hall, Darlington DL1 5QT

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APPENDIX 12.2: EIA SCOPING OPINION LETTER FROM PINS DATED 17 MAY 2023

The Planning Inspectorate
Yr Arolygiaeth Gynllunio

Environmental Services
Operations Group 3
Temple Quay House
2 The Square
Bristol, BS1 6PN

Customer Services: 0303 444 5000
e-mail: [redacted]

[redacted] DWD LLP
On behalf of H2 Teesside Ltd
Building E
Chertsey Road
Sunbury on Thames
Middlesex
TW16 7BP

By email: [redacted]

Your Ref: 16373

Our Ref: EN070009

Date: 17 May 2023

Dear [redacted]

Planning Act 2008 and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulation 10

Proposed application by H2 Teesside Ltd (the Applicant) for an Order granting Development Consent for the H2Teesside Project (the Proposed Development)

Issue of Scoping Opinion and list of the consultation bodies notified by the Secretary of State

Thank you for your letter received on 30 March 2023 requesting a Scoping Opinion under Regulation 10 of the EIA Regulations and for the Scoping Report entitled H2Teesside Project EIA Scoping Report dated April 2023.

In accordance with Regulation 10 of the EIA Regulations the Planning Inspectorate on behalf of the Secretary of State (SoS) has:

- consulted the consultation bodies;
- taken account of the consultation responses received within the prescribed time period; and
- taken account of the specific characteristics of the Proposed Development as described by the Applicant and the environmental features likely to be affected by the Proposed Development .

The attached document entitled 'Scoping Opinion - Proposed H2Teesside Project' and dated 17 May 2023 is the SoS's written opinion as to the information to be provided in

disability confident EMPLOYER

the Environmental Statement (ES) which must be submitted with an application for development consent. It should be read in conjunction with your EIA Scoping Report.

All consultation responses received up to and including 9 May 2023 from the consultation bodies have been appended to and form part of the Scoping Opinion.

Any late consultation responses the Planning Inspectorate receives will be forwarded to you for your consideration and made available via our website: https://infastructure.planninginspectorate.gov.uk.

Under Regulation 11(1)(b) of the EIA Regulations, the Planning Inspectorate on behalf of the SoS is required to notify the Applicant of the list of consultation bodies notified in accordance with Regulation 11 of the EIA Regulations. The Planning Inspectorate has notified these consultation bodies that the Applicant intends to provide an ES in respect of the Proposed Development. They have also been informed of their duty under Regulation 11(3) to enter into consultation with the Applicant regarding preparation of the ES, if requested. Please find this list enclosed.

To clarify, the Planning Inspectorate has not identified any persons under Regulation 11(1)(c) of the EIA Regulations, who may be affected by the Proposed Development.

Please be aware that it is the responsibility of the Applicant to ensure their consultation fully accords with the requirements of the Planning Act 2008 (as amended), and associated regulations and guidance. The enclosed list has been compiled by the Planning Inspectorate on behalf of the SoS in its duty to notify the consultees in accordance with Regulation 11(1)(a) and, whilst it can inform the Applicant's own consultation, it should not be relied upon for that purpose.

If you have any queries, please do not hesitate to contact us.

Yours sincerely

[redacted]

[redacted]
EIA Advisor
on behalf of the Secretary of State

Enclosed:

- Secretary of State Scoping Opinion - Proposed H2Teesside Project (dated 17 May 2023)
- Regulation 11 Notification List

This communication does not constitute legal advice.
Please view our Privacy Notice before sending information to the Planning Inspectorate.

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APPENDIX 13.1: SECOND CONSULTATION – EMAILS TO RCBC, STBC AND HBC DATED 28 NOVEMBER 2023

[redacted]

From: [redacted]
Sent: 28 November 2023 12:50
To: [redacted]
Cc:
Subject: H2Teesside Project - Further statutory consultation

Importance: High

Good afternoon.

I am writing to advise that H2 Teesside Limited, the Applicant will be carrying out further statutory consultation (the 'second consultation') on the H2Teesside Project from mid-December 2023 until late January 2024 in respect of a number of changes that have resulted to the proposed application site boundary as a result of further design development and technical assessments and responses to the statutory consultation (the 'first consultation') that took place between 14th September and 26th October 2023.

The second consultation will comprise of the following:

- The issue of letters to all the identified Section 42 consultees (including Redcar and Cleveland, Stockton-on-Tees and Hartlepool Councils) providing details of how to access the previous consultation documents, including the Preliminary Environmental Information Report ('PEIR'), as being still the preliminary environmental information of relevance to the H2Teesside Project and an Update Leaflet referred to below, which will include information on the extent to which changes to the proposed application site alter the environmental effects reported in the PEIR.

- For land interests, the Section 42 letter will include information (including supporting plans) on how the proposed application site boundary has changed in respect of their interests.

- Erection of Section 42 Site Notices around the proposed application site boundary.

- Publication of a further Section 48 Notice in the Telegraph, London Gazette, Fishing News and Lloyds List for one week and the Northern Echo, Teesside Gazette and Darlington and Stockton Times for two consecutive weeks.

- An Update Leaflet, which will accompany the Section 42 letters, be uploaded to the project website, advertised on social media and updates to the project website, and through letters to residents and businesses within the Inner Consultation Zone defined in the published Statement of Community Consultation ('SoCC').

Should you have any comments or questions with regard to the second consultation, please do let me know.

Kind regards

[redacted]
BA (Hons) BPl. MRTPI
Joint Managing Director
Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
69 Carter Lane, London, EC4V 5EQ

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APPENDIX 13.2: SECOND CONSULTATION – SECTION 46 NOTIFICATION TO PINS 12 DECEMBER 2023 AND PINS SECTION 46 ACKNOWLEDGEMENT DATED 12 DECEMBER 2023

[redacted]

From: [redacted]
Sent: 12 December 2023 11:38
To: [redacted]
Cc: H2Teesside; [redacted]

Subject: EN070009 - H2Teesside Project - Section 46 Notification
Attachments: H2T_2nd_Consultation_s46 Notification_Final.pdf

Importance: High

Dear [redacted]

Please find attached the Applicant's Section 46 notification in respect of its further (second) consultation on the H2Teesside Project.

The second consultation will commence on 13th December 2023 and run to 23rd January 2024.

The Consultation Letters and Consultation Documents for the second consultation can be downloaded via the link below to a secure fileshare site. The fileshare site also includes the consultation documents that were provided for the first consultation in September and October 2023.

https://dwd.ctit.co/url/fhjwzeicng2spvya

I would be grateful if you could confirm receipt of this email and the Section 46 notification and also that you are able to access the fileshare site and download the documents.

Kind regards

[redacted]
BA (Hons) BPl. MRTPI
Joint Managing Director
Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
69 Carter Lane, London, EC4V 5EQ

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[redacted]

From: [redacted]
Sent: 12 December 2023 13:46
To: [redacted]
Cc: H2Teesside; [redacted]
Subject: RE: EN070009 - H2Teesside Project - Section 46 Notification
Attachments: H2T_2nd_Consultation_s46 Notification_Final.pdf

[redacted] apologies, please could you disregard the previous s46 notification letter. There was a slight error within it. An amended version is attached.

I would be grateful if you could confirm receipt.

Thank you.

[redacted]

[redacted]
BA (Hons) BPl. MRTPI
Joint Managing Director
Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
69 Carter Lane, London, EC4V 5EQ

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From: [redacted]
Sent: Tuesday, December 12, 2023 11:38 AM
To: [redacted]
Cc: H2Teesside [redacted]
Subject: EN070009 - H2Teesside Project - Section 46 Notification
Importance: High

Dear [redacted]

Please find attached the Applicant's Section 46 notification in respect of its further (second) consultation on the H2Teesside Project.

The second consultation will commence on 13th December 2023 and run to 23rd January 2024.

The Consultation Letters and Consultation Documents for the second consultation can be downloaded via the link below to a secure fileshare site. The fileshare site also includes the consultation documents that were provided for the first consultation in September and October 2023.

https://dwd.ctit.co/url/fhjwzeicng2spvya

I would be grateful if you could confirm receipt of this email and the Section 46 notification and also that you are able to access the fileshare site and download the documents.

Kind regards

[redacted]
BA (Hons) BPl. MRTPI
Joint Managing Director
Head of Planning, Energy & Infrastructure

[redacted]
dwdllp.com

Chartered Surveyors & Town Planners
69 Carter Lane, London, EC4V 5EQ

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Date: 12 December 2023
Your Ref: EN070009
Our Ref: 16373

69 Carter Lane
London
EC4V 5EQ

National Infrastructure
The Planning Inspectorate
Temple Quay House
2 The Square
Bristol, BS1 6PN

FAO: [redacted]

By email to: [redacted]

Dear [redacted]

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

NOTIFICATION IN ACCORDANCE WITH SECTION 46 'DUTY TO NOTIFY SECRETARY OF STATE OF PROPOSED APPLICATION' OF THE PLANNING ACT 2008

I write on behalf of H2 Teesside Limited (the 'Applicant') in connection with the H2Teesside hydrogen project (the 'Project').

The Applicant is proposing to submit an application (the 'Proposed Application') seeking development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State (the 'SoS') for the Department of Energy Security and Net Zero ('DESNZ') for the construction, operation and maintenance of the Project on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance store and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 508 hectares in total.

DWD is the trading name of DWD Property and Planning Limited a subsidiary of RSK Environment Limited.
Registered in England No. 15174312.
Registered Office: Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR

It is anticipated that the Proposed Application will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ, in Q1 2024.

The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

This letter represents the Applicant's notification to the SoS of the Proposed Application pursuant to Section 46 'Duty to notify secretary of state of proposed application' of the PA 2008.

Section 42 'Duty to consult' of the PA 2008 requires prospective applicants for development consent to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. The Applicant will commence the second consultation pursuant to Section 42 by issuing letters (the 'Consultation Letters') accompanied by consultation documents (the 'Consultation Documents') to the persons specified in the PA 2008 and in regulations made pursuant to the PA 2008 on or around 13 December 2023.

A notice pursuant to Section 48 'Duty to publicise' of the PA 2008 will be published as follows:

- Telegraph – 14 December 2023
- London Gazette – 14 December 2023
- Lloyds List – 14 December 2023
- Fishing News – 14 December 2023
- Northern Echo – 14 and 21 December 2023
- Teesside Gazette – 14 and 21 December 2023
- Darlington and Stockton Times – 15 and 22 December 2023

In accordance with Regulation 13 'Pre-application publicity under Section 48 (duty to publicise)' of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017' (the 'EIA Regulations'), the Applicant will also send a copy of the Section 48 Notice to the relevant consultation bodies and to any person notified to the Applicant in accordance with EIA Regulation 11(1((c) on or around 13 December 2023.

The deadline stated in the Consultation Letters (and on the Section 48 Notice) for the receipt of comments and representations on the Proposed Application is **11:59pm on 23 January 2024**.

The Consultation Documents that are to be provided to the persons specified in the PA 2008 and in regulations made pursuant to the PA 2008 (and other 'non-prescribed persons') will be accessible via the download link that accompanies their Consultation Letter (and via the Project Website: www.h2teesside.co.uk) and include:

- a plan showing the extent of the proposed Project Site boundary edged in red and the areas that have been removed and those that have been added since the first consultation;

- land interest plans that have been sent to landowners showing how their land interests have been affected by the changes to the Project Site boundary (these plans are only being sent to landowners who have land that has either been removed from the proposed Project Site boundary or is within it);

- a Community Update Letter being sent to residents and businesses within the vicinity of the Project Site;

- a H2Teesside Project Update Brochure that includes information on whether the conclusions of the Preliminary Environmental Information Report ('PEIR') produced for the first consultation are affected by the changes to the Project that are the subject of this second consultation, which will be available on the Project Website;

- the Section 48 Notice that is being published for the second consultation;

- the published Statement of Community Consultation ('SoCC') dated September 2023.

- the PEIR and its Non-Technical Summary produced for the first consultation and accompanying plans and maps;

- the Consultation Brochure produced for the first consultation; and

- the Consultation Leaflet produced for the first consultation, which was sent to people living within the vicinity of the Project Site.

The above Consultation Documents, along with example versions of the Consultation Letters can be downloaded from the following fileshare link:

https://dwd.ctit.co/url/fhjwzeicng2spvya

I look forward to receiving the SoS's acknowledgement of the Applicant's notification to the SoS of the Proposed Application pursuant to Section 46 'Duty to notify secretary of state of proposed application' of the PA 2008. In the meantime, should you have any questions please do not hesitate to contact with myself or my colleague [redacted]

Yours sincerely,

[redacted]

[redacted]
Director – Head of Planning
DWD – on behalf of H2 Teesside Limited
[redacted]

APPENDIX 13.3: SECOND CONSULTATION – SECTION 42 LETTERS 1 TO 4

Date: 13 December 2023

Insert address

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance store and other nearby CO_2 stores that NEP holds CO_2 storage licences for.

These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

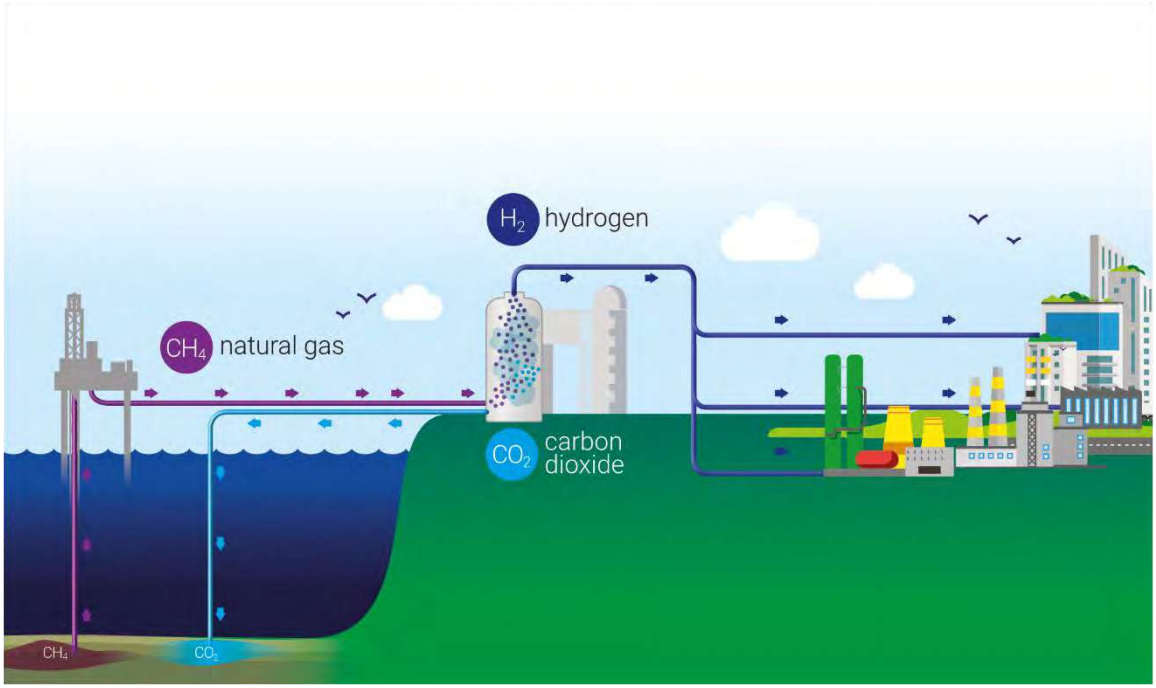
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the Consultation Documents that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than **23 January 2024**. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult' & EIA Regulation 13 'Pre-application publicity under Section 48 (duty to publicise)'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent (granted in the form of a 'Development Consent Order' or 'DCO') to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and persons with other interests in the relevant land. The consultation must be carried out prior to submitting the application for development consent to PINS.

The Applicant has identified a number of persons and organisations, which it is required to consult for the purposes of Section 42 of the PA 2008. It has been determined that you or your organisation is, or may be, a 'prescribed person' for the purposes of Section 42. The Applicant therefore wishes to seek your views on its latest proposals for H2Teesside.

Section 48 of the PA 2008 'Duty to publicise' also requires applicants for development consent to publicise their proposed application by publishing a notice (a 'Section 48 Notice') once in a national newspaper, once in the London Gazette, and in the case of a project like H2Teesside that involves tidal waters in the UK marine area, in the Lloyds List and an appropriate fishing journal, and for at least two successive weeks in a local newspaper circulating in the vicinity of the land to which the project relates. The Section 48 Notice for the Project is being published as follows:

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- Teesside Gazette – 14 and 21 December 2023
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Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017' (the 'EIA Regulations') requires applicants, at the same time as publishing the Section 48 Notice, to send a copy of that notice to the 'consultation bodies' and to any person notified to the applicant by the SoS under EIA Regulation 11(1)(c).

A copy of the Section 48 Notice that is being published is appended to this letter in accordance with EIA Regulation 13.

The Applicant

H2 Teesside Limited is indirectly owned by bp Plc ('bp'). bp or an affiliate thereof will be the lead developer and operator of the Project.

bp is an active global hydrogen participant and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

The Project Site

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The current extent of the Project Site, taking account of the changes made following further design development and technical assessments and

responses to the first consultation, is approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

- Mid-point – 454719 524286
- North – 451309 526476
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Plans are available within the 'Consultation Documents' (see further below) showing the current Project Site boundary.

Project Description

The proposed application will, amongst other matters, seek development consent for the construction, operation and maintenance of:

- a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
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- an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
- an electricity grid connection to provide power to the Project;
- water supply and treatment and wastewater infrastructure;
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Changes to the Project Site Boundary

A number of changes have resulted to the proposed Order Limits for the Project following further design development and technical assessments and responses to the first consultation.

The further design and technical work has allowed for some of the flexibility and optionality that was included at the time of the first consultation to be removed. This has resulted in a significant overall reduction in the proposed Order Limits from 1,350 hectares to 508 hectares.

A small number of additions have been made to the proposed Order Limits to accommodate works required for the Project.

The changes made to the proposed Order Limits are shown and described within the Consultation Documents listed below.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the proposed application for development consent.

Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS') and were made available for the first consultation. A H2Teesside Project Update Brochure that includes information on whether the conclusions of the PEIR are affected by the changes to the Project is included with the Consultation Documents.

Consultation Documents

The Consultation Documents relating to the Project, including plans and maps showing the nature and location of the Project can be downloaded via the below link to a secure fileshare site:

https://dwd.ctit.co/url/fhjwzeicng2spvya

The Consultation Documents include:

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- a H2Teesside Project Update Brochure that includes information on whether the conclusions of the Preliminary Environmental Information Report ('PEIR') produced for the first consultation are affected by the changes to the Project that are the subject of this second consultation, which is also being sent to people living within the vicinity of the Project Site;
- the Preliminary Environmental Information Report and its Non-Technical Summary produced for the first consultation and accompanying plans and maps;
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- the Consultation Leaflet produced for the first consultation, which was sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published for the second consultation.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 23 January 2024.

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

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Post: **Freepost H2TEESSIDE**

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Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice

Date: 13 December 2023

Insert address

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008

H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance store and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

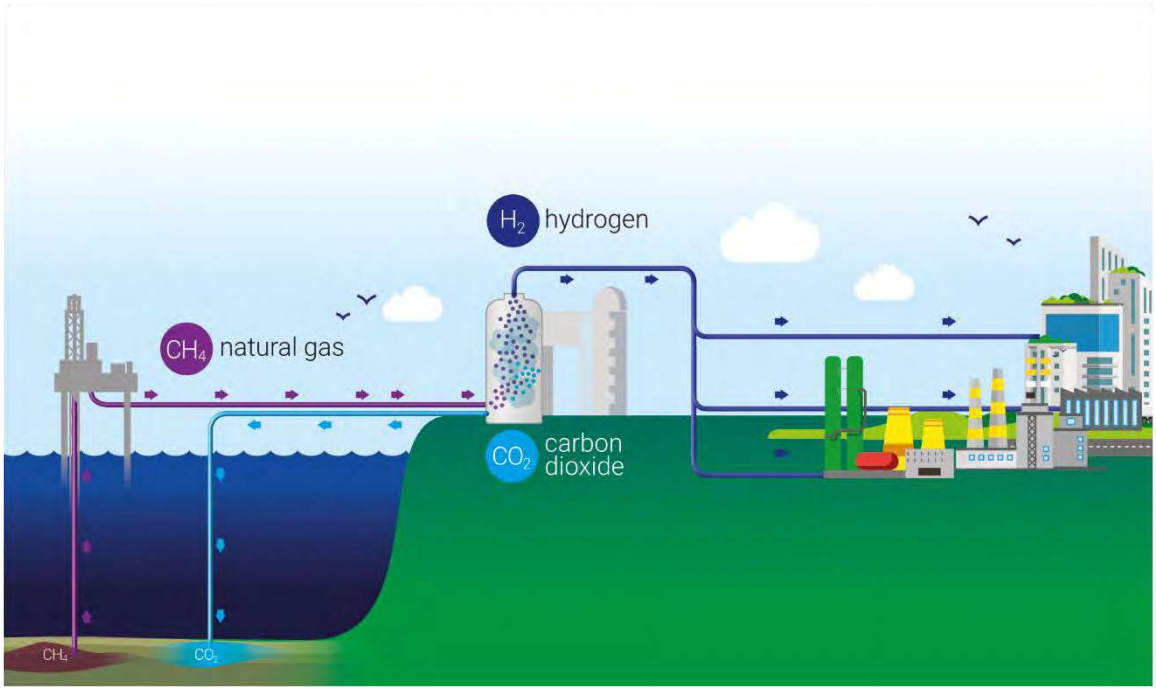
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by H2Teesside will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the Consultation Documents that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than **23 January 2024**. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent to consult on their proposed application with those persons specified in the PA 2008

and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and persons with other interests in the relevant land. The consultation must be carried out prior to submitting the application for development consent to PINS.

Although you do not fall within any of the categories of person specified by the PA 2008 and in regulations made pursuant to the Act, the Applicant considers that you may still have an interest in the Project and accordingly wishes to seek your views on its latest proposals for H2Teesside.

The Applicant

H2 Teesside Limited is indirectly owned by bp Plc ('bp'). bp or an affiliate thereof will be the lead developer and operator of the Project.

bp is an active global hydrogen participant and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

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landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

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FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

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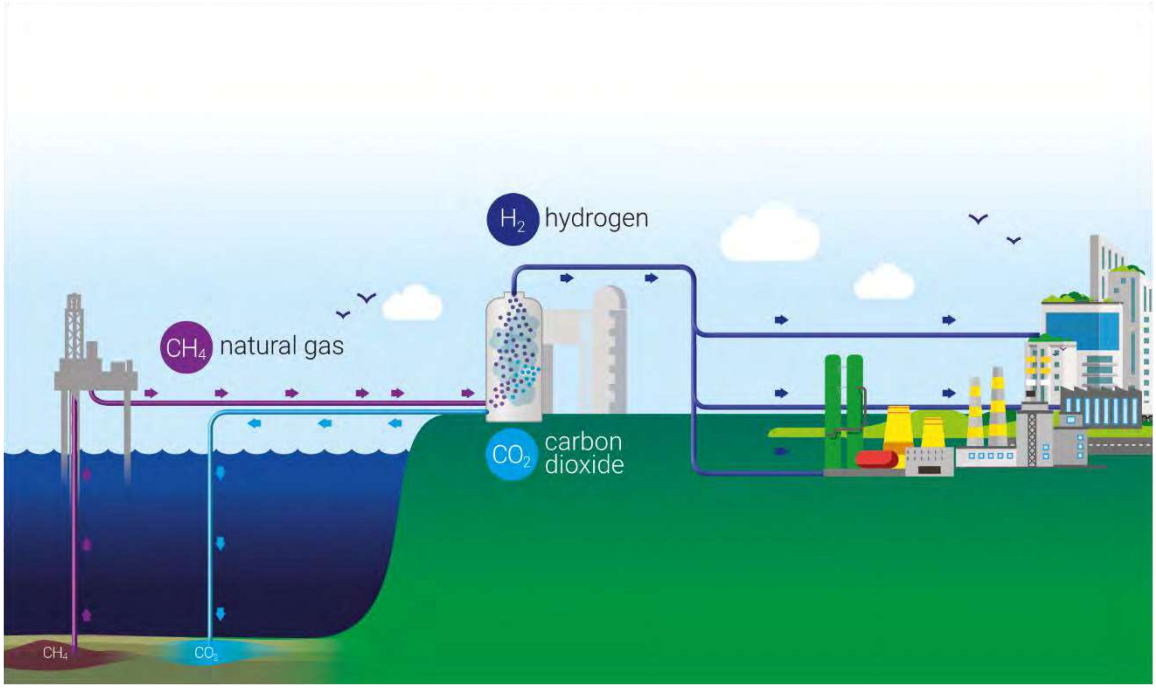

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As part of the first consultation on the Project, the Applicant identified you/your organisation as a 'prescribed person' (or potentially being a prescribed person) for the purposes of Section 42 of the PA 2008. This related to you/your organisation being a landowner identified as being affected/potentially affected by the Project or having an interest in land affected by the Project.

Following that first consultation and pursuant to that Section 42 duty, the Applicant wishes to now seek your views through the second consultation on the Project as it is considered that the changes to the proposed Order Limits for the Project, which are described in this second consultation affect land in which you hold an interest.

Section 48 of the PA 2008 'Duty to publicise' also requires applicants for development consent to publicise their proposed application by publishing a notice (a 'Section 48 Notice') once in a national newspaper, once in the London Gazette, and in the case of a project like H2Teesside that involves tidal waters in the UK marine area, in the Lloyds List and an appropriate fishing journal, and for at least two successive weeks in a local newspaper circulating in the vicinity of the land to which the project relates. The Section 48 Notice for the Project is being published as follows:

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The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Changes to the Project Site Boundary

A number of changes have resulted to the proposed Order Limits for the Project following further design development and technical assessments and responses to the first consultation.

The further design and technical work has allowed for some of the flexibility and optionality that was included at the time of the first consultation to be removed. This has resulted in a significant overall reduction in the proposed Order Limits from 1,350 hectares to 508 hectares.

A small number of additions have been made to the proposed Order Limits to accommodate works required for the Project.

The changes made to the proposed Order Limits are shown and described within the Consultation Documents listed below and a plan showing how the changes to the proposed Order Limits affect land in which you hold an interest is provided with this letter.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the proposed application for development consent.

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- a plan showing the extent of the current Project Site boundary edged in red and the areas that have been removed and those that have been added since the first consultation;
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- the Consultation Leaflet produced for the first consultation, which was sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published for the second consultation.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 23 January 2024.

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice
Landholding Plan

Date: 13 December 2023

Insert address

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences

for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

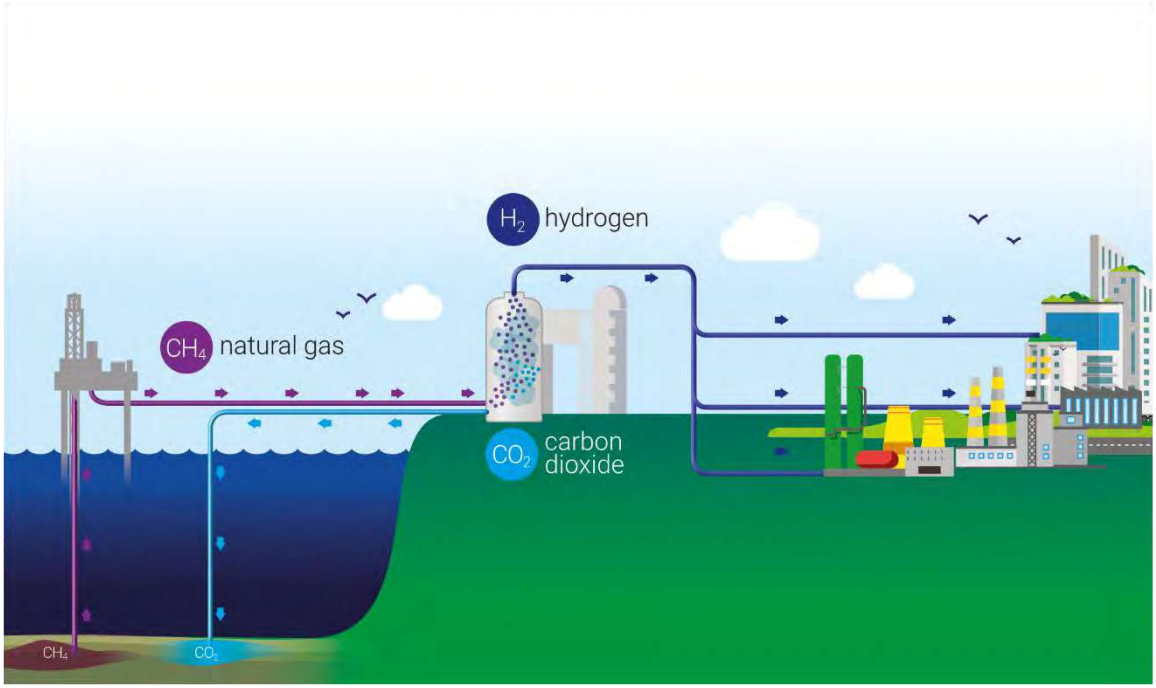
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by H2Teesside will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the Consultation Documents that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than **23 January 2024**. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult' & Section 48 'Duty to publicise'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent (granted in the form of a 'Development Consent Order' or 'DCO') to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and persons with other interests in the relevant land. The consultation must be carried out prior to submitting the application for development consent to PINS.

As part of the first consultation on the Project, the Applicant identified you/your organisation as a 'prescribed person' (or potentially being a prescribed person) for the purposes of Section 42 of the PA 2008. This related to you/your organisation being a landowner identified as being affected/potentially affected by the Project or having an interest in land affected by the Project. Since the first consultation the Applicant has made a number of changes to the Project Site boundary. The Applicant's review of landownership indicates that your landownership/interest in land is no longer within the proposed Project Site boundary following those changes. However, the Applicant still wishes to provide the opportunity for you/your organisation to make comments on the changes.

Section 48 of the PA 2008 'Duty to publicise' also requires applicants for development consent to publicise their proposed application by publishing a notice (a 'Section 48 Notice') once in a national newspaper, once in the London Gazette, and in the case of a project like H2Teesside that involves tidal waters in the UK marine area, in the Lloyds List and an appropriate fishing journal, and for at least two successive weeks in a local newspaper circulating in the vicinity of the land to which the project relates. The Section 48 Notice for the Project is being published as follows:

- Telegraph – 14 December 2023
- London Gazette – 14 December 2023
- Lloyds List – 14 December 2023
- Fishing News – 14 December 2023
- Northern Echo – 14 and 21 December 2023
- Teesside Gazette – 14 and 21 December 2023
- Darlington and Stockton Times – 15 and 22 December 2023

A copy of the Section 48 Notice that is being published is appended to this letter.

The Applicant

H2 Teesside Limited is indirectly owned by bp Plc ('bp'). bp or an affiliate thereof will be the lead developer and operator of the Project.

bp is an active global hydrogen participant and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

The Project Site

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The current extent of the Project Site, taking account of the changes made following further design development and technical assessments and responses to the first consultation, is approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

- Mid-point – 454719 524286
- North – 451309 526476

- East – 458760 521587
- South – 457001 520748
- West – 446938 521613

Plans are available within the 'Consultation Documents' (see further below) showing the current Project Site boundary.

Project Description

The proposed application will, amongst other matters, seek development consent for the construction, operation and maintenance of:

- a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
- a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
- an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
- an electricity grid connection to provide power to the Project;
- water supply and treatment and wastewater infrastructure;
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Changes to the Project Site Boundary

A number of changes have resulted to the proposed Order Limits for the Project following further design development and technical assessments and responses to the first consultation.

The further design and technical work has allowed for some of the flexibility and optionality that was included at the time of the first consultation to be removed. This has resulted in a significant overall reduction in the proposed Order Limits from 1,350 hectares to 508 hectares, including the land in which you hold and interest.

A small number of additions have been made to the proposed Order Limits to accommodate works required for the Project.

The changes made to the proposed Order Limits are shown and described within the Consultation Documents listed below.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the proposed application for development consent.

Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS') and were made available for the first consultation. A H2Teesside Project Update brochure that includes information on whether the conclusions of the PEIR are affected by the changes to the Project is included with the Consultation Documents.

Consultation Documents

The Consultation Documents relating to the Project, including plans and maps showing the nature and location of the Project can be downloaded via the below link to a secure fileshare site:

https://dwd.ctit.co/url/fhjwzeicng2spvya

The Consultation Documents include:

- a plan showing the extent of the current Project Site boundary edged in red and the areas that have been removed and those that have been added since the first consultation;
- a H2Teesside Project Update Brochure that includes information on whether the conclusions of the Preliminary Environmental Information Report ('PEIR') produced for the first consultation are affected by the changes to the Project that are the subject of this second consultation, which is also being sent to people living within the vicinity of the Project Site;
- the Preliminary Environmental Information Report and its Non-Technical Summary produced for the first consultation and accompanying plans and maps;
- the Consultation Brochure produced for the first consultation;
- the Consultation Leaflet produced for the first consultation, which was sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published for the second consultation.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 23 January 2024.

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence

relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice

APPENDIX 13.4: SECOND CONSULTATION – PLAN SHOWING THE CHANGES AND H2TEESSIDE PROJECT UPDATE BROCHURE



H2Teesside consultation December update

As one of the UK's largest low carbon hydrogen production facilities, H2Teesside aims to bring jobs, customers and investment to Teesside.

H2Teesside aims to be one of the biggest blue hydrogen production facilities in the UK, delivering economic growth for Teesside and the domestically-produced low carbon hydrogen that the UK needs.

It will produce approximately 160,000 tonnes of low carbon hydrogen per annum, which will displace existing natural gas consumption by industrial emitters in Teesside, and capture and send for secure long-term storage approximately two million tonnes of CO_2 per year.

Along with its sister project HyGreen Teesside and a number of other proposed projects in the area, H2Teesside can strengthen Teesside's development into the UK's leading hydrogen hub, creating new high quality jobs, supporting local education and skills development and kick-starting a highly-skilled UK-based hydrogen supply chain.

bp will also invest in green skills by launching a dedicated education skills programme for H2Teesside. The programme will aim to reach more than 5,000 people to help inspire the next generation of talent, ensuring local people benefit from near-term job opportunities and advancing social mobility.

Our vision

At bp, we are taking action through transformative projects that will help us achieve our net zero ambition.

As operator of the Northern Endurance Partnership, we are helping build the infrastructure needed to safely capture, transport and store CO_2 from a range of power, hydrogen and industrial businesses in Teesside and the Humber who together make up the East Coast Cluster (ECC). The ECC aims to remove up to 27 million tonnes of CO_2 emissions a year by 2030.

We're also operators of Net Zero Teesside Power which will be the world's first commercial scale, gas-fired power station with carbon capture technology, capable of capturing approximately two million tonnes of CO_2 a year.

In addition to H2Teesside, Teesside is also the planned location of bp's green hydrogen project – HyGreen Teesside. Together, H2Teesside and HyGreen Teesside, could deliver over 15% of the UK Government's target of developing 10GW of hydrogen production by 2030.

Next steps

Thank you to everyone who took part in our statutory consultation for the H2Teesside proposed development between 14 September and 26 October 2023.

The feedback from that consultation has been considered and we have carried out further technical work. This has allowed us to review our project design. We have identified several revisions on which we are now consulting.

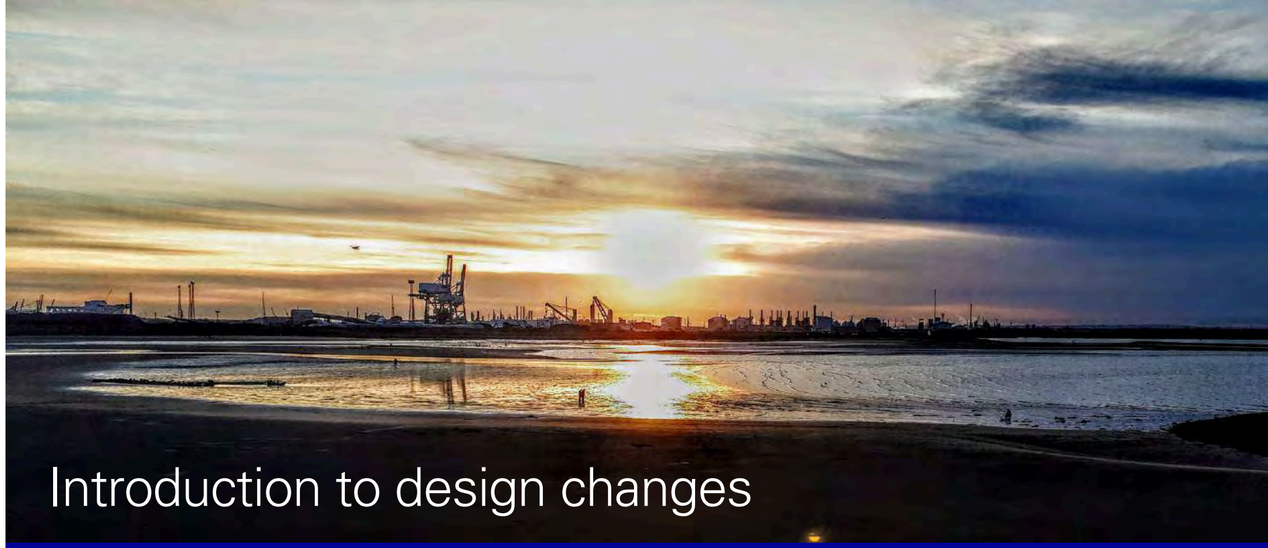
This second round of consultation is open between 13 December 2023 and 23 January 2024.

In advance of our first consultation round, we published a Preliminary Environmental Information (PEI) Report, when the Proposed Development for H2Teesside was in an early stage of design development. The PEI Report presented an assessment based on a worst-case scenario for the Proposed Development and the Order Limits presented in the PEI Report gave flexibility for further design development to take place. As a result of our further technical works, the design of the Proposed Development has now developed, demonstrated by the amount of area removed from the Order Limits, shown in black hatching on Figure 1 (overleaf). These changes are minor and have no worsening effect than that previously identified in the PEI Report.

There are seven proposed additions (shown in yellow hatching on Figure 1) to the Order Limits for which greater details are provided below, these changes have come about as a result of further technical and design work, assessment and in response to feedback received during the first round of statutory consultation.

In addition, there have been a number of small changes made to the Order Limits that are not covered in detail below. These minor changes predominantly relate to enabling the use of existing access roads required to deliver the Proposed Development. These changes are minor in nature and have no worsening effect than that previously identified in the PEI Report.

These small changes can be seen in greater detail **here**.



Introduction to design changes

The following sections outline the seven proposed additions to the new Order Limits, including a description of the works taking place and a comparison of effects to that reported in the PEI Report.

Some of the changes comprise the inclusion of Above Ground Installations (AGIs). AGIs are made up of a range of structures and pieces of equipment that are designed to be kept at a low level – usually around two metres tall. AGIs comprise:

- Pressure reduction units that control the flow or pressure of hydrogen into the network.
- Instrument and control kiosks that house the equipment that monitors parameters like flow, pressure and temperature of the hydrogen.
- Facilities that enable inspection and cleaning of the pipeline.

Where a topic is not mentioned in the tables below, there are no differences of effect against what has been assessed and presented within the PEI Report and previously consulted on.

This document is intended as an update to what has been assessed and presented within the PEI Report. Please read this document alongside the PEI Report, located **here** to get a full picture of the Proposed Development and its potential environmental effects.

Figure 1: Map displaying the proposed additions and removals to the Order Limits since the publishing of the PEIR.

Key: **Red line boundary** **Area added:** Total 70.55 acres **Area removed:** Total 2166.42 acres





change 1

Area at Venator

Description of works

Installation of Above Ground Installation (AGI) within the Venator site on the area of land highlighted in yellow.

Potential environmental effects

Ecology and nature conservation

Although this land has not been subject to detailed baseline survey, there are unlikely to be any new or different significant effects from that reported in the PEI Report from this change. This area is predominantly hardstanding and directly adjacent to areas of land in similar use and similar works are already considered in the PEI Report. Potential significant effects to the nearby Special Protection Area (SPA) and adjacent habitats have already been reported. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders. The results of all surveys and mitigation measures will be provided within the Environmental Statement (ES).





change 2 North of Seal Sands roundabout

Description of works

Areas in yellow required for natural gas distribution network connection. These areas would be required for pipe works to support installation of the trenchless crossing to the existing NGN AGI located approx. 350m to the east.

Potential environmental effects

Ecology and nature conservation

This area comprises hardstanding but is immediately adjacent to a waterbody that is likely to be used by birds. This area (including the waterbody) will be surveyed to ascertain how it is used.

There are unlikely to be any new or different significant effects from that reported in the PEI Report as works have been designed to utilise existing hardstanding and minimise potential impacts. Potential significant effects to the nearby SPA and adjacent habitats have already been reported in the PEI Report and impacts to potential habitat such as the adjacent waterbody will be mitigated using the same measures as are referenced in the PEI Report. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders. The results of all surveys and mitigation measures will be provided within the ES.



change 3

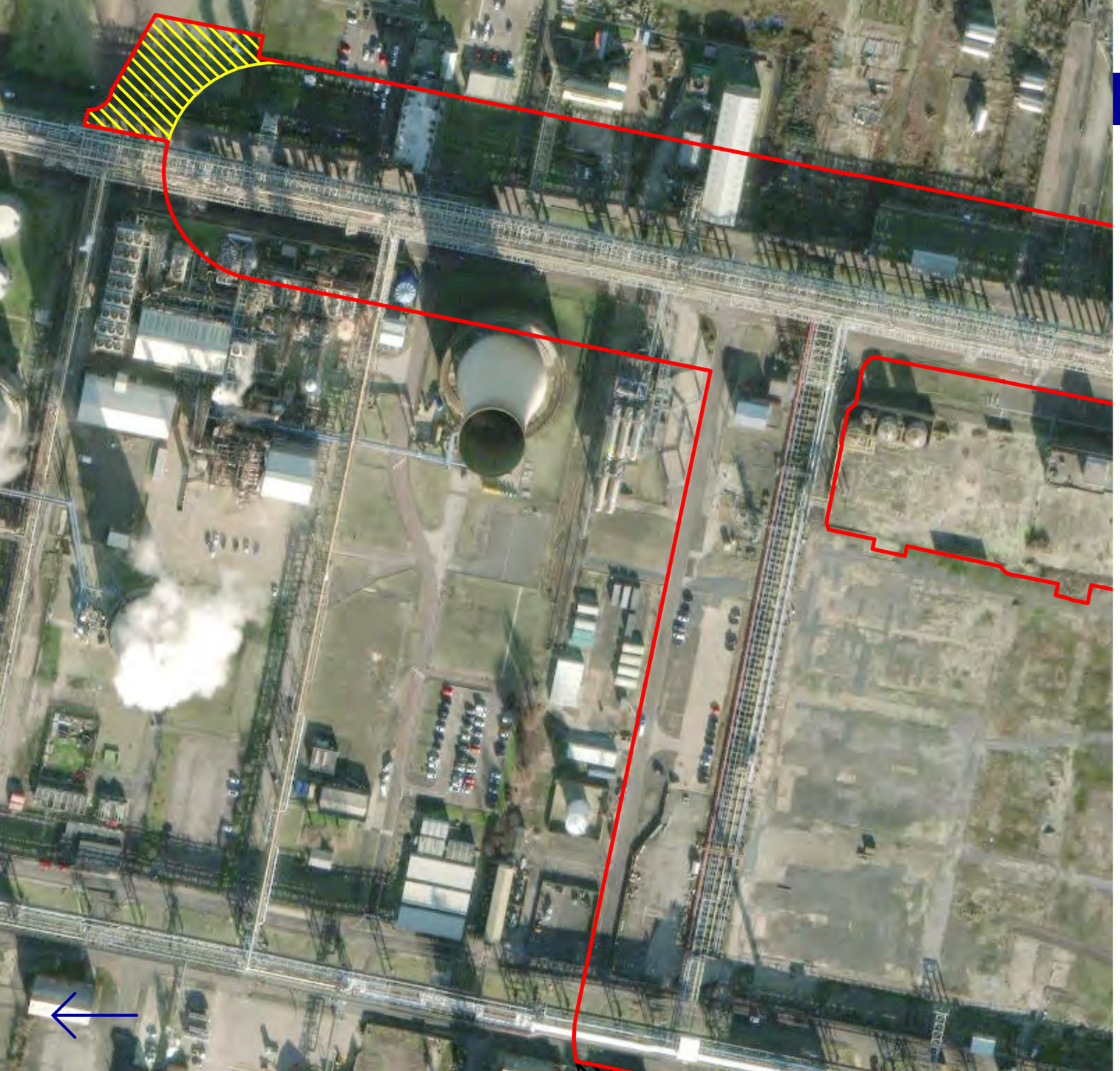
North-west of A174/A102 roundabout

Description of works

Installation of AGI in the area highlighted in yellow.

Potential environmental effects

This area is predominantly hardstanding and directly adjacent to areas of land in similar use and similar impacts are already considered in the PEI Report. There are unlikely to be any new or different significant effects from that reported in the PEI Report arising from this change.



change 4

Area at SNF Oil and Gas Ltd

Description of works

Installation of AGI in the area highlighted in yellow.

Potential environmental effects

This area is predominantly hardstanding and directly adjacent to areas of land in similar use and similar impacts are already considered in the PEI Report. No changes to the conclusions of the PEI Report arise from this change.



change 5

Area at Furatom (UK) Ltd. on the B1275

Description of works

Installation of AGI on the land highlighted in yellow.

Potential environmental effects

Ecology and nature conservation

Although this land has not been subject to either detailed baseline survey or bat roost assessment, there is unlikely to be any new or different significant effects from that reported in the PEI Report. The area is directly adjacent to areas of land in similar use. Potential significant effects to habitats have already been reported in the PEI Report. This initial precautionary conclusion is reached before taking into consideration site specific mitigation and habitat management measures. Site specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be provided in the ES.

change 6

Area west of A1185/ East of Cowpen Bewley



Description of works

Amendment to pipeline routing to avoid ponds and other areas of habitat creation within RSPB reserve land shown in image on the area highlighted yellow.

Potential environmental effects

Ecology and nature conservation

The proposed change has the potential to reduce effects upon habitats and birds due to the removal of land to the east from the RLB. Although the proposed additional land has not yet been surveyed to confirm habitat condition and to check for ecological constraints, there are unlikely to be any new or different significant effects from that reported in the PEI Report. The area is directly adjacent to similar works already assessed. Potential significant effects to habitats have already been reported in the PEI Report. This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures. Site-specific mitigation will be developed in consultation with Natural England and other stakeholders, as required. Mitigation measures will be identified in the ES.

Cultural heritage

The proposed change has the potential to cross an area of known non-designated medieval field systems of Cowpen Bewley included in the Historic Environmental Record. The area has not been subject to geophysical survey and is in relative proximity to a Roman settlement. This route option has the potential to result in additional effects to those considered in the PEIR. However, these will be able to be managed through mitigation secured by a requirement in the Development Consent Order. A significant residual effect cannot be ruled out at this stage and will be confirmed by a geophysical survey. However, this will be undertaken before submission of the application to confirm the design in this area.



change 7

Area north of Redcar British Steel train station

Description of works

Yellow area at the top (north) of the image on the left added to cover rerouting of water connection taking into account feedback received from Teesworks.

Yellow area at the bottom (south) of the image required to pipeline connections (shown in greater detail on the right).

Potential environmental effects

Surface water, flood risk and water resources:

This area has potential for interactions or crossings with Ash Gill. Further information is required to assess the full extent of any impact, which will be reported within the Environmental Statement. However, the watercourse is of low morphological importance due to the industrial nature of the surrounding area, and it is anticipated that any crossings or interactions with Ash Gill as a result of this additional area would be managed in accordance with best practice guidance, secured through the Framework CEMP being submitted as part of the DCO Application. Taking this into account, there is unlikely to be any new or different potential residual significant effects over and above what was reported in the PEI Report.



Have your say

Do you have any comments on H2Teesside and our proposed changes? If so, we want to hear your views. You can respond to our consultation in the following ways:

Online fill in the response form here or at our website **www.h2teesside.co.uk**

Post: Write to us or send send a completed copy of the response form to **FREEPOST H2Teesside**

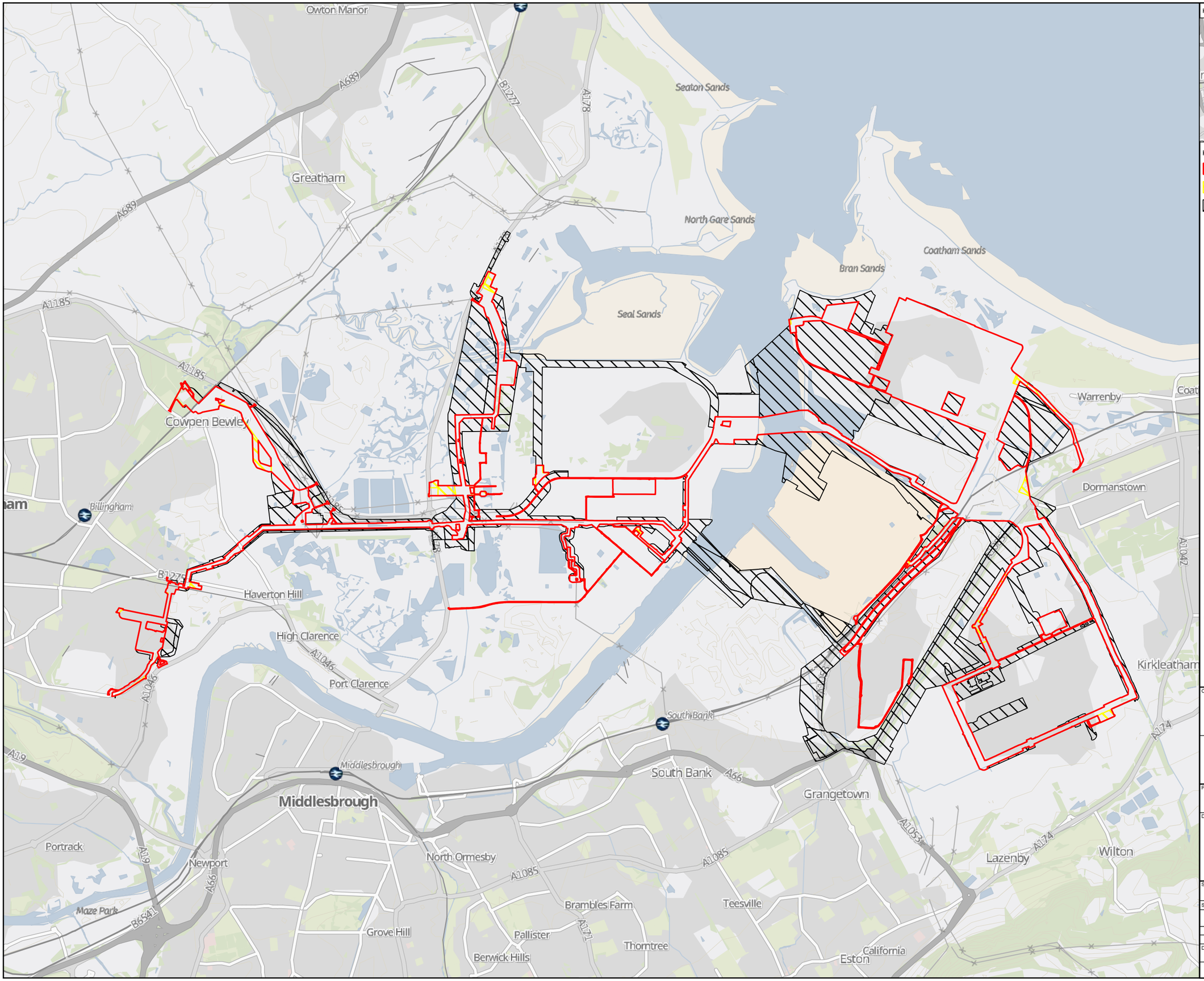
Email: Write to us or send a completed copy of the response form to **info@h2teesside.net**

Please submit your feedback by 23:59 on 23 January 2024

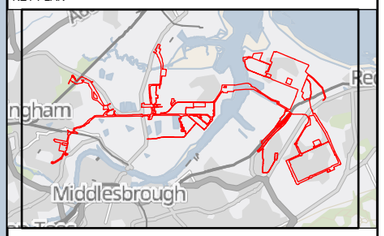
Next steps

Your feedback will inform the progression of the Proposed Development. Each proposed revision detailed above, will be assessed and reported in full (including accounting for within baseline surveys) in the Environmental Statement that accompanies the application for development consent. Once we have taken your feedback into consideration, we plan to submit our application in Q1 2024.





KEY PLAN



Key

- Revised Draft Order Limits
- Additional Land Area Required
- Land Area Reduced

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Client: H2 Teesside

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title: STAGE 2 CONSULTATION OVERVIEW

Status	FINAL	Revision	000
		Date	07/12/2023
Scale	1:40,000 @ A3	Spatial Reference System	British National Grid

0 250 500 1,000 1,500 2,000 Metres

Drawn By	Checked By	Approved By
J.NEYE-SWIFT	N/A	J.WITHINGTON

Drawing reference: 073_ARDG_H2Teesside_LIP

This document is not to be used in whole or in part other than for the intended purpose and project for which it was prepared and provided.

Plot Date: 07 December 2023 12:40
File Name: C:\Users\JakeN\Ardent Management Ltd\Projects - Aecom - H2 Teesside\P16 - GIS & CAD Files\073_ARDG_Teesside\ArcPro Projects\Re-Consultation Plans\073_ARDG_H2Teesside_LIC_OVERVIEW.aprx

APPENDIX 13.5: SECOND CONSULTATION – SECTION 42 SITE NOTICE AND SITE NOTICE LOCATIONS PLAN

THE H2TEESSIDE PROJECT

The Planning Act 2008 – Sections 42 and 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), who registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application to the Secretary of State (the 'SoS') for Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').

2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.

3. The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Proposed Application Site boundary following further design development and technical assessments and responses to the first consultation.

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    - North – 451309 526476

- East – 458760 521587
- South – 457001 520748
- West – 446938 521613

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   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of gas to the hydrogen production plant;
   c. an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   g. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   h. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

8. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

9. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

10. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the Proposed Application.

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12. A H2Teesside Project Update Brochure forms part of the Consultation Documents includes information on whether or not the conclusions of the PEIR are affected by the changes to the Project that are the subject of this second consultation.

Consultation Documents

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16. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

17. Digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 23 January 2024:

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18. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

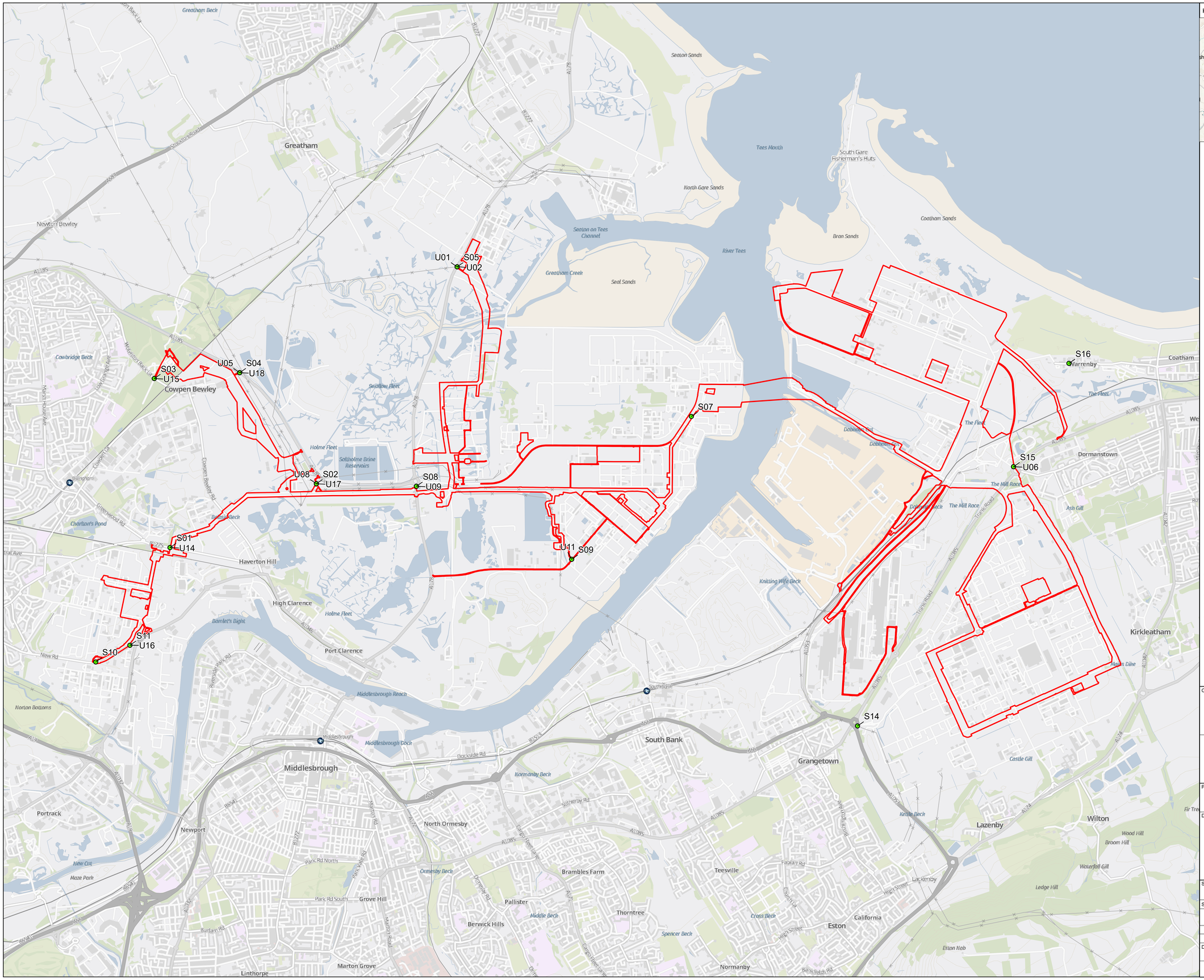
19. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

20. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**. Responses received after this date may not be considered.

21. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited

13 December 2023



KEY PLAN



Key

- Order Limits
- Notice Locations

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Client: H2 Teesside

N

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title: SITE NOTICE PLAN OVERVIEW

Status		Revision	000
FOR INFORMATION		Date	01/12/2023
Scale	1:20,000 @ A1	Spatial Reference System	British National Grid

0 250 500 1,000 1,500 2,000 Metres

Drawn By	Checked By	Approved By
J.NEYE-SWIFT	N/A	J.WITHINGTON

Drawing reference: 073_ARDG_H2T_Notice_Overview

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Plot Date: 15 March 2024 10:31
File Name: C:\Users\JakeN\Ardent Management Ltd\Projects - Aecom - H2 Teesside\P16 - GIS & CAD Files\073_ARDG_Teesside\ArcPro Projects\Notice Plans\ARDG_Teeside_Site_Notices.aprx

APPENDIX 13.6: SECOND CONSULTATION – SECTION 48 NOTICE AND COPIES OF PUBLISHED NOTICES

THE H2TEESSIDE PROJECT

The Planning Act 2008 – Section 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), who registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application to the Secretary of State (the 'SoS') for Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').

2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.

3. The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Proposed Application Site boundary following further design development and technical assessments and responses to the first consultation.

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H2 Teesside Limited

13 December 2023

Thursday 14 December 2023 *** telegraph.co.uk No 52,437 £3.00

GCHQ's hardest Christmas puzzle. Can you solve the spies' teasers? P.3



The Daily Telegraph
NATIONAL NEWS MEDIA ORGANISATION OF THE YEAR

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Enter this year's contest
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Ben Lawrence
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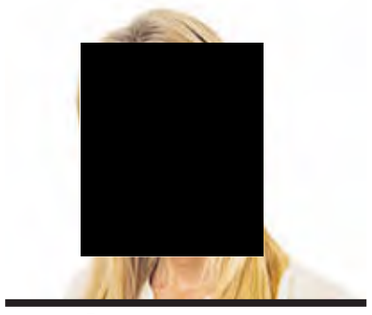
Isabel Oakeshott
My humiliating pat-down at airport security
Features



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ISSN-0307-1235

Britain to build next generation fighter jets

UK-based project with Japan and Italy aims to create new supersonic aircraft by 2035

By **Danielle Sheridan** DEFENCE EDITOR

BRITAIN is to spearhead a new fighter jet project for the first time under a treaty to be signed with Japan and Italy today.

The agreement reveals that the UK will host the headquarters of the Global Combat Air Programme (GCAP), where all major decisions about the project will be made.

Britain, Japan and Italy have joined forces to develop the next generation of fighter jets. The aim of the project, announced last December and previously known as Tempest, is to create a supersonic aircraft that takes to the skies by 2035. Grant Shapps, the Defence Secretary, is to meet his Japanese and Italian counterparts in Tokyo today to sign the treaty formalising the agreement, which states that the headquarters will be in the UK.

Writing in *The Daily Telegraph*, Mr Shapps says that the GCAP aims to "engineer strengthened collective security".

He writes: "This effort comes as we face growing dangers in the skies and international airspace is increasingly contested, not least from the threats posed by Russia and China.

"In a more dangerous age, the new fighter jet is being designed to form the backbone of our future air fleets. It will place our nations at the centre of air combat capability. And it will enhance regional security both in the Indo-Pacific and Europe."

Tokyo has never collaborated on such a project before. In May, Rishi Sunak signed the Hiroshima Accord, which pledged to build a stronger defence relationship with Japan over fears of Chinese aggression in the Indo-Pacific region. It agreed to increase defence cooperation and improve supply chains with the country.

Britain has participated in previous multinational fighter jet programmes but has never hosted a headquarters for such a project. The Tornado and Typhoon headquarters were in Germany, and the headquarters of the F-35 project was in the US. The new jet will replace the Typhoon. The last time the UK designed and built an aircraft was the Harrier.

One senior defence source described basing the project in the UK as "a coup". "It means when other nations come to talk about GCAP, they come to the UK. For us to be at the centre and managing this programme means we will get more influence," they said.

While the deal has been signed between the UK, Italy and Japan, it could expand to include other nations.

Earlier this year, *The Daily Telegraph* revealed that Britain and Italy were eager to help Saudi Arabia play a greater role in Western defence partnerships, partly to coax the kingdom away from Chinese influence, and were studying a proposal for it to join GCAP.

Companies from the UK involved in the effort to develop the new jet include BAE Systems, Rolls-Royce, Leonardo UK and MBDA UK. They will work with companies from Japan and Italy to progress the design and development of the supersonic stealth jet that will use a radar that can provide 10,000 times more data than current systems.

While the UK will host the headquarters, which will in turn support hundreds of UK jobs, the first chief executive will come from Japan.

It is likely that the Tempest jets to be used by the Royal Air Force will also be built in Britain.

Mr Shapps is expected to say: "Today in Tokyo, in the small hours of the morning UK time, I signed a treaty that puts pedal to the metal on another great partnership between our three nations.

"Faster than a speeding Formula One car, this major programme will see Japan, Italy and the UK engineer an entirely new type of stealth fighter.

"Sixth-generation, supersonic and equipped with state-of-the-art sensors: it will set the standard for fighter jets of the future."

He adds: "The stealth jet will demonstrate our capacity to project power across the skies for decades to come."

Grant Shapps: Page 2

Police step up hunt for missing mother



Police have released CCTV footage of Gaynor Lord's last known movements after the 55-year-old went missing from the centre of Norwich last week. The mother of three failed to return home from work on Friday evening. *Report: Page 6*

Vallance's pandemic diary to be kept secret

By **Blathnaid Corless** *and* **Gordon Rayner**

SIR PATRICK VALLANCE'S full pandemic diary is to be kept secret by the Covid Inquiry, it has emerged.

Lawyers acting for the former chief scientific adviser have argued that publishing his nightly notes, written between January 2020 and December 2021 while he was advising the Government, in their entirety would breach his human rights. Extracts from the diary shown during inquiry hearings have provided an unique insight into the relationship between scientists and ministers, with Sir Patrick writing of Boris Johnson's "bipolar decision-making" and "impossible flip-flopping".

Despite requests from the press to reveal the diary in full, including by *The Daily Telegraph*, the chairman of the inquiry has indicated that nothing beyond the excerpts shown during hearings will be published.

Critics have argued that the public deserves to "know the truth" of how pandemic decisions were made. It comes amid concerns the inquiry might be biased towards those in favour of lockdowns. Oxford academics Prof Carl Heneghan and Dr Tom Jefferson wrote to the inquiry accusing its chair Baroness Hallett of favouring scientists who backed tough restrictions.

A senior Tory MP said: "Transparency is supposed to be fundamental to what government does... and in an inquiry like this there should be a high bar to any refusal to release material. The public are entitled to know the truth of how these decisions were made and especially how expert advice was weighed before decisions were taken that robbed us all of our freedoms."

Analysis: Page 9
Editorial Comment: Page 17

Two million people will be told to increase statin dose

By **Laura Donnelly** HEALTH EDITOR

TWO million people will be advised to boost their statin dose in order to reduce their cholesterol levels under NHS targets.

The National Institute of Health and Care Excellence (Nice) said the guidance could mean about 145,000 fewer heart attacks, strokes and other cardiac incidents in the next decade.

For the first time, Nice has set specific cholesterol targets for those who have already suffered a cardiovascular event, such as a heart attack or stroke. GPs will be told to offer higher doses of statins to such patients during their check-ups.

Nice had previously called for such patients to aim for at least a 40 per cent reduction in non-high-density lipoprotein (non-HDL) cholesterol.

But under the new guidance, about two million people already taking statins will be advised to take heavier doses or be prescribed additional drugs, including injections, to cut their risk.

For low-density lipoprotein (LDL) cholesterol levels, often known as bad cholesterol, the target is 2.0 millimoles per litre (mmol/L) or less.

The target for non-HDL will be 2.6 mmol/L or less. The targets are far lower than the general advice to the public, which says LDL levels should be below 3.0 mmol/L, while non-HDL levels should be below 4.0.

The guidance says treatments to cut cholesterol should be "escalated" to hit the new targets. For those who have had a heart attack or stroke, 80mg of atorvastatin will be offered by GPs, unless there is thought to be a high risk of adverse effects or a reaction with other drugs.

If statins are not enough, other treatments should be considered. These include a prescription-only tablet that helps stop the body from taking in cholesterol from food (ezetimibe), a lipid-lowering injection called inclisiran, or two drugs known as PCSK9 inhibitors (alirocumab and cvolocumab), which block a protein made in the liver linked to high cholesterol.

The new guidance means GPs will need to keep a close check on cholesterol levels. While healthy people are expected to get their cholesterol checked by GPs every five years from the age of 40, annual checks should be carried out for those who have suffered a cardiac event.

Nice said up to 2.1 million people could benefit from the new targets. It said that between 50,000 and 145,000 heart attacks, strokes, deaths and other cardiovascular events, such as angina, could be prevented in the next decade if more patients hit the target.

Earlier this year, Nice said that anyone who wants to take statins to ward off heart disease should have the option to do so, amid concern about surging deaths among the middle-aged. Heart disease is the cause of one in four deaths in England. Prof Jonathan Benger, Nice's chief medical officer, said: "Improving the control of cholesterol in a larger number of people will further reduce deaths from heart attacks and strokes. This guideline will help clinicians talk through the options with their patients to achieve the best outcomes."

Those being offered statins should be advised that the risk of side-effects such as muscle pain, tenderness or weakness is "small" with an "extremely low" risk of muscle breakdown, Nice said.

Last year, a study by Oxford University found that the drugs cause muscle pain for one in 100 people. In most cases when people taking statins had aches and pains, the cause was old age, researchers concluded.

NEWS

Netflix reveals viewing habits for first time

A little-hyped spy thriller has topped the list of Netflix's most-watched shows as the streaming platform released viewing figures for its entire catalogue for the first time. The US series *The Night Agent* was crowned as the most-watched show on the streaming platform. The data also showed that the drama *Suits*, which starred the Duchess of Sussex, racked up nine times more viewing hours on the platform than her own documentary series with Prince Harry.
Page 5

NEWS

Lineker likely broke BBC rules, says chief

Gary Lineker's tweets may have broken BBC guidelines, according to the corporation's new chairman. The *Match of the Day* host signed an open letter criticising the Government's Rwanda policy this week, and used social media to seemingly mock Tory MPs. Samir Shah, the incoming BBC chairman, told MPs Lineker's mockery was likely to be in breach of social media guidelines largely brought in to prevent any further controversy being provoked by his political views.
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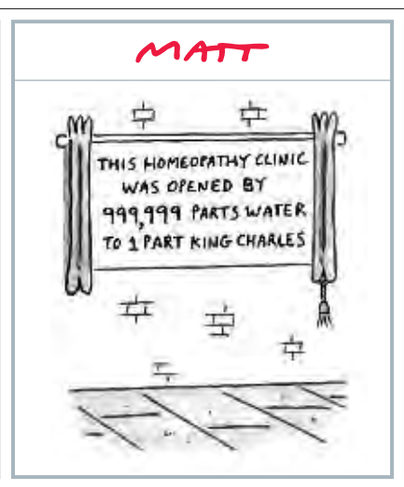

WORLD

Hunter Biden launches fightback against GOP

Hunter Biden gave an unscheduled press conference outside Congress yesterday to say his father had "no involvement" in his business dealings as he refused to give testimony to a Republican investigation. Mr Biden Jr, 53, was subpoenaed to appear before representatives investigating the president and pushing for a full impeachment inquiry. Some Republicans argue that Joe Biden benefited from his son's global business interests from 2014 to 2019.
Page 13

BUSINESS

BP's ex-boss forfeits £32m over misconduct

The former boss of BP will lose up to £32million in pay after the oil giant's board found he knowingly misled them about a string of romantic affairs he had with colleagues. Bernard Looney resigned in September after admitting he had not been "fully transparent" about his past relationships. But BP's board yesterday said they were cutting short his notice period and sacking him immediately effect after deeming that his actions amounted to "serious misconduct".
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Court & Social

Court Circular

BUCKINGHAM PALACE
December 13th
His Excellency Mr Stefan Gullgren was received in audience by The King today and presented the Letters of Recall of his predecessor and his own Letters of Credence as Ambassador from the Kingdom of Sweden to the Court of St James's.

Mrs Alla Logova was also received by His Majesty.

His Excellency General Cheikh Wade was received in audience by The King and presented the Letters of Recall of his predecessor and his own Letters of Credence as Ambassador from the Republic of Senegal to the Court of St James's.

Mrs Wade was also received by His Majesty.

Ms Harriet Matthews (Director General, Africa and the Americas, Foreign, Commonwealth and Development Office) was present.

The King this afternoon received United Kingdom Community and Faith Leaders.

Her Excellency Ms Rachér Croney was received in audience by The King upon her appointment as British High Commissioner to Grenada.

The King held a Council at 4.00pm.

There were present: the Rt Hon Penelope Mordaunt MP (Lord President), the Rt Hon Claire Coutinho MP (Secretary of State for Energy Security and Net Zero), the Rt Hon Michael Gove MP (Secretary of State for Levelling Up, Housing and Communities) and the Rt Hon Mark Harper MP (Secretary of State for Transport).

Mr Richard Holden MP and Ms Laura Trott MP were sworn in as members of His Majesty's Most Honourable Privy Council.

Mr Richard Tilbrook was in attendance as Clerk of the Council.

The Rt Hon Sir Clive Alderton (Principal Private Secretary to Their Majesties) was in attendance.

The Rt Hon Penelope Mordaunt MP had an audience of His Majesty before the Council.

Later the Rt Hon Rishi Sunak MP (Prime Minister and First Lord of the Treasury) had an audience of The King.

ST JAMES'S PALACE
December 13th
The Duke of Edinburgh, Colonel-in-Chief, this morning visited The Queen's Royal Hussars (The Queen's Own and Royal Irish) at the Regimental Headquarters, Assaye Barracks, Tidworth Garrison, Wiltshire.

The Duchess of Edinburgh this morning attended the retirement at Windsor Castle of the Royal National Lifeboat Institution lifeboat, *HM The Queen*, from Operational Service.

Her Royal Highness, Patron, this afternoon visited Disability Initiative, Resource Centre, Knoll Road, Camberley, and was received by His Majesty's Lord-Lieutenant of Surrey (Mr Michael More-Molyneux).

ST JAMES'S PALACE
December 13th
The Princess Royal, Patron, Catch22, this morning visited Include London at 191 Freston Road, London W10, and was received by the Earl Cadogan (Deputy Lieutenant of Greater London).

Her Royal Highness, President, Racing Welfare, today attended a Beneficiaries' Christmas Luncheon at Epsom Racecourse and was received by Mr Peter Lee (Deputy Lieutenant of Surrey).

The Princess Royal this afternoon received Captain Marcus Hember RN upon relinquishing his appointment as Commanding Officer, HMS *Albion*.

Her Royal Highness, Chancellor, University of London, this evening attended a Dinner at Mansion House, London EC4, to mark the Two Hundredth Anniversary of Birkbeck.

KENSINGTON PALACE
December 13th
The Duke and Duchess of Gloucester this evening attended the Presentation of the "Story of Christmas" at St George's Church, Hanover Square, London W1.

Today's birthdays

Mr Peter Jones, Director, Goodwood Racecourse, 2008-18; Chairman, Horserace Totalisator Board (the Tote), 1997-2007, is 81; **Lord McAvoy**, 80; **Sir Antony Beevor**, military historian and author, 77; **Mr Stan Smith**, former tennis player; Wimbledon Men's Singles Champion, 1972, 77; **Lord Stewart**, a former Senator of the College of Justice in Scotland, 77; **Mr Phil Orr**, former Ireland and Lions rugby international, 73; **Mr Chris Waddle**, former England football international, 63; **Mr Yotam Ottolenghi**, chef, restaurateur and food writer, 55; **Mr Stuart Pringle**, Secretary, British Racing Drivers' Club, 2007-15, 52; **Miss Miranda Hart**, actress, comedian and writer, 51; **Mr Ben Kay**, former England and Lions rugby union international, 48; **Mr Jamie Peacock**, former England and Great Britain rugby league international, 46; **Mr Michael Owen**, former England football international; now commentator and racehorse breeder/owner, 44; and **Mr Matthew Ball**, Principal Dancer, Royal Ballet, 30.

Today is the anniversary of the death of the Prince Consort in 1861.

Forthcoming marriage

Mr S.P.J. Palmer and Miss S.L. Wimble
The engagement is announced between Shamus, middle son of Mr and Mrs David Palmer, and Sophie, daughter of Mr and Mrs Andrew Wimble.
Online ref: W0018895

Other notice

Chester Business Club
The Bishop of Chester and Mrs Tucker were the hosts at a Christmas reception held by Chester Business Club yesterday evening at Bishop's House, Chester. Ms Jan Chillery, Chairman, welcomed the guests and presented the Bishop with a donation in aid of the Cathedral Choir.

Dinner

Armed Forces Parliamentary Trust
The Armed Forces Parliamentary Trust held its annual Armed Forces Parliamentary Scheme Graduation Dinner last night at the Army and Navy Club. Mr James Gray, MP, Chairman, presided. Thirty MPs and six Peers received their graduation certificates.

Vice-Adml Martin Connell, Second Sea Lord, Maj Gen the Rt Hon The Lord Lancaster of Kimbolton, Director Reserves, and AVM Tim Jones, Assistant Chief of the Air Staff, were among others present.

Clergy appointments

Revv Shirley Hebden, distinctive dn, Beeford with Frodingham and Foston, and Brandesburton and Leven (York), to be p-in-c (hfd), Beeford with Frodingham and Foston (same dio); Mark Griffin, r, St Martin and St Paul, Canterbury (Canterbury), to be p-in-c, Beeley and Edensor (Derby); Stewart Carolan-Evans, ap, Bewsborough (Canterbury), to be r, St John, Burlington (Niagara).

Bridge news

Once again Baron Kalms of Edgware kindly sponsored the annual Lords v Commons Bridge match, **writes Julian Pottage, Bridge Correspondent**.

After 18 of the scheduled 24 boards the Commons was ahead by 4 IMPs (international match points). There was then a vote in the Commons, which several players needed to attend. Initial indications were that this would result in a delay of only 20 minutes but subsequent information was that the voting would last an hour, with the consequence that the Lords won the match on a walkover.

Sally Brock adjudged Richard Cumming-Price as the winner of the Anthony Berry Award for the best bid hand because his choice of opening bid enabled the partnership to bid a making slam not found at other tables.

ONE HUNDRED YEARS AGO

The Daily Telegraph

LONDON, FRIDAY DECEMBER 14, 1923

GOVERNMENT AND FOOT-AND-MOUTH DISEASE

£1,500,000 COMPENSATION

The steps being taken by the Government to deal with the present outbreak of foot-and-mouth disease were, explained, by the Minister for Agriculture, Sir Robert Sanders, at a meeting of the Council of Agriculture for England held yesterday at Middlesex Guildhall under the chairmanship of Sir Douglas Newton, The Ministry, he said, were prepared to adhere to the policy of slaughter and to pay by way of compensation at least £1,500,000; they were expediting the slaughter in the badly-affected areas of Shropshire and Cheshire; and were consulting the highest medical authority on the matter of investigation and research.

The subject was raised on a resolution moved by Mrs. Hugh Middleton (Northumberland), asking that the policy of slaughtering infected animals should be discontinued in favour of isolation, and that no further compensation be paid.

The following important statement by Sir William Joynson-Hicks, Minister of Health, on the subject of the disease as affecting man was issued last night:

Having regard to the recent statement of the President of the Royal Society of Medicine that doctors were willing to co-operate with the veterinary profession in the prevention and cure of animal diseases, and in view of the suspicion that foot-and-mouth disease may extend from animals to man, I have inquired into the present position, I find that while there is evidence that the disease can be communicated from animals to man, mainly through the secretions from the mouth of the infected animals to the dairyman, cowkeeper, or other persons in very close contact with them, the occurrence of such eases is rare, the illness has been very mild, and in this country there is no instance of death having resulted.

ISOLATION ADVOCATED

In introducing her motion at the meeting of the Council of Agriculture, Mrs. MIDDLETON said they were all full of gratitude for what the Ministry had endeavoured to do, but the machinery did not work. There had been a very valuable report by a Departmental Committee, but Apparently nobody was following anti that Committee's instructions. Very great stress was laid on the proper disinfection of weighbridges, railway docks, trucks, and so on, but it was not carried out. At the present time the disease existed on 978 premises, and since August and Dec. 11 Cattle 32,132, Sheep 15,443, Pigs 17,769 had been slaughtered. In compensation £950,009 had been paid, and the estimated receipts from salvage were £200,000, leaving £750,000 net compensation. In addition, there were many indirect expenses. It had been worked out carefully, for instance, that the exact cost of exporting cattle from Dublin to England via Glasgow was £4 17a a head, and this charge was eventually paid by the consumer. Far more important than the money aspect was the fact that our very valuable live stock was being depleted, and cattle was becoming scarcer and scarcer.

Mrs. Middleton complained of the utter brutality of the slaughter, and declared that the hides of slaughtered animals were sometimes left lying about for a long time. She strongly advocated the policy of isolation, and, with the cessation of slaughter, the stoppage of compensation. It was her considered opinion, she said, that the high rate of valuation placed upon slaughtered stock did not conduce to exceptional precautions being taken against infection.

MINISTER'S PROTEST.

Sir ROBERT SANDERS (Minister for Agriculture) said he could not let Mrs. Middleton's statements go by without a word of protest. He was informed there were no grounds whatever for allegations of cruelty in the slaughtering; in most cases the humane killer was used, and in all cases every precaution was taken to see that there should be no cruelty at all.

With regard to disinfection and the burying of the hides, his information was exactly the opposite to what had been stated. Compensation was left in the hands of expert valuers, and he had quite as many complaints that the compensation was too small as he had that it was too big. The experience of those who bad tried it was that isolation on a big scale broke down. They could isolate a pedigree herd, because the people who kept pedigree herds generally had the very best equipment and a fairly ample staff of men; but to isolate in every case with an enormous number of outbreaks was quite impossible. In the countries where it had been tried the result was that, instead of spasmodic outbreaks, the disease became permanent and irremediable.

The alternative was not between slaughter and isolation, but between slaughter and "letting the thing rip." It would mean the practical extinction of our export trade in cattle. In England, up to March last, the cost had been just under £1,000,000 in thirty-one years, whereas the annual loss to farmers in Holland, where they had tried isolation and found it a failure, was £2,500,000. In France in one year they had lost £5,000,000, and in the United States they had a bad outbreak in 1916, and spent £1,500,000 and succeeded in clearing the country of it.

An amendment moved by Sir MEYRICK BURRELL urged the Ministry to continue the policy of slaughter until advised otherwise by veterinary authorities.

Mr. HARRY GERMAN (president of the National Farmers' Union), seconding, said it was ridiculous to talk about "wholesale slaughter" when the 32,000 cattle mentioned by Mrs. Middleton represented only 0.45 per cent, of the total cattle in the country, the 15,000 sheep only 0.07 per cent., and the 17,600 pigs only 0.63 per cent.

Mrs. Middleton's motion was heavily defeated, and Sir Meyrick Burrell's amendment was carried.

Bridge Hand

Home run for Byrne

By **Tom Townsend**

Dealer South
Vulnerability North-South

North: ♠ J 2 ♥ 5 3 ♦ K J 8 6 ♣ A 6 5 4 3

West: ♠ 7 3 ♥ K J 9 7 6 ♦ A 2 ♣ K 10 8 7

East: ♠ Q 10 8 5 ♥ 8 4 ♦ 10 7 5 4 3 ♣ Q 2

South: ♠ A K 9 6 4 ♥ A Q 10 2 ♦ Q 9 ♣ J 9

West	North	East	South
			1NT(1)
2♦(2)	dble(3)	pass	pass
2♥	3♣(4)	pass	3NT
pass	pass	pass	

(1) Strong no-trump, 15-17
(2) Hearts or spades
(3) General values
(4) Should pass it round to South

Contract 3NT by South
Opening Lead ♥6

FROM the Soloway Knockout Teams in Atlanta. Knottenbelt (England and Zia) played Bremark (Sweden and Portugal) in the round-of-16. The other surviving team with British players was Connie Goldberg's, containing Simon Cope and Thomas Paske. They took on the mighty Zimmermann.

My own team, Dyson, lost to Amoils the day before. The Coca-Cola museum awaited, with the Blue Ribbon Pairs to follow. One great thing about North American bridge is that there is always a strong national event to play in, even if you get knocked out from time to time. For non-expert players, there's an equally good Flight B scene.

North-South were Maggie Knottenbelt and Michael Byrne. East-West were Lars Bremark and Simon Hult. Byrne's bid of 1NT, with 5-4 in the majors, may not win widespread theoretical approval, but was a sound practical choice.

South's problem was the likely uncontested sequence 1♠-1NT-2♥. Responder might pass this with 3NT on. Alternatively, he might give preference to 2♠. Then does opener push on to 2NT? That's quite a lot with 16 points. At this stage, he might be wishing he'd opened 1NT for starters.

Byrne got the ♥6 lead to 3NT, and played the ♦Q to West's ♦A. He put the ♦K on the safe ♦2 return, advanced the ♠J from dummy, and let East hold the ♠Q. Michael ducked the heart return, and got a spade back from Hult (club or heart was more challenging, but how could he tell South's distribution?). This made it easy-peasy. Byrne showed his hand, claiming at least the contract. If the ♦10 happened to fall, not that he expected it, he would have scored up an overtrick.

West in the replay was Stefano Tommasini, partnering Ben Norton. Stefano bid 1♥ over South's strong club, and found himself on lead to 3NT. Since his hearts had gone unsupported, he tried a club lead instead. This made defending very easy. Norton scored the ♣Q at trick one, and fired through a heart. That put down two in the picture, but down one was quite enough. The swing was 12 IMPs to Knottenbelt.

Table One 3NT made, N/S +600
Table Two 3NT off one, N/S -100

Chess

A Royal favour

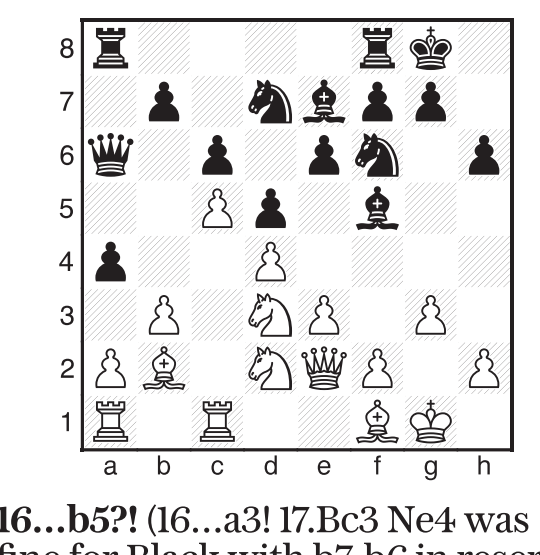
By **Malcolm Pein**

ENGLISH chess prodigy Shreyas Royal did Michael Adams a favour and took a huge step towards scoring a GM result, as he stunned French international Jules Moussard in the eighth and penultimate round of the 13th London Chess Classic. As D Gukesh was held to a draw by Amin Tabatabaei, Adams took a half-point lead into the final game after a solid draw with white against Luke McShane. Scores: Adams 5.5/8; Tabatabaei & Gukesh 5; Volokitin 4.5; Bartel 4; Niemann, Royal, Moussard 3.5; Vitiugov 3; McShane 2.5.

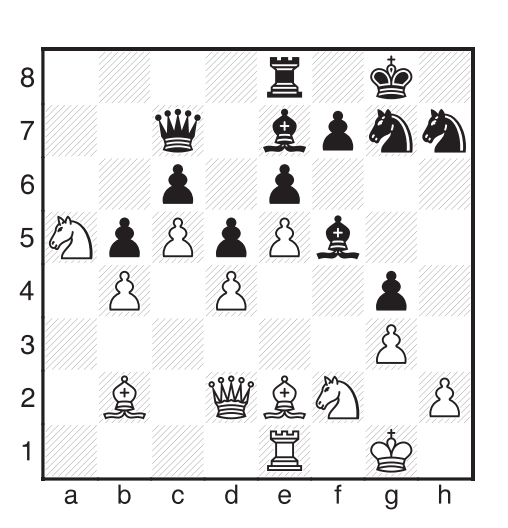
For today's puzzle, see if you can find Royal's clever move that started to turn the tide in his favour; see right, Moussard – Royal after **41.Ke3-d3?**.

J Moussard – S Royal
Reti Opening

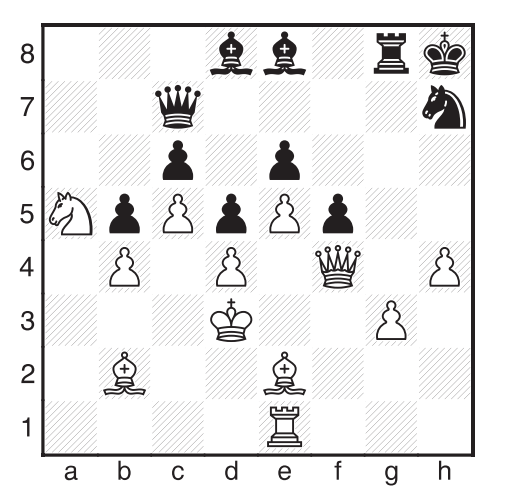
1.Nf3 d5 2.g3 Nd7 3.d4 Nb6 4.Bg2 Bf5 5.b3 e6 6.0–0 h6 7.c4 c6 8.Nbd2 Nf6 9.Bb2 Be7 10.e3 0–0 11.Qe2 a5 12.Ne5 Nbd7 13.Nd3 a4 14.Rfc1 Qb6 15.c5 Qa6 16.Bf1



16…b5?! (16…a3! 17.Bc3 Ne4 was fine for Black with b7-b6 in reserve) **17.f3 axb3 18.axb3 Qb7 19.e4 Bh7 20.e5 Ne8 21.Rxa8 Qxa8 22.Ra1 Qb7 23.b4 g5 24.Nb3 Ng7 25.Na5 Qc7 26.Nf2 h5 27.Re1 Re8 28.Qd2 Nf8 29.Nh3 g4 30.fxg4 hxg4 31.Nf2 Bf5 32.Be2 Nh7**



33.Nxg4 Bg6 34.Qf4 Nf5 35.h4 Kh8 36.Ne3 Nxe3 37.Qxe3 f5 38.Qf4 Rg8 39.Kf2 Be8 40.Ke3 Bd8 41.Kd3?



Answer:
41…Nf6! 42.Rg1 (If 42.exf6 Rxg3+ wins. If 42.Qh6+ Qh7 43.Qxh7+ Nxh7= g3 falls) **42…Ne4 43.Kc2?! Qh7! 44.Kb3? Bxh4 45.Bc3 Nxg3 46.Bf3 Rg6 47.Rg2 Qh6! 48.Bd2? Bg5 49.Qxg3 Bxd2 50.Qh2 Rxg2 51.Qxh6+ Bxh6 52.Bxg2 Bd2 53.Bf1 Kg7 54.Nb7 Kg6 55.Kc2 Bxb4 56.Kd3 Be1 57.Be2 Bf2 58.Bd1 Kg5 59.Be2 Bg1 60.Bd1 Kh4 61.Be2 f4 62.Nd8 Bd7 63.Nf7 b4 64.Bd1 Be8 65.Nd8 Bg6+ 66.Kd2 Bxd4 67.Nxe6 Bc3+ 68.Kc1 Bxe5 0–1**

Announcements

Email: announcements.ads@telegraph.co.uk **Book online:** announcements.telegraph.co.uk

Deaths

BERTIN.—Christine Mary (née Grayrigge). On November 23rd aged 84. Wife of Ronald (deceased). Mother of Louise, Ben, Alex and Tom. Grandmother of Michael, Rebecca, Fenn, Evie, Gray, Endeavour and Evelyn. Funeral private.
Online Ref: W0018726

BRADLEY.—Judith Elizabeth died peacefully on 30th November 2023. Much loved and sadly missed by her family and friends. The Funeral will take place at St Leonard's Church, Priors Marston on Friday 5th January 2024 at 11.30 a.m. No flowers, but donations if desired to the Injured Jockeys Fund or The Bob Champion Cancer Trust. Enquiries to John White Independent Family Funeral Directors, Towcester. Tel: 01327 359266.
Online Ref: W0018917

BROWN.—George Henry (formerly of Cowes) on 9th December, aged 87. Private family funeral. A celebration of his life will be held next year.
Online Ref: W0019026

CARPENTER.—Rosemary Elisabeth, died peacefully on 25th November, aged 92. Beloved wife, stepmother and stepgrandmother, she will be sadly missed. Funeral Service to be held at St John the Evangelist, Bovey Tracey on Tuesday 19th December at 2 p.m.
Online Ref: W0018987

COWEN.—Heather Cowen passed away peacefully on 29th November 2023. She will be greatly missed by her friends and family. Funeral will be held at GreenAcres Chiltern, Potkiln Lane, Jordans, Beaconsfield, Buckinghamshire HP9 2XB on 20th December at 11 a.m.
Online Ref: W0018966

DAVEY.—Richard John Chatterton died aged 82 on 29th November following an operation. A dear husband to Helen, father to Sarah, Katharine and Georgina, and grandfather to six. May he rest in peace. Funeral at 12.40 p.m. on 18th December at Barham Crematorium, Kent.
Online Ref: W0019012

FRASER.—Viola 'Vee' Fraser (née Fuller), sadly died on Thursday 7th December 2023 aged 96. Devoted wife to the late Ian Fraser, she will be greatly missed by her family, David, Amanda, Katie and Patrick. A Thanksgiving Service will take place on 19th January 2024 at 12.30 p.m., St Andrew's Church, Donhead St Andrew, SP7 9EB. No flowers please.
Online Ref: W0019024

GEMMELL.—John Grigor, of Solihull on 4th December 2023, aged 69. Beloved son, brother, husband, father and grandfather. Funeral on 28th December at 11.30 a.m. at Robin Hood Crematorium, Solihull. All enquiries to Bastock and Bruce. Tel: 01564 335577.
Online Ref: W0018990

GUISELEY.—On December 1st 2023, at home Doris Edith (née Vaughan-Bentley) aged 96. Dearly loved wife of the late Eric, loved and loving mother of Eden, and mother-in-law of Janet. Sometime of Guiseley, Southport and latterly Harrogate. Funeral private.
Online Ref: W0018965

KERR.—Richard Buchanan died unexpectedly but peacefully on 8th December 2023. Adored husband of Charlotte and dog father to his beloved Welsh Terriers; Chester, Buddy and Dodger. A humble but talented and much respected songwriter, his music will be his lasting legacy.
Online Ref: W0018963

LUCE.—Rose died peacefully on 8th December aged 86. Wife of Richard, mother of Alexander and Edward, grandmother of Mimi. Funeral and Thanksgiving at St Mary Magdalene, Bolney, RH17 5QR at 12.30 p.m. on Friday 19th January. No flowers. For those wishing to attend please contact sharon@swanva.co.uk or Freeman Brothers, 126 High Street, Hurstpierpoint, BN6 9PX. Telephone: 01273 831497.
Online Ref: W0019015

NICHOLS.—Audrey of Thropton, peacefully at home on 6th December aged 97 years. Much loved and loving wife of the late Ted. A loving mum, gran and friend who will be sadly missed. A long life well lived. Friends, please meet for Funeral Service at West Road Crematorium on Thursday 21st December at 12.45 p.m. Family flowers only. Donations in lieu to Cancer Research UK. A donation box will be available at the service. All welcome following the service to the family home for refreshments.
Online Ref: W0018996

ORFEUR.—Bridget (née Burrows) died peacefully on 2nd December 2023, aged 90 years. Cherished wife of the late Bernard, loving and dearly loved mother of Peter and Caroline, proud grandmother of Hannah, Christopher, Lois and Charlotte, and great grandmother of Max. Private family funeral. A service to commemorate Bridget's life will be held in Pitney, Somerset in May 2024. For further information please contact Caroline by email: theorfeurs@gmail.com Donations, if desired, to Dementia UK.
Online Ref: W0018896

RAWLL.—Major Peter Leslie RM (Retd). Beloved husband of Cicely and wonderful father to Andrew and Katie, died peacefully on 5th December 2023 aged 96. Private Funeral at Coney Hill Crematorium, Gloucester GL4 4PA on Monday 18th December 2023 at 2.30 p.m. Thanksgiving Service at St Cyr's Church, Stonehouse GL10 3QP on Friday 2nd February 2024 at 2 p.m. thanksgiving@rawll.com
Online Ref: W0019001

WARING.—(née Fogg). Joy Millicent Charlotte Latham peacefully passed away on November 22nd 2023, aged 104. Beloved mother of Caroline and Grant and GranGran to her grandchildren and great grandchildren. Latterly resident in Peterborough, previously of Girton, Cambridgeshire and Horsford and Reepham in Norfolk. Vice President of The Military Heraldry Society and indexer for London and Belfast Gazette for over 25 years. A Service of Thanksgiving will take place on Monday January 15th 2024 at 11 a.m. at All Saints Church, Horsford, Norwich, NR10 3DB. There will be an informal reception after the service. Donations, if desired, may be made payable to 'Calibre Audio' and 'Cam Sight' sent c/o Jerry March Funeral Services, 28 Holt Road, Horsford, Norwich, NR10 3DD or online via the donations page at www.jerrymarchfuneralservices.co.uk
Online Ref: W0018977

Memorial services

ARNOLD.—Sir Thomas Arnold. A Memorial Service will be held on January 31st at 11 a.m. at St Etheldreda's, Ely Place, London EC1N 6RY.
Online Ref: W0019002

Personal

Text for the day

BUT ALL who find safety in you will rejoice; they can always sing for joy. Protect those who love you; because of you they are truly happy.
Psalm 5.11 (GNB)

General personal

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Public notices

THE H2TEESSIDE PROJECT
The Planning Act 2008 - Section 48
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 - Regulation 4
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 - Regulation 13
NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), who registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application to the Secretary of State (the 'SoS') for Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Proposed Application Site boundary following further design development and technical assessments and responses to the first consultation.
4. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

5. The Site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   - Mid-point - 454719 524286
   - North - 451309 526476
   - East - 458760 521587
   - South - 457001 520748
   - West - 446938 521613
6. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
7. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of gas to the hydrogen production plant;
   c. an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   g. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   h. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
8. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
9. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

10. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the Proposed Application.
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Consultation Documents

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16. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
17. Digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 23 January 2024:

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18. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**
Post: **Freepost H2TEESSIDE**
Telephone: **Freephone 0800 080 3028**
Project Website: **www.h2teesside.co.uk**

19. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
20. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**. Responses received after this date may not be considered.
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H2 Teesside Limited
14 December 2023

THE GAZETTE
LONDON GAZETTE

CONTAINING ALL NOTICES PUBLISHED ONLINE ON 14 DECEMBER 2023

PRINTED ON 15 DECEMBER 2023 | NUMBER 64257
PUBLISHED BY AUTHORITY | ESTABLISHED 1665
WWW.THEGAZETTE.CO.UK

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ENVIRONMENT & INFRASTRUCTURE

ENVIRONMENTAL PROTECTION

DEPARTMENT FOR ENERGY SECURITY AND NET ZERO
SLOUGH MULTIFUEL EXTENSION PROJECT
THE PLANNING ACT 2008 AND THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017
NOTICE OF A DECISION ON AN APPLICATION FOR AN ORDER GRANTING DEVELOPMENT CONSENT FOR EIA DEVELOPMENT

The Secretary of State for Energy Security and Net Zero ("the Secretary of State") gives notice under regulation 31(2) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 that a determination has been made on an application made by SSE Slough Multifuel Limited ("the Applicant") for development consent under the Planning Act 2008 ("the 2008 Act") for development that constitutes "Environmental Impact Assessment development" as defined in the 2017 Regulations.

The application is to increase the efficiency and output of a previously consented energy from waste electricity generating station located in Slough, Berkshire from up to 50 megawatts to up to 60MW. The Secretary of State has decided, following consideration of the report of the Examining Authority who conducted an examination into the application, that development consent should be granted for the proposed Development.

The statement of reasons for deciding to make an Order granting development consent, which has been prepared by the Secretary of State under section 116 of the 2008 Act and regulation 31(2) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, containing the content of the decision, the requirements imposed in connection with the development, the main reasons and considerations on which the decision is based including relevant information about the participation of the public, a description of the main features to avoid, reduce and offset any major adverse effects of the development, is published on the Planning Inspectorate's website:
https://infrastructure.planninginspectorate.gov.uk/projects/south-east/slough-multifuel-project/.

The statement of reasons contains the information required by regulation 30(2) including information regarding the right to challenge the decision and the procedures for doing so.

Hard copies of the decision documentation will also be available to inspect at the Planning Inspectorate's offices (by appointment using the contact details below):

The Planning Inspectorate, National Infrastructure Directorate, Temple Quay House, Bristol BS1 6PN.

To make an appointment for inspection of the documents contact the Planning Inspectorate on 0303 444 5000 or email NIEnquiries@planninginspectorate.gov.uk.

Copies of the Secretary of State's decision letter and the text of the Order can be obtained by writing or sending an e-mail to the Planning Inspectorate. No charge will be made for this service. (4512027)

THE H2TEESSIDE PROJECT
THE PLANNING ACT 2008 – SECTION 48
THE INFRASTRUCTURE PLANNING (APPLICATIONS: PRESCRIBED FORMS AND PROCEDURE) REGULATIONS 2008 – REGULATION 4
THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 – REGULATION 13
NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT
The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), who registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application to the Secretary of State (the 'SoS') for Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').

2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.

3. The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Proposed Application Site boundary following further design development and technical assessments and responses to the first consultation.

4. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

5. The Site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

- Mid-point – 454719 524286
- North – 451309 526476
- East – 458760 521587
- South – 457001 520748
- West – 446938 521613

6. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.

7. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:

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e. water supply and treatment and wastewater infrastructure;

f. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;

g. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;

h. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

8. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located

within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

9. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

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16. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

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How to respond to this notice

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H2 Teesside Limited

13 December 2023 (4509361)

Planning

TOWN PLANNING

DEPARTMENT FOR TRANSPORT
TOWN AND COUNTRY PLANNING ACT 1990

The Secretary of State gives notice of an Order made under Section 247 of the above Act entitled "The Stopping up of Highways (West Midlands) (No.34) Order 2023" authorising the stopping up of two part-widths of Queen Victoria Road, at Coventry in the City of Coventry. This is to enable development as permitted by Coventry City Council, under reference OUT/2020/2876.

Copies of the Order may be obtained, free of charge, from the Secretary of State, National Transport Casework Team, Tyneside House, Skinnerburn Road, Newcastle Business Park, Newcastle upon Tyne NE4 7AR or nationalcasework@dft.gov.uk (quoting NATTRAN/WM/S247/5258). They may also be inspected during normal opening hours at Coventry City Council, The Council House, Coventry CV1 5RR.

Any person who wishes to challenge the validity of the decision to make the Order may apply to the High Court within 6 weeks from 14 December 2023.

N Crass, Casework Manager (4512025)

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TOWN AND COUNTRY PLANNING ACT 1990

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Lloyd's List

Daily Briefing

Leading maritime commerce since 1734

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Consolidation in dry bulk shipping is easier said than done, says Pappas

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Forwarders betting on freight rates remaining low

Suez Canal extends rebates

Fun times ahead for Scorpio's shareholders, Jefferies say

IN OTHER NEWS:
EU emissions trading to impact 37% of boxship fleet

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Swedish Club gives further details of 2024 renewal pricing

COP28: Agreement reached to transition away from fossil fuels

X-Press Feeders to ply biomethanol boxship vessel in Northern Europe

Shipping will 'get there by 2050', industry heavyweights tell Lloyd's List Outlook Forum



SHIPPING WILL MANAGE to meet the International Maritime Organization's goal of net zero emissions sometime around mid-century, an industry audience was told in London this morning.

However, progress is likely to be uneven and developments in world politics will likely make progress more complicated than otherwise, a heavyweight panel argued.

BIMCO president and Reederei F Laeisz chief executive Nikolaus Schües, Shell decarbonisation manager Alexandra Ebbinghaus, Cargill Ocean Transportation global operations director Eman Abdalla and Citi's shipping and logistic chair Michael Parker, who also chairs the Poseidon Principles, were speaking at a Shipping Outlook Forum organised by Lloyd's List Intelligence.

The first question the panel was asked was what was keeping them awake at night. Abdalla highlighted a continually accelerating situation in world politics, with tension seen particularly in the Middle East and the Russia/Ukraine conflict.

This will have implications for global trade, decarbonisation and safety, and is undermining progress on various fronts.

Ebbinghaus agreed from an environmental point of view, highlighting the possibility that COP28 in Dubai will end without meaningful agreement. In addition to climate change, the planet has boundaries for things such as pollution and water supply.



THE H2TEESSIDE PROJECT

The Planning Act 2008 – Section 48

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13

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The Application

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Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

19. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

20. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**. Responses received after this date may not be considered.

21. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited

13 December 2023

FISHING NEWS

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NEW REVELATIONS ON ROCKALL ROW

SEE PAGE 2

Crew visa salary hike ‘absolutely devastating’

‘EVERYONE IS IN SHOCK’ following the home secretary’s announcement last week of a 50% rise in the skilled worker visa salary threshold, says Clyde Fishermen’s Association secretary Elaine Whyte.

Speaking ahead of a meeting with UK government officials to obtain more details on the terms and conditions of the new rules, she said it would be ‘really devastating’ for areas like the west of Scotland if there were no alternatives for the fishing industry.

Vessel owners had invested in sponsorship licences, and were now faced with the prospect of additional costs from next spring that they would be unable to meet. “People are heavily invested in something that’s effectively going to last only a few months,” she said.

“I appreciate the issues with immigration, but I don’t think measures should affect migrant workers who are coming in supporting food production and essential services.



Elaine Whyte.

“On top of the issues with the MCA, it almost feels like it’s getting quite impossible to operate inshore boats.”

She said she understood the rationale about training up local people, but many of the affected areas are suffering rural depopulation, and there are not the people there to train.

“We can’t magic people out of the sky. In Kintyre you’re not going to suddenly get a huge workforce regardless of what you pay.

“I’m the first person to advocate different wages for anybody who’s working a decent shift, that’s fair, but I also think if you are basing what’s a basic wage in London and extending that to somewhere like Kintyre or Skye or Orkney, it’s not almost £40,000 – that’s way beyond average for those areas.

“These changes are absolutely devastating.”

Full story on page 3

9 770015 303212 50

Sea trials for new Genesis



The new 14.99m vivier crabber Genesis H 37 heading out from Whitby at daybreak last Wednesday for sea trials. Built by Parkol Marine Engineering for Genesis Fishing Ltd, the new vessel will be skippered by George Robson. With her crew and gear now aboard, final touches were being made to the fit-out last week. A full feature on the new Genesis will appear in *Fishing News* soon. *(Photo: Paul Armstrong/The Artistic Lens)*



THE H2TEESSIDE PROJECT | THE PLANNING ACT 2008 – SECTION 48
THE INFRASTRUCTURE PLANNING (APPLICATIONS: PRESCRIBED FORMS AND PROCEDURE) REGULATIONS 2008 – REGULATION 4
THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 – REGULATION 13

NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), who registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application to the Secretary of State (the 'SoS') for Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Proposed Application Site boundary following further design development and technical assessments and responses to the first consultation.
4. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

5. The Site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   - Mid-point – 454719 524286
   - North – 451309 526476
   - East – 458760 521587
   - South – 457001 520748
   - West – 446938 521613
6. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
7. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of gas to the hydrogen production plant;
   c. an air separation unit or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   g. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   h. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
8. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
9. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

10. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the Proposed Application.
11. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS'). The PEIR reflects the Project Site boundary (and the proposals within that wider boundary) as it stood at the first consultation.
12. A H2Teesside Project Update Brochure forms part of the Consultation Documents includes information on whether or not the conclusions of the PEIR are affected by the changes to the Project that are the subject of this second consultation.

Consultation Documents

13. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
14. The second consultation on the Proposed Application will take place between the **13 December 2023 and 23 January 2024**.
15. The Consultation Documents to this second consultation comprise the H2Teesside Project Update Brochure and plans and maps showing the proposed changes to the Project Site boundary. The PEIR, a Non-Technical Summary of the PEIR, the Consultation Brochure and Consultation Leaflet for the first consultation are also available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 23 January 2024.
16. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
17. Digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 23 January 2024:

How to respond to this notice

Inspection Location	**Opening Times** (subject to opening hours over the Christmas holiday period)
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
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18. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net

Post: Freepost H2TEESSIDE

Telephone: Freephone 0800 080 3028

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H2 Teesside Limited

13 December 2023

The Northern Echo

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PAGE 46



NEWCASTLE OUT OF EUROPE AFTER AGONISING NIGHT

PAGE 21

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INSIDE



WHICH IS THE BEST PANTO?

Jobs secured in SeAH contract



'Largest ever deal' at Teesworks firm

SEAH Wind has signed its largest ever contract - securing well over 700 jobs at its Teesworks site.

The contract with Vattenfall to supply all the wind turbine monopiles for its Norfolk Vanguard Project, positions SeAH Wind as the UK's leading Foundation Manufacturer and ensures that the UK is at the forefront of developing offshore wind globally.

By Mike Hughes

SeAH says it can now plan and grow the business with order security from 2025 until the end of 2027. Production is due to start in 2026, and continue until the end of 2027, utilising the Teesworks heavy duty quay for both incoming raw materials, and outbound monopiles, which will range from 10-11 meters in diameter, weighing between 1,600 and 2,250 tons each, and varying in length from 70 95 meters.

Minister for Investment Lord Johnson said: "I'm delighted that SeAH Wind has increased its investment to £650 million to build a state-of-the-art manufacturing facility in Teesside.

FULL STORY PAGE 4

PAGE 16



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THE H2TEESSIDE PROJECT
The Planning Act 2008 – Section 48
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13
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Project Website: **www.h2teesside.co.uk**

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H2 Teesside Limited
13 December 2023

TRAFFIC & Roads

national highways

ROAD TRAFFIC REGULATION ACT 1984 - SECTION 14(1)(a)
THE A19 TRUNK ROAD (HOWDON INTERCHANGE TO FISHER LANE) (TEMPORARY PROHIBITION OF TRAFFIC) ORDER 2023

NOTICE IS HEREBY GIVEN that National Highways Limited (Company No. 09346363) has made an Order on the A19 Trunk Road, in the Counties of Northumberland, North Tyneside and Tyne and Wear, to enable maintenance and improvement works, to be carried out in safety.

The works are expected to take place overnight between 8pm and 6am during a period starting on 1 January 2024 and ending on 23 December 2024.

The effect of the Order will be to impose prohibitions on the following lengths of carriageway:

(i) the A19 Trunk Road, in both directions, between Howdon Interchange and Fisher Lane;
(ii) all slip roads leading to and from the lengths of carriageway described above; and
(iii) all lay-bys, adjacent to the lengths of carriageway as described in (i).

During any road closures traffic will be diverted via alternative junctions of the A19 Trunk Road and local roads. These diversions will be clearly indicated by traffic signs throughout the area.

To obtain a copy of the A19 Programme of Works please contact the National Highways Customer Contact Centre on 0300 123 5000 or info@nationalhighways.co.uk.

The duration of each prohibition will vary depending upon the nature of the work being undertaken on each occasion and access will be maintained at all times to premises and properties which are accessible from, and only from, the A19.

The prohibitions will not apply to emergency services, works, or winter maintenance vehicles. The prohibitions will only apply during such times and to such extent as shall be indicated by traffic signs.

The Order comes into force on 31 December 2023 and will expire on 21 December 2024.

Richard Foxton, an official of National Highways Limited, 2 City Walk, Leeds LS11 9AR.

National Highways Limited, Bridge House, 1 Walnut Tree Close, Guildford, GU1 4LZ. Registered in England & Wales number 09346363.

national highways

ROAD TRAFFIC REGULATION ACT 1984 - SECTION 14
THE A1(M) MOTORWAY AND A168 TRUNK ROAD (DISHFORTH) (TEMPORARY PROHIBITION OF TRAFFIC)

NOTICE IS HEREBY GIVEN that National Highways Limited intends to make an Order on the A1(M) Motorway and A168 Trunk Road, in the County of North Yorkshire, to enable resurfacing and road marking works to be carried out in safety.

The works are expected to start on Monday 8 January 2024 for 2 nights, or until completed, and will take place between 8pm and 6am.

The effect of the Order will be to close, at times during the works, the:

(i) A168 carriageway from its commencement at the northbound entry slip road at the A1M Junction 49 (Dishforth) to its junction with the Dishforth Interchange western dumbell roundabout, a distance, a distance of 670 metres;
(ii) A1(M) northbound entry slip road at Junction 49; and
(iii) A1(M) southbound exit slip road at Junction 49.

During the closures suitably signed alternative routes will be available at all times.

Traffic signs will indicate the extent of the prohibitions (which will not apply to emergency service vehicles or vehicles being used in connection with the said works or for winter maintenance or traffic officer purposes). The Order comes into force on 7 January 2024 and has a maximum duration of eighteen months.

The contact for this scheme is Michael McCormack. For enquiries please contact the National Highways Customer Contact Centre on 03001235000 or info@nationahighways.co.uk

RICHARD FOXTON, National Highways, 2 City Walk, LEEDS, LS11 9AR.

TRAFFIC & Roads

national highways

ROAD TRAFFIC REGULATION ACT 1984 - SECTION 14(1)(a) & 14(7)
THE A168, A19, A174, A1053, A66 TRUNK ROADS (TEMPORARY PROHIBITION OF TRAFFIC) ORDER 2023

NOTICE IS HEREBY GIVEN that National Highways Limited (Company No. 09346363) has made an Order on the A168, A19, A174, A1053, A66 Trunk Roads, in the Counties of North Yorkshire, Cleveland, County Durham and Tyne and Wear, to enable maintenance and improvement works, to be carried out in safety.

The works are expected to take place overnight between 8pm and 6am during a period starting on 2 January 2024 and ending on 21 December 2024.

The effect of the Order will be to impose prohibitions on the following lengths of carriageway:

(i) the A168, A19, A174, A1053, A66 Trunk Roads, in both directions, between Dishforth and Tyne Tunnel; and
(ii) all slip and link roads leading to and from the lengths of carriageway as described above in (i).

During any road closures traffic will be diverted via alternative junctions of the A168, A19, A174, A1053, A66 Trunk Roads and local roads. These diversions will be clearly indicated by traffic signs throughout the area.

To obtain a copy of the A168, A19, A174, A1053, A66 Programme of Works please contact the National Highways Customer Contact Centre on 0300 123 5000.

The duration of each prohibition will vary depending upon the nature of the work being undertaken on each occasion.

The prohibitions will not apply to emergency services, works, or winter maintenance vehicles. The prohibitions will only apply during such times and to such extent as shall be indicated by traffic signs.

The Order comes into force on 1 January 2024 and will expire on 21 December 2024.

Richard Foxton, an official of National Highways Limited, 2 City Walk, Leeds, LS11 9AR.

National Highways Limited, Bridge House, 1 Walnut Tree Close, Guildford, GU1 4LZ. Registered in England & Wales number 09346363.

national highways

ROAD TRAFFIC REGULATION ACT 1984 - SECTION 14(1)(a) & 14(7)
THE A66(M) MOTORWAY (BLACKWELL SPUR TO BLACKWELL ROUNDABOUT) (TEMPORARY PROHIBITION OF TRAFFIC)

NOTICE IS HEREBY GIVEN that National Highways Limited (Company No. 09346363) has made an Order on the A66(M) Motorway, in the Counties of North Yorkshire and County Durham, to enable maintenance and improvement works, to be carried out in safety.

The works are expected to take place overnight between 8pm and 6am during a period starting on 2 January 2024 and ending on 23 December 2024.

The effect of the Order will be to impose prohibitions on the A66(M), in both directions, between Blackwell Spur and Blackwell Roundabout.

During any road closures traffic will be diverted via alternative junctions of the A66(M) Motorway and local roads. These diversions will be clearly indicated by traffic signs throughout the area.

To obtain a copy of the A66(M) Programme of Works please contact the National Highways Customer Contact Centre on 0300 123 5000 or info@nationahighways.co.uk.

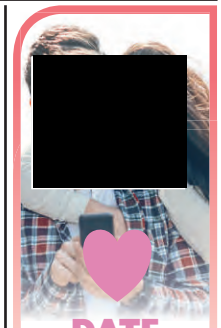
The duration of each prohibition will vary depending upon the nature of the work being undertaken on each occasion.

The prohibitions will not apply to emergency services, works, winter maintenance, or traffic officer vehicles. The prohibitions will only apply during such times and to such extent as shall be indicated by traffic signs.

The Order comes into force on 2 January 2024 and will expire on 23 December 2024.

RICHARD FOXTON, National Highways, 2 City Walk, LEEDS, LS11 9AR.

National Highways Limited, Bridge House, 1 Walnut Tree Close, Guildford, GU1 4LZ. Registered in England & Wales number 09346363.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The Northern Echo

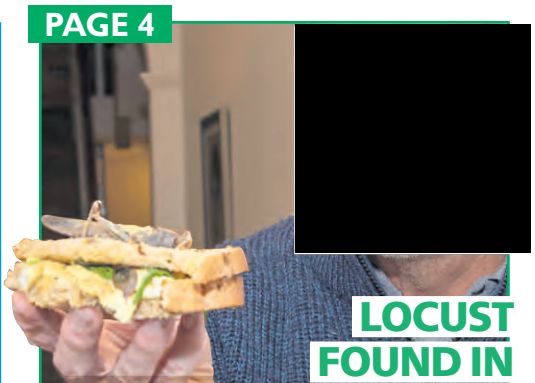
£1.10 | THE GREAT DAILY OF THE NORTH | THURSDAY, DECEMBER 21, 2023

PAGE 5



PANTO STARS SPREAD CHRISTMAS CHEER

PAGE 4



LOCUST FOUND IN SUPERMARKET SALAD

PAGE 6



WIN £100 TO SPEND ON FOOD SHOPPING

READER OFFER: 50% OFF THE NORTHERN ECHO & WIN £100 LOVE2SHOP VOUCHER PAGE 33

Bumper success for coats appeal

Thousands of donations from Echo readers help out struggling families

By Tom Burgess

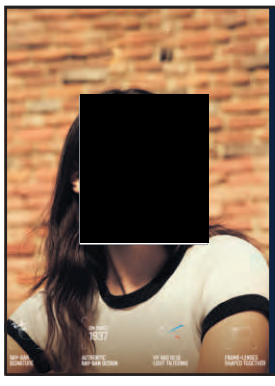
IT has been a bumper year for donations of clothes to Darlington Cares school uniform scheme as residents have responded in their masses to a campaign backed by The Northern Echo.

We launched our 'Coats for Christmas' campaign, which backs Darlington Cares' winter clothes appeal, at the start of December and since then a surge of donations have flooded in.

The shop, run by Darlington Cares and located in Queen Street Shopping Centre has seen an unprecedented demand for winter clothing as the cost of living crisis continues and families are struggling more than ever. 13,000 items have been donated and 12,337 pieces of clothing have been given out to 4,393 customers over the last 12 months.

FULL STORY - PAGE 3

The Northern Echo COATS FOR Christmas



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23rd to 26th Dec closed | 27
3rd Jan back to norm

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CHRISTMAS OPENING TIMES

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INSTANT CASH ON COLLECTION -
£150 minimum on any complete small vehicle,
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PRIVATE NUMBER PLATES REMOVED

CARS, COMMERCIAL VEHICLES, FARM MACHINERY, VANS, JEEPS, TRUCKS, ALSO MOTORHOMES AND MOTORBOATS. RUNNERS, NON RUNNERS, UNTAXED, DVLA NOTIFIED. SAME DAY COLLECTION. BEST PRICES PAID. LOST KEYS OR LOG BOOK? NO PROBLEM!! • FREE COLLECTION

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PLANNING

TOWN & COUNTRY PLANNING ACT 1990
PLANNING (LISTED BUILDINGS & CONSERVATION AREAS) ACT 1990

The following applications are required to be advertised under the above Acts:

1. Single storey rear extension. Internal alterations to attic, new flat roof dormer, 2 rooflights & increasing size of existing dormer. Demolition of existing garage & construction of 2 storey garage & garden room. 28 Albert Street Durham 23/02439
2. Change of use of storage shed to dwelling. Sparks Farm Wearhead 23/03651
3. Variation of Conditions 1 (approved plans), 2 (floorspace) & 8 (minimum retail floorspace) pursuant to planning permission 23/02838 (mixed use scheme). Land Rear Of Tindale Crossing Public House Stadium Way St Helen Auckland 23/03718
4. Reserved Matters for Cell C (22/03572). Land South Of A182 Cold Hesledon 23/03605
5. Single storey rear extension. 4 Back Mount Joy Durham 23/03526
6. 53 dwellings. Land North Of Redworth Business Park Redworth Road Shildon 23/03270
7. Change of use to dwelling & external alterations. 1 Lumsden Terrace Catchgate 23/03693
8. 2 dwellings. Land East Of Railway Villa Granville Avenue Annfield Plain 23/03715
9. Conversion to dwelling & parking. Hunstanworth Farm Hunstanworth 23/03725
10. Replace ground & 1st floor windows to front. 68 Hallgarth Street Durham 23/03641
11. 100 dwellings. Land West Of 20 Pont Road Leadgate 23/03633
12. 41 dwellings. Land South Of Broadway Avenue Salters Lane Trimdon 23/03533
13. Removal of 1 rack & the installation of cabinet within internal room. Vane Tempest Hall Maynards Row Gilesgate 23/03482 & 23/03483
14. Erection of detached dwelling & stable. Stables Tudhoe Village 23/02227
15. Concrete plant (retrospective) & construction & demolition washing plant. Aycliffe Quarry Aycliffe Village 23/03701
16. Change of use to hot food takeaway (across all 3 levels) & erection of flue to rear. Revised application to allow opening to midnight 7 days a week. 17 Seaside Lane Easington Colliery 23/03627
17. Renewal of below ground drainage system to the North Terrace of Durham Castle Palace Green Durham 23/03666 & 23/03667

View applications at www.durham.gov.uk/planning. Representations should be made by **11 January 2024** & will be recorded online. Signatures, phone numbers & e-mail addresses will be removed.

M Kelleher
Head of Planning & Housing
21 December 2023

TRAFFIC & Roads

NOTICE OF MAKING OF AN ORDER
HIGHWAYS ACT 1980
WILDLIFE AND COUNTRYSIDE ACT 1981
THE COUNTY COUNCIL OF DURHAM
(PUBLIC FOOTPATH NO.44 WOLSINGHAM PARISH)
PUBLIC PATH DIVERSION AND DEFINITIVE MAP AND STATEMENT MODIFICATION ORDER 2023

The above order, made on 13 December 2023, under section 119 of the Highways Act 1980, will **Divert Public Footpath No. 44 Wolsingham Parish** from a point south-south-east of the disused Thistlewood Quarry, proceeding in a generally north-north-westerly direction on the west side of a wall past the quarry to the junction with Public Footpath and Bridleway No. 43 **to a line running** north-east then north-north-westerly on the east side of the wall to the same point at the junction with the existing Public Footpath and Bridleway No.43 as shown on the order map. The above order will also modify the Definitive Map and Statement of the Public Rights of Way for County Durham by deleting and adding the footpath described.

A copy of the order and the order map have been placed and may be seen free of charge at Wolsingham library during normal opening hours and via the Council website.

Any representations about or objections to the order may be sent in writing addressed to Sharon Renwick, Legal Assistant, County Hall, Durham DH1 5UL or by email to Highways.orders@durham.gov.uk (ref: 4309432) not later than 18 January 2024. Please state the grounds on which they are made.

If no such representations or objections are duly made, or if any so made are withdrawn, the County Council of Durham may confirm the order as an unopposed order. If the order is sent to the Secretary of State for the Environment for confirmation any representations or objections which have not been withdrawn will be sent with the order.

Dated: 21 December 2023

HELEN LYNCH
Head of Legal and Democratic Services
County Hall, Durham DH1 5UL

THE H2TEESSIDE PROJECT
The Planning Act 2008 – Section 48
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13
NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), who registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application to the Secretary of State (the 'SoS') for Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Proposed Application Site boundary following further design development and technical assessments and responses to the first consultation.
4. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

5. The Site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   • Mid-point – 454719 524286 • North – 451309 526476
   • East – 458760 521587 • South – 457001 520748 • West – 446938 521613
6. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
7. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of gas to the hydrogen production plant;
   c. an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   g. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   h. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
8. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
9. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

10. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the Proposed Application.
11. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS'). The PEIR reflects the Project Site boundary (and the proposals within that wider boundary) as it stood at the first consultation.
12. A H2Teesside Project Update Brochure forms part of the Consultation Documents includes information on whether or not the conclusions of the PEIR are affected by the changes to the Project that are the subject of this second consultation.

Consultation Documents

13. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
14. The second consultation on the Proposed Application will take place between the **13 December 2023 and 23 January 2024**.
15. The Consultation Documents to this second consultation comprise the H2Teesside Project Update Brochure and plans and maps showing the proposed changes to the Project Site boundary. The PEIR, a Non-Technical Summary of the PEIR, the Consultation Brochure and Consultation Leaflet for the first consultation are also available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 23 January 2024.
16. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
17. Digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 23 January 2024:

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Email: info@h2teesside.net Post: Freepost H2TEESSIDE Telephone: Freephone 0800 080 3028
Project Website: www.h2teesside.co.uk
19. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
20. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**. Responses received after this date may not be considered.
21. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited • 13 December 2023

The Gazette

teessidelive.co.uk TRUSTED NEWS SINCE 1869 InYourArea.co.uk Thursday, December 14, 2023 £1.55

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COUNCIL'S 'SURVIVAL' PLANS



Middlesbrough mayor Chris Cooke says the measures are needed in order for the authority to survive

BUDGET PROPOSALS *INCLUDE* ***JOB LOSSES,*** ***COUNCIL TAX*** *RISES,* ***GREEN WASTE*** *CHARGES AND THE CLOSURE OF* ***CAPTAIN COOK BIRTHPLACE MUSEUM..*** *AND THERE WOULD STILL BE A* ***SHORTFALL OF £6.3M*** *IF ALL THESE* ***APPROVED***

PAGES 4&5



BORO *TAKE LEAD - BUT HULL HIT BACK*

SPORT



ORDER ***SECURES*** *HUNDREDS OF JOBS*

PAGE 2



LITTLE *POD'S* ***BIG*** *IMPACT*

PAGE 7



WE'RE OFF TO SEE ***SANTA!***

PAGE 7

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Statutory

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H2 Teesside Limited
14 December 2023

Planning

STOCKTON ON TEES BOROUGH COUNCIL

I give notice that the following application(s) have been made to Stockton on Tees Borough Council:-

Planning (Listed Building and Conservation Areas) Regulations 1990
Applications for development within a Conservation Area

Erection of dormer to rear, installation of 2no roof lights and internal alterations to the first and ground floor to include installation of 2no doors to the ground floor and the installation of a corridor, utility room, staircase and walls to first floor. at 122 High Street, Norton, Stockton-on-Tees by Pyramid Architectural Designs 23/1985/LBC

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) (ENGLAND) ORDER 2015
Notice Under Article 15
Affecting a Public Right of Way to which Part III of the Wildlife and Countryside Act 1981 applies

Erection of 87no. dwelling to include the creation of associated accesses, landscaping, external works, and the erection of a substation. at Land East Of Mandale Park, Urlay Nook Road, Eaglescliffe by ELG Planning 23/2223/FUL

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) (ENGLAND) ORDER 2015 Notice Under Article 15

Change of use of site to vehicle repair and maintenance depot within use class B2 to include the erection of extensions to the building, erection of a vehicle wash bay, alterations to external yard layout and the erection of a 4 metre high fence. at Virgin Media, The Annexe Building , De Havilland Avenue, Preston Farm Business Park by ID Planning 23/2169/FUL

Erection of two storey factory building to include the creation of 58 car parking spaces, 8 EV parking spaces and demolition of 4no existing buildings. at Thorpe Leazes Farm, Thorpe Leazes Lane, Thorpe Thewles by Origin Planning Services 23/2099/FUL

Planning (Listed Building and Conservation Areas) Regulations 1990 Applications Affecting the setting of a Listed Building Consent

Erection of a detached summer house building within rear garden area at 464A Thornaby Road, Thornaby, Stockton-on Tees by miss Jessica Riley 23/1492/FUL

Members of the public may inspect copies of the application, plans and other documents submitted with the application(s) via our web site at www.stockton.gov.uk or alternatively, if you do not have access to the internet please contact Planning Development Services on 01642 526022. Anyone who wishes to make a representation about any of the above applications should write to Planning Services, Municipal Buildings, Church Road, Stockton on Tees. TS18 1LD or online at https://www.stockton.gov.uk/planningapplication or email: planningdevelopmentservices@stockton.gov.uk by **4 January 2024**

Please Note: Any comments received, applications forms, plans and/or any other documentation submitted will be made available for inspection on-line by visiting our web site at www.stockton.gov.uk.
For a large print version of this advert please contact 01642 526067

Simon Grundy
Manager
Planning Services
On behalf of: Stockton on Tees Borough Council
Date : 14 December 2023


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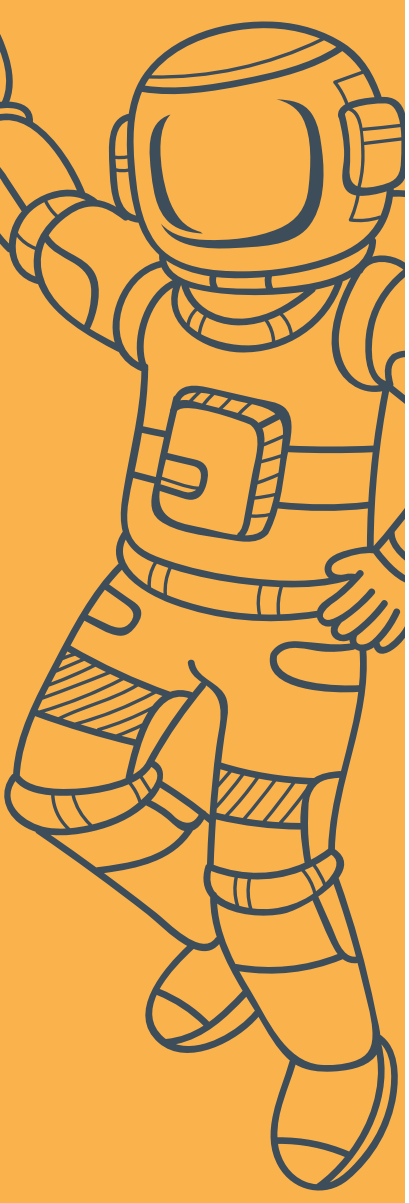

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Stark council tax warning



FULL STORY, PAGE 9

MAYOR **CAUTIONS** OVER **'DIFFICULT'** CHOICES FACING AUTHORITY INCLUDING TAX **RISES**, GREEN WASTE CHARGES AND RESIDENTS' PARKING **PERMITS**



PETRIFIED FOREST RETURNS

PAGE 5



AWARD-WINNING RESTAURANT BAGS ANOTHER TROPHY

PAGE 4

PLANS FOR **NEW** HOMES

PAGE 5





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Planning

REDCAR & CLEVELAND BOROUGH COUNCIL
Town and Country Planning (Development Management Procedure) (England) Order 2015 and Town and Country Planning (Environmental Impact Assessment) Regulations (Environmental Impact Assessment) Regulations 2017

Proposed development at **BRITISH STEEL LACKENBY WORKS REDCAR TS6 7RP (R/2023/0787/ESM)**
I give notice that BRITISH STEEL LIMITED are applying to REDCAR AND CLEVELAND BOROUGH COUNCIL for HYBRID APPLICATION TO INCLUDE DETAILED PLANNING PERMISSION FOR THE ERECTION OF STEEL MANUFACTURING FACILITY (ELECTRIC ARC FURNACE) AND OUTLINE PERMISSION FOR ASSOCIATED BUILDINGS, APPARATUS AND INFRASTRUCTURE (ALL MATTERS RESERVED) and that the application is accompanied by an environmental statement.
Proposed development at **WILTON WASTE TREATMENT PLANT BOUNDARY ROAD WEST WILTON INTERNATIONAL (R/2023/0820/ESM)** I give notice that CSG are applying to REDCAR AND CLEVELAND BOROUGH COUNCIL for HAZARDOUS WASTE TO ENERGY PROCESS PLANT and that the application is accompanied by an environmental statement.
Anyone who wishes to make representation about these two applications should write to the Council at Redcar and Cleveland Borough Council, Development Management, Kirkleatham Street, Redcar, TS10 1RT or by email to planning_admin@redcar-cleveland.gov.uk by **20 January 2024.**
Members of the public may inspect copies of the application, plans, environmental statement and other documents submitted with the application online at www.redcar-cleveland.gov.uk until the **20 January 2024** and may obtain copies of the environmental statement from Redcar and Cleveland Borough Council by contacting planning_admin@redcar-cleveland.gov.uk
John Sampson Corporate Director for Resources 21 December 2023

MIDDLESBROUGH BOROUGH COUNCIL

TOWN AND COUNTRY PLANNING ACT 1990
PLANNING (LISTED BUILDINGS & CONSERVATION AREAS) ACT 1990
PUBLICITY FOR PLANNING APPLICATIONS (CIRCULAR 15/92)

Notice is hereby given that the following applications have been submitted to Middlesbrough Council. Public rights of way may be affected.
Ref No: 23/0660/FUL
Address: 5, Hustlers Way, MIDDLESBROUGH, TS5 7DT
Proposal: Installation of 3no. new conservation style rooflights to the main roof of the property (North facing side)
Ref No: 23/0661/FUL
Address: 4, Hall Drive, Middlesbrough, TS5 7EN
Proposal: Retrospective extensions and alterations to garage to side to create residential annex
The applications are available for viewing, and comments can be made, on the Council's website using the following link or typing it into your web browser:
https://planning.agileapplications.co.uk/middlesbrough/search-applications/
Anyone wanting to make representations about the applications should do so in writing by 10-Jan-2024

Traffic & Roads

national highways

ROAD TRAFFIC REGULATION ACT 1984 – SECTION 14 THE A19 TRUNK ROAD (STOCKTON ROAD INTERCHANGE TO PORTRACK INTERCHANGE) (TEMPORARY PROHIBITION OF TRAFFIC)

NOTICE IS HEREBY GIVEN that National Highways Limited intends to make an Order on the A19 Trunk Road and the A66 Trunk Road, in the Districts of Middlesbrough and Stockton-On-Tees, to enable routine maintenance works to be carried out in safety.

The works are expected to start at 8pm on Monday 15 January 2024 and will take place periodically over a period of 12 months and will end on 23 December 2024.

The effect of the Order will be to close, between 8pm and 6am, on Monday to Friday nights, at times during the works, the:

(i) A19 northbound carriageway from the exit slip road at Stockton Road Interchange to the entry slip road at Portrack Interchange, a distance of 2470 metres;
(ii) A19 southbound carriageway from the exit slip road at Portrack Interchange to the entry slip road at Stockton Road Interchange, a distance of 2500 metres;
(iii) link roads connecting the A66 eastbound carriageway with the A19 southbound and northbound carriageways at Stockton Road Interchange;
(iv) link road connecting the A66 westbound carriageway with the A19 northbound carriageway at Stockton Road Interchange;
(v) A19 northbound exit and southbound entry slip roads at Portrack Interchange;
(vi) link roads connecting the A19 southbound carriageway with the A66 eastbound and westbound carriageways at Stockton Road Interchange; and
(vii) layby adjacent to the A19 southbound carriageway approximately 500 metres north of the exit slip road at Portrack Interchange.

When required, traffic signs will indicate the extent of the prohibitions (which will not apply to emergency service vehicles or vehicles being used in connection with the said works or for winter maintenance or traffic officer purposes). The Order comes into force on 14 January 2024 and will expire on 23 December 2024.

The project manager for this scheme is Michael Morgan. For enquiries please contact the National Highways Customer Contact Centre on 03001235000 or info@nationalhighways.co.uk

RICHARD FOXTON, National Highways, 2 City Walk, LEEDS, LS11 9AR.


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Statutory

THE H2TEESSIDE PROJECT
The Planning Act 2008 - Section 48
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 - Regulation 4
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 - Regulation 13
NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), who registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application to the Secretary of State (the 'SoS') for Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Proposed Application Site boundary following further design development and technical assessments and responses to the first consultation.
4. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

5. The Site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   - Mid-point - 454719 524286
   - North - 451309 526476
   - East - 458760 521587
   - South - 457001 520748
   - West - 446938 521613
6. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
7. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of gas to the hydrogen production plant;
   c. an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2 ;
   g. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   h. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
8. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
9. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

10. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the Proposed Application.
11. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS'). The PEIR reflects the Project Site boundary (and the proposals within that wider boundary) as it stood at the first consultation.
12. A H2Teesside Project Update Brochure forms part of the Consultation Documents includes information on whether or not the conclusions of the PEIR are affected by the changes to the Project that are the subject of this second consultation.

Consultation Documents

13. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
14. The second consultation on the Proposed Application will take place between the **13 December 2023 and 23 January 2024**.
15. The Consultation Documents to this second consultation comprise the H2Teesside Project Update Brochure and plans and maps showing the proposed changes to the Project Site boundary. The PEIR, a Non-Technical Summary of the PEIR, the Consultation Brochure and Consultation Leaflet for the first consultation are also available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 23 January 2024.
16. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
17. Digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 23 January 2024:

Inspection Location	Opening Times (subject to opening hours over the Christmas holiday period)
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

18. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net
Post: Freepost H2TEESSIDE
Telephone: Freephone 0800 080 3028
Project Website: www.h2teesside.co.uk

19. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
20. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**. Responses received after this date may not be considered.
21. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited
21 December 2023

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RIPON AND RICHMOND CHRONICLE

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Height of luxury
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Looking Back
Legacy of a Yorkshire settler **Page 28**



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More inside

FORMER workers at a collapsed North Yorkshire food firm have won a "significant" pay out following a tribunal decision that sided with the ex-employees.
Full story – Page 2

THE "preferred candidate" to become the new chief constable of North Yorkshire Police has been named as Tim Forber, current deputy chief constable at the South Yorkshire force.
Full story – Page 3

A POST OFFICE worker walked free from court after admitting she stole more than £60,000 to fund her gambling addiction.
Full story – Page 4

A RICHMOND hotel could be converted to apartments, plus a bar and restaurant.
Full story – Page 5

DOG walkers have been helping to decorate an outdoor Christmas tree in woodland near Thirsk.
Full story – Page 5

RANGERS and volunteers have built a bridge in a corner of the northern Yorkshire Dales to complete a four-year programme of flood recovery work.
Full story – Page 7

BAD weather and a "technical issue" have caused months of further delay to the re-opening of a toll bridge.
Full story – Page 18

ISSN 2516-5348 50
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Villagers step up campaign to save pub

By Janet Gleeson
Staff Reporter

HOUSEHOLDERS are driving forward a campaign to save their village's historic pub.

The Horseshoe Inn at West Rounton, near Northallerton, has been a pub since the 1860s but struggled to carry on after Covid.

Since January, it has been up for sale with the price reduced to about £300,000. The owners said there has been no interest and applied to turn the Grade II-listed building into a house.

Concerned residents set up the Rountons Community Interest Group to try and save the venue. The planning application was due to be decided by November 27, but following protests, campaigners have been told it has been deferred until after the New Year.

A spokesperson for the Rountons Community Interest Group said: "A key next step for the community is to start collating ideas of how the community hub could work and we will be looking to gauge interest and give further updates at a public meeting in mid-January at East Rounton Village Hall.

"Other steps taken by the Rountons Community Interest Group involve carrying out more research, obtaining knowledge and speaking with others who have already succeeded in running a community pub and hub.

"We are also looking at how to apply to the Government Ownership Community Fund for financial support as well as how to form a co-operative to manage the Horseshoe Inn."

Visits have already been made to the George and Dragon at Hudswell, near Richmond, one of the oldest community pubs in the UK, where a new landlord was recently appointed after villagers took over running the pub when previous tenants left. Members of the Rounton group have also visited the Travellers Rest at Skeeby, near Richmond, where residents battled for 14 years to buy back their beloved pub. In 2022 the dream became a reality and in June 2023 the pub reopened and has since gone from strength to strength.

The parish council is also applying to make the Horseshoe Inn an asset of community value to try and ensure it is offered to local people.

●Continued on page 3



IT'S that time of year again – panto season. And with that, one of the most hotly-anticipated shows in the region, the Georgian Theatre Royal's Rapunzel, has opened. Pictured are two of the stars, Paige Rochelle and Rebecca Huish. Turn to page eight for our review of the Richmond show, which has generated a strong local, national and international following.



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OTHER

North Yorkshire Council

Notice of Confirmation of a Public Path Diversion & Definitive Map & Statement Modification Order, Highways Act 1980 & Wildlife & Countryside Act 1981, The North Yorkshire Council, Public Footpath No. 10.150/35, Thirsk Hall Estates, Thirsk, Diversion Order 2023 The above Order made under Section 119 of the Highways Act 1980 & Section 53A(2) of the Wildlife & Countryside Act 1981 was confirmed on 21/11/23. The effect of the Order as confirmed is to divert the Public Footpath as follows. Public Footpath No. 10.150/35 between SE 4178 8380 & SE 4200 8351 will be diverted onto a new route along a grass field edge in a general South South East then East South East direction between SE 4178 8380 & SE 4200 8351. A copy of the Order as confirmed & the Order Map may be seen free of charge during normal office hours at Thirsk Community Library, Meadowfields, Chapel Street, Thirsk, North Yorkshire until 09/02/24. Copies of the Order & Order Map may be purchased from Countryside Access Service, North Yorkshire Council, County Hall, Northallerton, North Yorkshire, DL7 8AD (tel: 03001312131) at a cost of £2, or can be downloaded free from our website www.northyorks.gov.uk/pathnotices. The Order comes into force on the date on which the Authority certifies, in accordance with Section 119(3)(b) of the 1980 Act, that work to the new section of path, described in Part 2 of the Schedule, has been completed, but if a person aggrieved by the Order wants to question its validity, or that of any provision contained in it, on the ground that it is not within the powers of the Highways Act 1980 as amended, or on the ground that any requirement of the Act, as amended, or of any regulation made under the Act has not been complied with in relation to the Order, he or she may, under Paragraph 2 of Schedule 2 to the Act as applied by Paragraph 5 of Schedule 6 to the Act, within 8 weeks from 15/12/23, make an application to the High Court. Dated: 15/12/23 Barry Khan, Assistant Chief Executive, Legal & Democratic Services

Notice of Confirmation of a Public Path Diversion & Definitive Map & Statement Modification Order, Highways Act 1980 & Wildlife & Countryside Act 1981, The North Yorkshire Council, Footpath No. 10.37/6, Reedholme Farm, Danby Wiske with Lazenby, Diversion Order 2023 The above Order made under Section 119 of the Highways Act 1980 & Section 53A(2) of the Wildlife & Countryside Act 1981 was confirmed on 21/11/23. The effect of the Order as confirmed is to divert the Public Footpath as follows. Public Footpath No. 10.37/6 between NZ 3125 0066 & NZ 3117 0016 will be diverted onto a new route through grass fields & along a farm track in a generally South South West direction between NZ 3125 0066 & NZ 3117 0016. A copy of the Order as confirmed & the Order Map may be seen free of charge during normal office hours at Northallerton Library, 1 Thirsk Road, Northallerton, North Yorkshire until 09/02/24. Copies of the Order & Order Map may be purchased from Countryside Access Service, North Yorkshire Council, County Hall, Northallerton, North Yorkshire, DL7 8AD (tel: 03001312131) at a cost of £2, or can be downloaded free from our website www.northyorks.gov.uk/pathnotices. The Order comes into force on the date on which the Authority certifies, in accordance with Section 119(3)(b) of the 1980 Act, that work to the new section of path, described in Part 2 of the Schedule, has been completed, but if a person aggrieved by the Order wants to question its validity, or that of any provision contained in it, on the ground that it is not within the powers of the Highways Act 1980 as amended, or on the ground that any requirement of the Act, as amended, or of any regulation made under the Act has not been complied with in relation to the Order, he or she may, under Paragraph 2 of Schedule 2 to the Act as applied by Paragraph 5 of Schedule 6 to the Act, within 8 weeks from 15/12/23, make an application to the High Court. Dated: 15/12/23 Barry Khan, Assistant Chief Executive, Legal & Democratic Services

Notice of Confirmation of a Public Path Diversion & Definitive Map & Statement Modification Order, Highways Act 1980 & Wildlife & Countryside Act 1981, The North Yorkshire Council, Public Footpath No. 10.110/8, Land Off Tannery Lane, Northallerton, Diversion Order 2023 The above Order made under Section 119 of the Highways Act 1980 & Section 53A(2) of the Wildlife & Countryside Act 1981 was confirmed on 21/11/23. The effect of the Order as confirmed is to divert the Public Footpath as follows. Public Footpath No. 10.110/8 between SE 3645 9420 & SE 3639 9408 will be diverted onto a crushed stone surface in a generally South South West then East South East direction between SE 3641 9423 & SE 3639 9408. A copy of the Order as confirmed & the Order Map may be seen free of charge during normal office hours at Northallerton Library, 1 Thirsk Road, Northallerton, North Yorkshire until 09/02/24. Copies of the Order & Order Map may be purchased from Countryside Access Service, North Yorkshire Council, County Hall, Northallerton, North Yorkshire, DL7 8AD (tel: 03001312131) at a cost of £2, or can be downloaded free from our website www.northyorks.gov.uk/pathnotices. The Order comes into force on the date on which the Authority certifies, in accordance with Section 119(3)(b) of the 1980 Act, that work to the new section of path, described in Part 2 of the Schedule, has been completed, but if a person aggrieved by the Order wants to question its validity, or that of any provision contained in it, on the ground that it is not within the powers of the Highways Act 1980 as amended, or on the ground that any requirement of the Act, as amended, or of any regulation made under the Act has not been complied with in relation to the Order, he or she may, under Paragraph 2 of Schedule 2 to the Act as applied by Paragraph 5 of Schedule 6 to the Act, within 8 weeks from 15/12/23, make an application to the High Court. Dated: 15/12/23 Barry Khan, Assistant Chief Executive, Legal & Democratic Services

Notice of Confirmation of a Public Path Diversion & Definitive Map & Statement Modification Order Highways Act 1980 & Wildlife & Countryside Act 1981 The North Yorkshire Council Public Footpath No. 20.10/3, Ash House, Brough St Giles Diversion Order 2023 The above Order made under Section 119 of the Highways Act 1980 & Section 53A(2) of the Wildlife & Countryside Act 1981 was confirmed on 21/11/23. The effect of the Order as confirmed is to divert the Public Footpath as follows: Public Footpath No. 20.10/3 Starts at GR SE2156 9935 & running generally east south east to GR SE2183 9925 will be diverted onto a new line from GR SE2156 9935 & running north north east & then running south east, then generally east south east to GR SE2183 9925. Also GR SE2191 9919 & running south east to GR SE2200 9913 will be diverted onto a new line from GR SE2191 9919 & running generally south east to GR SE2200 9913. A copy of the order as confirmed & the Order Map may be seen free of charge during normal office hours at Catterick Community Library, 1 Gough Rd, Catterick Garrison, North Yorkshire until 9.2.24. Copies of the Order & Map may be purchased from Countryside Access Service, North Yorkshire Council, County Hall, Northallerton, North Yorkshire, DL7 8AD (tel: 03001312131) at a cost of £2, or can be downloaded free from our website www.northyorks.gov.uk/pathnotices. The Order comes into force on the date on which the Authority certifies, in accordance with Section 119(3)(b) of the 1980 Act, that work to the new sections of path, described in Part 2 of the Schedule, has been completed, but if a person aggrieved by the Order wants to question its validity, or that of any provision contained in it, on the ground that it is not within the powers of the Highways Act 1980 as amended, or on the ground that any requirement of the Act, as amended, or of any regulation made under the Act has not been complied with in relation to the Order, he or she may, under Paragraph 2 of Schedule 2 to the Act as applied by Paragraph 5 of Schedule 6 to the Act, within 8 weeks from 15/12/23, make an application to the High Court. Dated: 15/12/23 Barry Khan, Assistant Chief Executive, Legal & Democratic Services

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THE H2TEESSIDE PROJECT
The Planning Act 2008 – Section 48
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13
NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), who registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application to the Secretary of State (the 'SoS') for Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Proposed Application Site boundary following further design development and technical assessments and responses to the first consultation.
4. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

5. The Site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
   • Mid-point – 454719 524286 • North – 451309 526476 • East – 458760 521587
   • South – 457001 520748 • West – 446938 521613
6. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
7. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of gas to the hydrogen production plant;
   c. an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
   d. an electricity grid connection to provide power to the Project;
   e. water supply and treatment and wastewater infrastructure;
   f. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   g. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   h. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
8. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
9. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

Environmental Impact Assessment

10. The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the Proposed Application.
11. Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS'). The PEIR reflects the Project Site boundary (and the proposals within that wider boundary) as it stood at the first consultation.
12. A H2Teesside Project Update Brochure forms part of the Consultation Documents includes information on whether or not the conclusions of the PEIR are affected by the changes to the Project that are the subject of this second consultation.

Consultation Documents

13. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', this notice publicises the Proposed Application, summarising the Project and explaining where the Consultation Documents can be viewed.
14. The second consultation on the Proposed Application will take place between the **13 December 2023 and 23 January 2024**.
15. The Consultation Documents to this second consultation comprise the H2Teesside Project Update Brochure and plans and maps showing the proposed changes to the Project Site boundary. The PEIR, a Non-Technical Summary of the PEIR, the Consultation Brochure and Consultation Leaflet for the first consultation are also available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 23 January 2024.
16. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
17. Digital copies of the Consultation Documents will also be available to view free of charge at the following inspection locations until 23 January 2024:

Inspection Location	Opening Times (subject to opening hours over the Christmas holiday period)
Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT	Monday to Wednesday 9am to 6pm; Thursday 9am to 5pm; Friday 9am to 6pm; Saturday 9.30am to 12.30pm; Sunday closed
Stockton Central Library, Church Road, Stockton, TS18 1TU	Monday & Wednesday 8.30am to 6pm; Tuesday & Thursday 8.30am to 8pm; Friday 8.30am to 6pm; Saturday 09.30am to 4pm; Sunday closed
Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

18. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net • Post: Freepost H2TEESSIDE
Telephone: Freephone 0800 080 3028 • Project Website: www.h2teesside.co.uk

19. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
20. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**. Responses received after this date may not be considered.
21. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited • 13 December 2023

OTHER

NOTICE
AGM
Stockton & District Advice & Information Service
on Wednesday 31ST JANUARY 2024
at 5.30PM via Zoom.
If you wish to attend please contact gshepherdson@stockton-cab.co.uk

PROBATE & Trustee

DOROTHY ANNE PEARCE
Deceased

Pursuant to the Trustee Act 1925 anyone having a claim against or an interest in the Estate of the deceased, late of Apartment 22, The Convent, Reeth Road, Richmond, DL10 4GD, who died on 07/11/2023, must send written particulars to the address below by 16/02/2024, after which date the Estate will be distributed having regard only to claims and interests notified.

Karen Lucas c/o Co-operative Legal Services Limited, 650 Aztec West, Almondsbury, Bristol, BS32 4SD. Ref: KALU/6578280P/Pearce

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RIPON AND RICHMOND CHRONICLE

@DandSTimes



Champagne crossword
Can you crack our festive brainteaser? **Page 30**



NORTH YORKSHIRE edition serving Richmond, the Dales, Northallerton, Thirsk, Bedale, Stokesley and Great Ayton

dobbies garden centres
Get £5 off when you spend £25 **Page 18**

More inside

THE police watchdog has started a criminal investigation into a senior North Yorkshire Police officer who is alleged to have tried to avoid a speeding offence by providing a "false or misleading account".
Full story – Page 2

THE Wensleydale Creamery in Hawes has welcomed some very special guests to its visitor centre – Wallace and Gromit.
Full story – Page 3

TWO arrests have been made following a "high value" burglary at farm and garden suppliers Sam Turners in October.
Full story – Page 8

FUNDING of more than £9.2m to build 700 homes on brownfield sites in North Yorkshire and York has been approved.
Full story – Page 11

A POPULAR family-friendly music festival staged near Thirsk has won a major national industry award.
Full story – Page 14

D&S Property Country charmers **Page 45**



ISSN 2516-5348

Progress as leisure site fences come down at last

By Janet Gleeson
Staff Report

THERE have been developments on the long-awaited opening of Northallerton Sports Village, with people now allowed to use the land and the running track, but organised events cannot yet take place.

The £1.3m first phase of the scheme was due to be opened in July but became bogged down in the transfer of the land from Hambleton District Council to North Yorkshire Council.

This week North Yorkshire's assistant director for leisure and culture, Jo Ireland said: "Although the transfer of the land is still not complete, we are now able to allow public access on to the site which includes the one-kilometre circuit, amenity grass and car park.

"However, organised activity, that would require a licence, will not be permitted until the land has been transferred to the council.

"The capital works on the first phase of Northallerton Sports Village were completed in July, but the site remained closed to the public to allow the recreational grassed areas to establish.

"Opening of the site was then further held up due to a delay in the transfer of the land from the developers to the council."

Excitement started to mount at the beginning of the week when lorries were seen taking down much of the fencing which was supposed to block off the site, but had been pushed down in places. Vandals had also caused damage along with graffiti on a bridge and underpasses.

The sports village was always designed to enhance the former Stonecross playing fields and was a major part of the North Northallerton development of more than 900 houses, in conjunction with contractors Taylor Wimpey. The council said it is hoping to complete the transactions in the next few weeks so the site can be totally opened.

Organisers of Northallerton Parkrun welcomed the news but said they cannot have runs there until organised events can be licensed. A spokesperson said: "The good news is once open the core team can start looking at potential new routes, something we've been unable to whilst the space has been closed.

●Continued on page 3



Joe Cornish in his Northallerton gallery, which closes today
Picture: SARAH CALDECOTT

Joe Cornish says his farewells to gallery

IT is the end of an era in Northallerton today as the Joe Cornish Gallery closes after almost 20 years as a focal point for landscape photographers across Britain and beyond.

Joe is 65 and is keen to move on while he can still walk miles and climb mountains.

He says: "I am not getting any younger, next year I will be retirement age. We have found it very difficult over the last two years as a small team with five full time staff and a few part timers. It has become a showcase for other photographers, and it's been great to be part of that community."

●Full interview – Page 9

Deck your halls!
Merry Christmas and a Happy New Year from all of us to all of you.
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CALVERTS
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THE H2TEESSIDE PROJECT
The Planning Act 2008 – Section 48
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008 – Regulation 4
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 13
NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER FOR THE H2TEESSIDE PROJECT

The Application

1. Notice is hereby given that H2 Teesside Limited (the 'Applicant'), who registered office is Chertsey Road, Sunbury on Thames, Middlesex, TW16 7BP, intends to submit an application to the Secretary of State (the 'SoS') for Energy Security and Net Zero for development consent under Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008'), to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project').
2. H2 Teesside Limited is owned by bp Plc ('bp'). bp will be the lead developer and operator of the Project.
3. The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Proposed Application Site boundary following further design development and technical assessments and responses to the first consultation.
4. In accordance with Section 48 of the PA 2008, Regulation 4 of 'The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2008' and Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017', the Applicant has a duty to publicise the Proposed Application. In accordance with those provisions, this notice also summarises the Project and explains where the consultation documents (the 'Consultation Documents') can be viewed.

The Project

5. The Site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The Project Site extends to approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:
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6. Plans are available within the 'Consultation Documents' on the Project Website: www.h2teesside.co.uk (see further below) showing the current Project Site boundary.
7. H2Teesside will be one of the UK's largest blue hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal, representing more than 10% of the Government's hydrogen production target of 10 gigawatts by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year. The Proposed Application will, amongst other matters, seek development consent (granted in the form of a Development Consent Order 'DCO') for the construction, operation and maintenance of:
   a. a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
   b. a natural gas supply connection for the supply of gas to the hydrogen production plant;
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   e. water supply and treatment and wastewater infrastructure;
   f. CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
   g. hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
   h. other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.
8. The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial off-takers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.
9. The DCO to be sought would also authorise, if required, the permanent and/or temporary compulsory acquisition of land and/or rights in land for the Project; the extinguishment and/or overriding of easements and other rights over or affecting land required for the Project; and/or the temporary occupation of land required for the Project; the application and/or disapplication of legislation relevant to the Project as may be required; permanent and temporary changes to the highway and public rights of way network as may be required; tree and hedgerow removal; a deemed marine licence for those parts of the Project within or affecting the tidal section of the River Tees or other sections of the UK Marine Area; and such ancillary, incidental and consequential works, provisions, permits, consents, waivers or releases as are necessary and/or convenient for the successful construction, operation and maintenance of the Project.

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16. If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy
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Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY	Mondays to Thursdays 9am to 5pm; Fridays 9am to 4.30pm; Saturday and Sunday closed

How to respond to this notice

18. If you wish to respond to this notice or make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net • Post: Freepost H2TEESSIDE
Telephone: Freephone 0800 080 3028 • Project Website: www.h2teesside.co.uk

19. Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, the Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its DCO application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy
20. Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**. Responses received after this date may not be considered.
21. If you would like any further information in respect of this notice or the Project, please contact the Applicant using one of the contact methods set out above.

H2 Teesside Limited
13 December 2023

OTHER

NOTICE

The Registrar General has cancelled the registrations of Unitarian Church, Wellington Street, Stockton-on-Tees; Baptist Church, Lightfoot Grove, Stockton -on-Tees and Salvation Army Hall, Westbury Street, Thornaby, Stockton-on-Tees as a place of religious worship in accordance with the Marriage Act 1949.

A Jones for the Registrar General
December 2023

PLANNING

NOTICE IS HEREBY GIVEN THAT Darlington Borough Council has received the following Planning Applications:

MAJOR DEVELOPMENT
Skipbridge Farm, Neasham Road, Hurworth Moor, Darlington, DL2 1QL (23/01211/FUL)
Application submitted under Section 73 of the Town and Country Planning Act 1990 for the variation of Condition 2 (approved drawings) and Condition 3 (landscaping scheme) attached to planning permission 20/00967/FUL dated 21 January 2022 (Removal of redundant agricultural sheds and conversion of barns into 8 no. dwellings with associated parking, landscaping and access works) to permit the reduction from 4 No. dwellings to 3 No. dwellings at Skipbridge farm and revised vehicular access to each plot

MAJOR DEVELOPMENT LIKELY TO AFFECT THE SETTING OF A LISTED BUILDING AND RIGHT OF WAY
Manor Farm Poultry Unit, Manor Farm, Low Dinsdale, Neasham, Darlington, DL2 1PN (23/01158/FUL)
Erection of poultry house to allow farm to convert to higher welfare, low stock density, incorporating concrete apron, surface water soakaway and underground dirty water tank

LISTED BUILDING CONSENT
1 And 3 Neasham Hill, Neasham, Darlington, DL2 1QY (23/01128/LBC)
Amalgamation of 2 no. dwellings to form 1 no. single dwelling with associated internal works to re-configure internal spaces including removal of staircase (property no.1) and partition/internal walls, formation of doorways, installation of fixtures & fittings and external works consisting of infill and render of rear door area, insertion of sun-tunnel to rear roof slope, refurbishment works to brickwork on south elevation and windows, including replacement of first floor rear windows with timber sash windows, together with the partial demolition of the garden wall on the west boundary to provide new access and off-street parking with EV charging point

PLANNING PERMISSION LIKELY TO AFFECT A LISTED BUILDING
1 And 3 Neasham Hill, Neasham, Darlington, DL2 1QY (23/01129/FUL)
Amalgamation of 2 no. dwellings to form 1 no. single dwelling with associated internal and external works including infill and render of rear door area, insertion of sun-tunnel to rear roof slope, refurbishment works to brickwork on south elevation and windows, including replacement of first floor rear windows with timber sash windows, together with the partial demolition of the garden wall on the west boundary to provide new access and off-street parking with EV charging point

PLANNING PERMISSION IN A CONSERVATION AREA
Reservoir (Disused), Darlington Road, Sadberge, Darlington (23/01157/FUL)
Demolition of existing tower structure and installation of seating area, public interpretation board and feature wall panel

A copy of the applications and plans are available online at www.darlington.gov.uk/PA
Any representations should quote the planning reference number and reach us no later than 12 January 2024
Friday 22 December 2023

PROBATE & Trustee

FRANCIS HENRY WALTON (Deceased)

Pursuant to the Trustee Act 1925 any persons having a claim against or an interest in the Estate of the above named, late of Maple Lodge Care Home, Scotton, Catterick Garrison, North Yorkshire DL9 4LJ (Formerly of 15 Spenceley Place, Aldbrough St John, Richmond, DL11 7TQ), who died on 26/08/2023, are required to send written particulars thereof to the undersigned on or before 23/02/2024, after which date the Estate will be distributed having regard only to the claims and interests of which they have had notice.

CLOSE THORNTON,
31 Houndgate, Darlington DL1 5RH
(Ref:IR/WAL346/2)

Exchange and Mart

TRAFFIC & Roads

North Yorkshire Council, Prohibition of Waiting & Loading & Provision of Parking, Amendment No 33, Order 2023 Notice is hereby given that on 15/12/23 The North Yorkshire Council made an Order under Sections 1(1), 2(1) to (3), 4(2), 32(1) & 35(1) of the Road Traffic Regulation Act 1984 & Part IV of Schedule 9 to the 1984 Act & under the Traffic Management Act 2004, the effect of which will be to amend "North Yorkshire County Council (Prohibition of Waiting & Loading & Provision of Parking) (District of Richmondshire) Consolidation Order 2013" by introducing the restrictions specified in the Schedules:- **Schedule 1 - Prohibition of Waiting & Loading & Provision of Parking** Leyburn, A684 Market Place, South side, from a point 2 metres west of its junction with the westernmost side of the vehicular access between properties 12A and 13 to a point 22 metres west of its junction with the westernmost side of the vehicular access between properties 12A and 13 - Loading Bay (Operational 5:00am - 9:30am daily) Outside of these times the bay will be available for general parking with waiting restricted to a maximum period of 30 minutes with no return within 1 hour. Leyburn, A684 Market Place, South side, from a point 22 metres west of its junction with the westernmost side of the vehicular access between properties 12A and 13 to a point 29 metres west of its junction with the westernmost side of the vehicular access between properties 12A and 13 - Disabled Parking Bay. Leyburn, A684 Market Place, South side, from a point 89 metres north-west of its junction with the west side of Hetton Garth to a point 97 metres north-west of its junction with the west side of Hetton Garth - No waiting at any time. Leyburn, A684 Market Place, South side from a point 97 metres north-west of its junction with the west side of Hetton Garth to a point 136 metres north-west of its junction with the west side of Hetton Garth - No waiting at any time (Carriageway Only). Leyburn, A684 Market Place, South side from a point 154 metres north-west of its junction with the west side of Hetton Garth to its junction with the A684 Wensley Road - No waiting at any time (Carriageway Only). **Schedule 2 – Revocations** Leyburn, A684 (South side of Market Place), South side from a point 45 metres west of its junction with the centre line of the access road across the Market Place, for a distance of 12.5 metres in a westerly direction - No waiting at any time. Leyburn, A684 (South side of Market Place), South side from a point 57.5 metres west of its junction with the centre line of the access road across the Market Place, for a distance of 40 metres in a westerly direction - No waiting at any time. Leyburn, A684 (South side of Market Place), South side from a point 6 metres east of its junction with the centre line of the access road across the Market Place, for a Distance of 43.5 metres in a westerly direction - No waiting at any time. Leyburn, A684 (South side of Market Place), South side from a point 97.5 metres west of its junction with the centre line of the access road across the Market Place for a distance of 13 metres in a westerly direction - No waiting at any time. A copy of the Order, which comes into operation on 29/12/23 together with a map showing the roads affected may be examined at County Hall, Northallerton & at Leyburn Library, Thornborough Hall, Leyburn, DL8 5AB during normal office hours from 22/12/23 until 26/01/24 & also viewed online at www.northyorks.gov.uk/roadworks-map or www.northyorks.gov.uk/traffic-regulation-orders. If you wish to question the validity of the above Order or of any provision contained in it, on the grounds that it is not within the powers conferred by the Road Traffic Regulation Act 1984, as amended, or on the grounds that any requirement of that Act, or of any Instrument made under it, has not been complied with in relation to the Order, you may, within 6 weeks of 22/12/23 make application to the High Court for the purpose. Barry Khan, Assistant Chief Executive, Legal & Democratic Services Dated 22/12/23

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TRAFFIC & Roads

DARLINGTON BOROUGH COUNCIL
ROAD TRAFFIC REGULATION ACT 1984
(TEMPORARY ROAD CLOSURE) 2023
YARM ROAD, MIDDLETON ST GEORGE

Darlington Borough Council has made an Order under the provisions of Section 14(1) of the Road Traffic Regulation Act, 1984, as amended, the effect of which will be to close:

YARM ROAD
From its southern junction of the roundabout at Woolsington Drive southwards to the north side of its junction with Middleton Back Road

An alternative route will be signed via Mill Lane, A67 and vice versa.

The Order is necessary to allow repairs to the rail bridge on behalf of Network Rail.

The maximum duration of the temporary closure under this Order is 18 months commencing from 29th January 2024, it is anticipated that the closure will be effective between 1930hours and 0730hours from 29th January to 2nd February and between 2300hours on 3rd February to 0700hours on 4th February.

Dated: 22nd December 2023

D. Winstanley
Group Director of Services
Town Hall
Darlington
DL1 5QT

LOCALiQ
Your digital marketing expert.

DARLINGTON BOROUGH COUNCIL
ROAD TRAFFIC REGULATION ACT 1984
(TEMPORARY ROAD CLOSURE) 2023
COACH HOUSE LANE, DARLINGTON

Darlington Borough Council intend, not less than seven days from the date of this notice, to make an Order under the provisions of Section 14(1) of the Road Traffic Regulation Act, 1984, as amended, the effect of which will be to close:

COACH HOUSE LANE
From its northern junction with Elton Parade westwards to the rear boundary of 35 Elton Parade

The Order is necessary to allow works to install a new gas supply by Northern Gas Networks

The maximum duration of the temporary closure under this Order is 18 months commencing from 30th January 2024, it is anticipated that the closure will be effective for 2 weeks.

Dated: 22nd December 2023

D. Winstanley
Group Director of Services
Town Hall
Darlington
DL1 5QT

DARLINGTON BOROUGH COUNCIL
ROAD TRAFFIC REGULATION ACT 1984
(TEMPORARY FOOTPATH CLOSURE) ORDER 2023

SUMMERHOUSE FOOTPATH NO. 1
Darlington Borough Council has made an Order under the provisions of Section 14(1) of the Road Traffic Regulation Act, 1984, as amended, the effect of which will be to close:

SUMMERHOUSE FOOTPATH NO. 1
From its junction with Summerhouse Back Lane northwards to its junction with Footpath No. 2 Summerhouse

The Order is necessary to allow works to replace a footbridge.

The maximum duration of the temporary closure under this Order is 6 months commencing from 3rd January 2023, it is anticipated that the closure will be effective for 1 month.

Dated: 22nd December 2023

D. Winstanley
Group Director of Services
Town Hall
Darlington
DL1 5QT

LOCALiQ
Digital marketing simplified.

APPENDIX 13.7: SECOND CONSULTATION – COMMUNITY UPDATE LETTER TO THE LOCAL COMMUNITY

Address1
Address2
Address3
Address4
Address5
Postcode

13 December 2023

Further consultation on our proposals for H2Teesside

Dear Sir/Madam,

As you may be aware, we're proposing to build a new blue hydrogen production facility on Teesside, known as H2Teesside. It aims to be one of the biggest blue hydrogen production facilities in the UK, delivering economic growth for Teesside and the domestically-produced low carbon hydrogen that the UK needs.

We held a consultation on our proposals for H2Teesside between 14th September and 26th October 2023. The feedback we received has been used, alongside further assessment and technical work, to review our project design. As a result, we have now identified several changes to our proposals and have launched a consultation on these changes. This consultation will run from 13th December 2023 until 23rd January 2024.

You can find out more about our H2Teesside proposals and our changes to them by:

- Viewing our Project Update Brochure and updated plans on our project website: www.h2teesside.co.uk
- Visiting one of the venues below during their opening hours to view all of our consultation documents to date on a publicly accessible computer:
    - Redcar and Cleveland House, Kirkleatham Street, Redcar, TS10 1RT
    - Stockton Central Library, Church Road, Stockton, TS18 1TU
    - Hartlepool Civic Centre, Victoria Road, Hartlepool, TS24 8AY
- Contacting us on our Freephone number (0800 0803028) or info@h2teesside.net to request printed documents

You can respond to our consultation in the following ways:

- Online: fill in our response form at www.h2teesside.co.uk
- Email: Send your response to info@h2teesside.net
- Post: Send your response to **FREEPOST H2Teesside**.

Please submit your feedback by **11.59pm on 23 January 2024**.

If you have any questions or need any further information, please contact the H2Teesside team on 0800 0803028 or info@h2teesside.net

Yours faithfully,

[redacted] **– on behalf of H2Teesside Limited**

APPENDIX 14.1: ADDITIONAL SECTION 42 LETTERS 18 JANUARY 2024

Date: 18 January 2024

The Company Secretary
Asda Stores Limited
Asda House
Great Wilson Street
Leeds
LS11 5AD

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences

for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

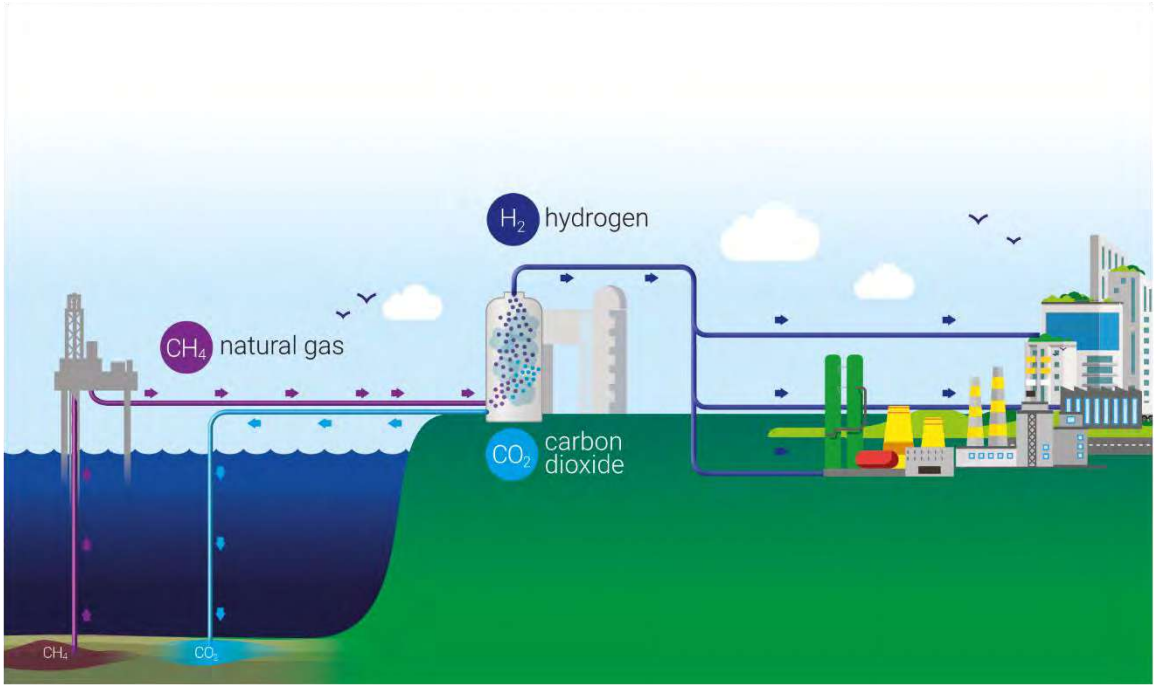
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by H2Teesside will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the Consultation Documents that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than **19 February 2024**. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult' & Section 48 'Duty to publicise'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent (granted in the form of a 'Development Consent Order' or 'DCO') to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and persons with other interests in the relevant land. The consultation must be carried out prior to submitting the application for development consent to PINS.

As part of the first consultation on the Project, the Applicant identified you/your organisation as a 'prescribed person' (or potentially being a prescribed person) for the purposes of Section 42 of the PA 2008. This related to you/your organisation being a landowner identified as being affected/potentially affected by the Project or having an interest in land affected by the Project.

Following that first consultation and pursuant to that Section 42 duty, the Applicant wishes to now seek your views through the second consultation on the Project as it is considered that the changes to the proposed Order Limits for the Project, which are described in this second consultation affect land in which you hold an interest.

Section 48 of the PA 2008 'Duty to publicise' also requires applicants for development consent to publicise their proposed application by publishing a notice (a 'Section 48 Notice') once in a national newspaper, once in the London Gazette, and in the case of a project like H2Teesside that involves tidal waters in the UK marine area, in the Lloyds List and an appropriate fishing journal, and for at least two successive weeks in a local newspaper circulating in the vicinity of the land to which the project relates. The Section 48 Notice for the Project is being published as follows:

- Telegraph – 14 December 2023
- London Gazette – 14 December 2023
- Lloyds List – 14 December 2023
- Fishing News – 14 December 2023
- Northern Echo – 14 and 21 December 2023
- Teesside Gazette – 14 and 21 December 2023
- Darlington and Stockton Times – 15 and 22 December 2023

A copy of the Section 48 Notice that is being published is appended to this letter.

The Applicant

H2 Teesside Limited is indirectly owned by bp Plc ('bp'). bp or an affiliate thereof will be the lead developer and operator of the Project.

bp is an active global hydrogen participant and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

The Project Site

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The current extent of the Project Site, taking account of the changes made following further design development and technical assessments and responses to the first consultation, is approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

- Mid-point – 454719 524286
- North – 451309 526476
- East – 458760 521587

- South – 457001 520748
- West – 446938 521613

Plans are available within the 'Consultation Documents' (see further below) showing the current Project Site boundary.

Project Description

The proposed application will, amongst other matters, seek development consent for the construction, operation and maintenance of:

- a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
- a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
- an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
- an electricity grid connection to provide power to the Project;
- water supply and treatment and wastewater infrastructure;
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Changes to the Project Site Boundary

A number of changes have resulted to the proposed Order Limits for the Project following further design development and technical assessments and responses to the first consultation.

The further design and technical work has allowed for some of the flexibility and optionality that was included at the time of the first consultation to be removed. This has resulted in a significant overall reduction in the proposed Order Limits from 1,350 hectares to 508 hectares.

A small number of additions have been made to the proposed Order Limits to accommodate works required for the Project.

The changes made to the proposed Order Limits are shown and described within the Consultation Documents listed below and a plan showing how the changes to the proposed Order Limits affect land in which you hold an interest is provided with this letter.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the proposed application for development consent.

Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS') and were made available for the first consultation. A H2Teesside Project Update Brochure that includes information on whether the conclusions of the PEIR are affected by the changes to the Project is included with the Consultation Documents.

Consultation Documents

The Consultation Documents relating to the Project, including plans and maps showing the nature and location of the Project can be downloaded via the below link to a secure fileshare site:

https://dwd.ctit.co/url/fhjwzeicng2spvya

The Consultation Documents include:

- a plan showing the extent of the current Project Site boundary edged in red and the areas that have been removed and those that have been added since the first consultation;
- a plan showing the extent of your landholding.
- a H2Teesside Project Update Brochure that includes information on whether the conclusions of the Preliminary Environmental Information Report ('PEIR') produced for the first consultation are affected by the changes to the Project that are the subject of this second consultation, which is also being sent to people living within the vicinity of the Project Site;
- the Preliminary Environmental Information Report and its Non-Technical Summary produced for the first consultation and accompanying plans and maps;
- the Consultation Brochure produced for the first consultation;
- the Consultation Leaflet produced for the first consultation, which was sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published for the second consultation.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 19 February 2024.

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 19 February 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice
Landholding Plan

Date: 18 January 2024

The Company Secretary
Kemira Chemicals (UK) LimitedAsda House
Bowling Park Drive
Bradford
BD4 7TT

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

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The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences

for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

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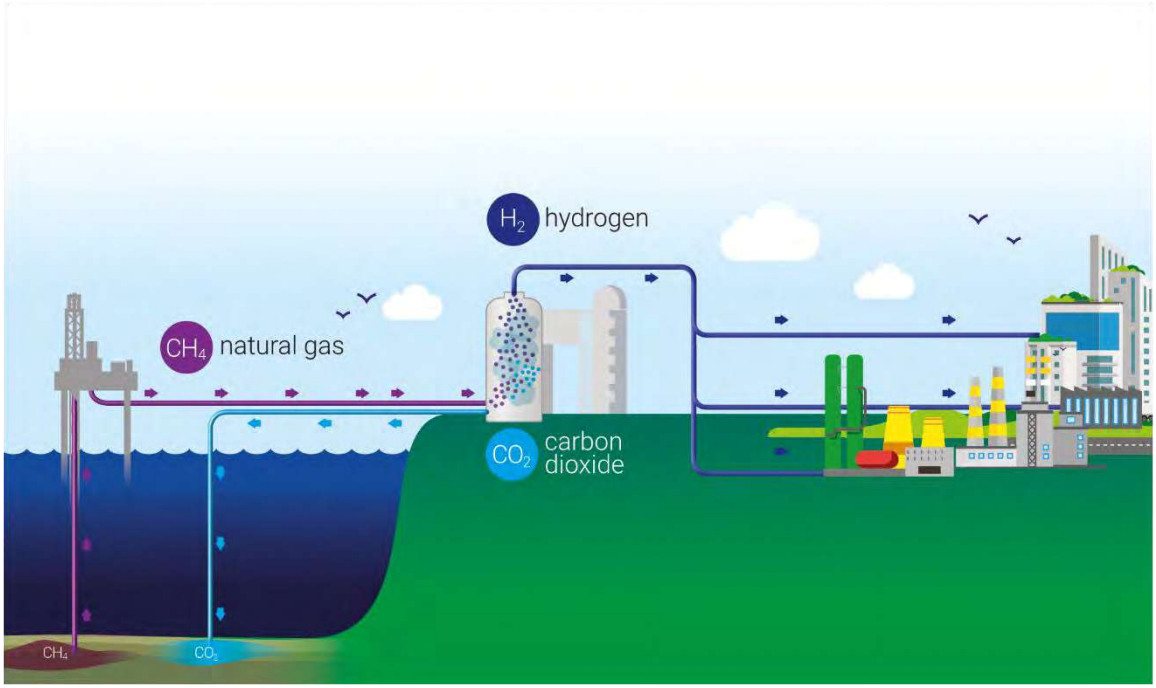

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The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

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- the Preliminary Environmental Information Report and its Non-Technical Summary produced for the first consultation and accompanying plans and maps;
- the Consultation Brochure produced for the first consultation;
- the Consultation Leaflet produced for the first consultation, which was sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published for the second consultation.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 19 February 2024.

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 19 February 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice
Landholding Plan

Date: 18 January 2024

The Company Secretary
Legal & General Assurance (Pensions Management) LimitedBowling Park Drive
1 Coleman Street
London
EC2R 5AA

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

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The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

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The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences

for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

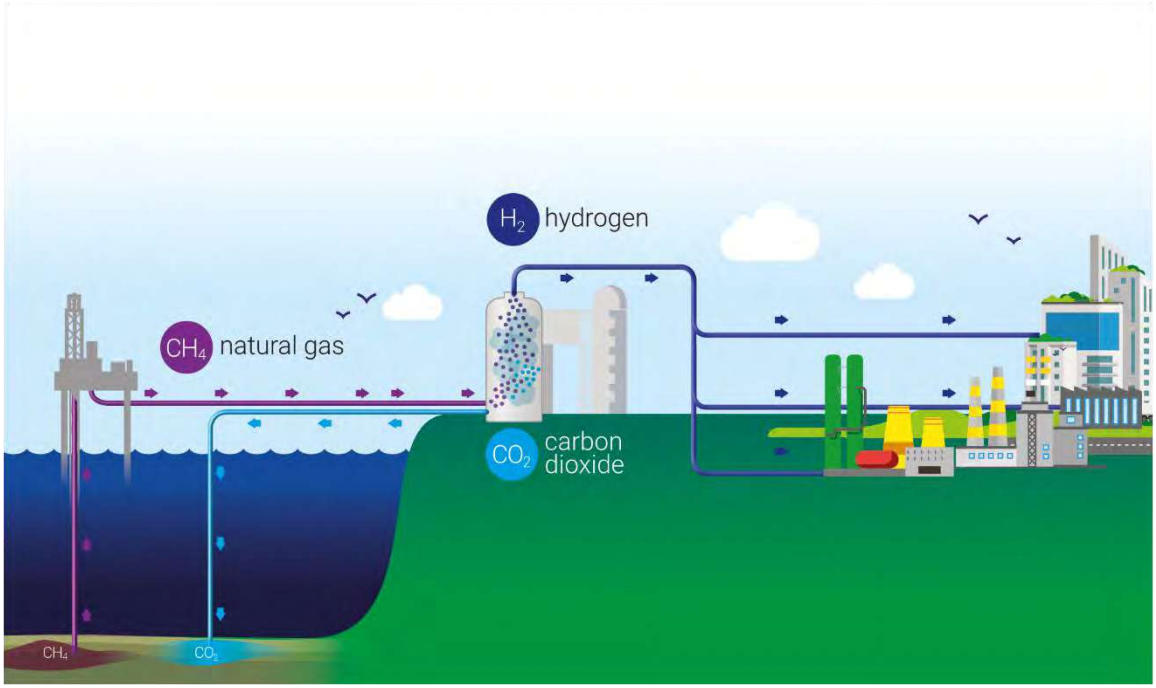
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by H2Teesside will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



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Any comments and representations you may have on the Project should be submitted to the Applicant no later than **19 February 2024**. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult' & Section 48 'Duty to publicise'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent (granted in the form of a 'Development Consent Order' or 'DCO') to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and persons with other interests in the relevant land. The consultation must be carried out prior to submitting the application for development consent to PINS.

As part of the first consultation on the Project, the Applicant identified you/your organisation as a 'prescribed person' (or potentially being a prescribed person) for the purposes of Section 42 of the PA 2008. This related to you/your organisation being a landowner identified as being affected/potentially affected by the Project or having an interest in land affected by the Project.

Following that first consultation and pursuant to that Section 42 duty, the Applicant wishes to now seek your views through the second consultation on the Project as it is considered that the changes to the proposed Order Limits for the Project, which are described in this second consultation affect land in which you hold an interest.

Section 48 of the PA 2008 'Duty to publicise' also requires applicants for development consent to publicise their proposed application by publishing a notice (a 'Section 48 Notice') once in a national newspaper, once in the London Gazette, and in the case of a project like H2Teesside that involves tidal waters in the UK marine area, in the Lloyds List and an appropriate fishing journal, and for at least two successive weeks in a local newspaper circulating in the vicinity of the land to which the project relates. The Section 48 Notice for the Project is being published as follows:

- Telegraph – 14 December 2023
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The Applicant

H2 Teesside Limited is indirectly owned by bp Plc ('bp'). bp or an affiliate thereof will be the lead developer and operator of the Project.

bp is an active global hydrogen participant and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

The Project Site

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The current extent of the Project Site, taking account of the changes made following further design development and technical assessments and responses to the first consultation, is approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

- Mid-point – 454719 524286
- North – 451309 526476
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Plans are available within the 'Consultation Documents' (see further below) showing the current Project Site boundary.

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The proposed application will, amongst other matters, seek development consent for the construction, operation and maintenance of:

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- a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
- an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
- an electricity grid connection to provide power to the Project;
- water supply and treatment and wastewater infrastructure;
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Changes to the Project Site Boundary

A number of changes have resulted to the proposed Order Limits for the Project following further design development and technical assessments and responses to the first consultation.

The further design and technical work has allowed for some of the flexibility and optionality that was included at the time of the first consultation to be removed. This has resulted in a significant overall reduction in the proposed Order Limits from 1,350 hectares to 508 hectares.

A small number of additions have been made to the proposed Order Limits to accommodate works required for the Project.

The changes made to the proposed Order Limits are shown and described within the Consultation Documents listed below and a plan showing how the changes to the proposed Order Limits affect land in which you hold an interest is provided with this letter.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the proposed application for development consent.

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The Consultation Documents relating to the Project, including plans and maps showing the nature and location of the Project can be downloaded via the below link to a secure fileshare site:

https://dwd.ctit.co/url/fhjwzeicng2spvya

The Consultation Documents include:

- a plan showing the extent of the current Project Site boundary edged in red and the areas that have been removed and those that have been added since the first consultation;
- a plan showing the extent of your landholding.
- a H2Teesside Project Update Brochure that includes information on whether the conclusions of the Preliminary Environmental Information Report ('PEIR') produced for the first consultation are affected by the changes to the Project that are the subject of this second consultation, which is also being sent to people living within the vicinity of the Project Site;
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Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 19 February 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice
Landholding Plan

Date: 18 January 2024

The Company Secretary
Subcoal Production TSP Limited
Suite F1-01 To F-03
Pera Business Park
Nottingham Road
Melton Mowbray
LE13 0PB

Dear Sir/Madam,

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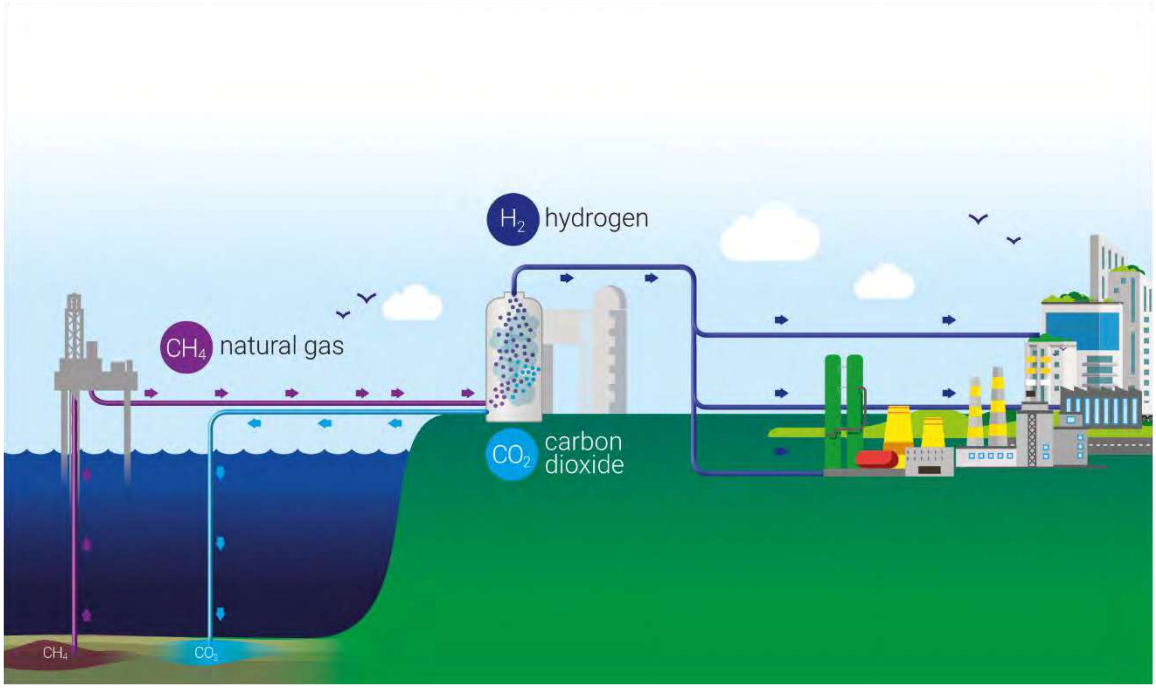

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Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice
Landholding Plan

Date: 18 January 2024

The Company Secretary
Tesco Blue (Nominee 1) Limited
Tesco House
Shire Park
Kestrel Way
Welwyn Garden City
AL7 1GA

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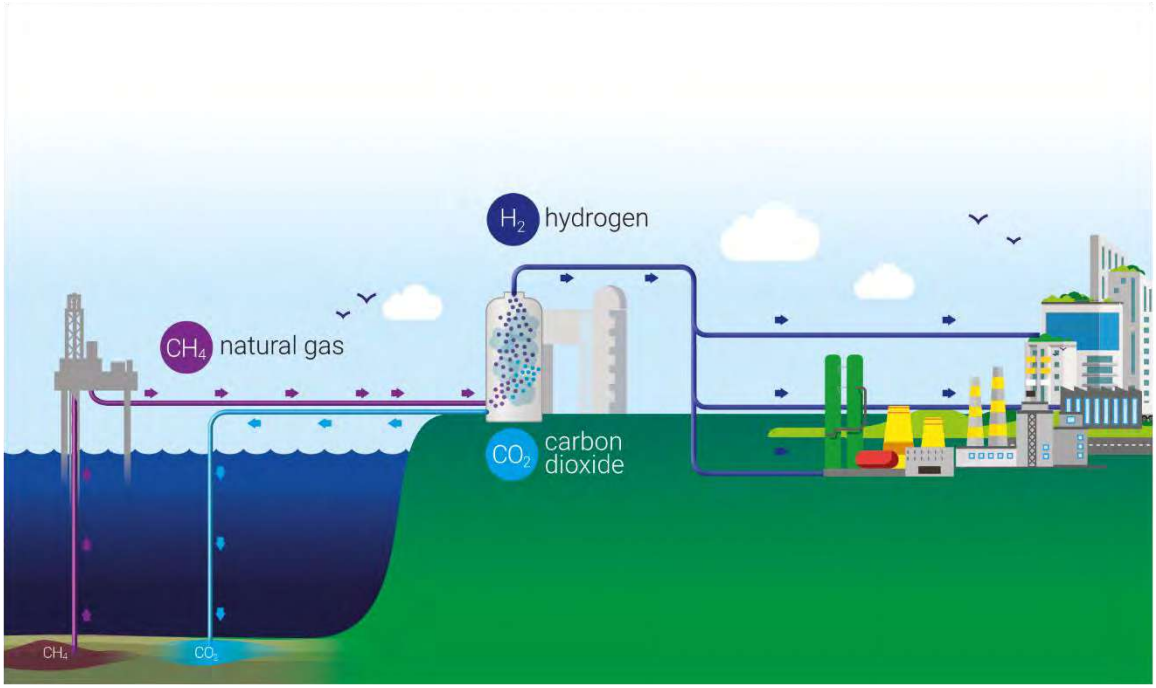

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- water supply and treatment and wastewater infrastructure;
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- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

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The Consultation Documents include:

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Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 19 February 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice
Landholding Plan

Date: 18 January 2024

The Company Secretary
Tesco Blue (Nominee 2) Limited
Tesco House
Shire Park
Kestrel Way
Welwyn Garden City
AL7 1GA

Dear Sir/Madam,

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H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences

for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

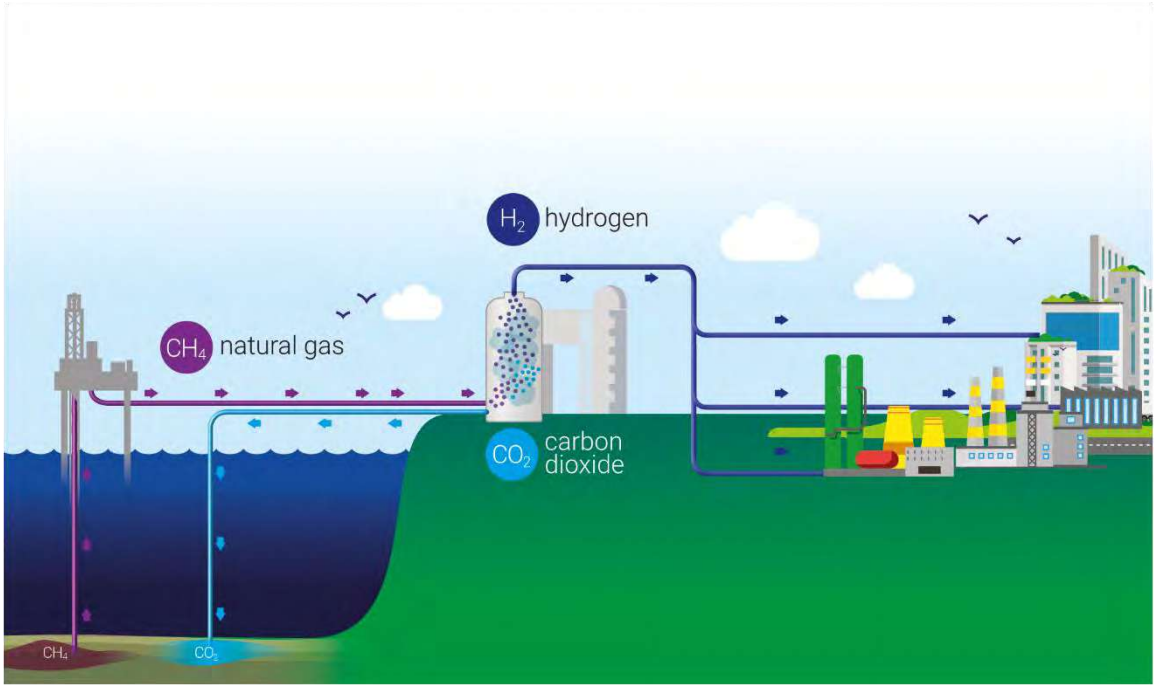
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by H2Teesside will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



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Landholding Plan

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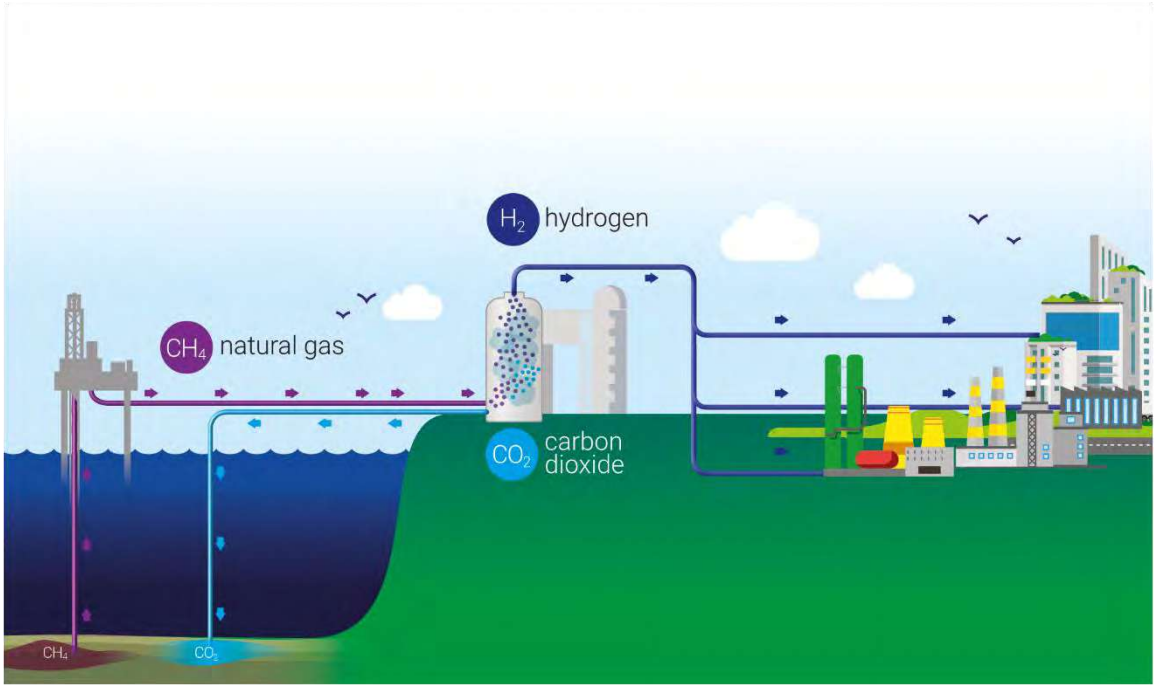

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The further design and technical work has allowed for some of the flexibility and optionality that was included at the time of the first consultation to be removed. This has resulted in a significant overall reduction in the proposed Order Limits from 1,350 hectares to 508 hectares.

A small number of additions have been made to the proposed Order Limits to accommodate works required for the Project.

The changes made to the proposed Order Limits are shown and described within the Consultation Documents listed below and a plan showing how the changes to the proposed Order Limits affect land in which you hold an interest is provided with this letter.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the proposed application for development consent.

Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS') and were made available for the first consultation. A H2Teesside Project Update Brochure that includes information on whether the conclusions of the PEIR are affected by the changes to the Project is included with the Consultation Documents.

Consultation Documents

The Consultation Documents relating to the Project, including plans and maps showing the nature and location of the Project can be downloaded via the below link to a secure fileshare site:

https://dwd.ctit.co/url/fhjwzeicng2spvya

The Consultation Documents include:

- a plan showing the extent of the current Project Site boundary edged in red and the areas that have been removed and those that have been added since the first consultation;
- a plan showing the extent of your landholding.
- a H2Teesside Project Update Brochure that includes information on whether the conclusions of the Preliminary Environmental Information Report ('PEIR') produced for the first consultation are affected by the changes to the Project that are the subject of this second consultation, which is also being sent to people living within the vicinity of the Project Site;
- the Preliminary Environmental Information Report and its Non-Technical Summary produced for the first consultation and accompanying plans and maps;
- the Consultation Brochure produced for the first consultation;
- the Consultation Leaflet produced for the first consultation, which was sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published for the second consultation.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 19 February 2024.

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 19 February 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice
Landholding Plan

APPENDIX 14.2: ADDITIONAL SECTION 42 LETTER 31 JANUARY 2024

Date: 31 January 2024

Chief Executive
Office for Health Improvement and Disparities
Department of Health and Social Care
39 Victoria Street
London
SW1H 0EU

Email: [redacted]

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance store and other nearby CO_2 stores that NEP holds CO_2 storage licences for.

These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

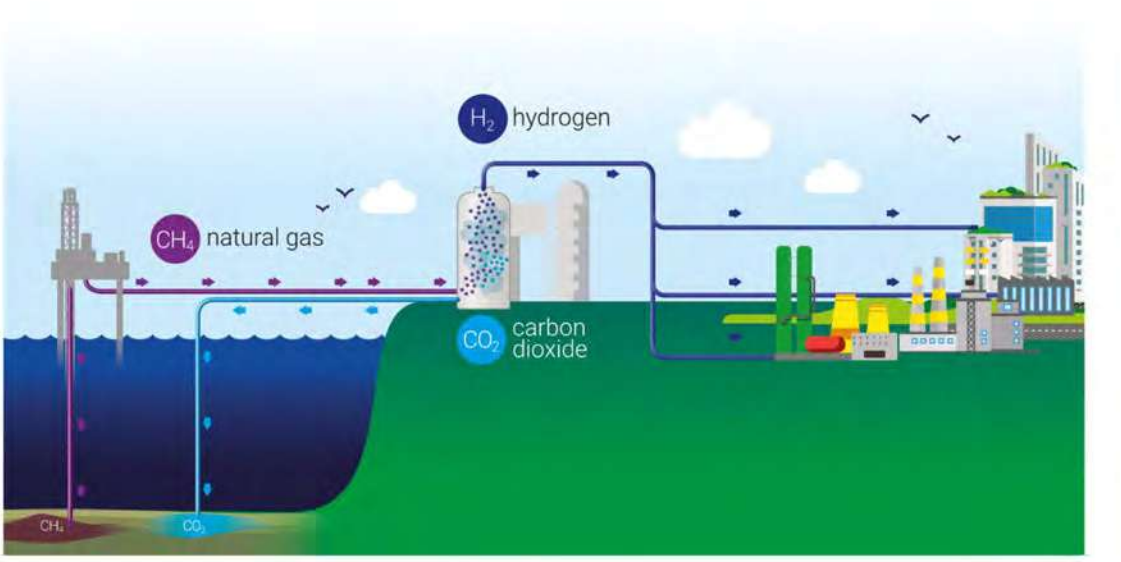
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the Consultation Documents that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than **1 March 2024**. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult' & EIA Regulation 13 'Pre-application publicity under Section 48 (duty to publicise)'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent (granted in the form of a 'Development Consent Order' or 'DCO') to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and persons with other interests in the relevant land. The consultation must be carried out prior to submitting the application for development consent to PINS.

The Applicant has identified a number of persons and organisations, which it is required to consult for the purposes of Section 42 of the PA 2008. It has been determined that you or your organisation is, or may be, a 'prescribed person' for the purposes of Section 42. The Applicant therefore wishes to seek your views on its latest proposals for H2Teesside.

Section 48 of the PA 2008 'Duty to publicise' also requires applicants for development consent to publicise their proposed application by publishing a notice (a 'Section 48 Notice') once in a national newspaper, once in the London Gazette, and in the case of a project like H2Teesside that involves tidal waters in the UK marine area, in the Lloyds List and an appropriate fishing journal, and for at least two successive weeks in a local newspaper circulating in the vicinity of the land to which the project relates. The Section 48 Notice for the Project was published as follows:

- Telegraph – 14 December 2023
- London Gazette – 14 December 2023
- Lloyds List – 14 December 2023
- Fishing News – 14 December 2023
- Northern Echo – 14 and 21 December 2023
- Teesside Gazette – 14 and 21 December 2023
- Darlington and Stockton Times – 15 and 22 December 2023

Regulation 13 of 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017' (the 'EIA Regulations') requires applicants, at the same time as publishing the Section 48 Notice, to send a copy of that notice to the 'consultation bodies' and to any person notified to the applicant by the SoS under EIA Regulation 11(1)(c).

A copy of the Section 48 Notice that has been published is appended to this letter in accordance with EIA Regulation 13.

The Applicant

H2 Teesside Limited is indirectly owned by bp Plc ('bp'). bp or an affiliate thereof will be the lead developer and operator of the Project.

bp is an active global hydrogen participant and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

The Project Site

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The current extent of the Project Site, taking account of the changes made following further design development and technical assessments and

responses to the first consultation, is approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

- Mid-point – 454719 524286
- North – 451309 526476
- East – 458760 521587
- South – 457001 520748
- West – 446938 521613

Plans are available within the 'Consultation Documents' (see further below) showing the current Project Site boundary.

Project Description

The proposed application will, amongst other matters, seek development consent for the construction, operation and maintenance of:

- a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
- a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
- an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
- an electricity grid connection to provide power to the Project;
- water supply and treatment and wastewater infrastructure;
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Changes to the Project Site Boundary

A number of changes have resulted to the proposed Order Limits for the Project following further design development and technical assessments and responses to the first consultation.

The further design and technical work has allowed for some of the flexibility and optionality that was included at the time of the first consultation to be removed. This has resulted in a significant overall reduction in the proposed Order Limits from 1,350 hectares to 508 hectares.

A small number of additions have been made to the proposed Order Limits to accommodate works required for the Project.

The changes made to the proposed Order Limits are shown and described within the Consultation Documents listed below.

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The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the proposed application for development consent.

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The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 1 March 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice

APPENDIX 14.3: ADDITIONAL SECTION 42 LETTERS 5 FEBRUARY 2024

[redacted]

From: [redacted]
Sent: 22 February 2024 14:53
To: [redacted]
Subject: FW: H2Teesside - Targeted s.42 Consultation
Attachments: H2T_Targeted_Consultation_s42_Ineos_Nitriles(1)_Final (05.02.24).pdf; H2T_Targeted_Consultation_s42_Ineos_Nitriles(2)_Final (05.02.24).pdf; H2T_s42_Ineos_Nitriles_Dec_23.pdf; 073_ARDG_H2Teesside_LIP_Ineos.pdf; H2T_s48_Notice_Dec_23.pdf

[redacted]

From: [redacted]
Sent: Tuesday, February 6, 2024 11:31 AM
To: [redacted]
Cc: [redacted]
Subject: H2Teesside - Targeted s.42 Consultation

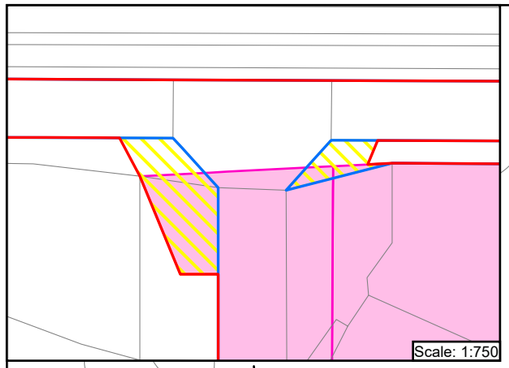
Hi [redacted]

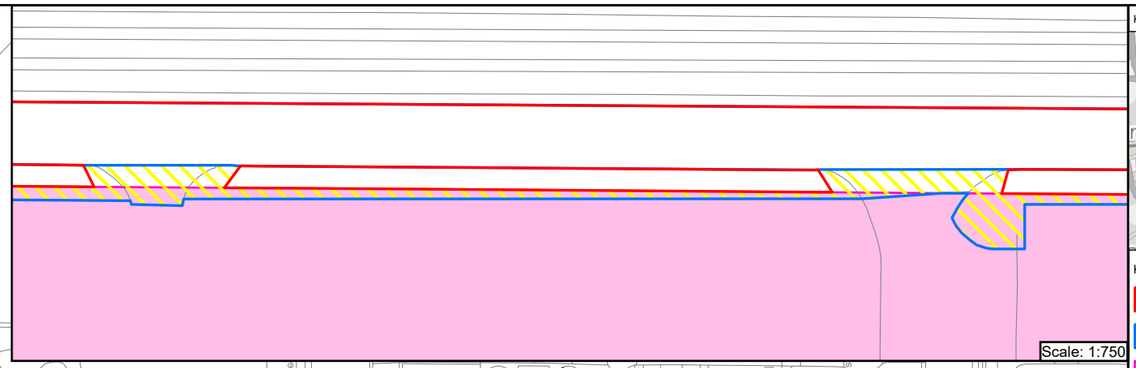
I hope you are well.

As you will be aware H2Teesside undertook an additional round of statutory consultation which closed last month. Following this, we have launched an additional round of targeted consultation following the addition of a sliver of land to the north of your landholding as shown in the attached plans. These documents have also been issued via post to INEOS. The deadline for any comments on this is the 7th March 2024 and as previously, this can be provided through the dedicated project channels outlined within the letter.

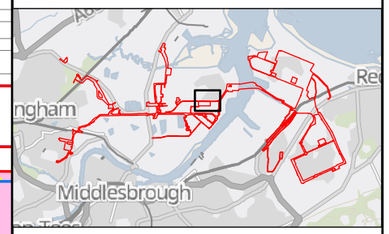
If you have any queries, please do not hesitate to contact me.

Kind regards
[redacted]





KEY PLAN



Key

- Revised Draft Order Limits
- Order Limits shown at Previous Statutory Consultation
- Land Interest Boundary
- Additional Land Area Required

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Client: H2 Teesside

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title: TARGETED CONSULTATION
LAND INTEREST PLAN
INEOS NITRILES (UK) LIMITED
SHEET 1 OF 1

Status	Revision
FINAL	000
	Date 02/02/2024
Scale 1:3,000 @ A3	Spatial Reference System British National Grid

0 25 50 100 150 Metres

Drawn By	Checked By	Approved By
J.NEYE-SWIFT	N/A	J.WITHINGTON

Drawing reference: 073_ARDG_H2Teesside_LIC

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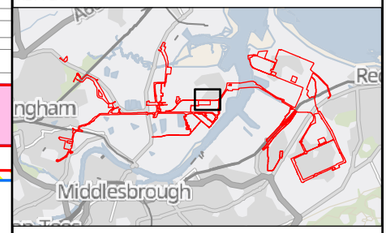
Plot Date: 02 February 2024 09:54
File Name: C:\Users\JakeN\Ardent Management Ltd\Projects - Aecom - H2 Teesside\P16 - GIS & CAD Files\073_ARDG_Teesside\ArcPro Projects\Re-Consultation Plans\073_ARDG_H2Teesside_LIC_Ineos_20240201.aprx

Scale: 1:750

Scale: 1:750

KEY PLAN



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- Order Limits shown at Previous Statutory Consultation
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Client: H2 Teesside

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title:

TARGETED CONSULTATION
LAND INTEREST PLAN
PD TEESPORTS LTD
SHEET 1 OF 1

Status	Revision
FINAL	000
	Date: 02/02/2024
Scale: 1:3,000 @ A3	Spatial Reference System: British National Grid

0 25 50 100 150 Metres

Drawn By	Checked By	Approved By
J.NEYE-SWIFT	N/A	J.WITHINGTON

Drawing reference: 073_ARDG_H2Teesside_LIC

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Plot Date: 02 February 2024 09:54
File Name: C:\Users\JakeN\Ardent Management Ltd\Projects - Aecom - H2 Teesside\P16 - GIS & CAD Files\073_ARDG_TeessideArcPro Projects\Re-Consultation Plans\073_ARDG_H2Teesside_LIC_PD_Teesports_LTD_20240131.aprx

Date: 13 December 2023

The Chief Executive
Ineos Nitriles (UK) Limited
38 Hanes Crescent
Knightsbridge
London
SW1X 0LZ

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

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Background to the Project

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Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

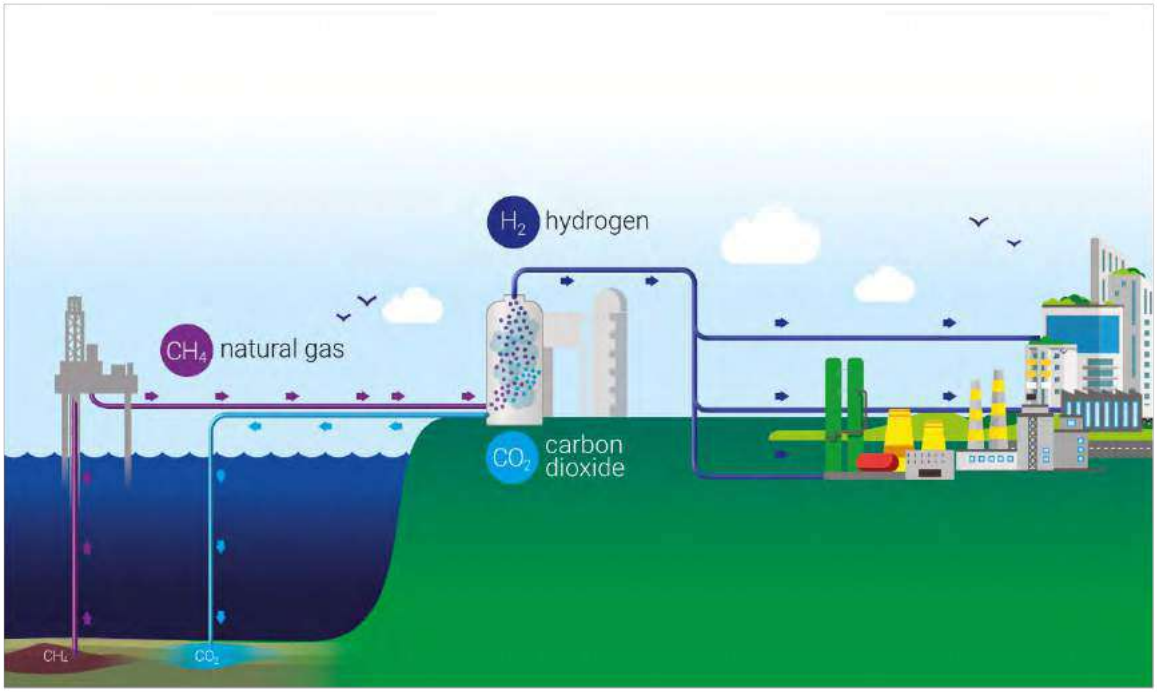
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by H2Teesside will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the Consultation Documents that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than **23 January 2024**. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult' & Section 48 'Duty to publicise'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent (granted in the form of a 'Development Consent Order' or 'DCO') to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and persons with other interests in the relevant land. The consultation must be carried out prior to submitting the application for development consent to PINS.

As part of the first consultation on the Project, the Applicant identified you/your organisation as a 'prescribed person' (or potentially being a prescribed person) for the purposes of Section 42 of the PA 2008. This related to you/your organisation being a landowner identified as being affected/potentially affected by the Project or having an interest in land affected by the Project.

Following that first consultation and pursuant to that Section 42 duty, the Applicant wishes to now seek your views through the second consultation on the Project as it is considered that the changes to the proposed Order Limits for the Project, which are described in this second consultation affect land in which you hold an interest.

Section 48 of the PA 2008 'Duty to publicise' also requires applicants for development consent to publicise their proposed application by publishing a notice (a 'Section 48 Notice') once in a national newspaper, once in the London Gazette, and in the case of a project like H2Teesside that involves tidal waters in the UK marine area, in the Lloyds List and an appropriate fishing journal, and for at least two successive weeks in a local newspaper circulating in the vicinity of the land to which the project relates. The Section 48 Notice for the Project is being published as follows:

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- Fishing News – 14 December 2023
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- Teesside Gazette – 14 and 21 December 2023
- Darlington and Stockton Times – 15 and 22 December 2023

A copy of the Section 48 Notice that is being published is appended to this letter.

The Applicant

H2 Teesside Limited is indirectly owned by bp Plc ('bp'). bp or an affiliate thereof will be the lead developer and operator of the Project.

bp is an active global hydrogen participant and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

The Project Site

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The current extent of the Project Site, taking account of the changes made following further design development and technical assessments and responses to the first consultation, is approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

- Mid-point – 454719 524286
- North – 451309 526476

- East – 458760 521587
- South – 457001 520748
- West – 446938 521613

Plans are available within the 'Consultation Documents' (see further below) showing the current Project Site boundary.

Project Description

The proposed application will, amongst other matters, seek development consent for the construction, operation and maintenance of:

- a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
- a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
- an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
- an electricity grid connection to provide power to the Project;
- water supply and treatment and wastewater infrastructure;
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Changes to the Project Site Boundary

A number of changes have resulted to the proposed Order Limits for the Project following further design development and technical assessments and responses to the first consultation.

The further design and technical work has allowed for some of the flexibility and optionality that was included at the time of the first consultation to be removed. This has resulted in a significant overall reduction in the proposed Order Limits from 1,350 hectares to 508 hectares.

A small number of additions have been made to the proposed Order Limits to accommodate works required for the Project.

The changes made to the proposed Order Limits are shown and described within the Consultation Documents listed below and a plan showing how the changes to the proposed Order Limits affect land in which you hold an interest is provided with this letter.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the proposed application for development consent.

Information so far compiled about the Project's environmental impacts is contained in a Preliminary Environmental Information Report ('PEIR') and summarised in a Non-Technical Summary ('NTS') and were made available for the first consultation. A H2Teesside Project Update Brochure that includes information on whether the conclusions of the PEIR are affected by the changes to the Project is included with the Consultation Documents.

Consultation Documents

The Consultation Documents relating to the Project, including plans and maps showing the nature and location of the Project can be downloaded via the below link to a secure fileshare site:

https://dwd.ctit.co/url/fhjwzeicng2spvya

The Consultation Documents include:

- a plan showing the extent of the current Project Site boundary edged in red and the areas that have been removed and those that have been added since the first consultation;
- a plan showing the extent of your landholding.
- a H2Teesside Project Update Brochure that includes information on whether the conclusions of the Preliminary Environmental Information Report ('PEIR') produced for the first consultation are affected by the changes to the Project that are the subject of this second consultation, which is also being sent to people living within the vicinity of the Project Site;
- the Preliminary Environmental Information Report and its Non-Technical Summary produced for the first consultation and accompanying plans and maps;
- the Consultation Brochure produced for the first consultation;
- the Consultation Leaflet produced for the first consultation, which was sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published for the second consultation.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 23 January 2024.

If you are unable to access the fileshare site or the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the Consultation Documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: info@h2teesside.net

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice
Landholding Plan

Date: 13 December 2023

The Chief Executive
PD Teesport Limited
17-27 Queen's Square
17-27 Queen's Square
Middlesbrough
TS2 1AH

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and is now carrying out further consultation ('the second consultation') on the Project in respect of a number of changes that have resulted to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the

Endurance storage site and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

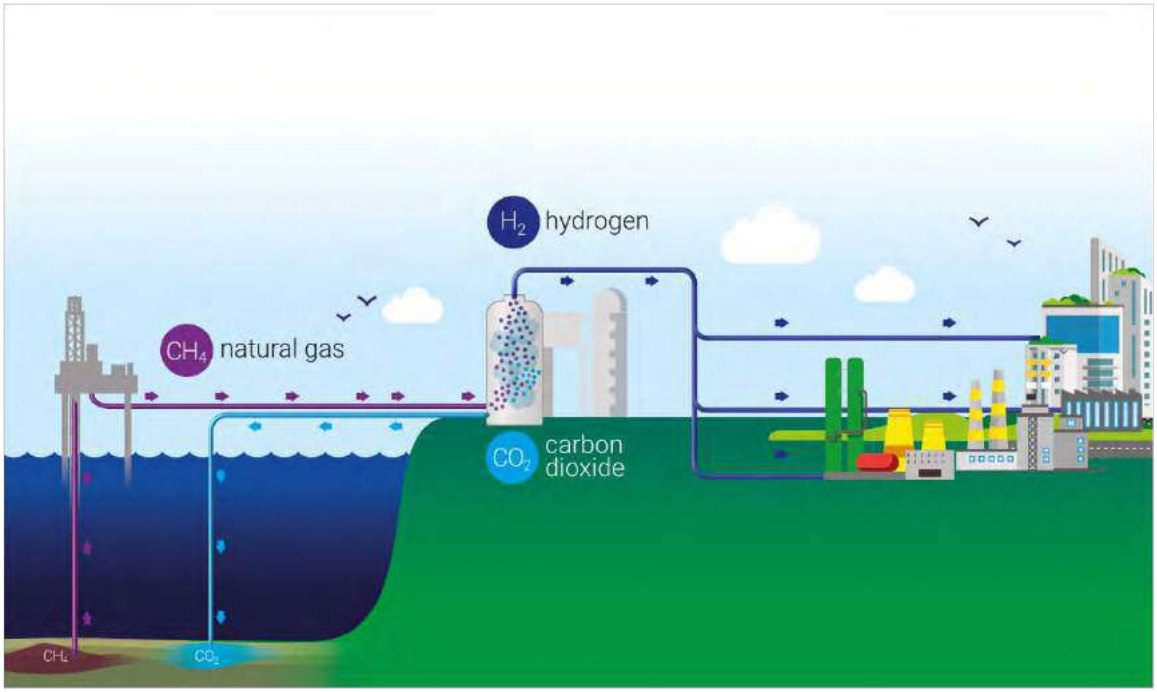
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by H2Teesside will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the Consultation Documents that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than **23 January 2024**. Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult' & Section 48 'Duty to publicise'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent (granted in the form of a 'Development Consent Order' or 'DCO') to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and persons with other interests in the relevant land. The consultation must be carried out prior to submitting the application for development consent to PINS.

As part of the first consultation on the Project, the Applicant identified you/your organisation as a 'prescribed person' (or potentially being a prescribed person) for the purposes of Section 42 of the PA 2008. This related to you/your organisation being a landowner identified as being affected/potentially affected by the Project or having an interest in land affected by the Project.

Following that first consultation and pursuant to that Section 42 duty, the Applicant wishes to now seek your views through the second consultation on the Project as it is considered that the changes to the proposed Order Limits for the Project, which are described in this second consultation affect land in which you hold an interest.

Section 48 of the PA 2008 'Duty to publicise' also requires applicants for development consent to publicise their proposed application by publishing a notice (a 'Section 48 Notice') once in a national newspaper, once in the London Gazette, and in the case of a project like H2Teesside that involves tidal waters in the UK marine area, in the Lloyds List and an appropriate fishing journal, and for at least two successive weeks in a local newspaper circulating in the vicinity of the land to which the project relates. The Section 48 Notice for the Project is being published as follows:

- Telegraph – 14 December 2023
- London Gazette – 14 December 2023
- Lloyds List – 14 December 2023
- Fishing News – 14 December 2023
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The Project Site

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The changes made to the proposed Order Limits are shown and described within the Consultation Documents listed below and a plan showing how the changes to the proposed Order Limits affect land in which you hold an interest is provided with this letter.

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- the Preliminary Environmental Information Report and its Non-Technical Summary produced for the first consultation and accompanying plans and maps;
- the Consultation Brochure produced for the first consultation;
- the Consultation Leaflet produced for the first consultation, which was sent to people living within the vicinity of the Project Site; and
- the Section 48 Notice that is being published for the second consultation.

The Consultation Documents are available to download and view free of charge from the Project Website: www.h2teesside.co.uk until 23 January 2024.

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Responding to the Consultation

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Telephone: **Freephone 0800 080 3028**

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Please note that all comments and representations must be received by the Applicant no later than **11.59pm on 23 January 2024**.

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc. Section 48 Notice
Landholding Plan

Date: 5 February 2024

The Chief Executive
Ineos Nitriles (UK) Limited
38 Hanes Crescent
Knightsbridge
London
SW1X 0LZ

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

TARGETED CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008

We recently consulted you by letter dated 13 December 2023 (our second consultation) on a number of changes that we had made to the Site boundary of the H2Teesside Project (the 'Project') following our first consultation on the Project in September and October 2023.

These changes, which followed further design development and technical assessments and responses to our first consultation on the Project, resulted in a significant overall reduction in the proposed Order Limits for the Project from 1,350 hectares to 508 hectares. A small number of additions were also made to the proposed Order Limits to accommodate works required for the Project.

The letter of 13 December 2023, which is attached to this letter, provided details of how to access the consultation documents showing the changes to the proposed Order Limits. Those documents, including plans and maps showing the nature and location of the Project are available to download and view free of charge from the Project Website: www.h2teesside.co.uk

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Since undertaking our second consultation, we have identified further land that is required for the Project, and which needs to be included within the Order Limits. This is a small slither of land in between two plots that has been mistakenly excluded from the draft Order Limits at the previous consultation, which the Project is now seeking to remedy. Our enquiries indicate that you have an interest in this land. The land in question is identified on the plan that also accompanies this letter.

We wish to seek your comments on the inclusion of this land within the Order Limits and this letter represents our targeted consultation of Ineos Nitriles (UK) Limited on this matter pursuant to Section 42 of the Planning Act 2008.

Any comments and representations you may have should be submitted to us no later than **11.59pm on 7 March 2024**. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by use and our appointed agents, and copies may be made available in due course to the Secretary of State, Planning Inspectorate and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, we are under a statutory duty to publish names and addresses as part of our development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Yours faithfully

[redacted] **– on behalf of H2 Teesside Limited**

Enc. Letter dated 13 December 2023
Section 48 Notice
Drawing Ref. 073_ARDG_H2Teesside_LIC

Date: 5 February 2024

The Chief Executive
Ineos Nitriles (UK) Limited
PO Box 62
Seal Sands
Middlesbrough
TS2 1TX

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

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Yours faithfully

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Drawing Ref. 073_ARDG_H2Teesside_LIC

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17-27 Queen's Square
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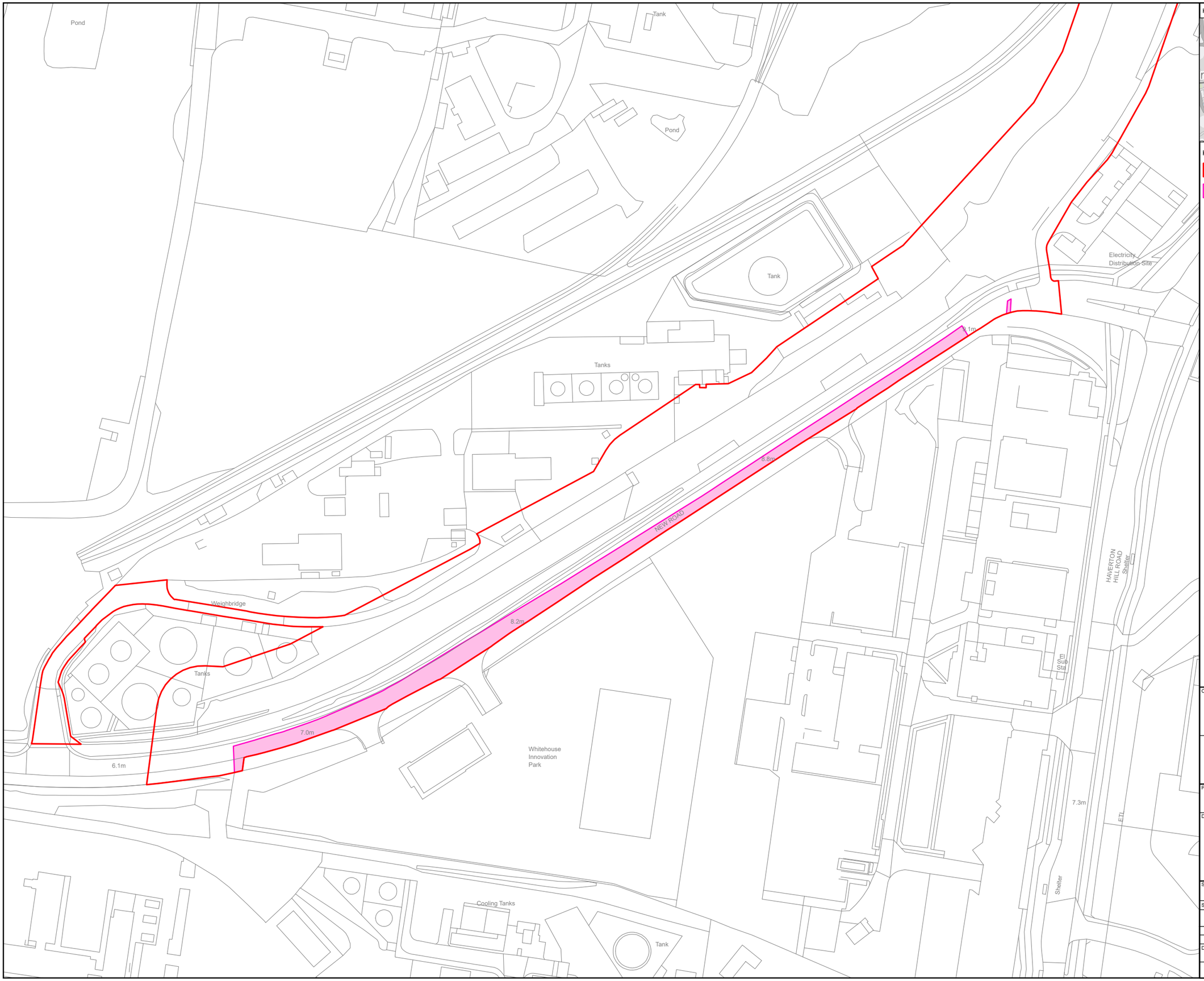
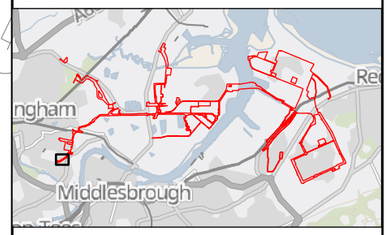
Enc. Letter dated 13 December 2023
Section 48 Notice
Drawing Ref. 073_ARDG_H2Teesside_LIC

APPENDIX 14.4: ADDITIONAL SECTION 42 LETTERS 8 FEBRUARY 2024



KEY PLAN



Key

- Revised Draft Order Limits
- Land Interest Boundary

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Client: H2 Teesside

N

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title:

CONSULTATION ON REPLACEMENT OPEN SPACE
LAND INTEREST PLAN
ARROWCRUIT HOLDINGS LIMITED
SHEET 1 OF 1

Status: FINAL		Revision	000
		Date	05/02/2024
Scale 1:1,500 @ A3	Spatial Reference System	British National Grid	

0 25 50 Metres

Drawn By	Checked By	Approved By
J.NEYE-SWIFT	N/A	J.WITHINGTON

Drawing reference: 073_ARDG_H2Teesside_LIC

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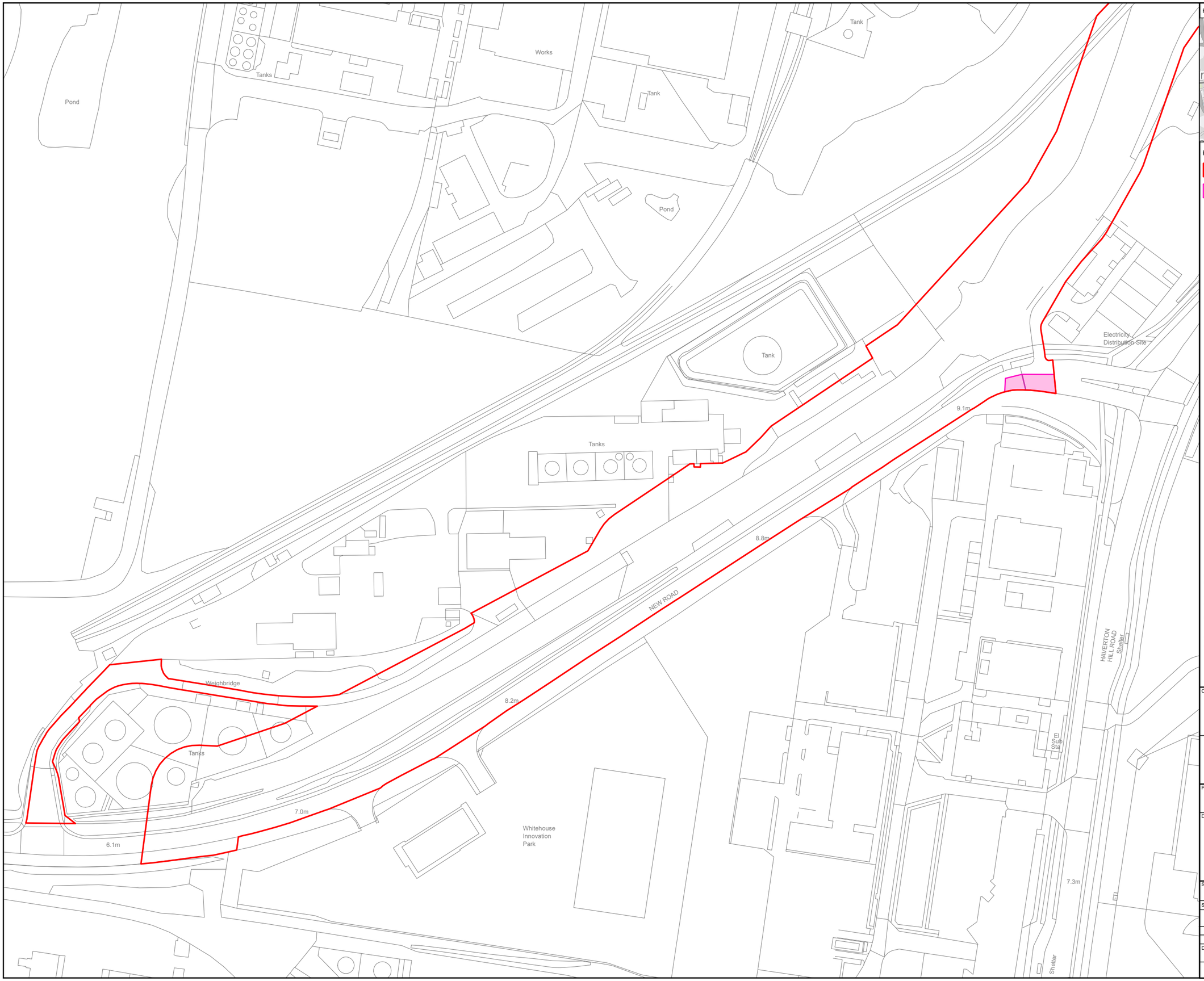
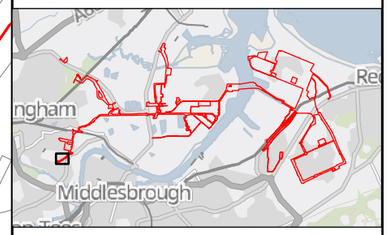
Plot Date: 05 February 2024 16:33
File Name: C:\Users\JakeN\Ardent Management Ltd\Projects - Aecom - H2 Teesside\P16 - GIS & CAD Files\073_ARDG_Teesside\ArcPro Projects\Re-Consultation Plans\073_ARDG_H2Teesside_LIC_Arrowcruit Holdings Limited.aprx



KEY PLAN



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Client: H2 Teesside

N

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title:

CONSULTATION ON REPLACEMENT OPEN SPACE
LAND INTEREST PLAN
INDUSTRIALISED LIMITED
SHEET 1 OF 1

Status: FINAL		Revision	000
		Date	05/02/2024
Scale 1:1,500 @ A3	Spatial Reference System	British National Grid	

0 25 50 Metres

Drawn By	Checked By	Approved By
J.NEYE-SWIFT	N/A	J.WITHINGTON

Drawing reference: 073_ARDG_H2Teesside_LIC

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Plot Date: 05 February 2024 16:41
File Name: C:\Users\JakeN\Ardent Management Ltd\Projects - Aecom - H2 Teesside\P16 - GIS & CAD Files\073_ARDG_ TeessideArcPro Projects\Re-Consultation Plans\073_ARDG_H2Teesside_LIC_Industrialised Limited.aprx

Date: 8th February 2024

Arrowcruit Holdings
White House Farm
Sandy Lane
West Billingham
TS22 5NB

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

FURTHER CONSULTATION IN ACCORDANCE WITH SECTION 42 'DUTY TO CONSULT' OF THE PLANNING ACT 2008 & REGULATION 13 'PRE-APPLICATION PUBLICITY UNDER SECTION 48 (DUTY TO PUBLICISE)' OF THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

H2 Teesside Limited (the 'Applicant') is proposing to apply for development consent pursuant to Section 37 'Applications for orders granting development consent' of the Planning Act 2008 (the 'PA 2008') from the Secretary of State ('SoS') for the Department of Energy Security and Net Zero ('DESNZ') to authorise the construction, operation and maintenance of the H2Teesside hydrogen project (the 'Project') on land either side of the River Tees within the boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and Hartlepool within County Durham.

The Applicant consulted on the Project between 14th September and 26th October 2023 ('the first consultation') and then carried out a further consultation ('the second consultation') on the Project between 13th December 2023 and 23rd January 2024 in respect of a number of changes to the Project Site boundary following further design development and technical assessments and responses to the first consultation.

Since undertaking our second consultation, we have continued our land referencing and scheme development, and have now identified that you have an interest in land within the Order Limits. This is because the adopted highway adjacent to your land falls within the limits of our Order (New Road, Haverton Hill, Stockton-on-Tees). While this project does not directly impact your land ownership, it does involve seeking powers over your assumed subsoil interests in the adopted highway. These assumed interests arise on the basis of the legal principle that, where a road is unregistered, such as New Road, adjacent land owners are assumed to own the 'subsoil' of that road. New Road is inclined in our Order limits as we anticipate the need to utilise it for temporary access during the construction phase. Additionally, we plan to acquire new rights, specifically in the form of an easement over the road, to facilitate the installation and on-going maintenance of a pipeline in the existing road (and therefore affecting the subsoil). The affected land is shown on the plan accompanying this letter.

Background to the Project

H2Teesside will be one of the UK's largest hydrogen production facilities with a capacity of up to 1.2 gigawatts ('GW') thermal by 2030, representing more than 10% of the Government's hydrogen production target of 10 GW by 2030. This equates to the production of approximately 160,000 tonnes of low carbon hydrogen per annum, with approximately two million tonnes of CO_2 being captured and stored each year.

The Project will use natural gas to produce hydrogen (known as 'blue' hydrogen) with the carbon dioxide (CO_2) created during the hydrogen production process being captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'). NEP will store the CO_2 securely below ground within the Endurance store and other nearby CO_2 stores that NEP holds CO_2 storage licences for. These are located approximately 145 kilometres ('km') offshore from Teesside under the North Sea.

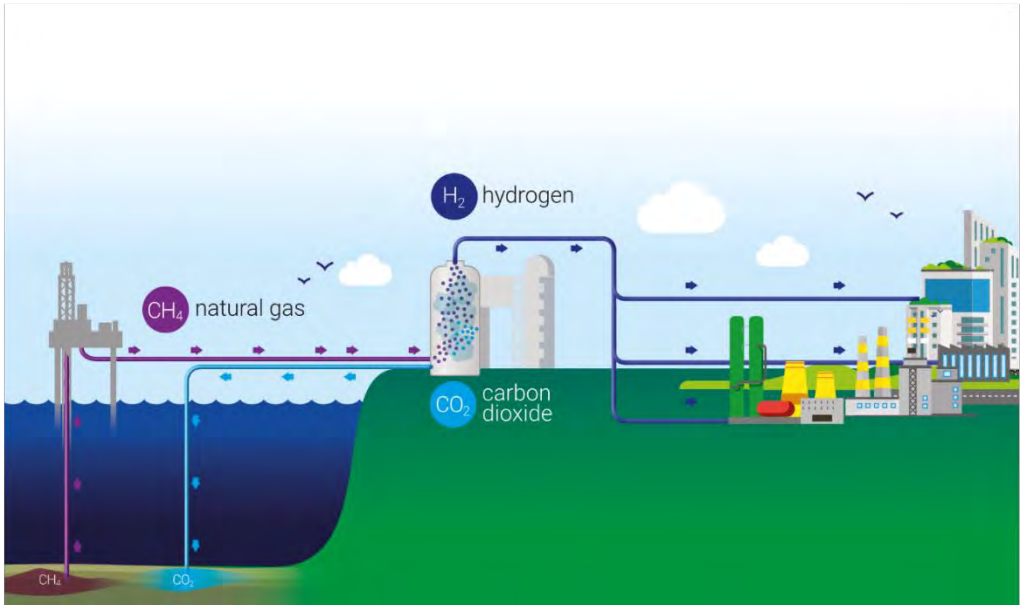
The onshore elements of the NEP infrastructure on Teesside are also known as the Net Zero Teesside ('NZT') Project and have been the subject of an application for development consent, in respect of which the SoS for DESNZ is expected to make a decision in the near future.

H2Teesside and NEP form part of the East Coast Cluster ('ECC'). The ECC has been selected as one of the first two carbon capture, usage and storage ('CCUS') clusters to be taken forward by the UK Government. The ECC has the potential to remove almost 50% of the UK's total industrial clusters carbon dioxide emissions, protect thousands of jobs and establish the region as a globally competitive climate friendly hub for industry and innovation. The ECC will include a diverse mix of low-carbon projects, including industrial carbon capture, low-carbon hydrogen production, negative emissions power, and power with carbon capture.

The low carbon hydrogen produced by the Project will be supplied via a new hydrogen pipeline network to existing businesses, helping heavy industry on Teesside reduce its carbon dioxide emissions and supporting the UK Government's commitment to reach to reach net zero by 2050.

It is anticipated that the proposed application for development consent will be submitted to the Planning Inspectorate ('PINS'), acting on behalf of the SoS for DESNZ in Q1 2024.

The infographic below provides an overview of the 'blue' hydrogen processes.



Further information relating to the Project is provided in this letter and the documents from the previous consultation that are being made available (see further details below).

Any comments and representations you may have on the Project should be submitted to the Applicant no later than **11 March 2024.** Details of how to make comments/representations are provided later in this letter.

Section 42 'Duty to consult' & EIA Regulation 13 'Pre-application publicity under Section 48 (duty to publicise)'

Section 42 of the PA 2008 'Duty to consult' requires prospective applicants for development consent (granted in the form of a 'Development Consent Order' or 'DCO') to consult on their proposed application with those persons specified in the PA 2008 and in regulations made pursuant to the PA 2008. These persons ('prescribed persons') include local authorities, prescribed consultation bodies and affected/potentially affected landowners and persons with other interests in the relevant land. The consultation must be carried out prior to submitting the application for development consent to PINS.

The Applicant has identified a number of persons and organisations, which it is required to consult for the purposes of Section 42 of the PA 2008. It has been determined that you or your organisation is, or may be, a 'prescribed person' for the purposes of Section 42, due to the land interest noted above. The Applicant therefore wishes to seek your views on its proposals for H2Teesside.

To ensure that you are receiving the same information that was produced at the first consultation also enclosed with this letter is a copy of the section 48 notice that was published in the local and national newspapers at the time of the first consultation.

The Applicant

H2 Teesside Limited is indirectly owned by bp Plc ('bp'). bp or an affiliate thereof will be the lead developer and operator of the Project.

bp is an active global hydrogen participant and believes hydrogen could play a key role in its energy portfolio. It is a vital industrial decarbonisation solution and together with carbon capture and storage, which can play a critical role in securely and safely storing the vast majority of CO_2 emissions produced by heavy industry, will be critical to delivering net zero.

The Project Site

The site for the Project (the 'Project Site') comprises land either side of the River Tees within boroughs of Redcar and Cleveland and Stockton-on-Tees on Teesside and the borough of Hartlepool in County Durham. The current extent of the Project Site, taking account of the changes made following further design development and technical assessments and responses to the first consultation, is approximately 508 hectares in total. National Grid References (NGRs) for the Project Site are provided below:

- Mid-point – 454719 524286
- North – 451309 526476
- East – 458760 521587
- South – 457001 520748
- West – 446938 521613

Plans are available on the Project Website described below. .

Project Description

The proposed application will, amongst other matters, seek development consent for the construction, operation and maintenance of:

- a hydrogen production plant of up to 1.2 GW thermal to be developed in two phases;
- a natural gas supply connection for the supply of natural gas to the hydrogen production plant;
- an air separation unit and or oxygen and nitrogen supply pipelines to supply these industrial gases for the hydrogen production process;
- an electricity grid connection to provide power to the Project;
- water supply and treatment and wastewater infrastructure;
- CO_2 capture and compression facilities and a connection to the NEP infrastructure for the transport and storage of the CO_2;
- hydrogen distribution pipelines to supply the low carbon hydrogen to industrial offtakers across Teesside;
- other associated development, including hydrogen storage; external lighting; fencing and boundary treatment; security measures; surface water and foul water drainage systems; water, electricity, gas and other utilities connections; hard and soft landscaping; biodiversity mitigation and enhancement measures; temporary contractor facilities and construction laydown areas; vehicle access roads, crossing, parking and pedestrian and cycle facilities.

The hydrogen production plant and its associated development (e.g. natural gas supply connection, air separation unit/oxygen and nitrogen supply pipelines, electricity grid connection, water infrastructure, hydrogen storage and CO_2 capture and compression facilities and connection) and ancillary development will be located within the administrative area of the borough of Redcar and Cleveland. The hydrogen distribution pipelines corridors will extend either side of the River Tees to several potential industrial offtakers and encompass land within the administrative areas of the boroughs of Redcar and Cleveland, Stockton-on-Tees and Hartlepool.

All of the above elements will be included in the proposed application for development consent.

Environmental Impact Assessment

The Applicant has notified the SoS in writing under Regulation 8(1)(b) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that it intends to provide an Environmental Statement ('ES') in respect of the Project. An ES will form part of the proposed application for development consent.

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Consultation Documents

Those documents, as well all other consultation documents that were produced for the first and second consultation are available to download and view free of charge from the Project Website: www.h2teesside.co.uk

If you are unable to access the Project Website, please email: info@h2teesside.net or telephone: 0800 080 3028 and you will be offered a paper copy of the documents free of charge (with the exception of the PEIR which will be charged at a maximum of £250) or a USB device containing the Consultation Documents free of charge. Any details you provide to us via email or telephone will be subject to our Privacy Notice: http://h2teesside.co.uk/privacy

Responding to the Consultation

If you wish to make comments or representations in respect of the Project, these should be sent to the Applicant. Please include your name and an address where any correspondence relating to the Project can be sent. Comments and representations may be submitted in the following ways:

Email: **info@h2teesside.net**

Post: **Freepost H2TEESSIDE**

Telephone: **Freephone 0800 080 3028**

Project Website: www.h2teesside.co.uk

Any comments received will be analysed by the Applicant and any appointed agent of the Applicant, and copies may be made available in due course to the SoS, PINS and other relevant statutory authorities so that your comments can be noted. For certain parties, those who own an interest in land or are affected by the Project, the Applicant is under a statutory duty to publish names and addresses as part of its development consent application. In respect of other people, we will request that your personal details are not placed on public record and these will be held securely by the Applicant in accordance with the Data Protection Act 1998 and the General Data Protection Regulation and used solely in connection with the consultation process and subsequent development consent application and, except as noted above, will not be passed to third parties. Please refer to our Privacy Notice: http://h2teesside.co.uk/privacy

Please note that all comments and representations must be received by the Applicant no later than **11.59pm 11 March 2024**

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc.

- Section 48 Notice
- Land Interest Plan

Date: 8th February 2024

Industrialised Limited
C/O Private A J Boyle
4 Bowcliffe Grange
Bramham
Wetherby
LS23 6UL

Dear Sir/Madam,

THE H2TEESSIDE PROJECT – LAND EITHER SIDE OF THE RIVER TEES WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES ON TEESSIDE AND THE BOROUGH OF HARTLEPOOL IN COUNTY DURHAM

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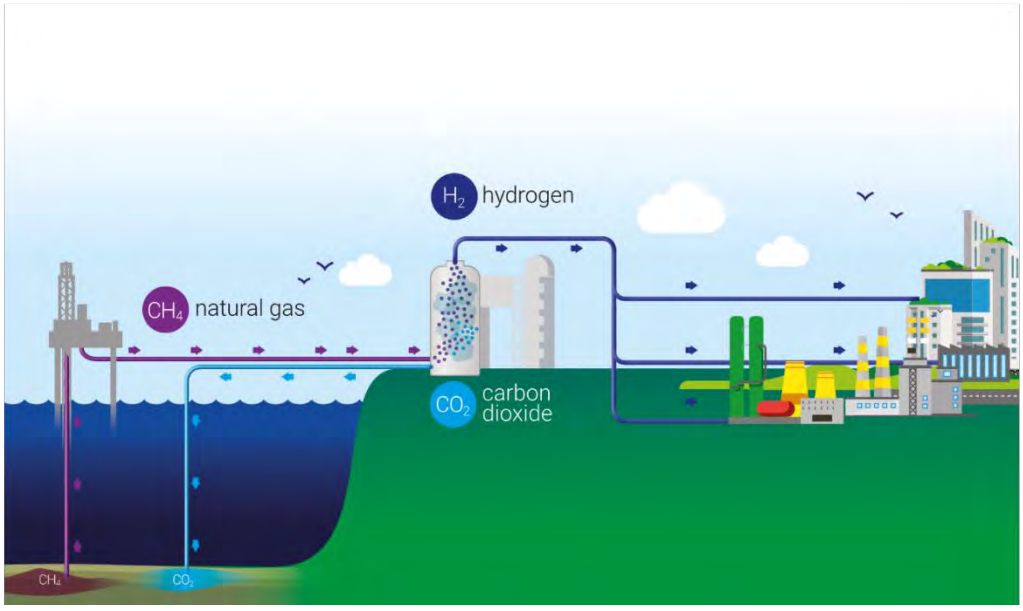

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Please note that all comments and representations must be received by the Applicant no later than **11.59pm 11 March 2024**

Yours faithfully

[redacted] **– on behalf of H2Teesside Limited**

Enc.

- Section 48 Notice
- Land Interest Plan

APPENDIX 14.5: TARGETED COWPEN BEWLEY CONSULTATION – EMAILS DATED 20 DECEMBER 2023 AND 16 JANUARY 2024 (INCLUDING OPEN SPACE REPLACEMENT LAND ASSESSMENT) TO STBC

[redacted]

From: [redacted]
Sent: 20 December 2023 13:02
To: [redacted]
Cc:
Subject: H2Teesside - replacement open space land

Importance: High

Hello [redacted] I hope you are keeping well and that the lead-up to Christmas has not been too busy.

I appreciate that officers will be on leave for the Christmas period, but I have been asked by bp to set up a meeting with Stockton early in the New Year to discuss the H2Teesside Project in terms of the potential requirement for replacement open space land.

To provide some context, part of the Project involves land to the north-west of Cowpen Bewley that is identified as open space/a woodland park. The potentially affected areas are marked in pink (permanent land take) and light blue below in **Figure 1** below. The land in question – the dark blue edged land between the railway and the pink land – would have above ground pipes within it after they have passed under the railway. The pink land will accommodate an AGI, but this will only occupy a small area as shown indicatively in **Figure 2** below. An extract of the Local Plan Proposals Map showing the area as open space is provided as **Figure 3** (also below).

I would be grateful if you could provide some dates and times for a meeting from 8th January in order to discuss this matter. We will provide more information on what is proposed within this area and also initial work and thoughts on possible replacement land.

Kind regards

[redacted]

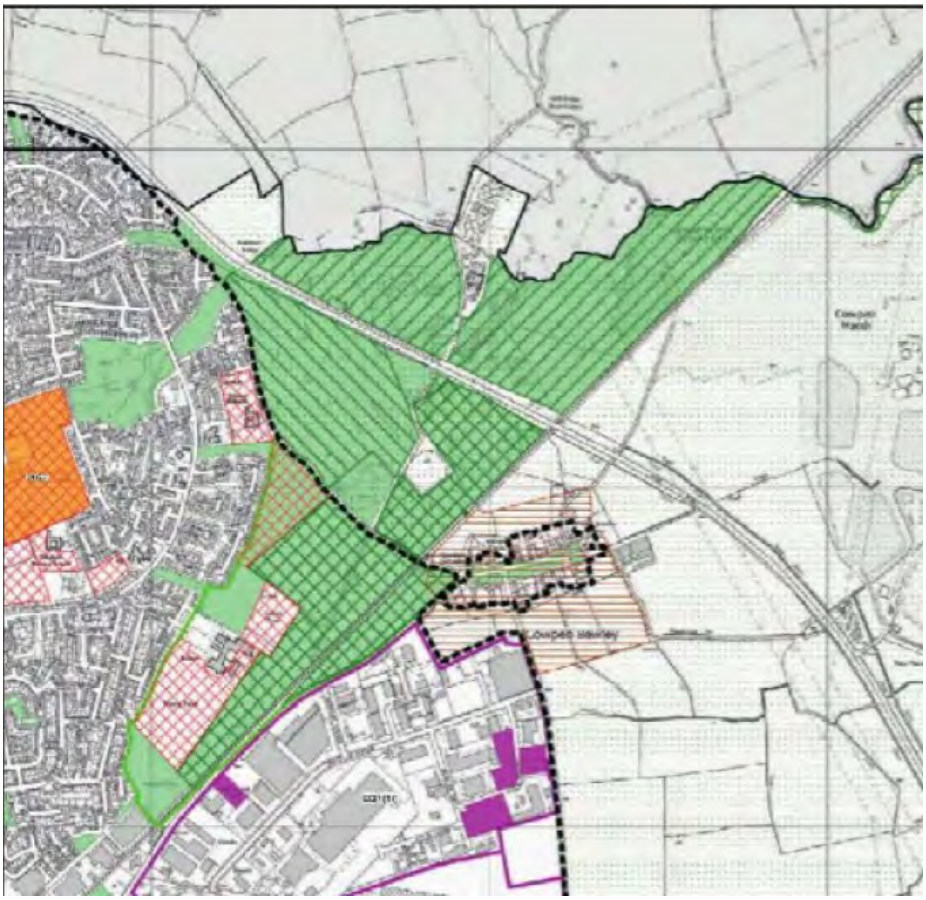
Figure 1



Figure 2



Figure 3



[redacted]
BA (Hons) BPl. MRTPI
Joint Managing Director
Head of Planning, Energy & Infrastructure

[redacted]

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Chartered Surveyors & Town Planners
69 Carter Lane, London, EC4V 5EQ

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[redacted]

From: [redacted]
Sent: 16 January 2024 10:13
To: [redacted]
Cc: [redacted]

Subject: H2Teesside - Cowpen Bewley (Open Space Replacement Land)

Importance: High

Dear [redacted] ahead of the meeting on Friday 19th, the following documents and plans are provided:

1. Open Space Replacement Land Assessment.
2. Plans and photographs of the Cowpen Bewley site (Refs. 22004379_PLN_ROC_307.1 to 307.57).
3. Plans and photographs of land on the north side of Cowpen Bewley (Field 1) (Refs. 22004379_PLN_ROC_307.58 to 307.76 – Field 1).
4. Plans and photographs of land lying to the south-east of Newton Bewley (Field 2) (Refs. 22004379_PLN_ROC_307.77 to 307.78 – Field 2).

The Open Space Replacement Land Assessment provides an assessment of potential replacement open space land within the vicinity of the Cowpen Bewley Woodland Park, including size, tenure, description, access routes to the land and local plan designation/status.

The documents and plans can be accessed and downloaded using the link below to our secure file share site.

https://dwd.ctit.co/url/qgwj3nevsigxsmhr

If you have any issues accessing the documents, please do let us know.

Kind regards

[redacted]
BA (Hons) BPl. MRTPI
Joint Managing Director
Head of Planning, Energy & Infrastructure

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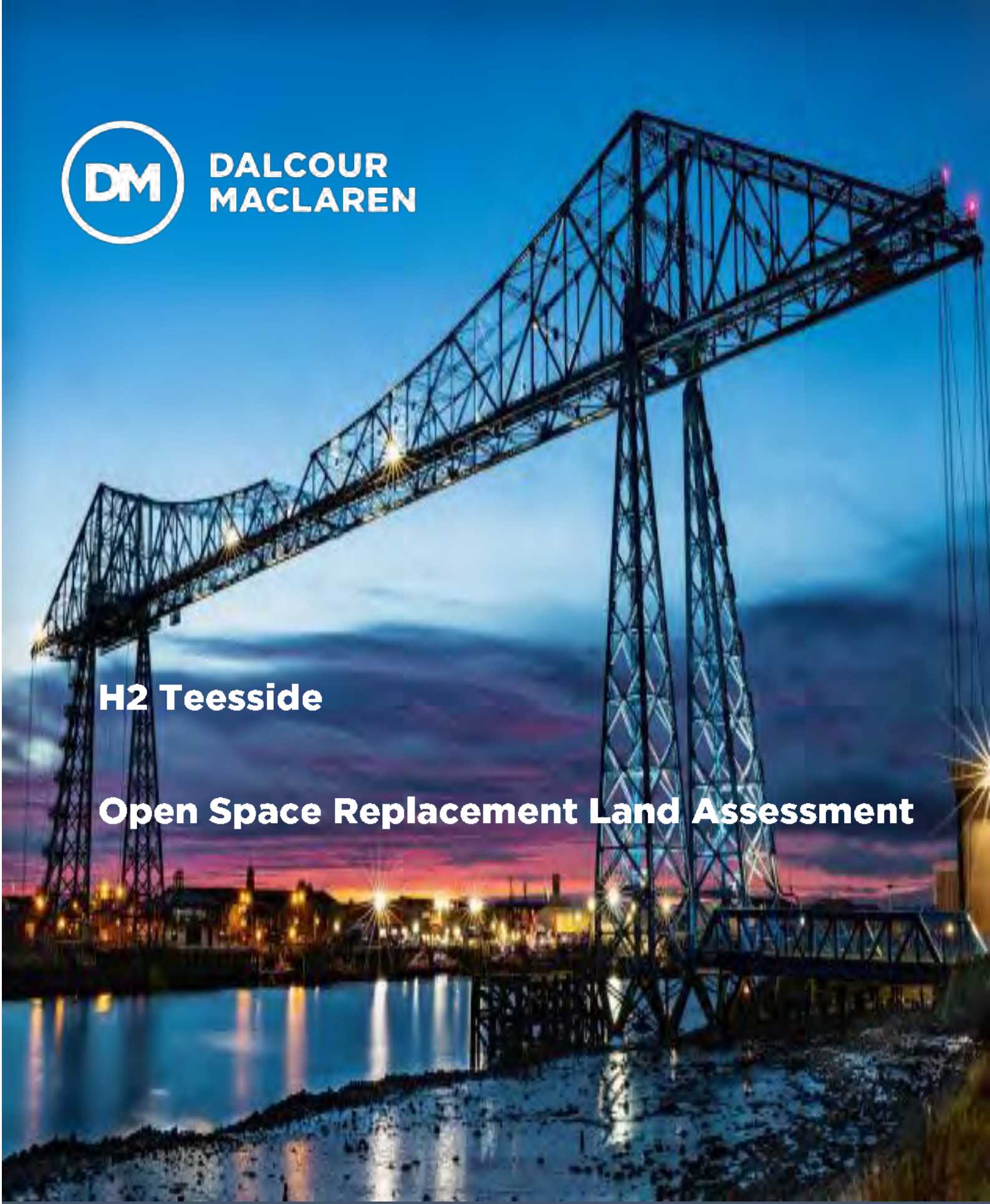

H2 Teesside

Open Space Replacement Land Assessment

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1.0 Summary

Following the identification of designated open space land being required by the H2 Teesside Project. An assessment has been undertaken by Dalcour Maclaren to review potential replacement open space land within the vicinity of the Cowpen Bewley Woodland Park. The land selected must not already be deemed as 'open space' and should be as close as possible to Cowpen Bewley Woodland Park to ensure it is 'equally advantageous'.

Summary of the existing space in table below:

Summary of Existing Open Space Assessment	Date assessment carried out: 04/01/2024
Maximum acres required (If whole area needs to be replaced)	4.85 acres
Minimum acres required (If only AGI location needs to be replaced)	0.15 acres
Number of pedestrians	2
Activity	Dog walkers
Ground Conditions	Pedestrian paths saturated and boggy.
Time Spent assessing the area	2 hours

The area bp will be required to replace under statutory tests remain under assessment.

Open Space Land

The land shown in the plan below is wholly within the Open Space designated land known as Cowpen Bewley Woodland Park. The land take for the development is summarised below;



The area outlined in White on the adjacent plan shows the land which is assumed to be required for construction of the AGI, Pipeline and associated maintenance and access ways.

The area bp will be required to replace under statutory tests remains under assessment.

Replacement Land Schedule

REF	Title Number	Owner	Size (Ac)	Local Authority	Tenure	Description	Access (Routes shown in Appendix 1)	Image of Area (Links to detailed Photographs of land on site located in Appendix 1)
Open Space Land	CE118976 CE1133628 & CE133734	Northern Gas Networks Limited Stockton on Tees Borough Council	4.85 acres in total	Stockton-on-Tees Borough Council	Freehold Freehold	• Topography – Flat • Land Use – Pasture/Woodland • Fencing – Hedges/Woodland. Other points of note: • Access to land parcel 1 from woodland via brick tunnel on foot.	Access off Wolviston Back Lane. The woodland itself is accessed via styles leading to the public footpath.	
1	CE125722 LAND ON THE NORTH SIDE OF, COWPEN BEWLEY, BILLINGHAM	Shirley Peel	14.8	Stockton-on-Tees Borough Council	Owner Occupied	• Topography – Flat. • Land Use – Pasture. • Fencing - Post and rail / wire fenced. • Adjacent to existing open space. Other points of note: • Part of this land is within a conservation area. • Assumed Grade 4 (Poor) land.	Land can be accessed from existing open space via footpath under railway. Accessed via brick tunnel from existing open space.	
2	CE210987 LAND LYING TO THE SOUTH EAST OF, NEWTON BEWLEY, BILLINGHAM	Church Commissioners for England.	10.3	Stockton-on-Tees Borough Council	Freehold – Unknown Occupier (Farmer). No registered Lease	• Topography - Slight incline. • Land Use – Arable. • Fencing – Hedges. Other points of note: • Standing water. • Adjacent to existing open space • Assumed Grade 3 (Good to moderate) land	Vehicular access from the A1185 via gateway. Can be accessed off existing footpath as part of the Cowpen Bewley Woodland Park open space.	

Local Plans

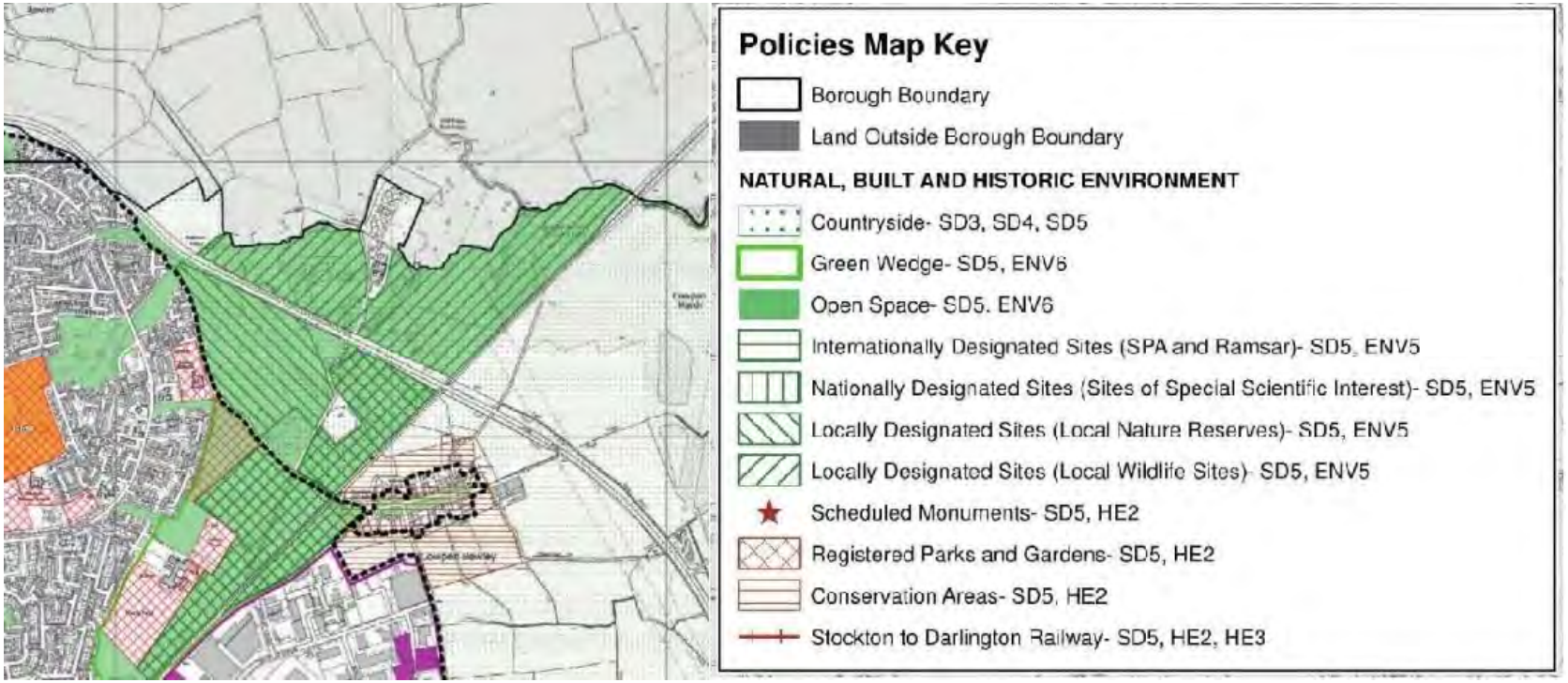
Stockton on Tees Borough Council

The figure below shows the Local Plan Policies Map for Stockton on Tees Borough Council. The

1. Shirley Peel - Land identified as within a 'Conservation Area'.
2. Church Commissioners – Land identified as 'Countryside'

Development

No land is currently allocated for development. We are unaware as to whether there are any Promotion or Option Agreements in place for the lands development.



Appendix 1 – Access Routes

Access to the two land parcels has been determined as follows;

Open Space Land



Existing Open Space

1 - Access can be taken from Wolviston Back Lane and then access into the Open Space is via public footpath.

2 - Access can be taken from Wolviston Back Lane and then access into the Open Space is via public footpath.

3/4 - There is vehicular access from location 3 but as the red line turns south, access is via a public footpath. As the blue line heads out of the white outlined parcel, this leads under the tunnel (railway) into Shirley Peels land (Replacement option Field 1) which is a public footpath down to 4 which ends in Cowpen Bewley village.



Shirley Peel

Access to Shirley Peels land can be taken as follows;

1&2 - From the public highway at several points and linearly from the Red Line Boundary.

3 – From the public highway but via a private 3rd party landowner.

4 – Access into land from existing open space via tunnel beneath the railway.

Field 1 - 65 meters from existing site.



Church Commissioners for England

Access to Church Commissioners land can be taken from one principle location from the public Highway.

1 - Access from The A1185

There is a public footpath in the woodland to the south but this below the neighbouring field to the East.



Figure of Field 2 showing existing footpath

The image to the left shows the existing footpath locations adjacent to Field 2 by a red dotted line.

Appendix 2 – ALC

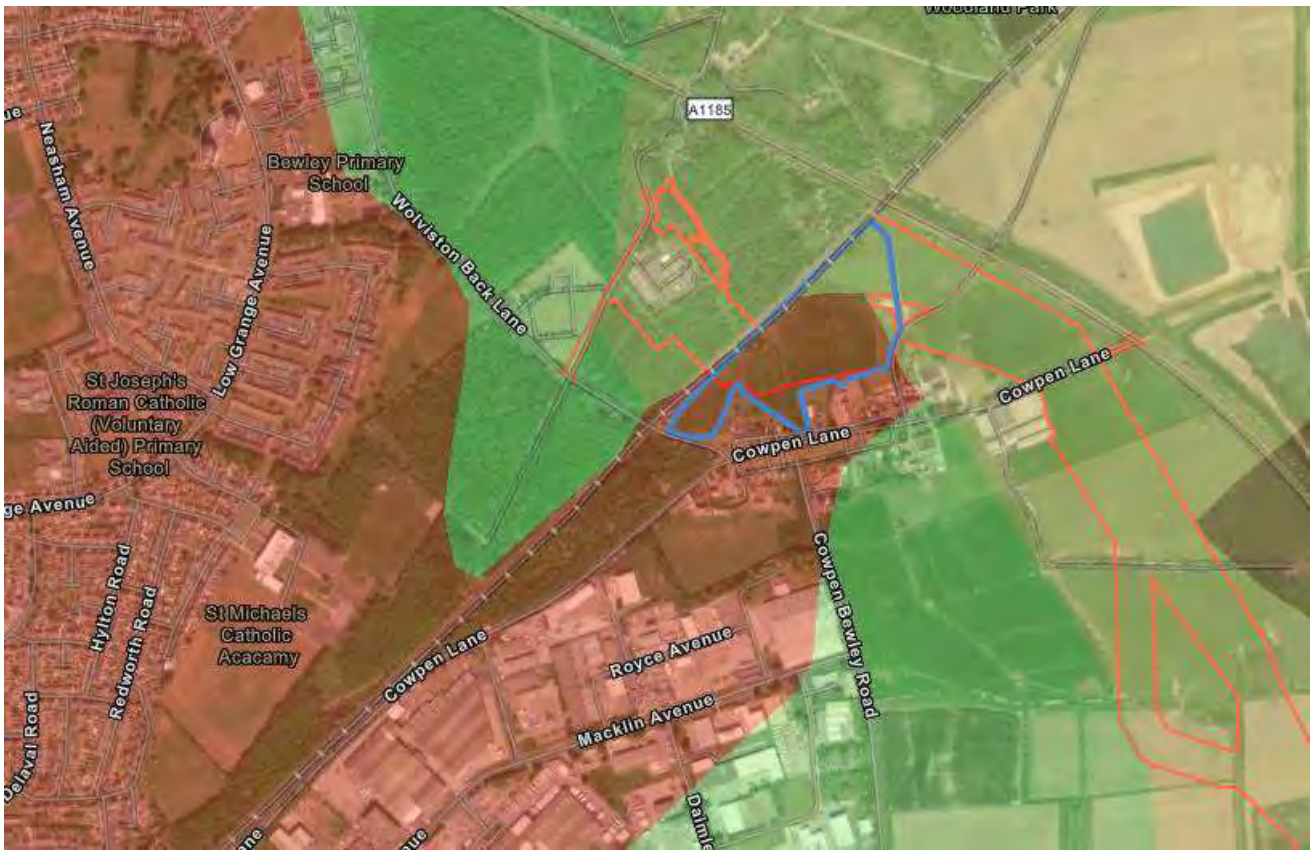


Figure showing Field 1 – Assumed to be Grade 4.

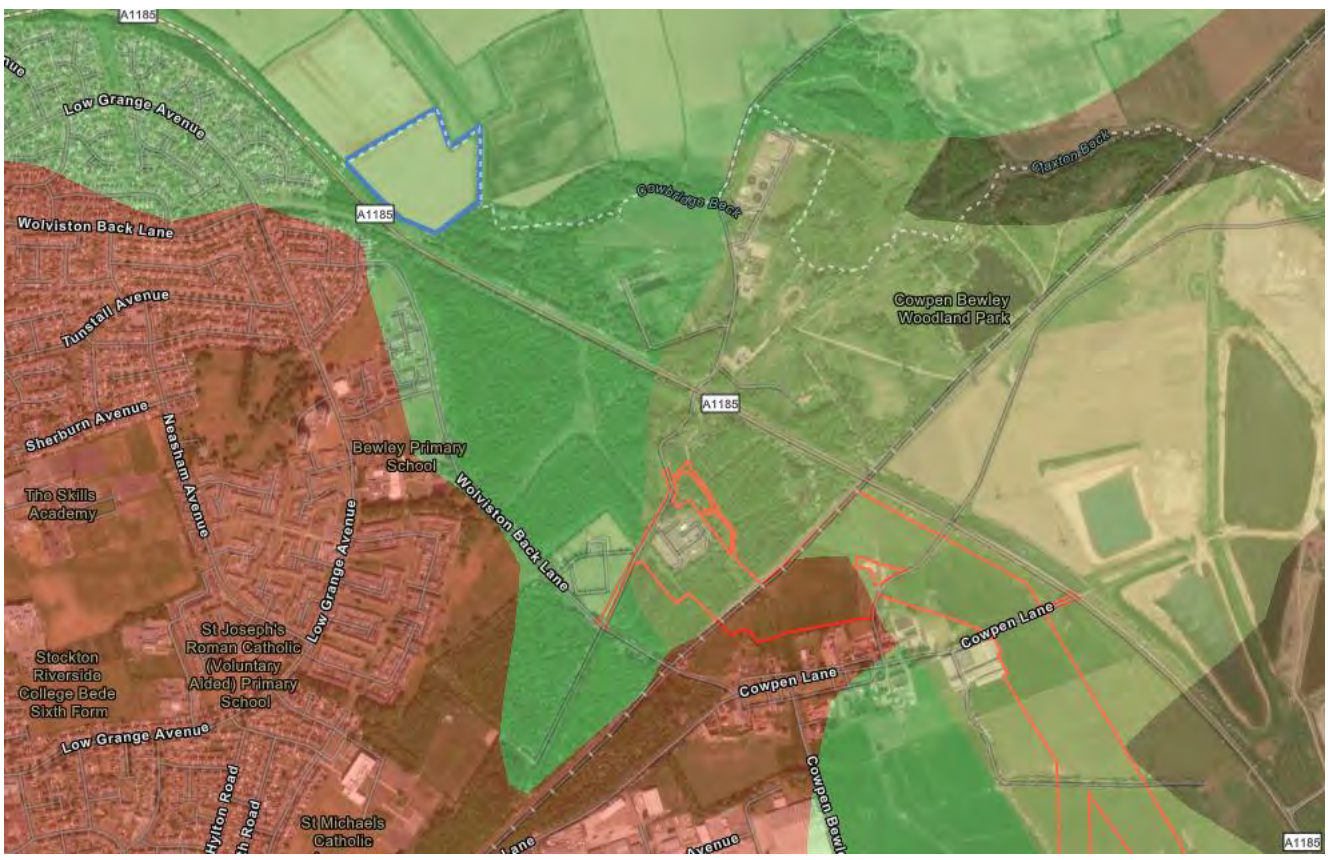


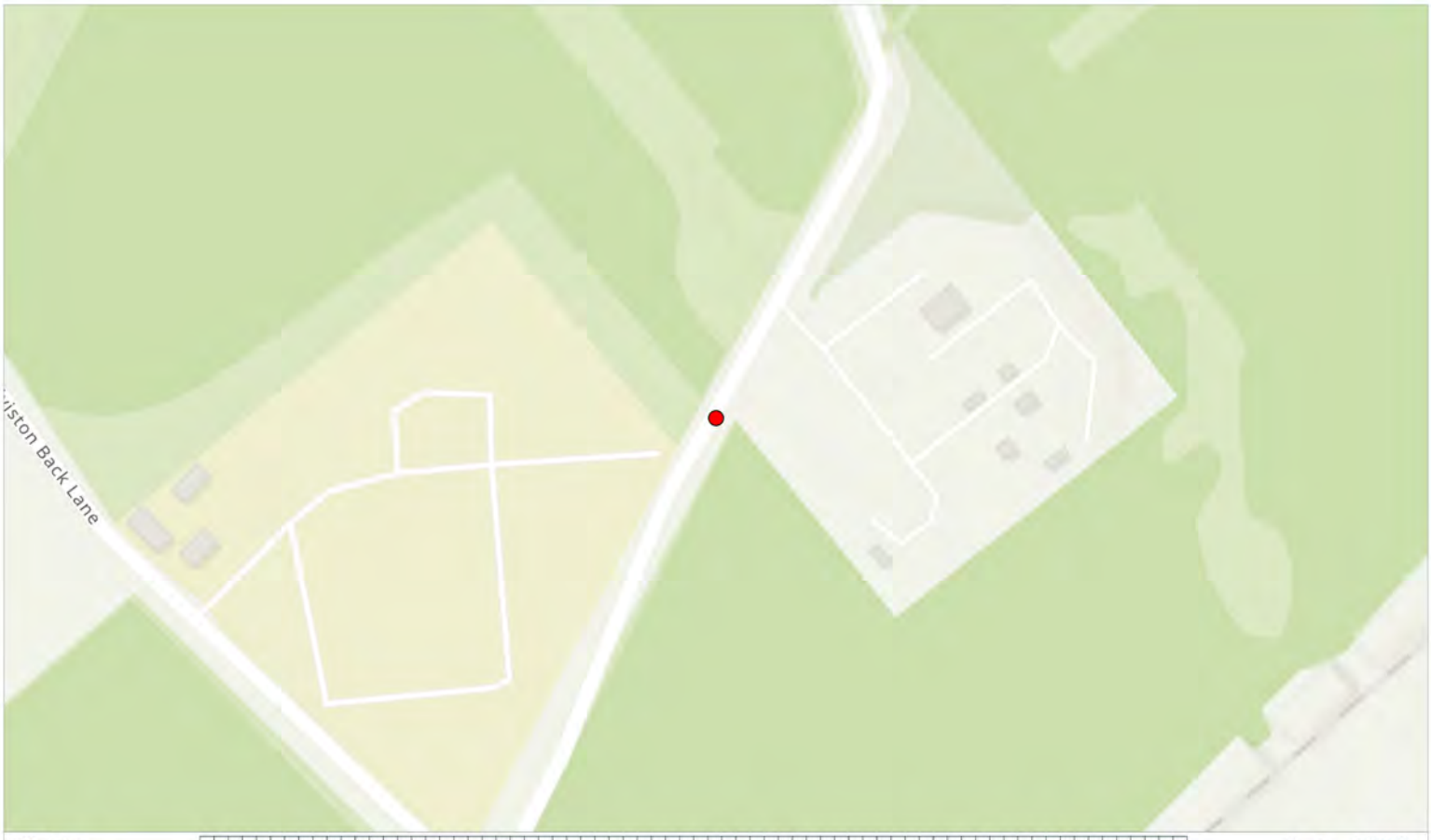
Figure showing Field 2 – Grade 3. Sub category (a/b) unknown.

Appendix 3 – Record of Condition

Existing site – Doc name 20240108_22004379_PLN_ROC_307.1-307.57_Existing_Sites (sent separately).

Field 1 – Doc name 20240108_22004379_PLN_ROC_307.58-307.76_Field_1 (sent separately).

Field 2 – Doc name 20240108_22004379_PLN_ROC_307.77-307.78_Field_2 (sent separately).



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Northing: 525037.6034

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447736, 525038

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.1

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
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Sheet Size:	A4

Key:

Photo Location

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Projection: Transverse Mercator
Datum: OSGB 1936

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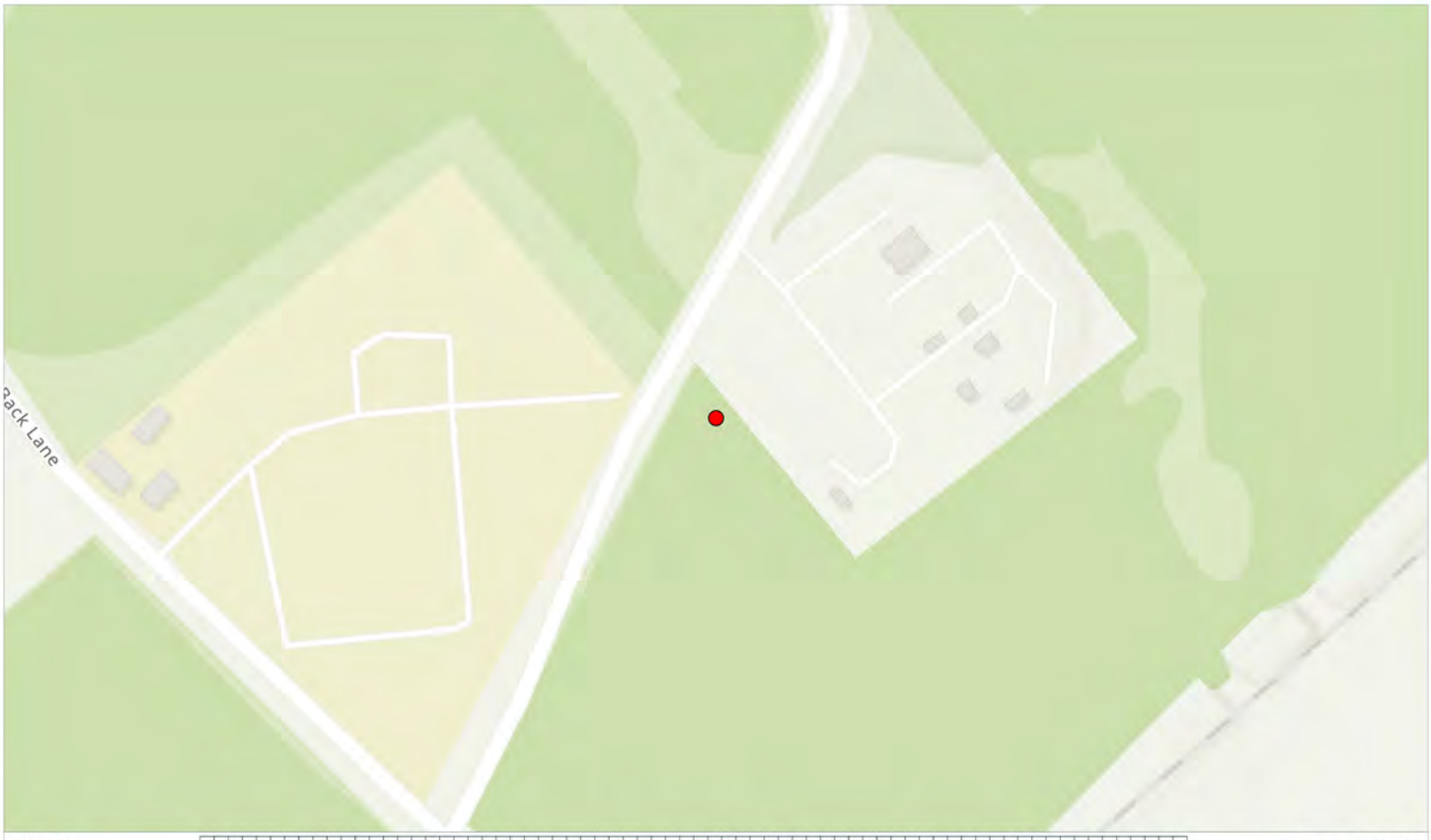

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Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447750, 525017

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.2

Rev	Date	Description
-	08.01.2024	First Issue

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Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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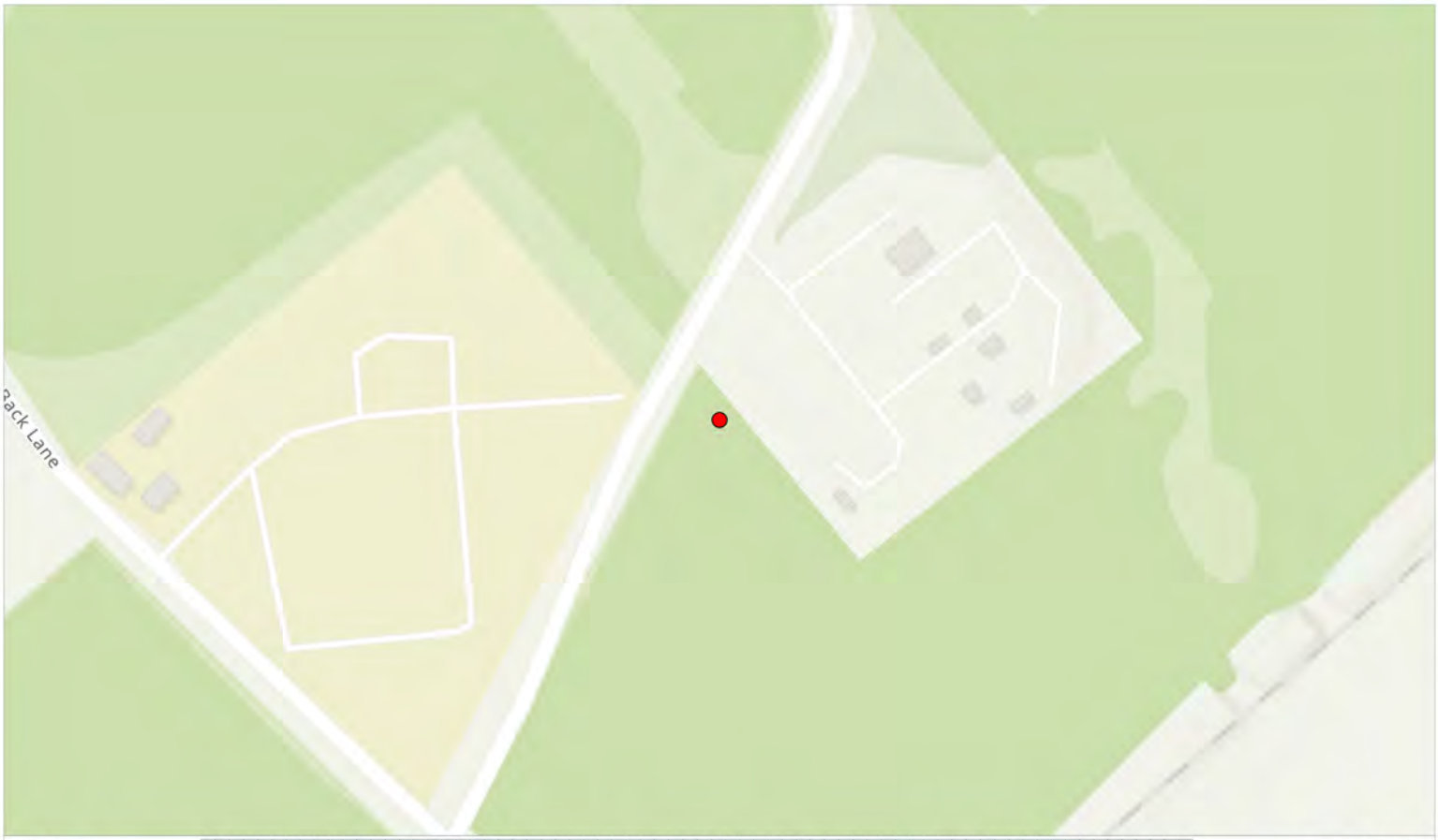

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Northing: 525016.9862

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447750, 525017

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.3

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Projection: Transverse Mercator
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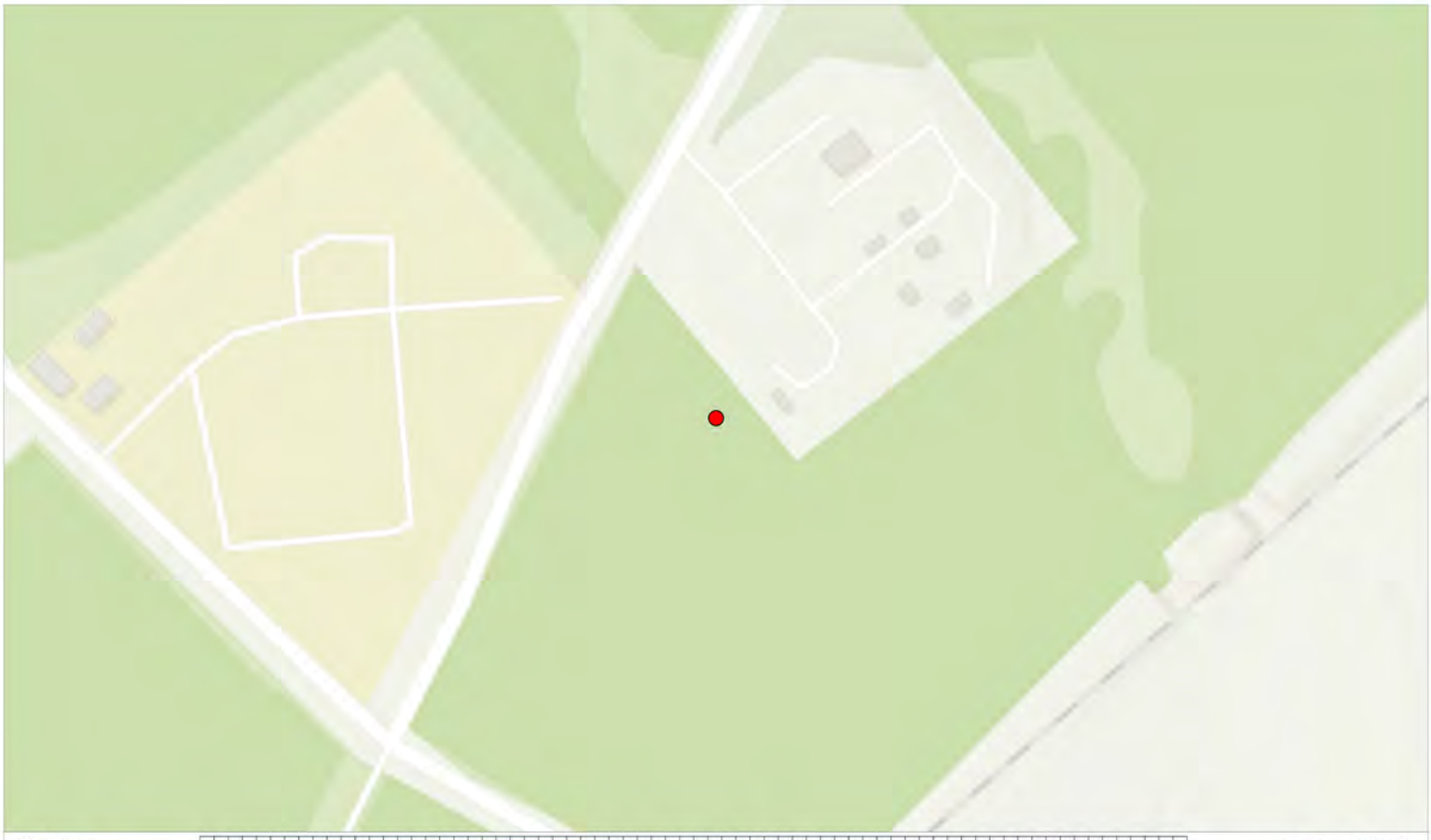

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Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447771, 524983

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.4

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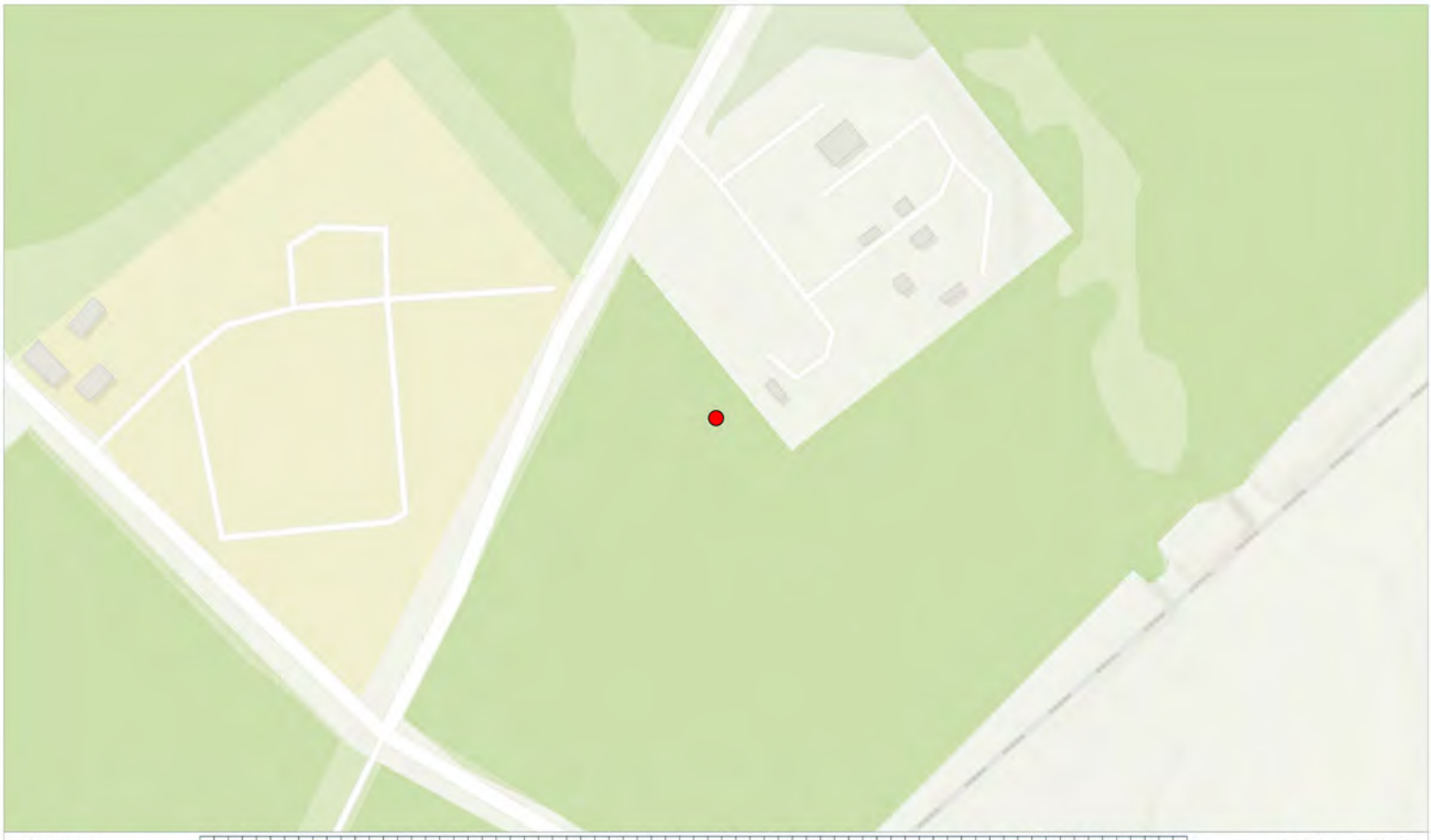

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Additional Comments:

Existing Sites



Interest: N/A

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Coords: 447773, 524979

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.5

Rev	Date	Description
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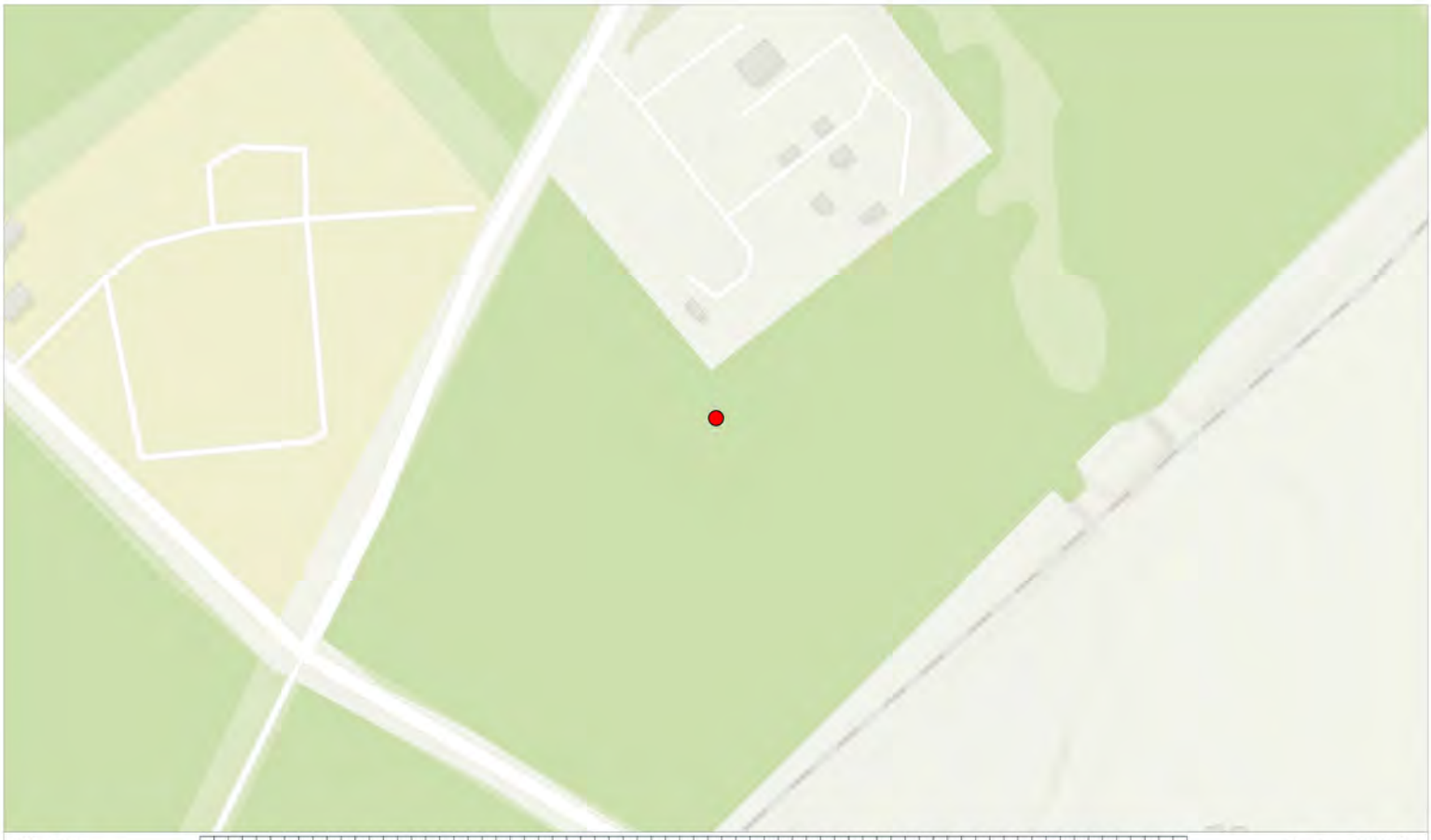

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Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447801, 524951

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.6

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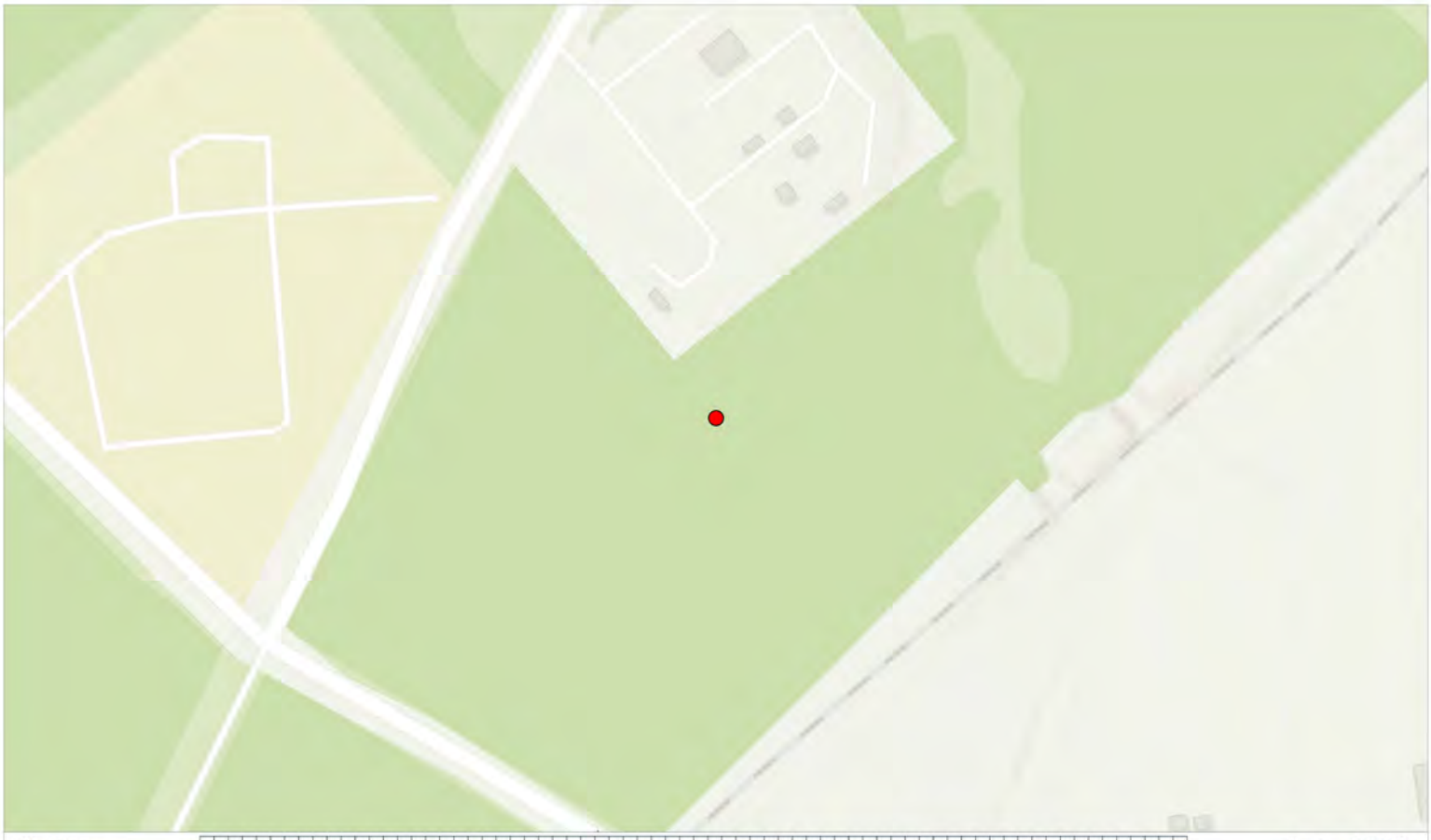

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Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447814, 524947

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.7

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
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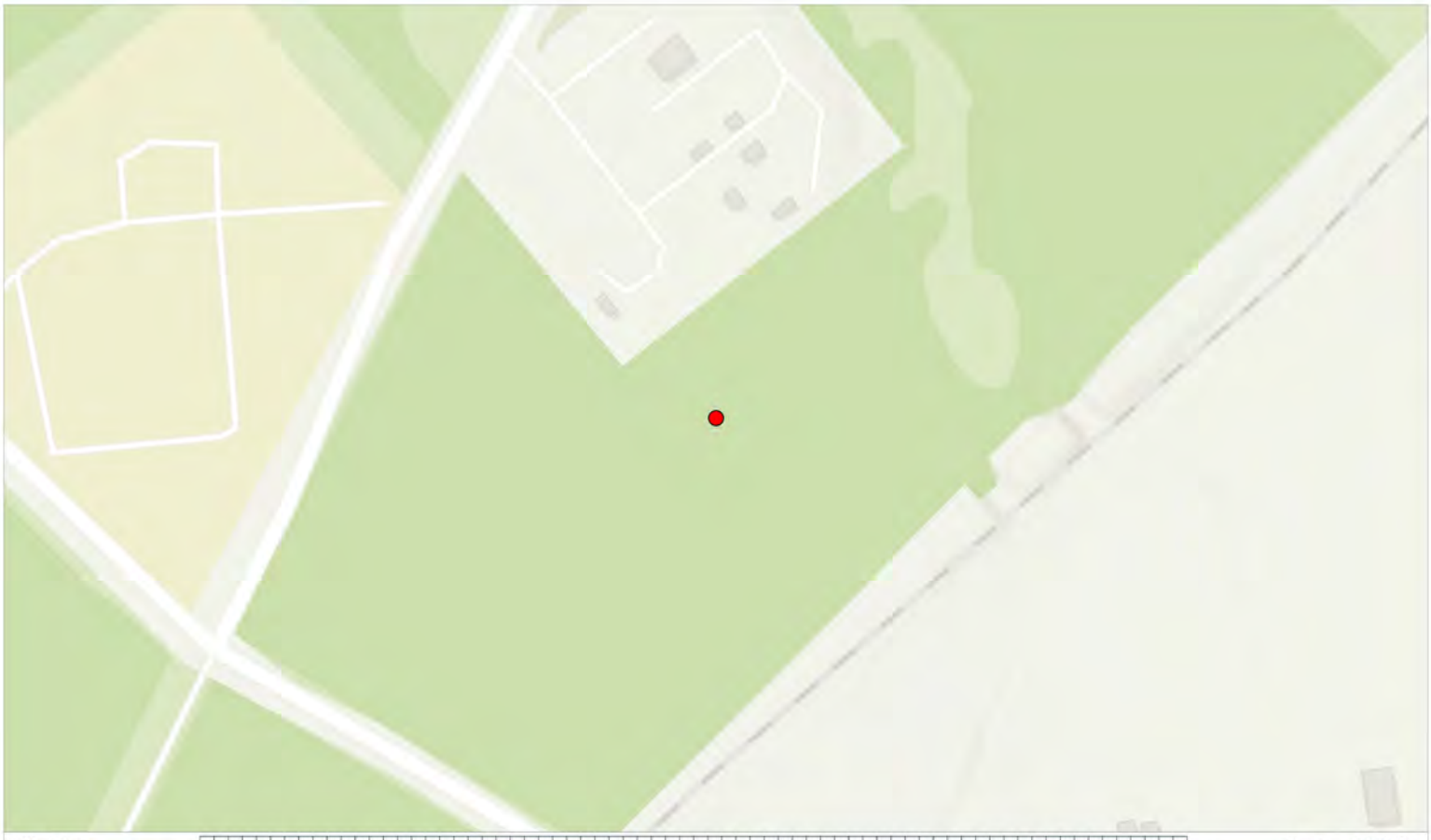

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Easting: 447832.4925
Northing: 524948.857

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447832, 524949

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.8

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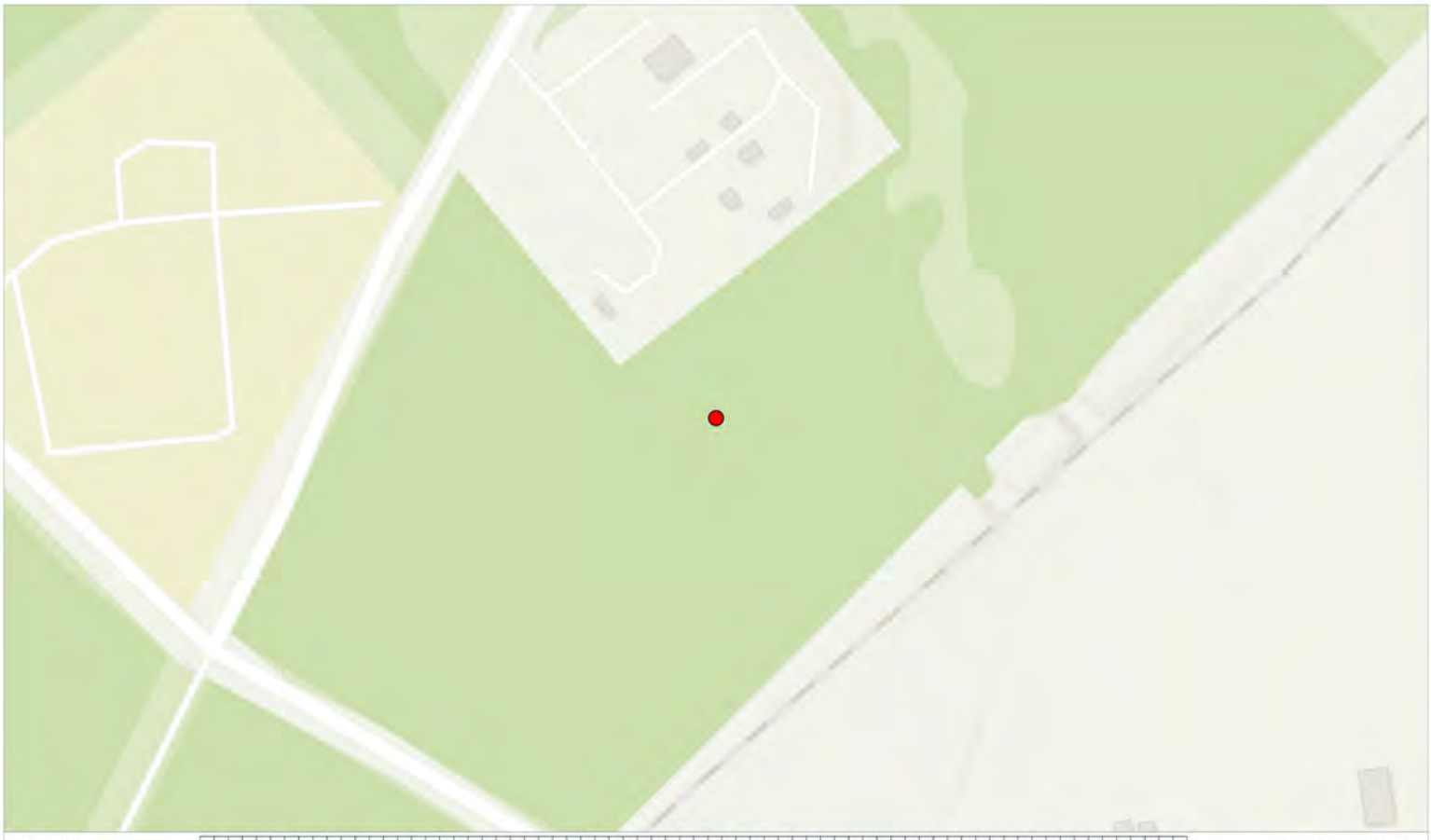

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_111411.jpg
Easting: 447833.6745
Northing: 524948.8694

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447834, 524949

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.9

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
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Sheet Size:	A4

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Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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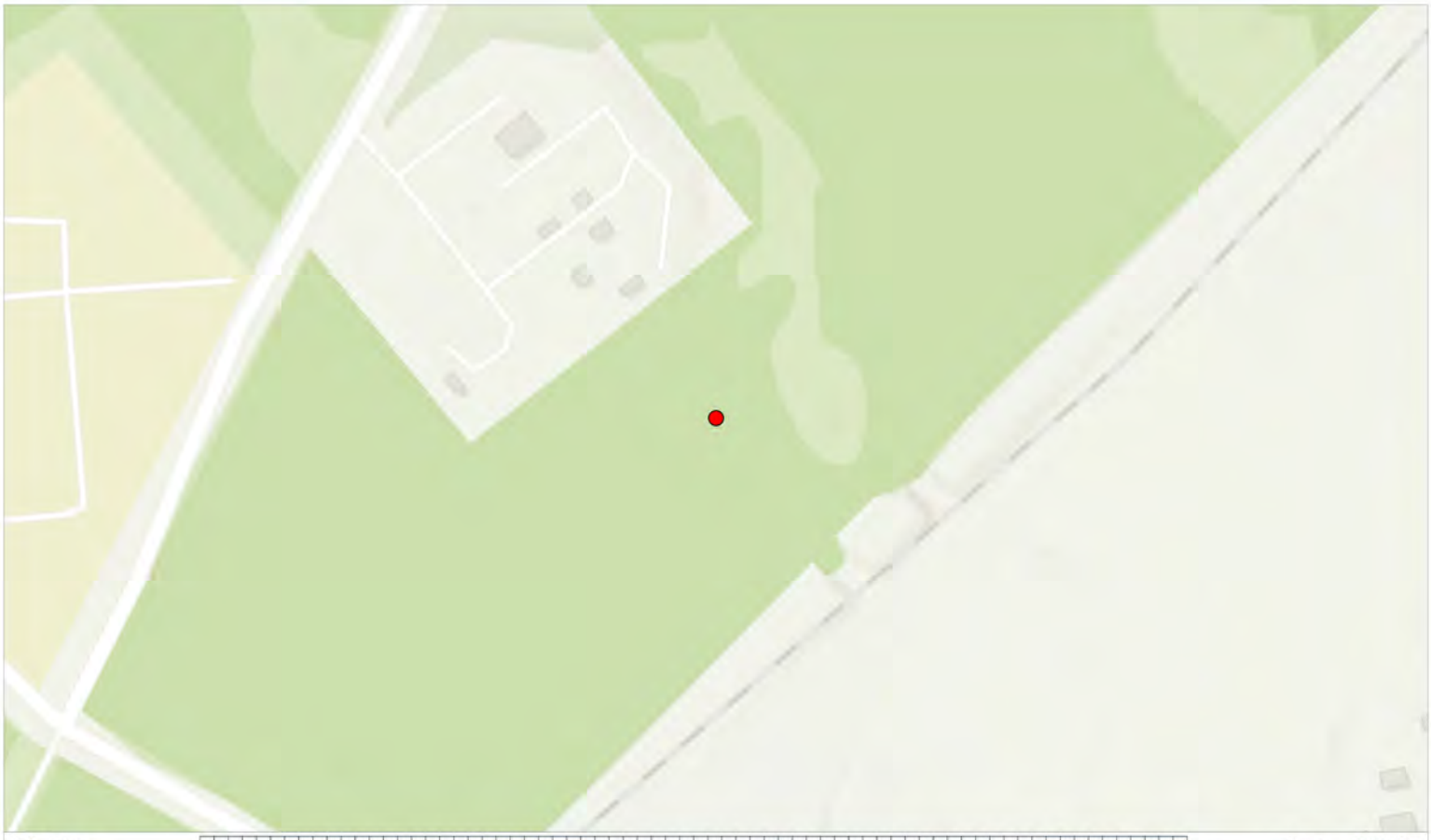

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Photo Information:

Image Name: 20240104_111526.jpg
Easting: 447886.4528
Northing: 524976.3117

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 524976

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.10

Rev	Date	Description
-	08.01.2024	First Issue

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Approved:	SW
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Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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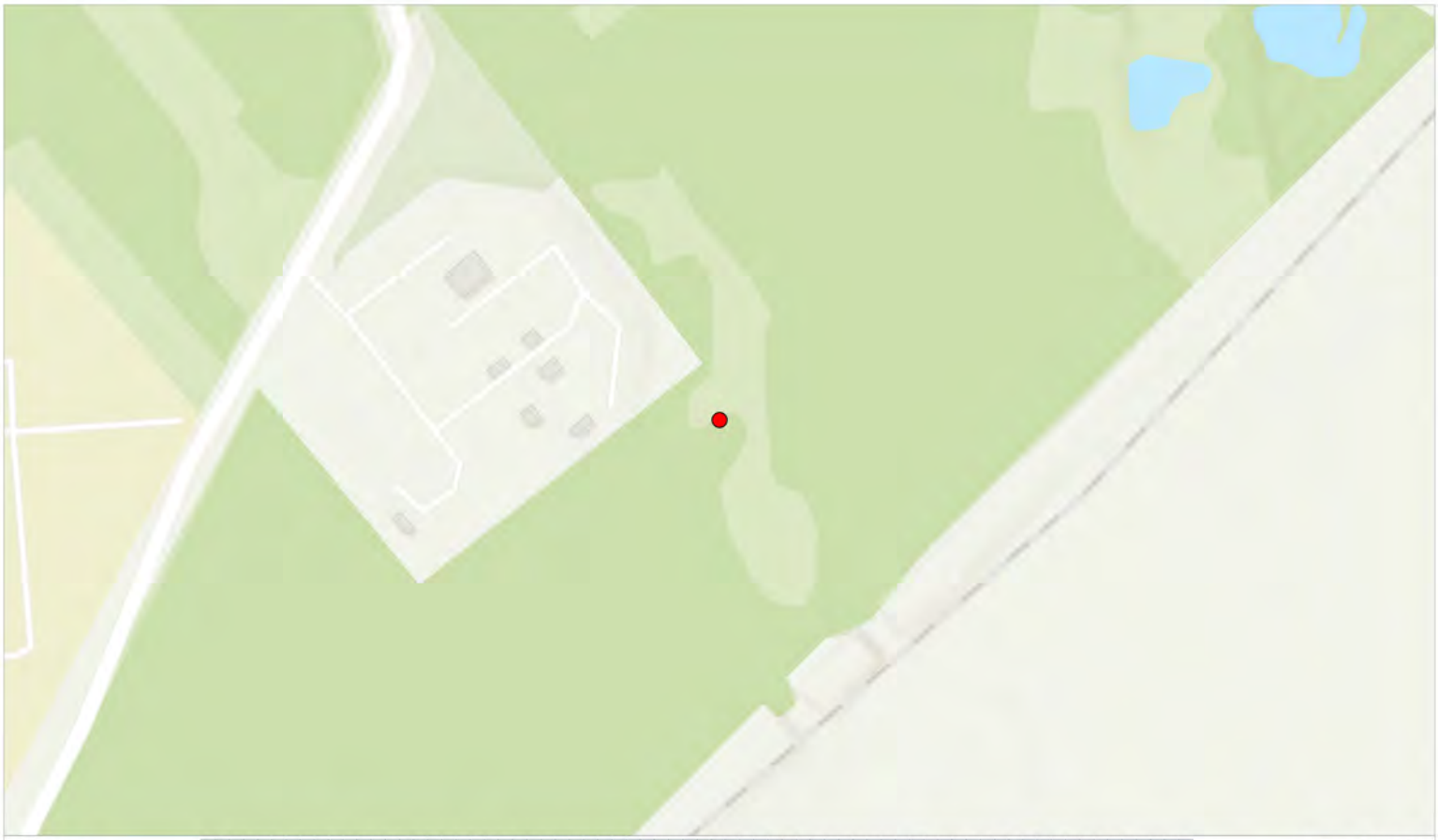

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_111747.jpg
Easting: 447905.3118
Northing: 525025.2877

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447905, 525025

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.11

Rev	Date	Description
-	08.01.2024	First Issue

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Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
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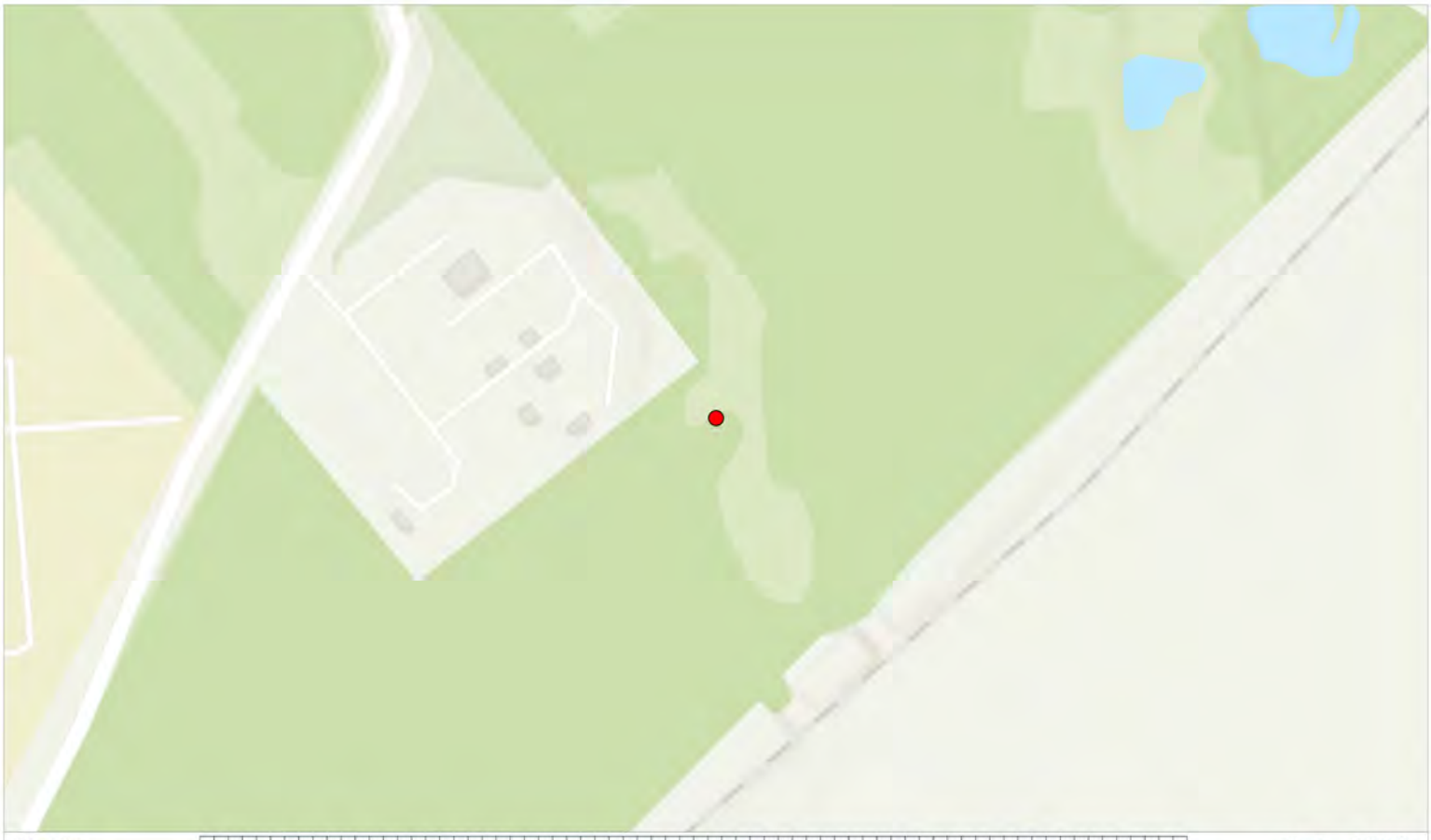

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_111830.jpg
Easting: 447905.3118
Northing: 525025.2877

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447905, 525025

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.12

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-	08.01.2024	First Issue

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Approved:	SW
Sheet No:	12 of 117
Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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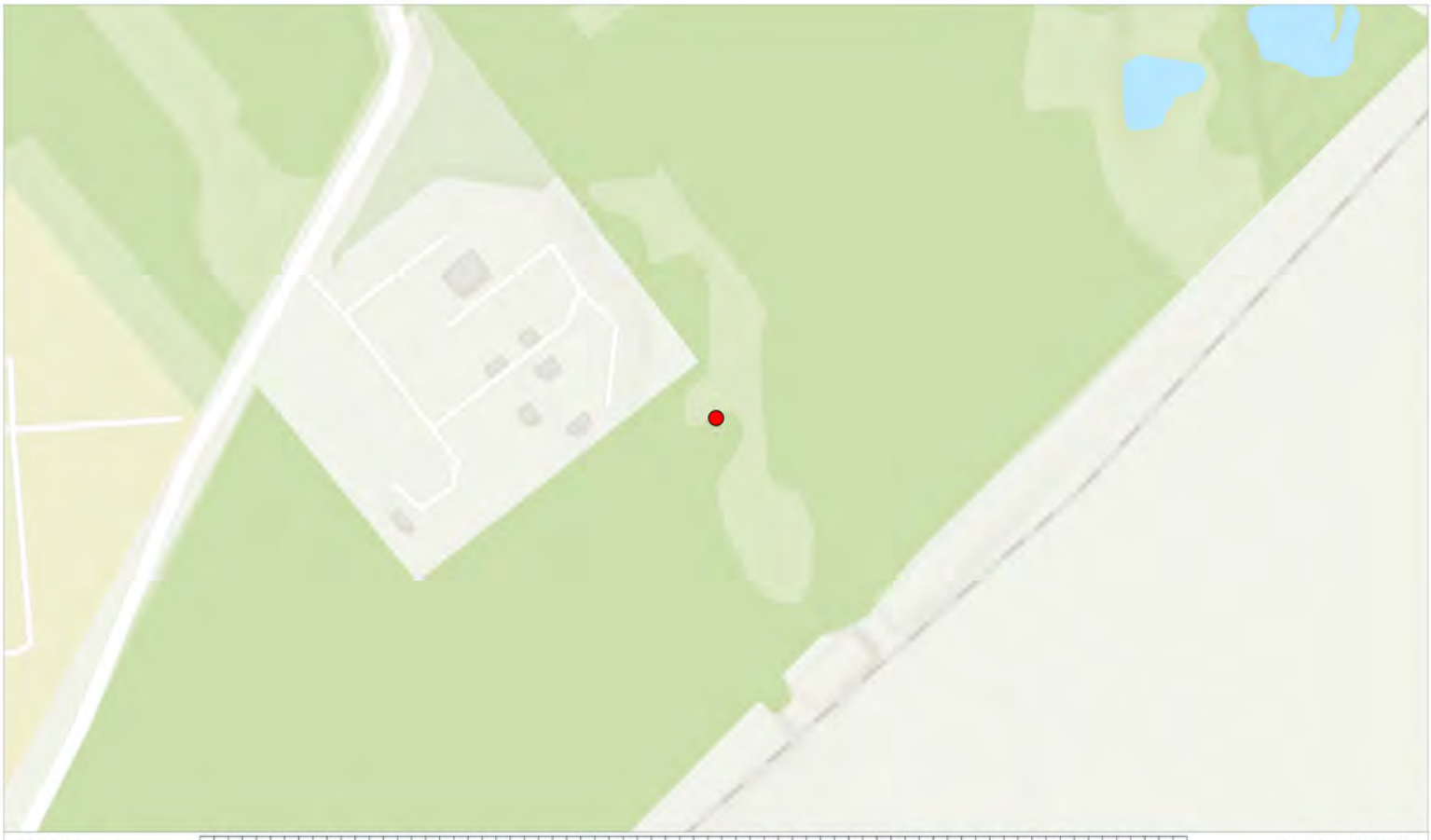

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_111837.jpg
Easting: 447905.3118
Northing: 525025.2877

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447905, 525025

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.13

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-	08.01.2024	First Issue

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Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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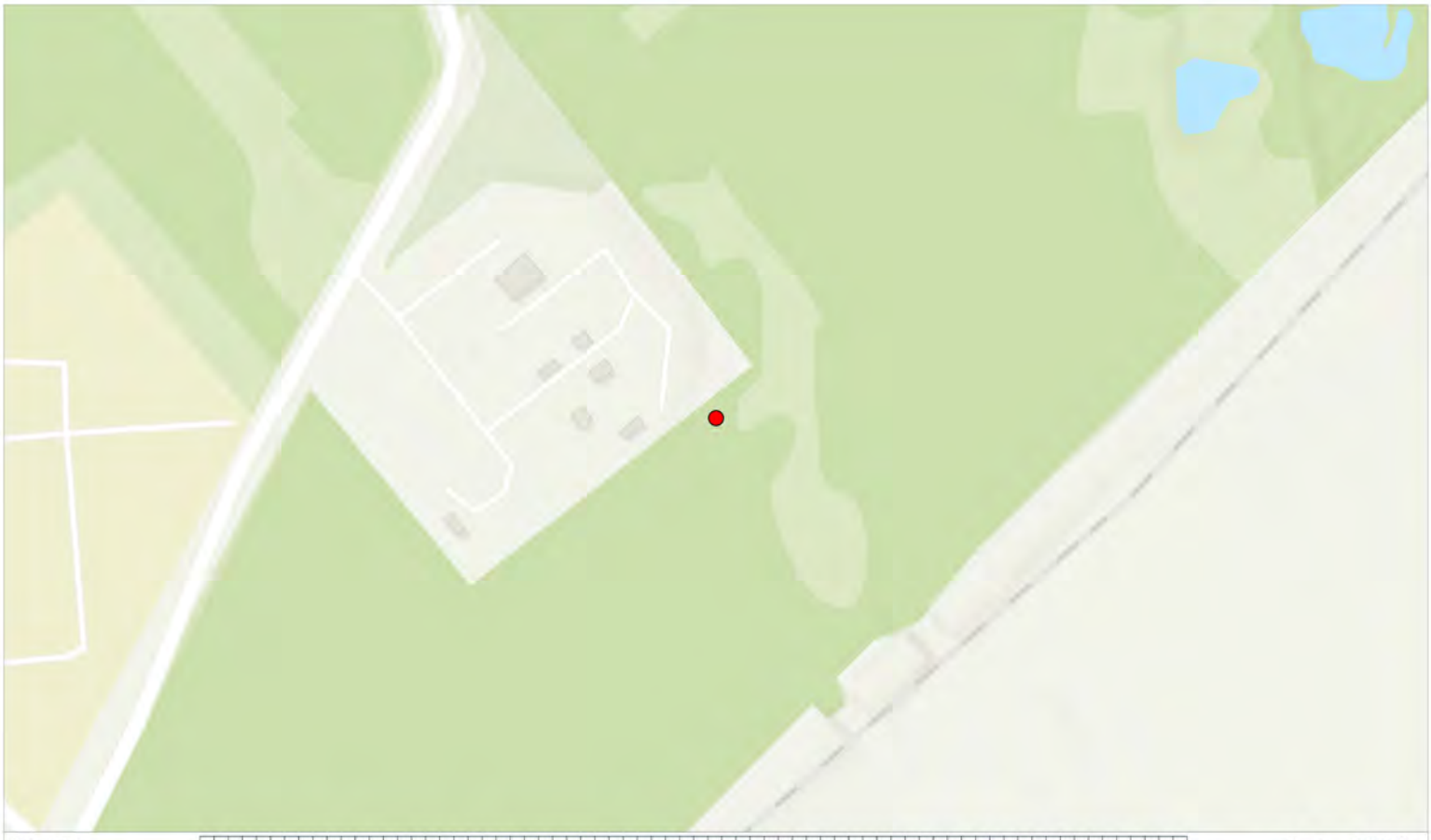

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_111916.jpg
Easting: 447886.3579
Northing: 525026.5795

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 525027

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.14

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-	08.01.2024	First Issue

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Sheet No:	14 of 117
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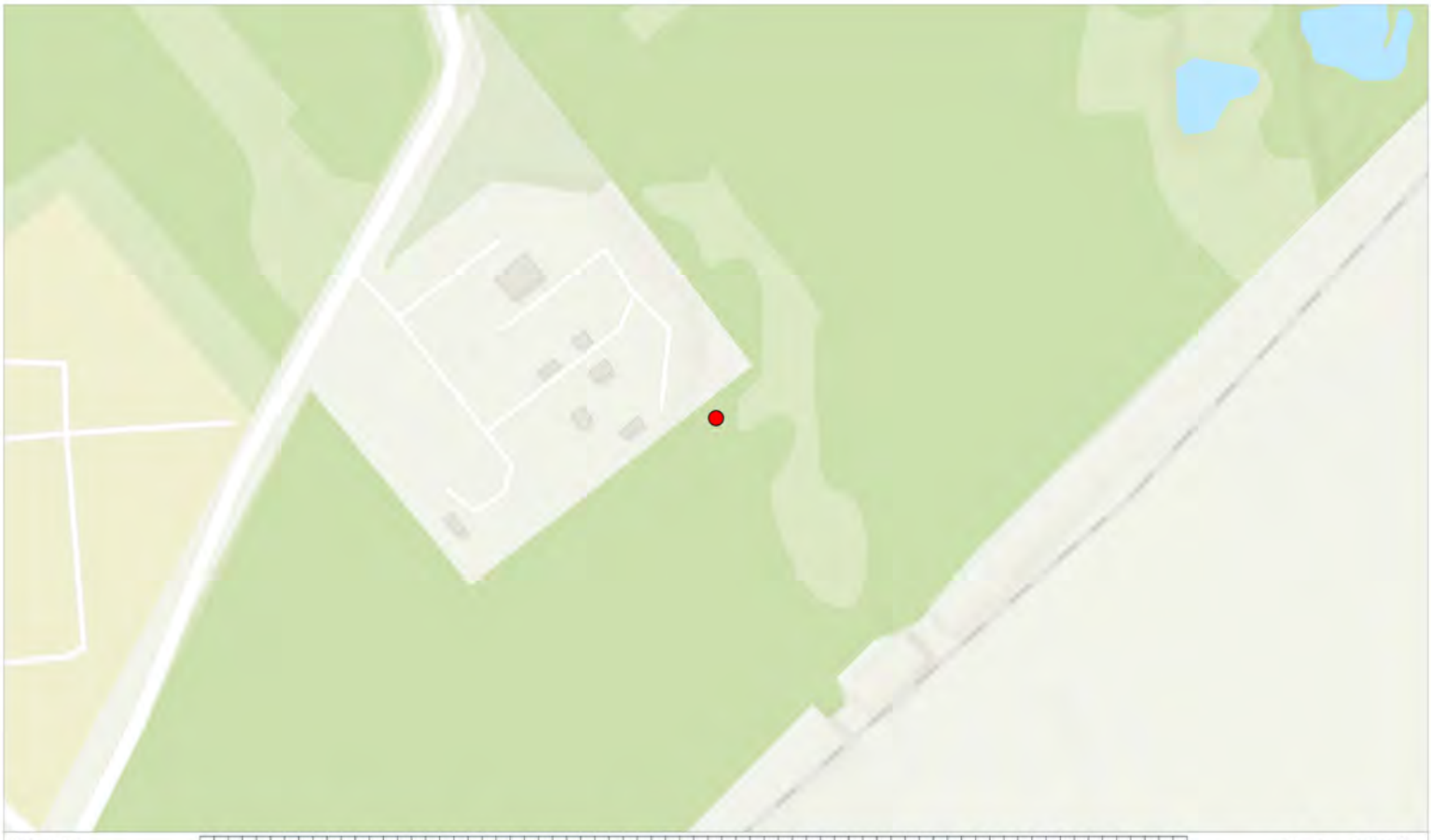

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_111926.jpg
Easting: 447886.3579
Northing: 525026.5795

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 525027

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.15

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Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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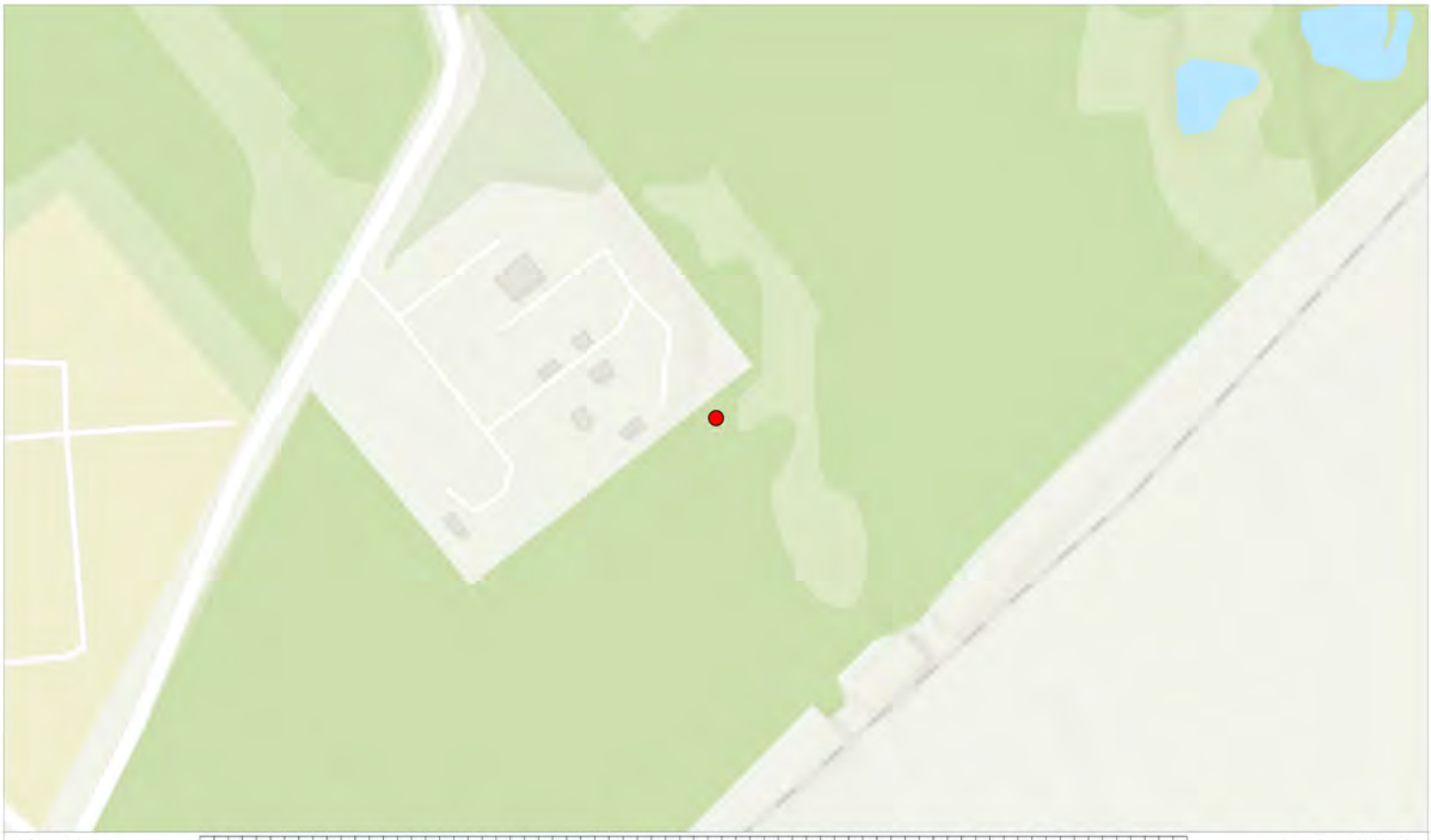

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_111931.jpg
Easting: 447886.3579
Northing: 525026.5795

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 525027

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.16

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Photo Location

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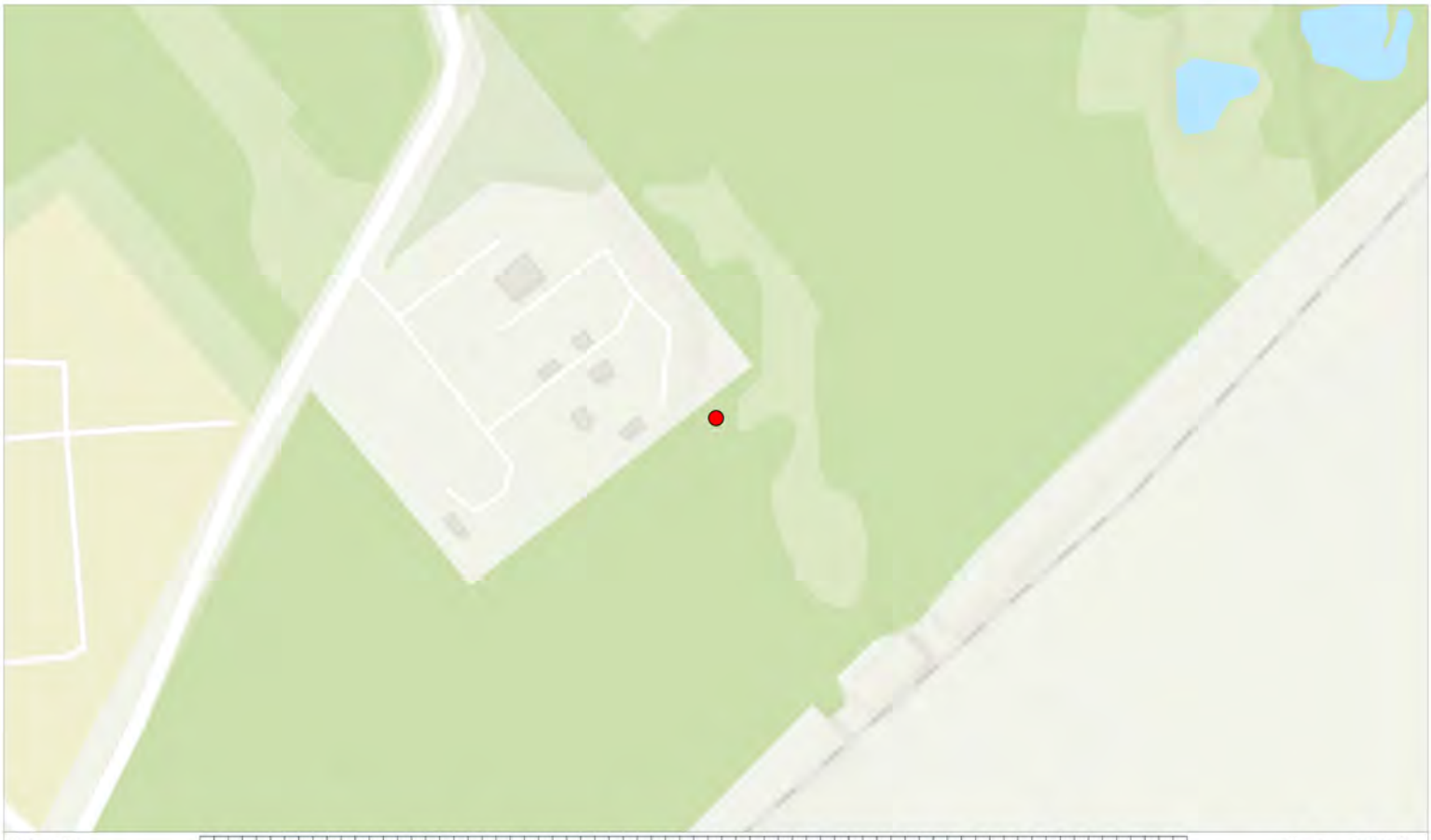

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_111941.jpg
Easting: 447886.3579
Northing: 525026.5795

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 525027

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.17

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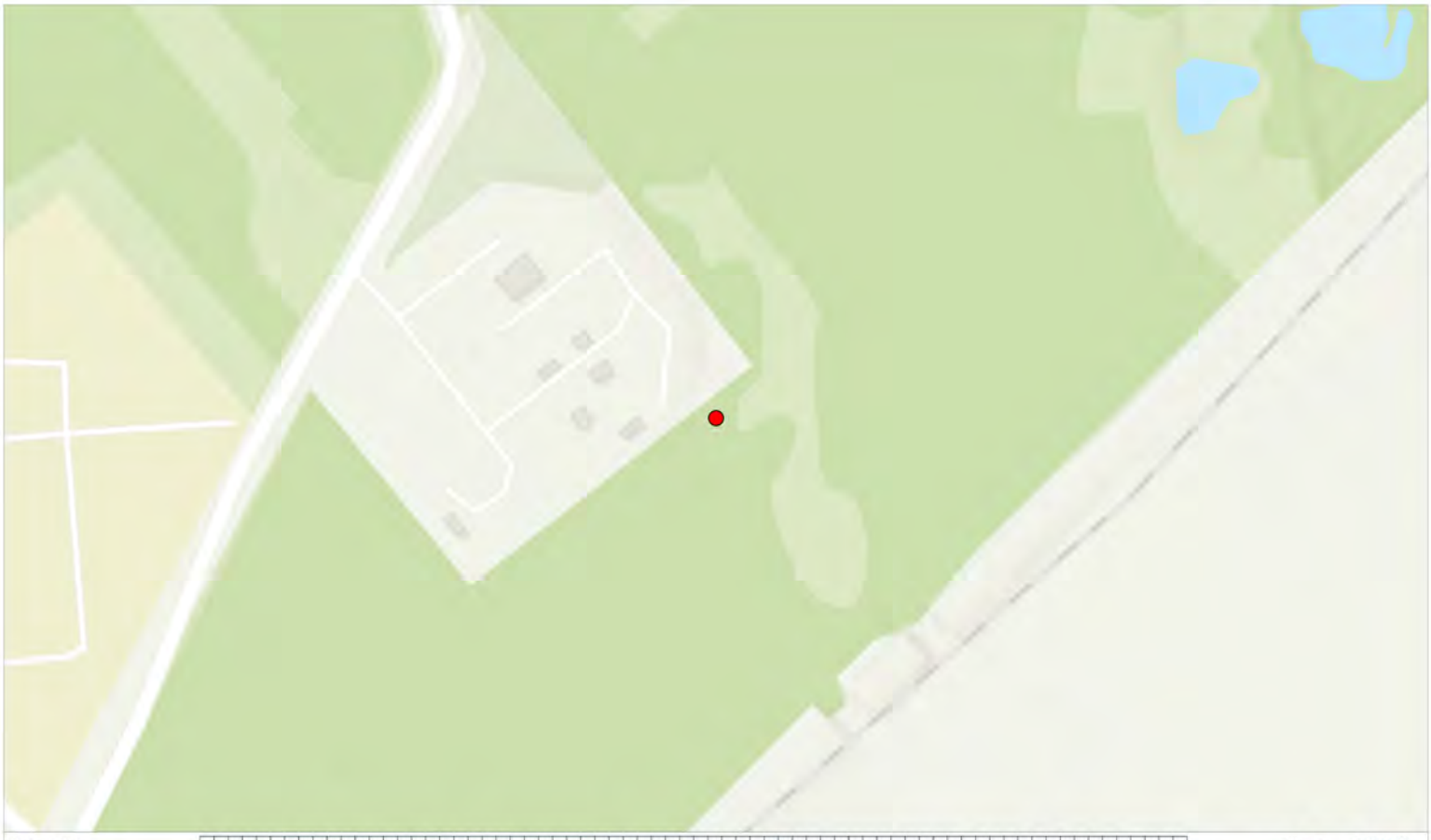

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_111953.jpg
Easting: 447886.3579
Northing: 525026.5795

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 525027

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.18

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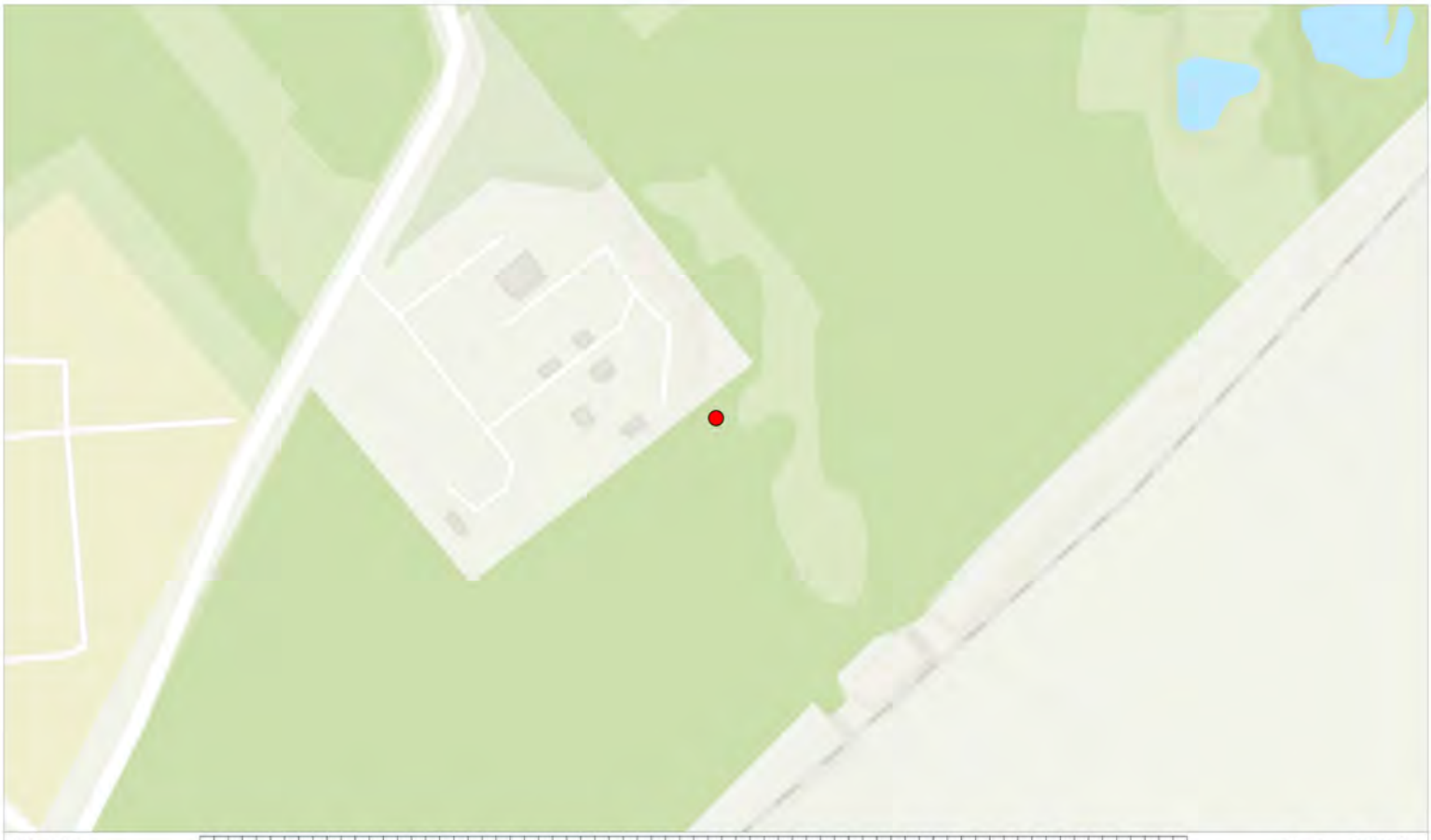

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Photo Information:

Image Name: 20240104_112017.jpg
Easting: 447886.1451
Northing: 525025.8316

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 525026

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.19

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Drawn:	HM
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Photo Location

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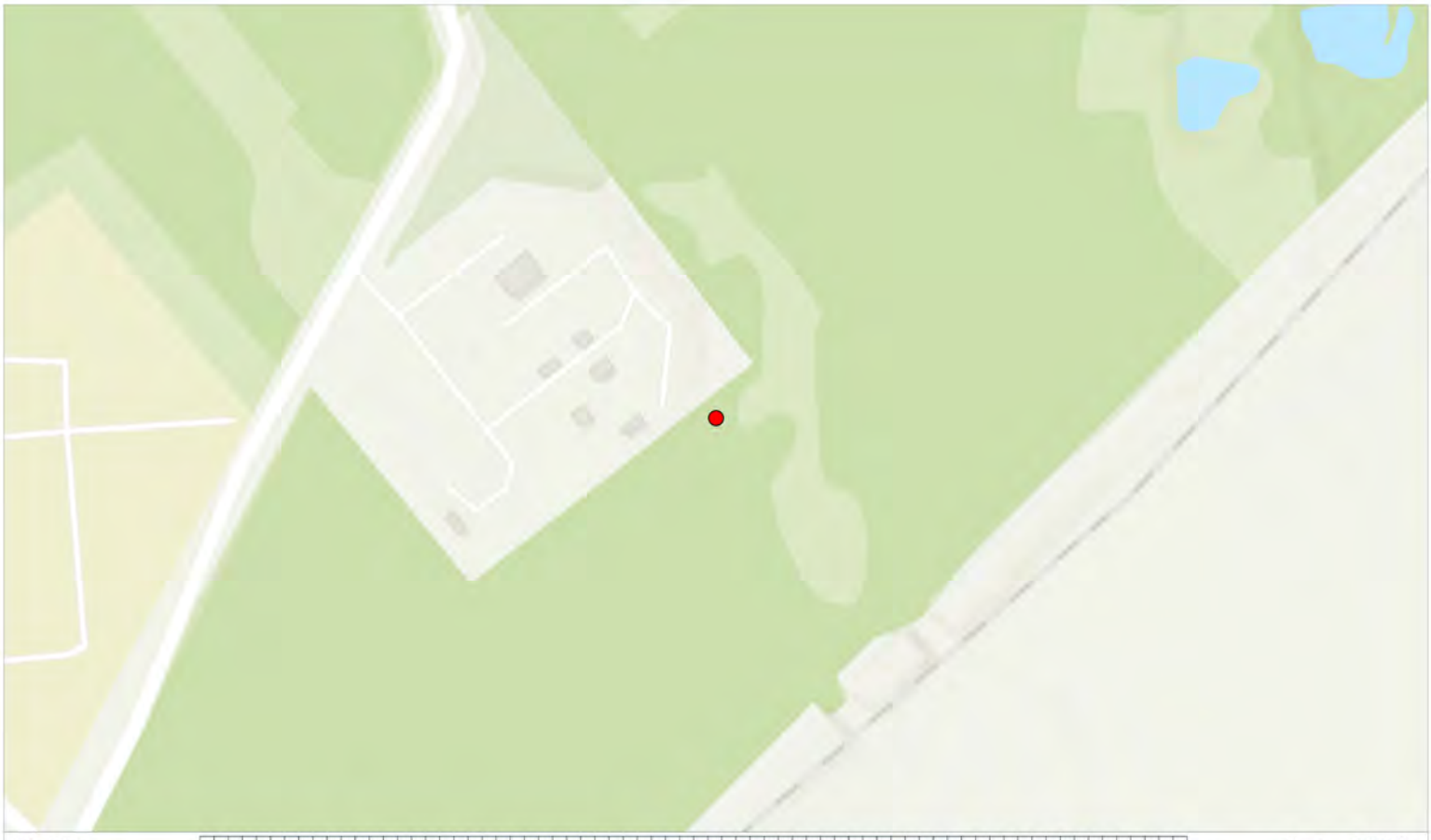

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Photo Information:

Image Name: 20240104_112030.jpg
Easting: 447886.1451
Northing: 525025.8316

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 525026

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.20

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Drawn:	HM
Approved:	SW
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Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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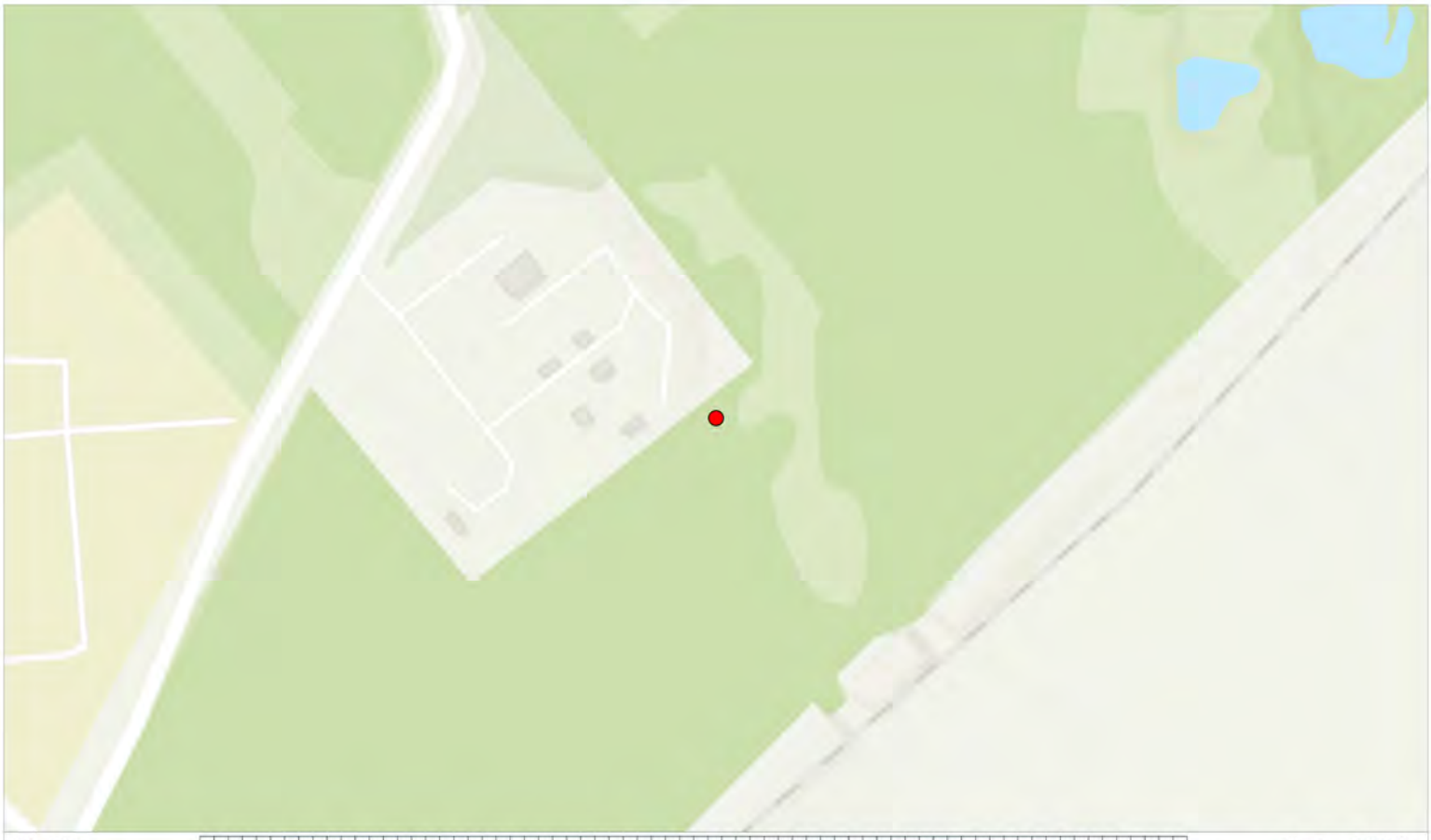

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112033.jpg
Easting: 447886.1451
Northing: 525025.8316

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 525026

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.21

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Drawn:	HM
Approved:	SW
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Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
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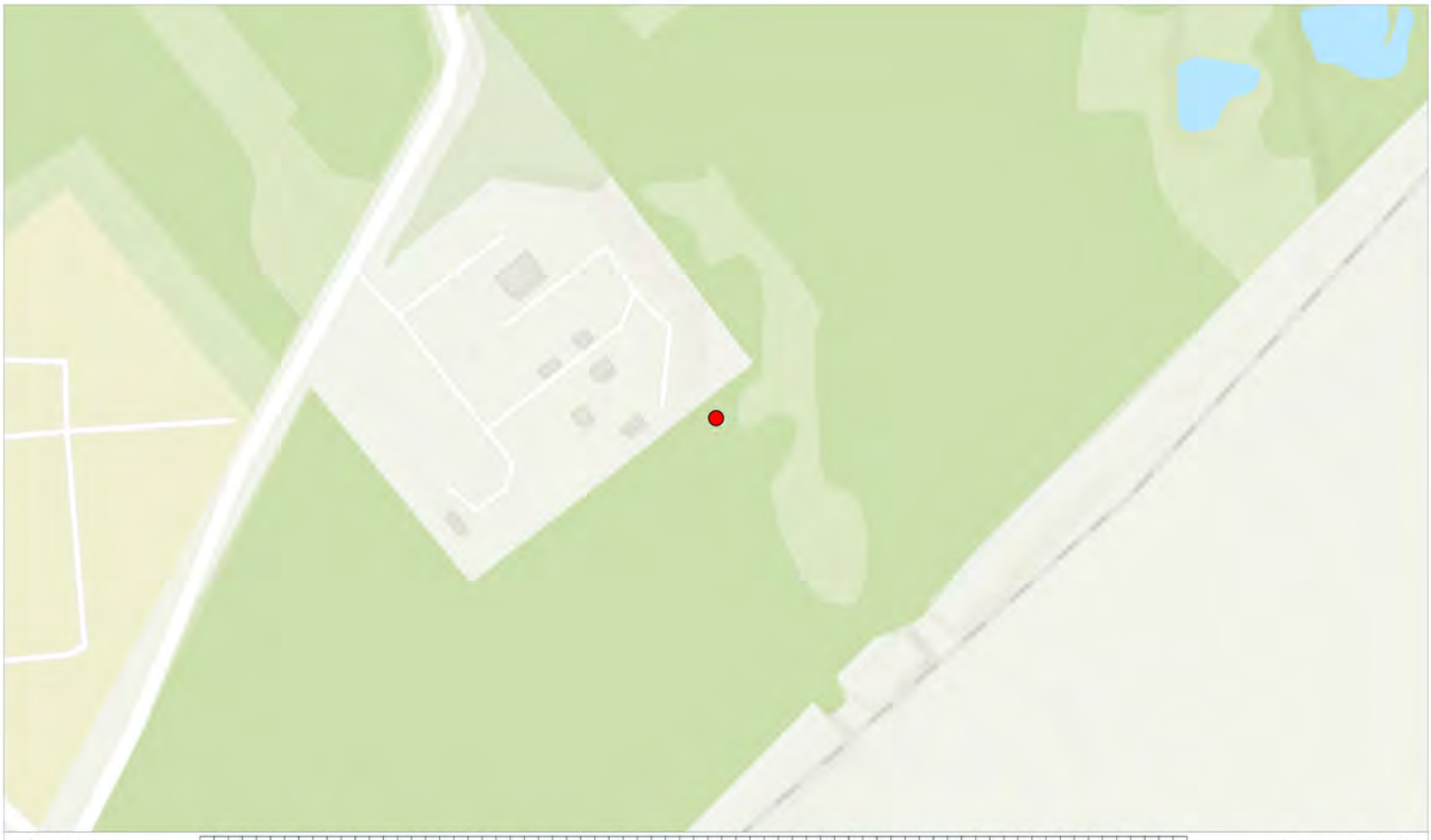

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112057.jpg
Easting: 447886.1451
Northing: 525025.8316

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447886, 525026

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.22

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Approved:	SW
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Sheet Size:	A4

Key:

Photo Location

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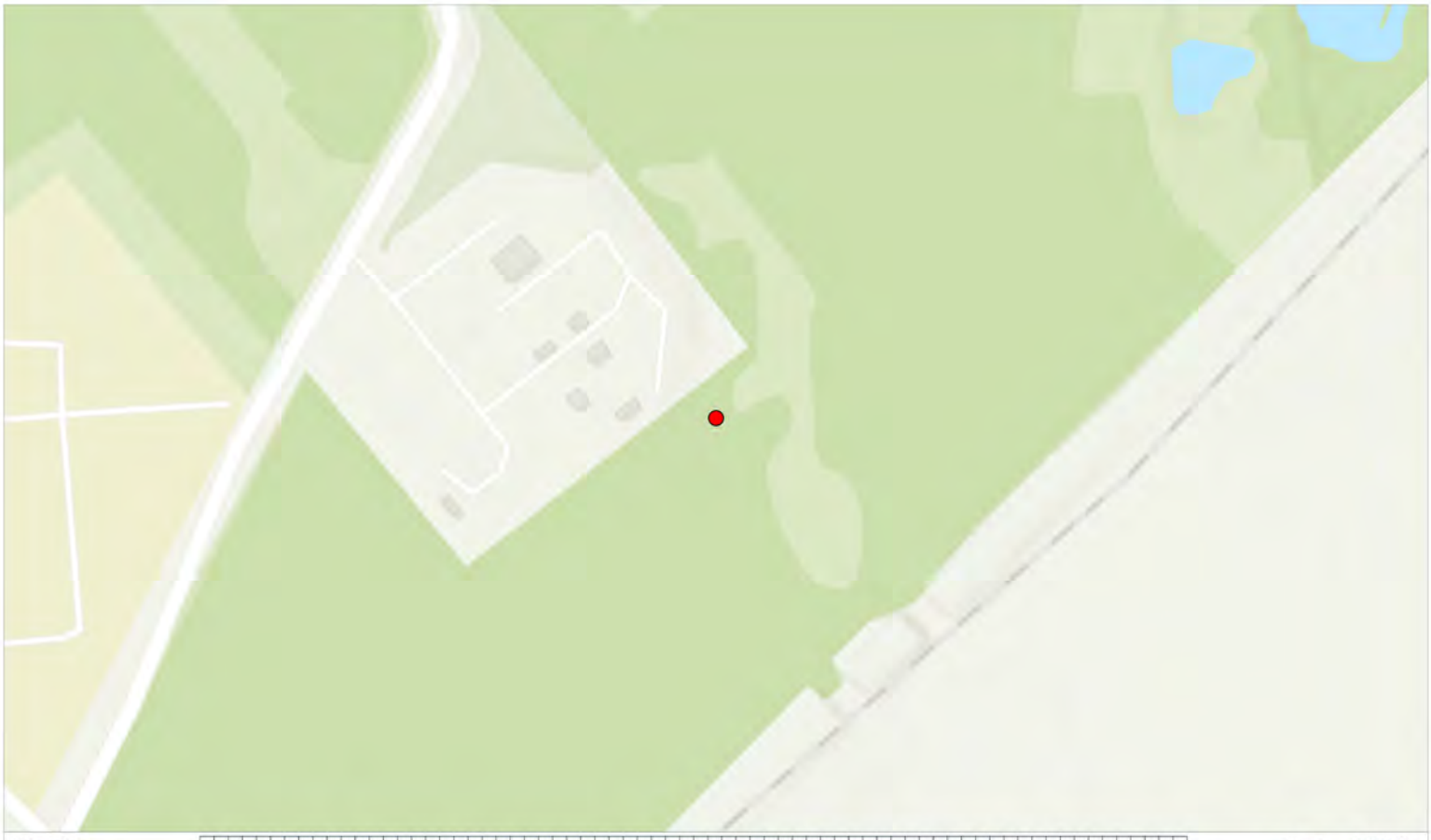

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112134.jpg
Easting: 447887.8219
Northing: 525019.9176

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447888, 525020

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.23

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Key:

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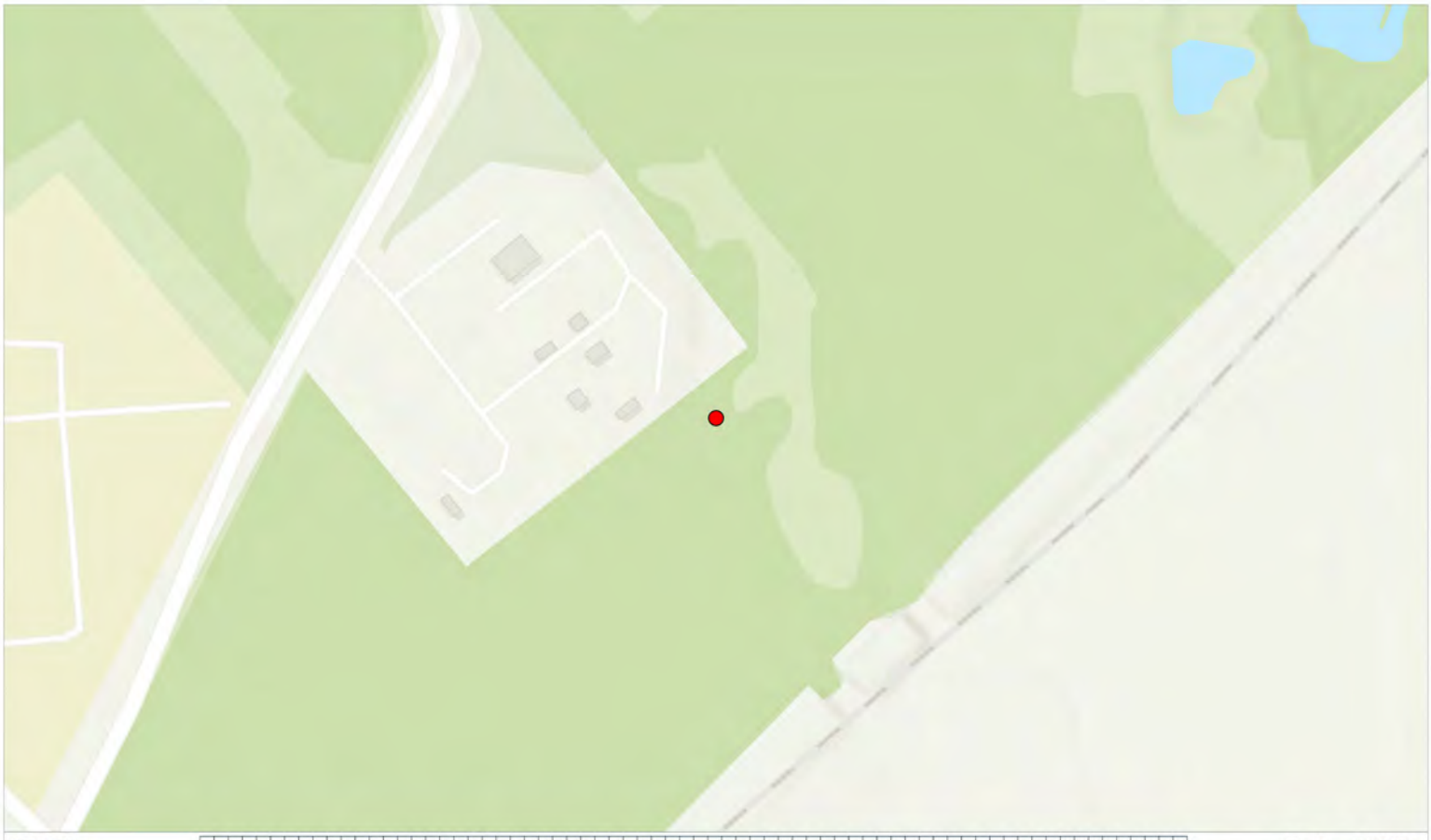

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112143.jpg
Easting: 447887.8219
Northing: 525019.9176

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447888, 525020

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.24

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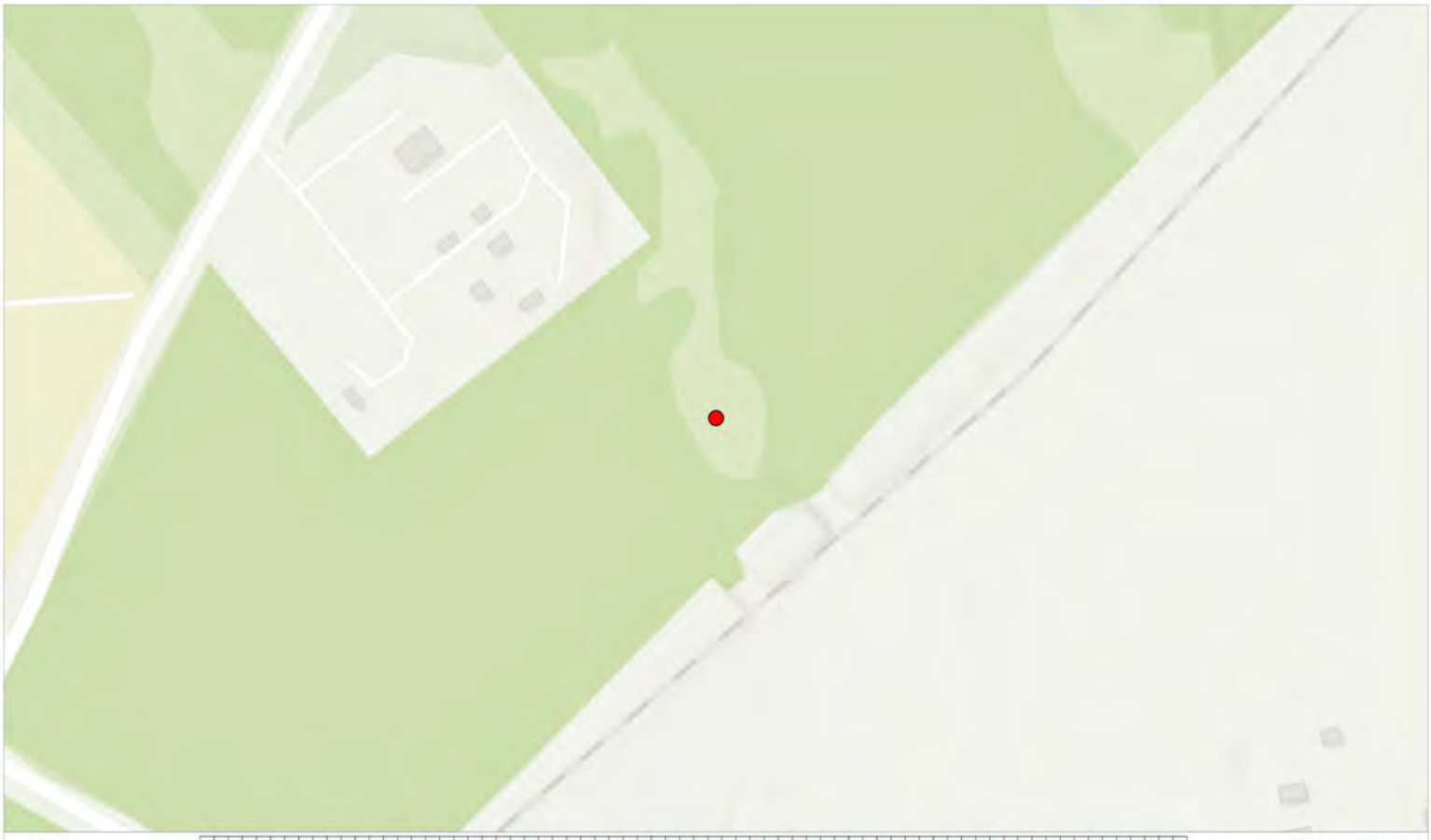

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112254.jpg
Easting: 447922.241
Northing: 524981.5185

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447922, 524982

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.25

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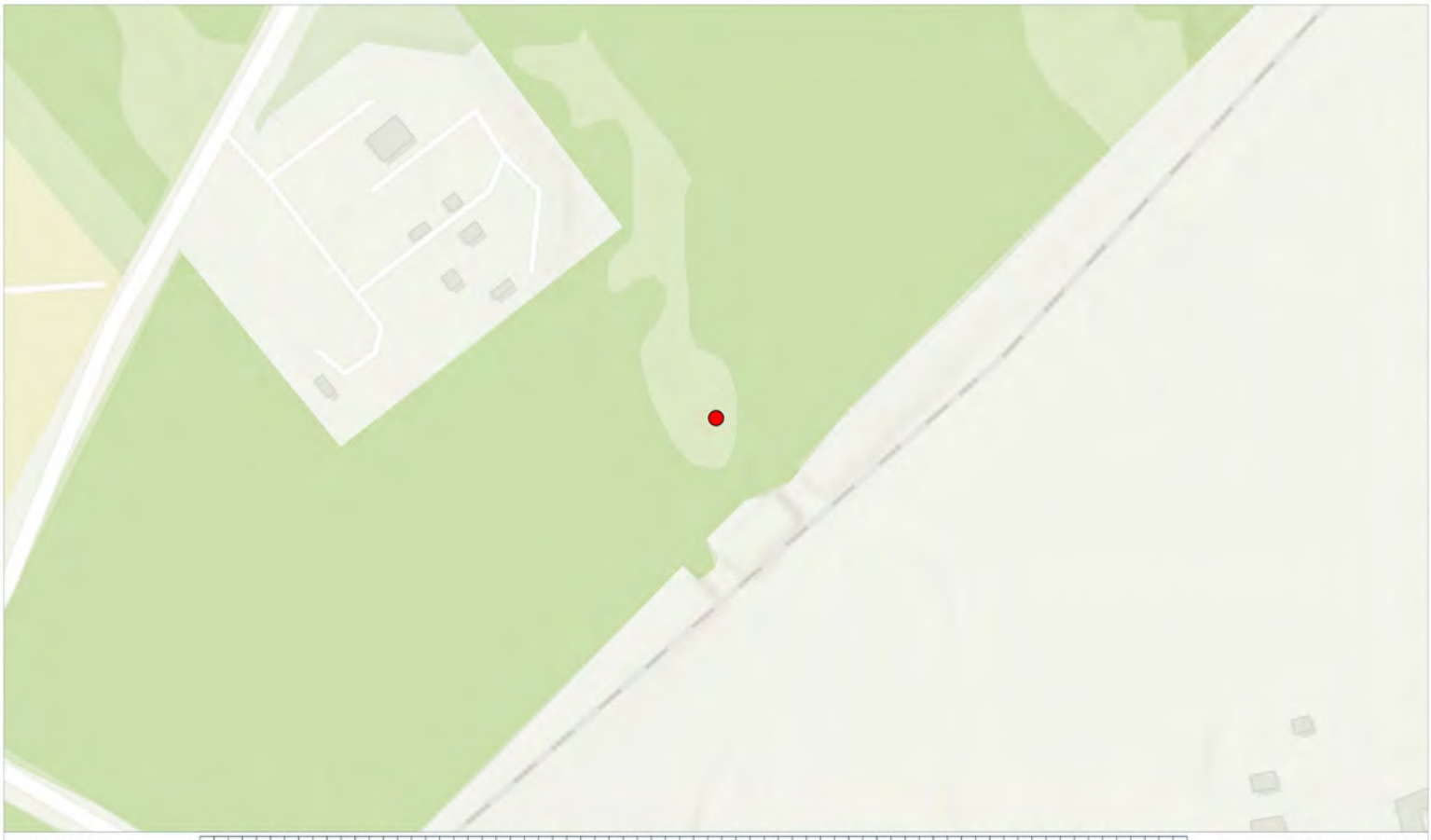

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Photo Information:

Image Name: 20240104_112322.jpg
Easting: 447932.3971
Northing: 524977.5412

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447932, 524978

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.26

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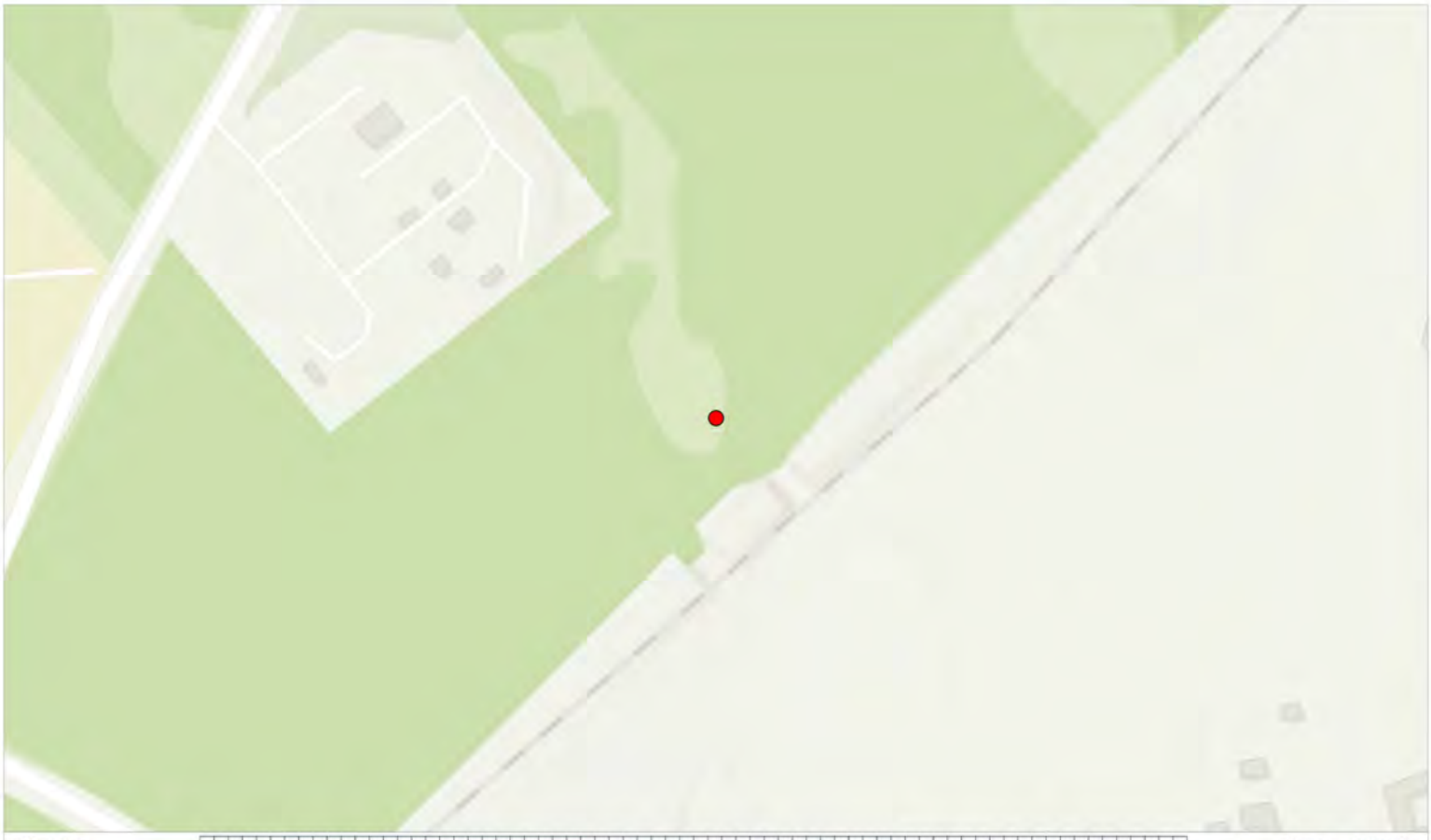

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112343.jpg
Easting: 447936.3224
Northing: 524972.7638

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447936, 524973

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.27

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Key:

Photo Location

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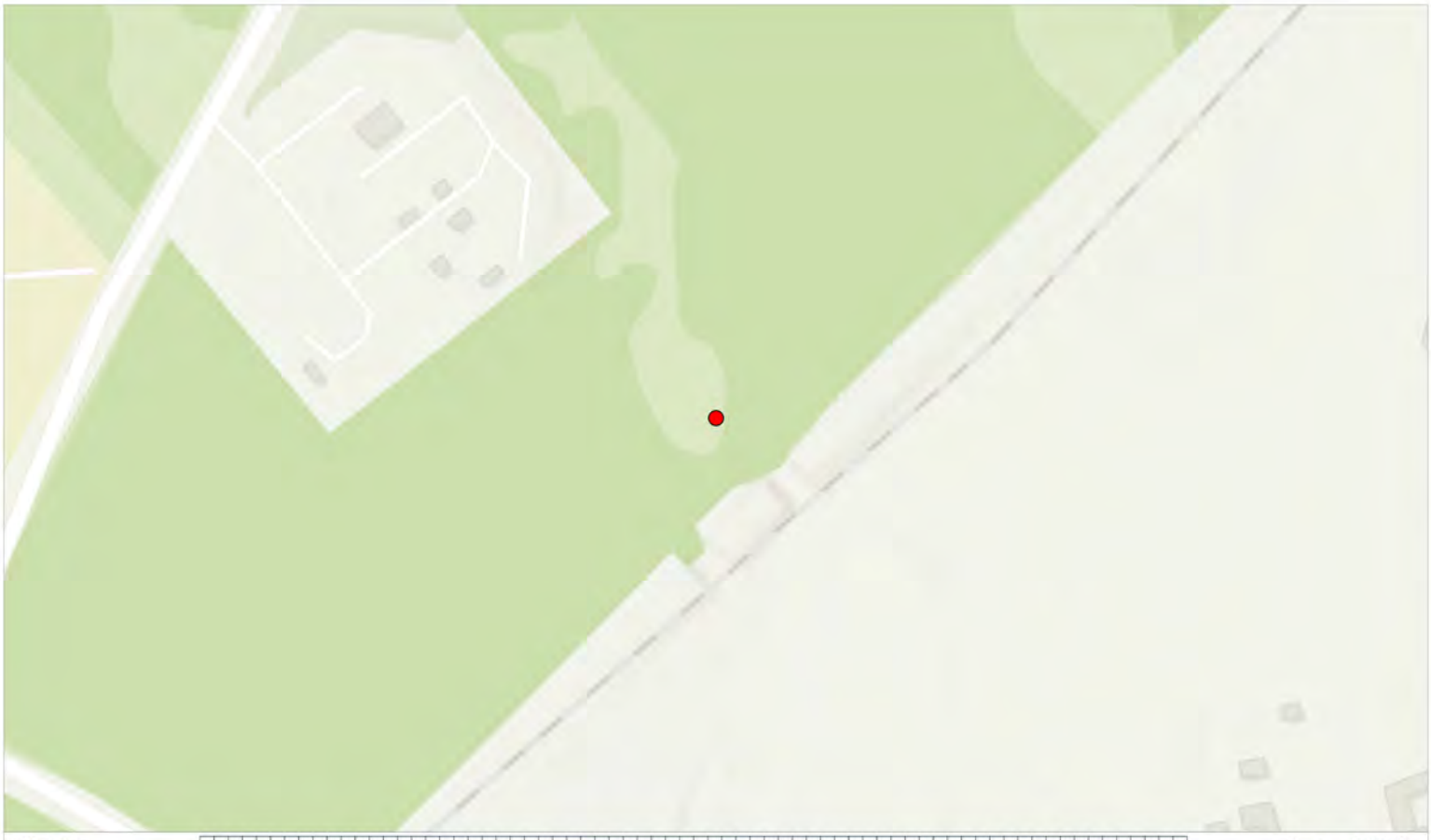

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112345.jpg
Easting: 447936.3224
Northing: 524972.7638

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447936, 524973

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.28

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Key:

Photo Location

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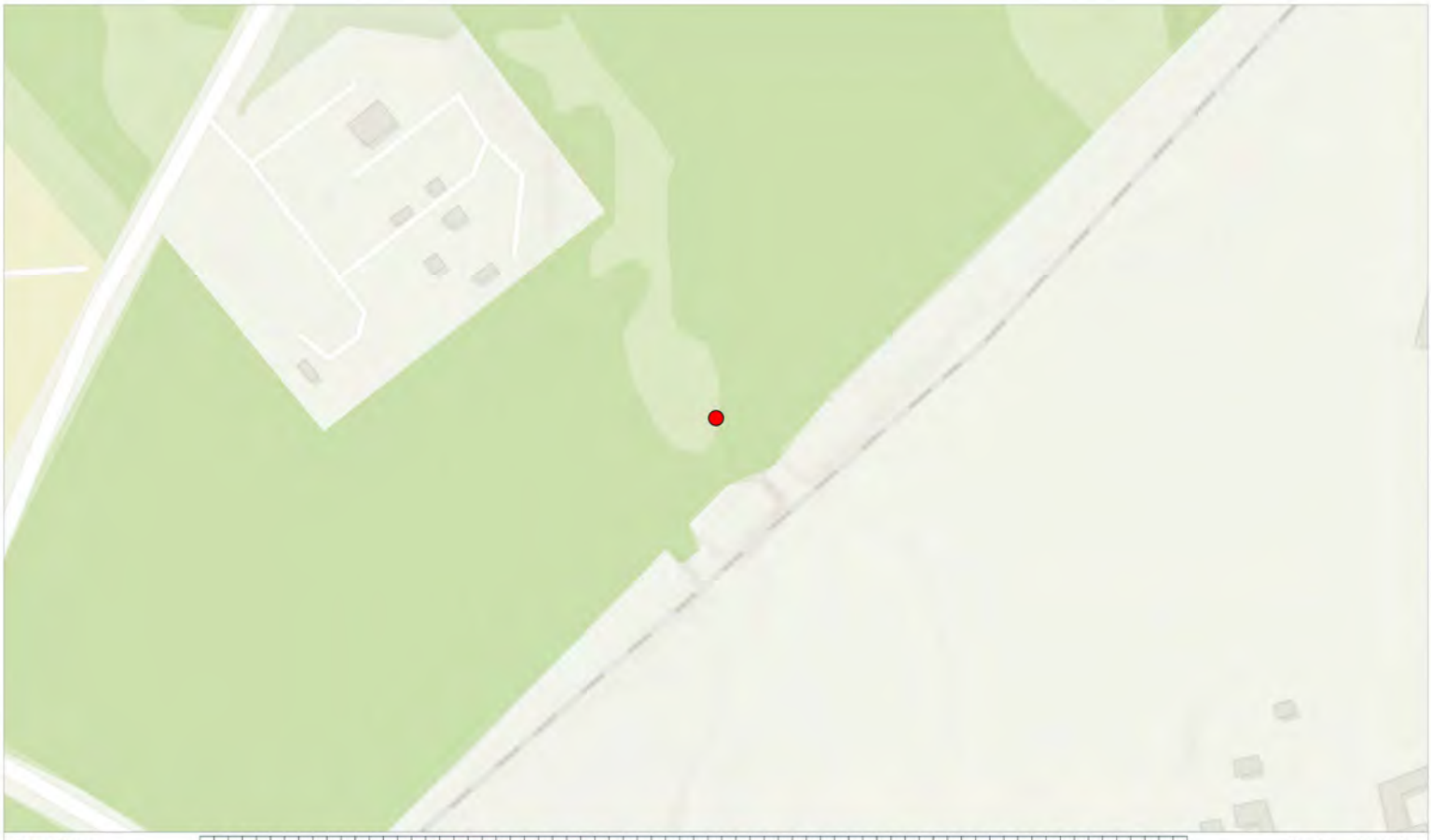

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112357.jpg
Easting: 447938.4863
Northing: 524972.041

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447938, 524972

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.29

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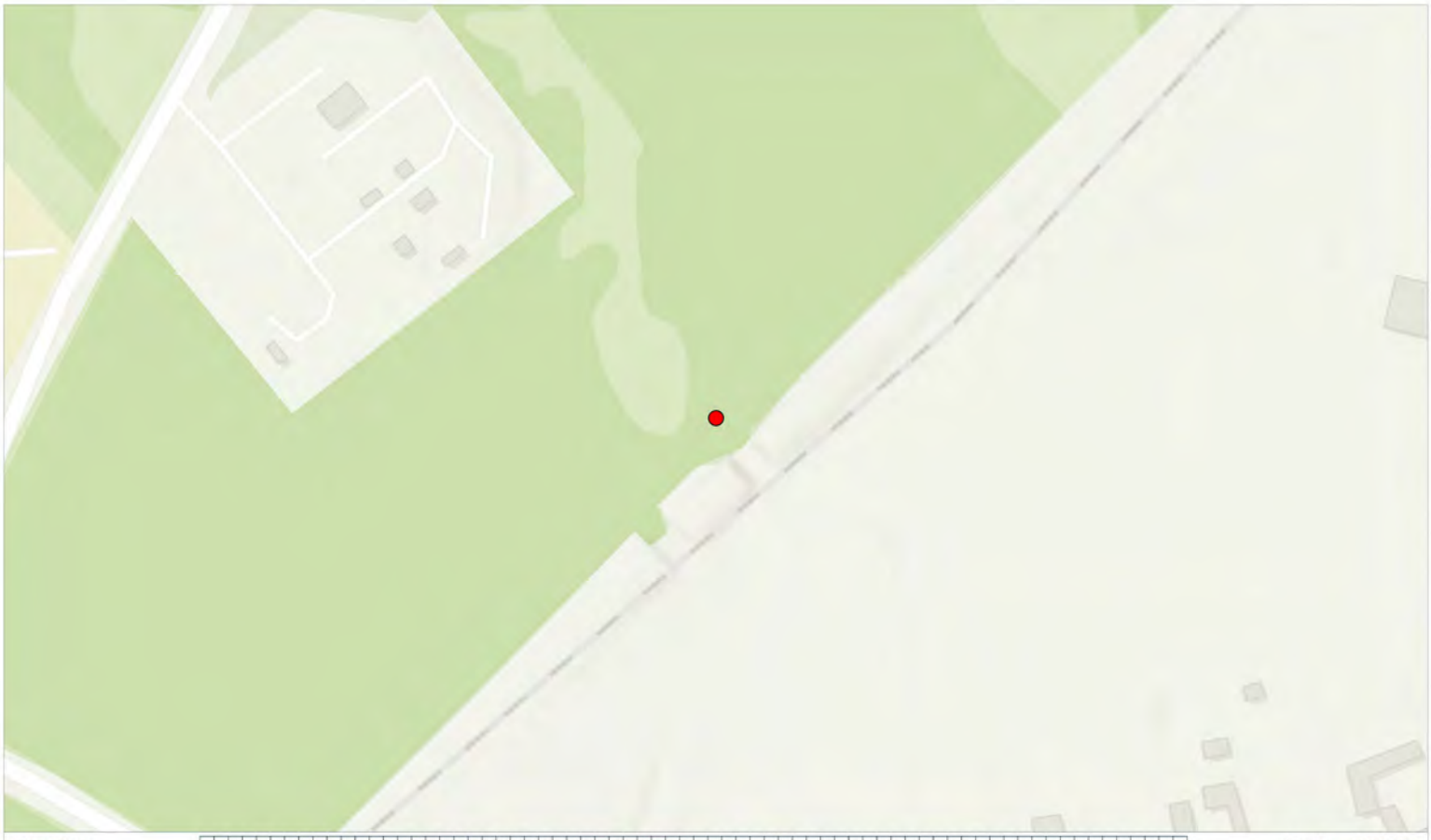

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112440.jpg
Easting: 447949.5325
Northing: 524965.6582

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447950, 524966

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.30

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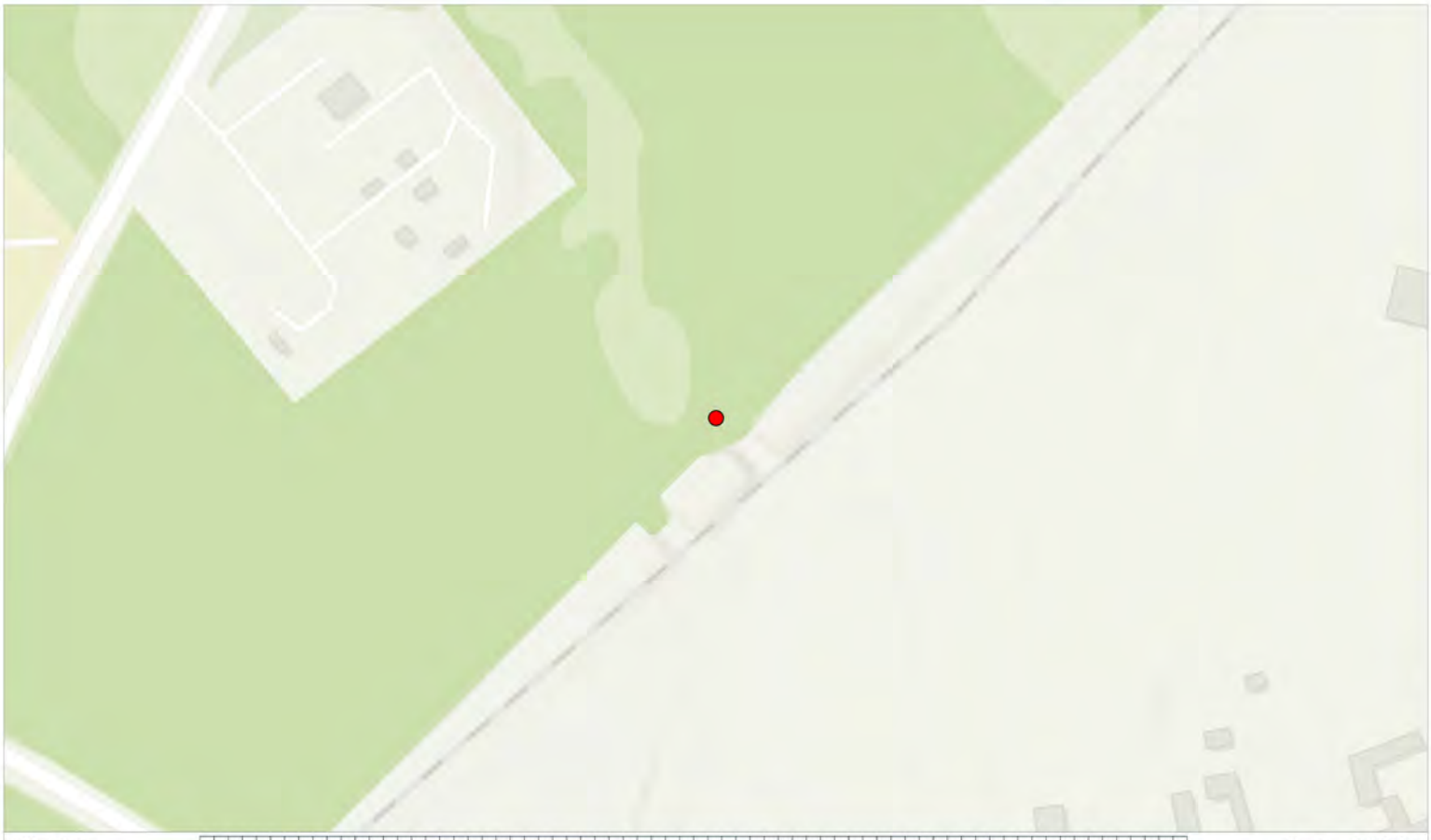

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112443.jpg
Easting: 447948.8144
Northing: 524962.1339

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447949, 524962

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.31

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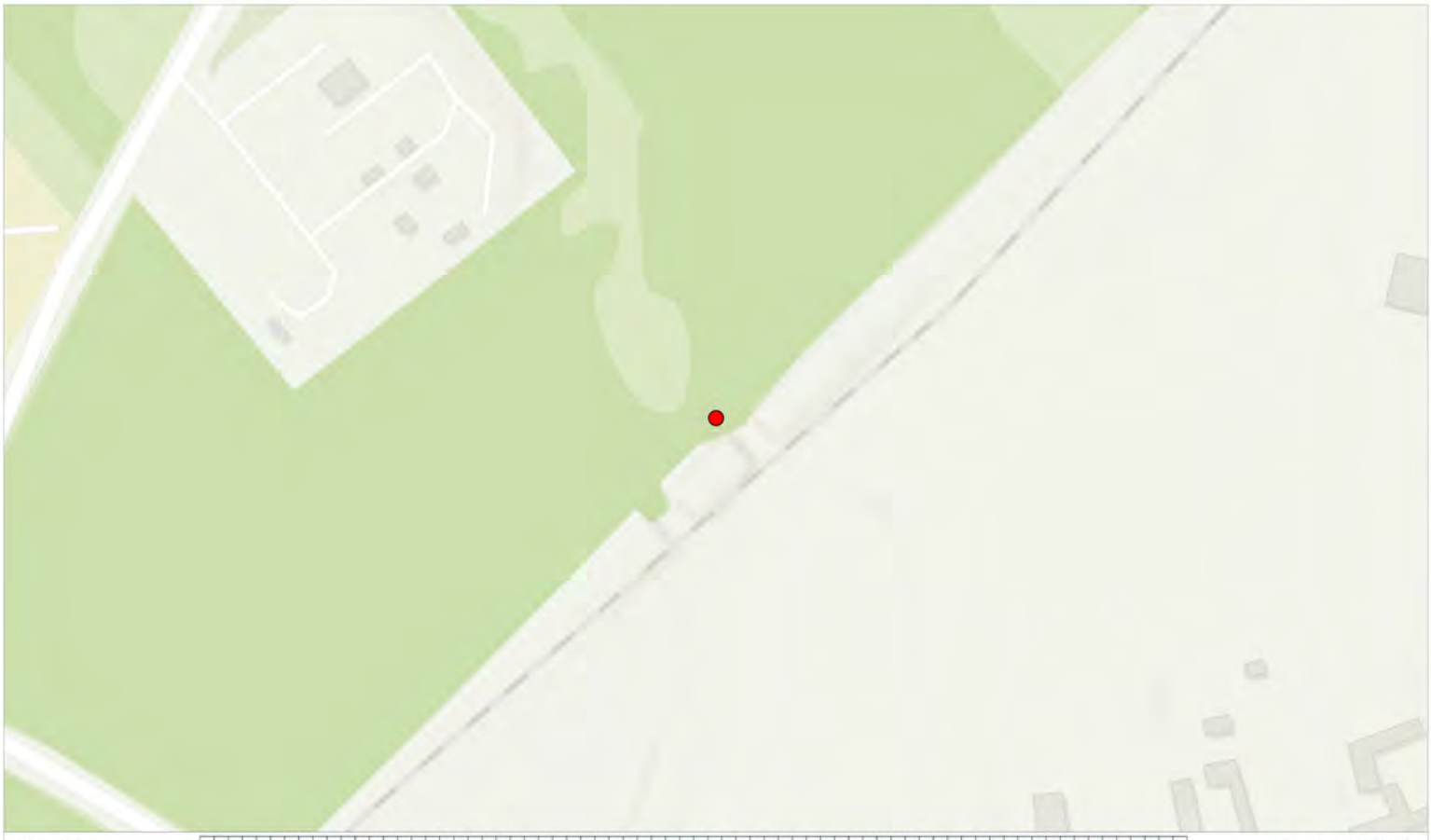

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112446.jpg
Easting: 447948.9707
Northing: 524957.6841

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447949, 524958

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.32

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	32 of 117
Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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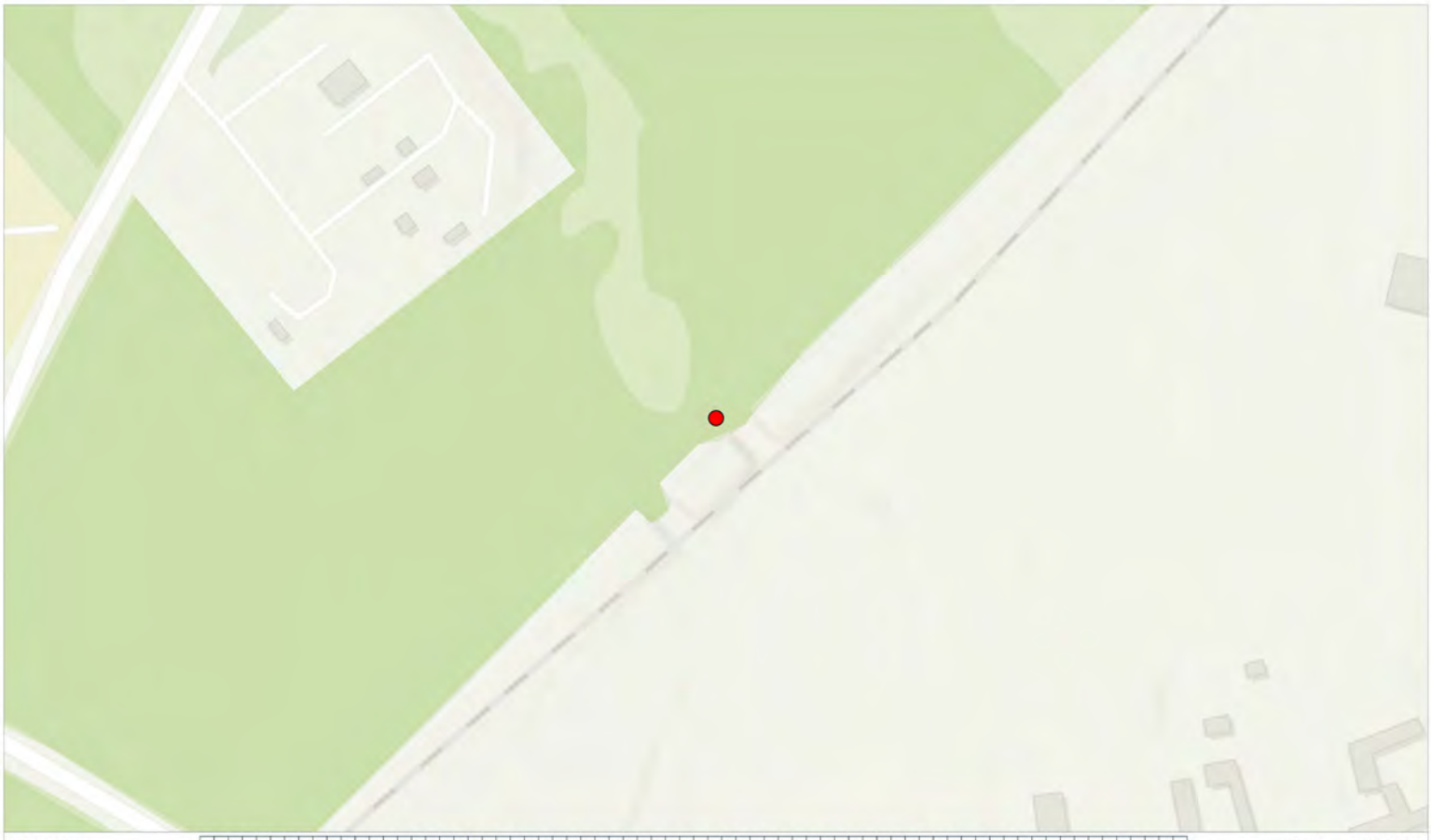

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112529.jpg
Easting: 447948.9707
Northing: 524957.6841

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447949, 524958

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.33

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	33 of 117
Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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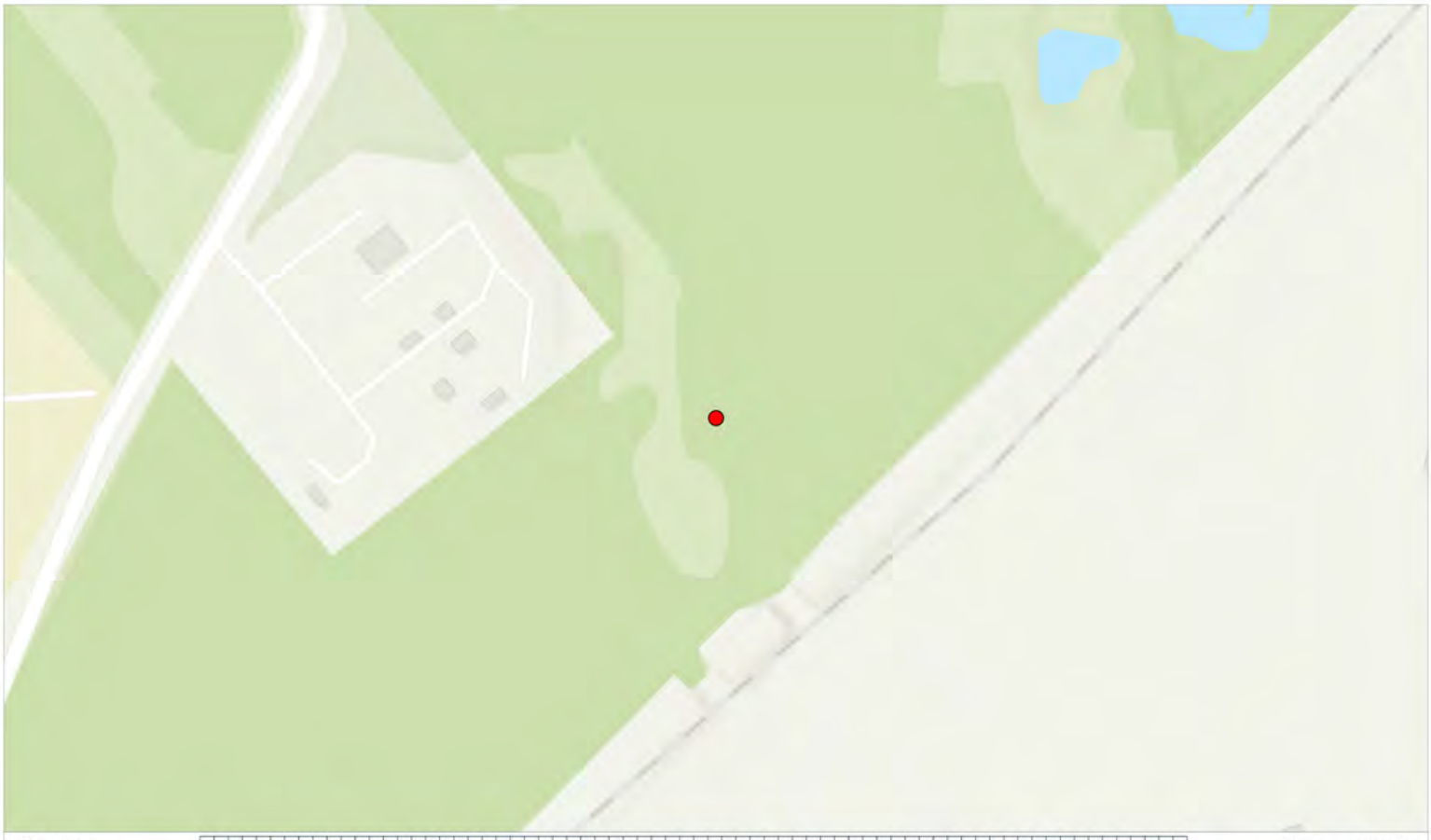

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112959.jpg
Easting: 447935.3289
Northing: 525016.1556

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447935, 525016

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.34

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	34 of 117
Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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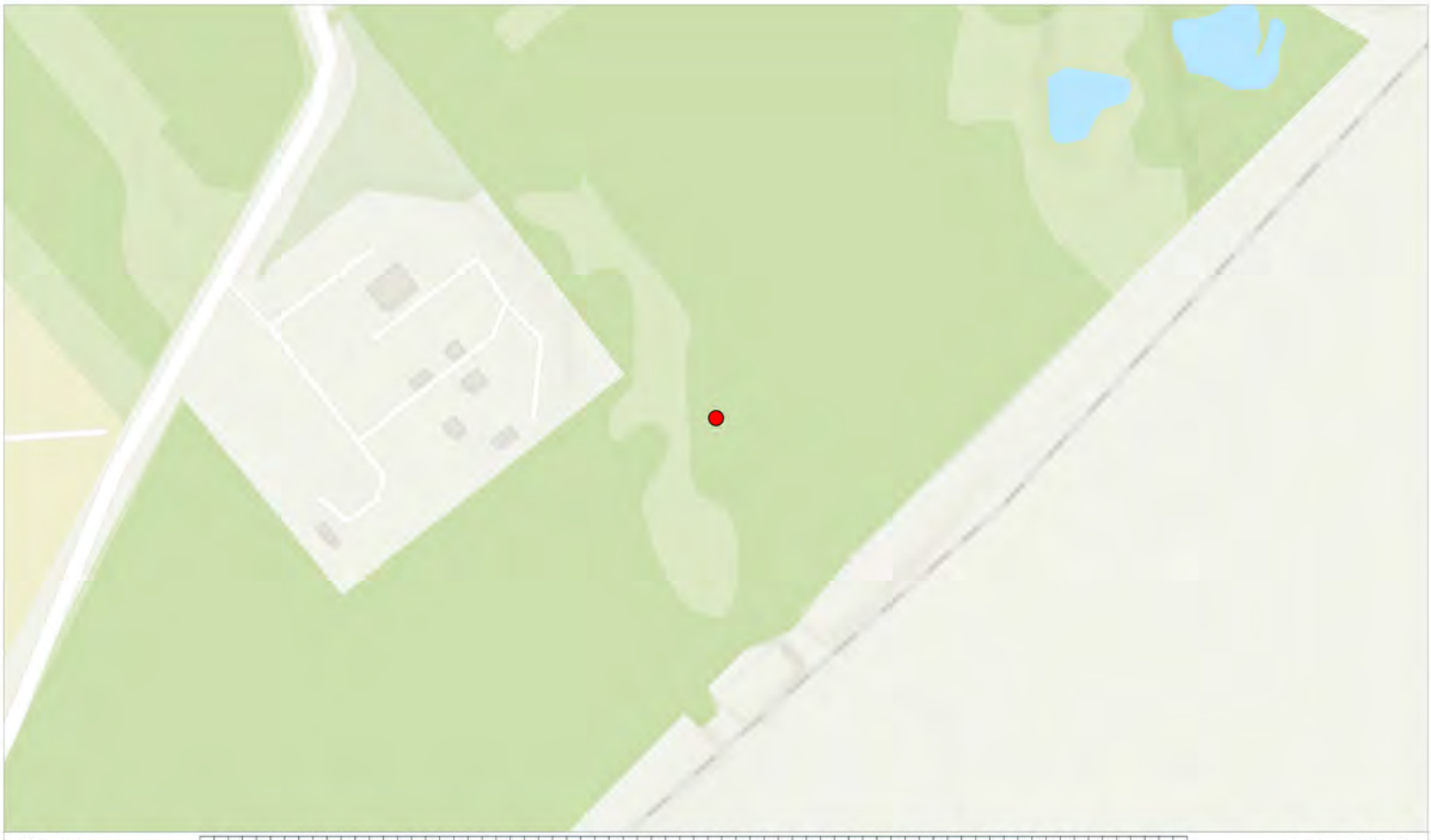

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113146.jpg
Easting: 447931.7422
Northing: 525029.8396

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447932, 525030

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.35

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	35 of 117
Sheet Size:	A4

Key:

Photo Location

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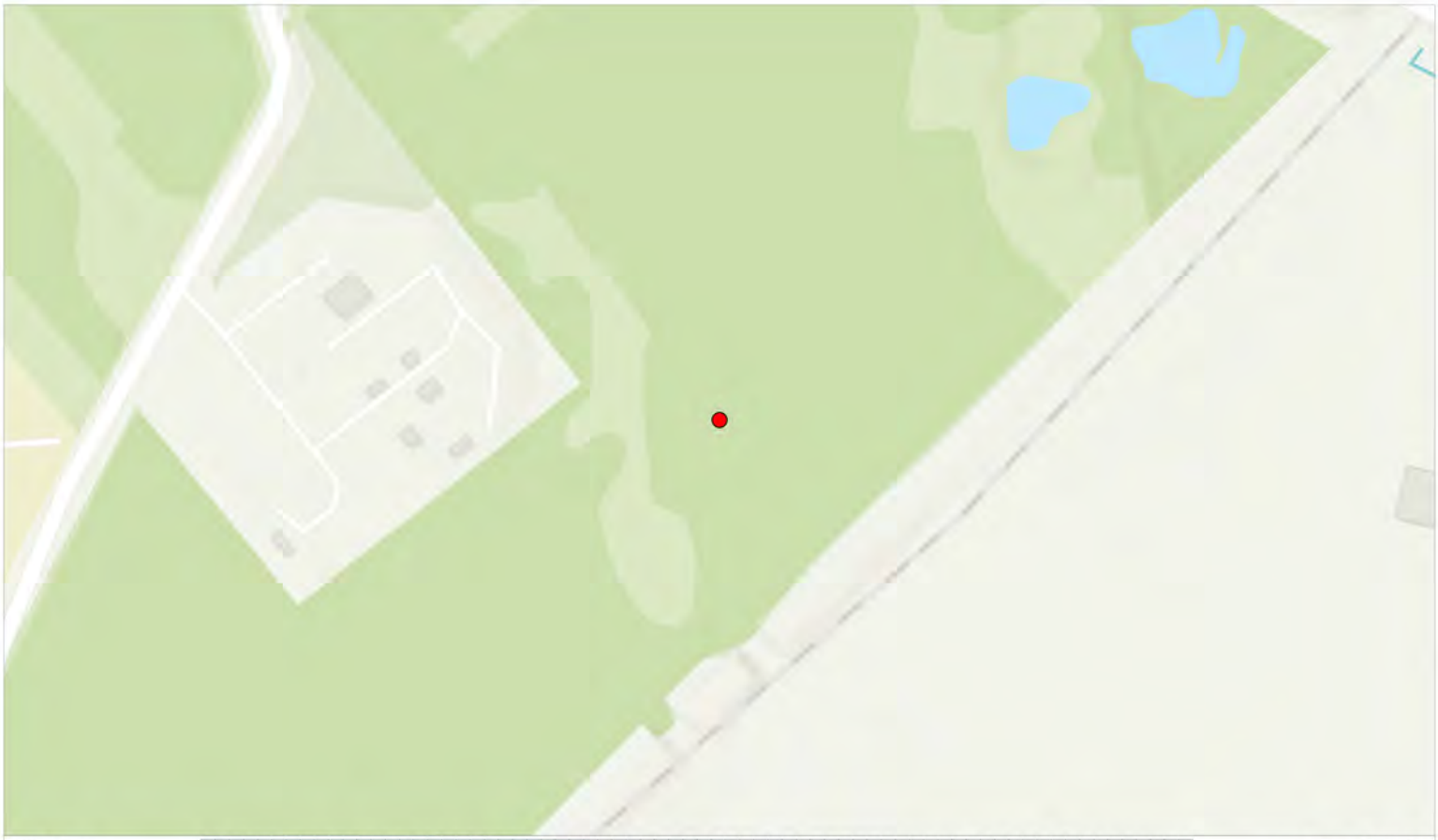

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113315.jpg
Easting: 447948.0737
Northing: 525032.4266

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447948, 525032

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.36

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	36 of 117
Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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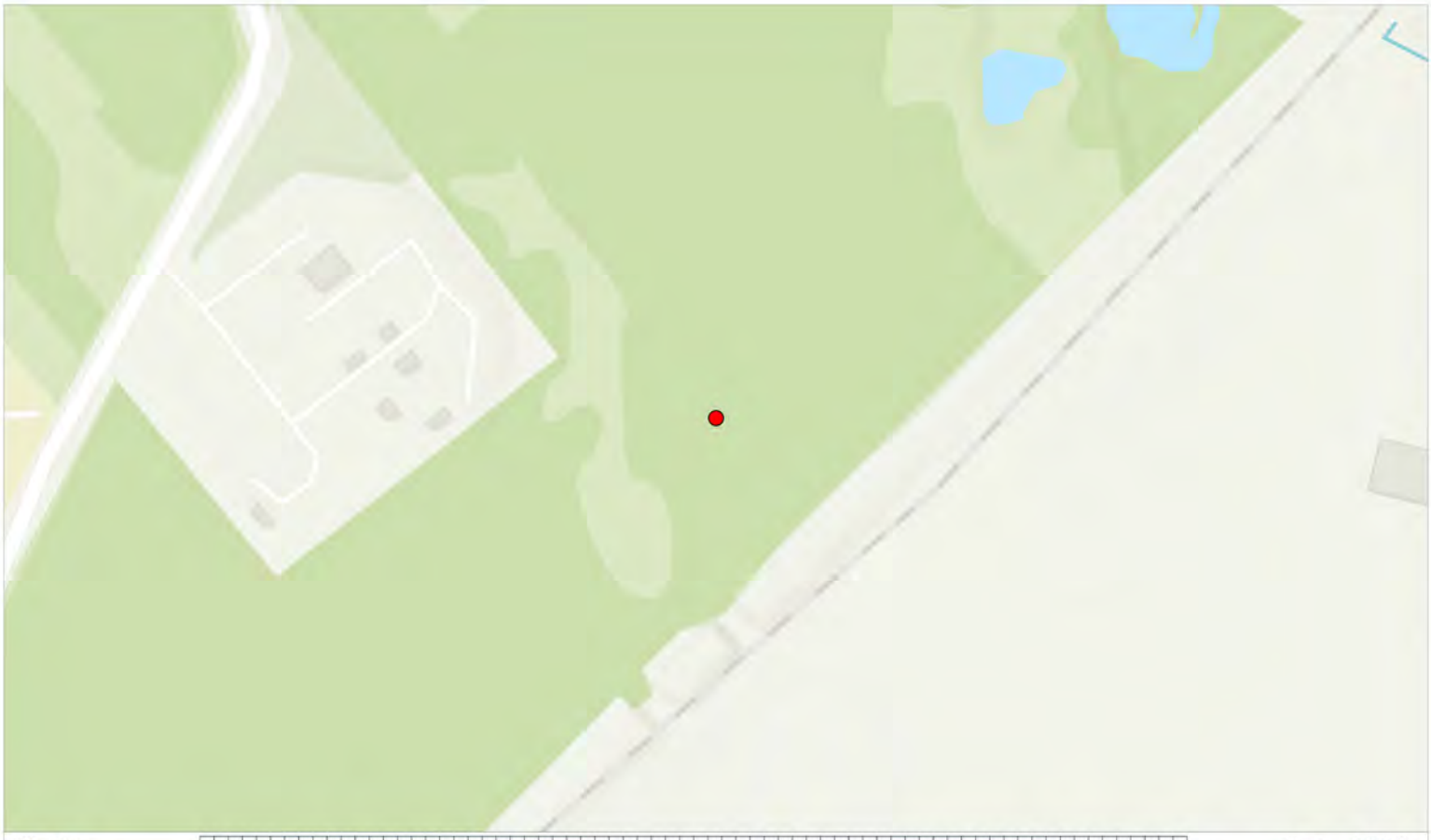

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113320.jpg
Easting: 447955.0592
Northing: 525023.4081

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447955, 525023

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.37

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	37 of 117
Sheet Size:	A4

Key:

Photo Location

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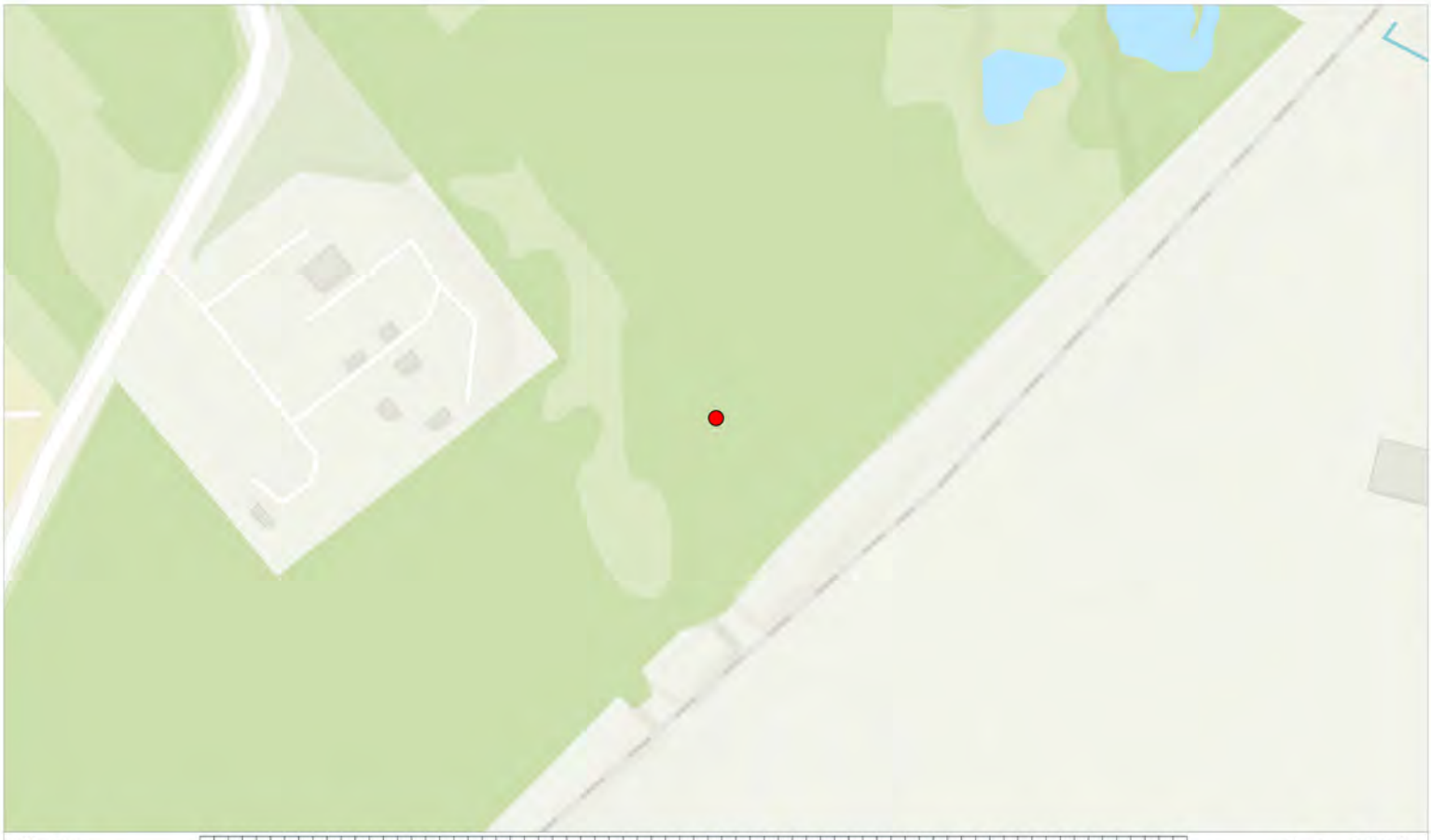

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113329.jpg
Easting: 447955.0592
Northing: 525023.4081

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447955, 525023

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.38

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	38 of 117
Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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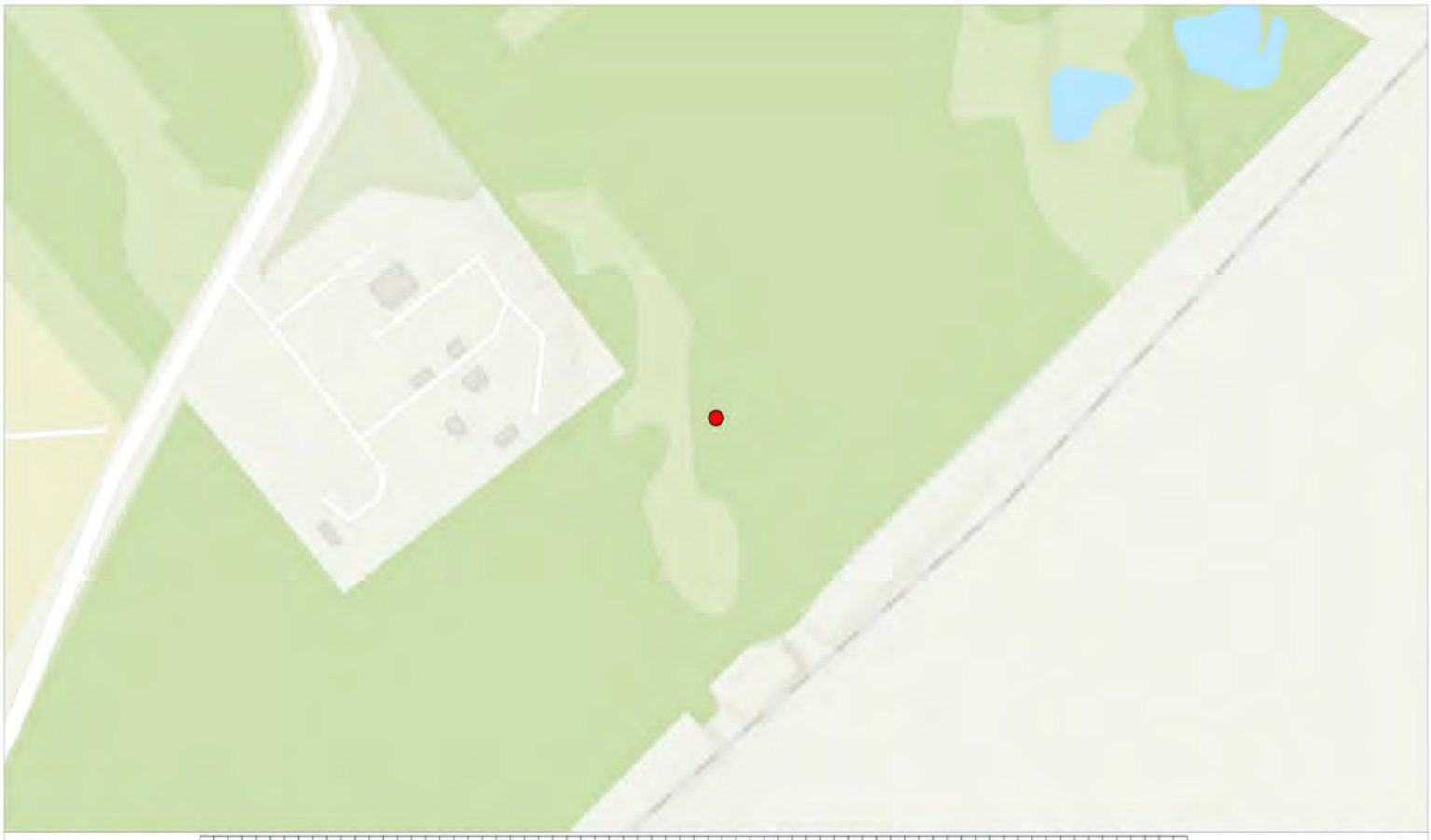

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113623.jpg
Easting: 447931.2063
Northing: 525029.2775

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447931, 525029

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.39

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-	08.01.2024	First Issue

Drawn:	HM
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Sheet No:	39 of 117
Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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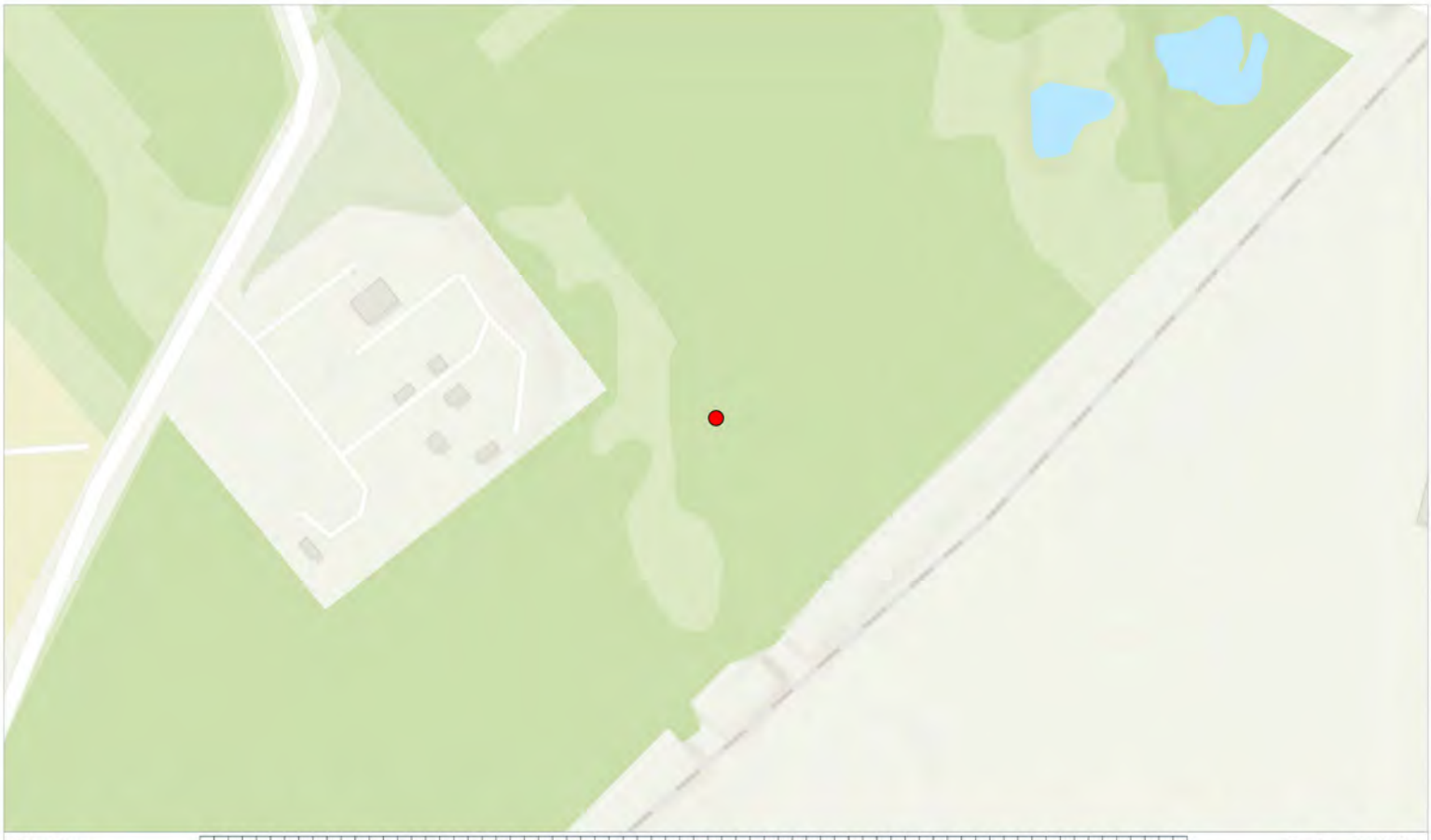

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113704.jpg
Easting: 447937.822
Northing: 525035.1008

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447938, 525035

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.40

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
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Key:

Photo Location

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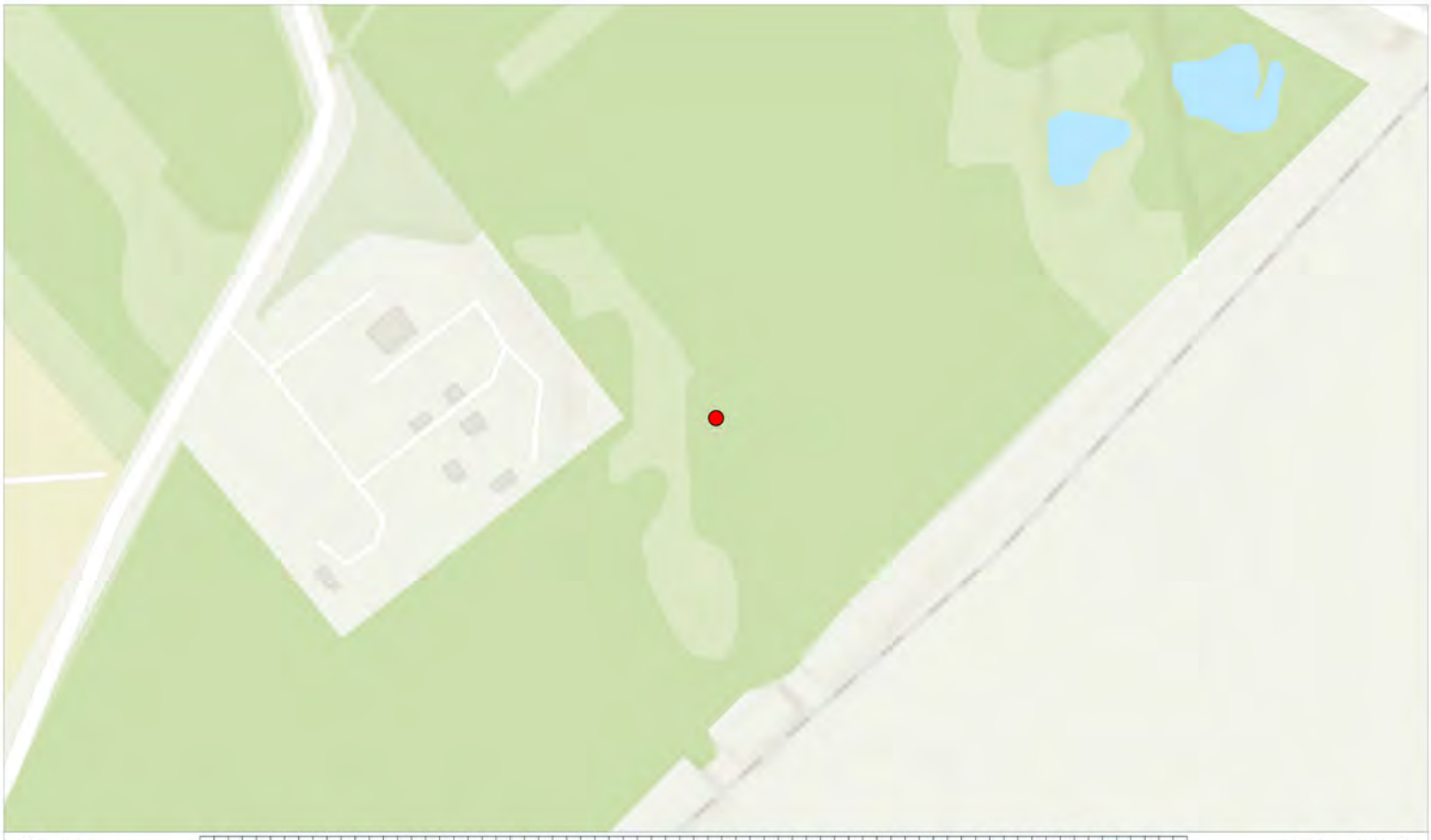

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113714.jpg
Easting: 447931.9048
Northing: 525045.0544

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447932, 525045

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.41

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-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	41 of 117
Sheet Size:	A4

Key:

Photo Location

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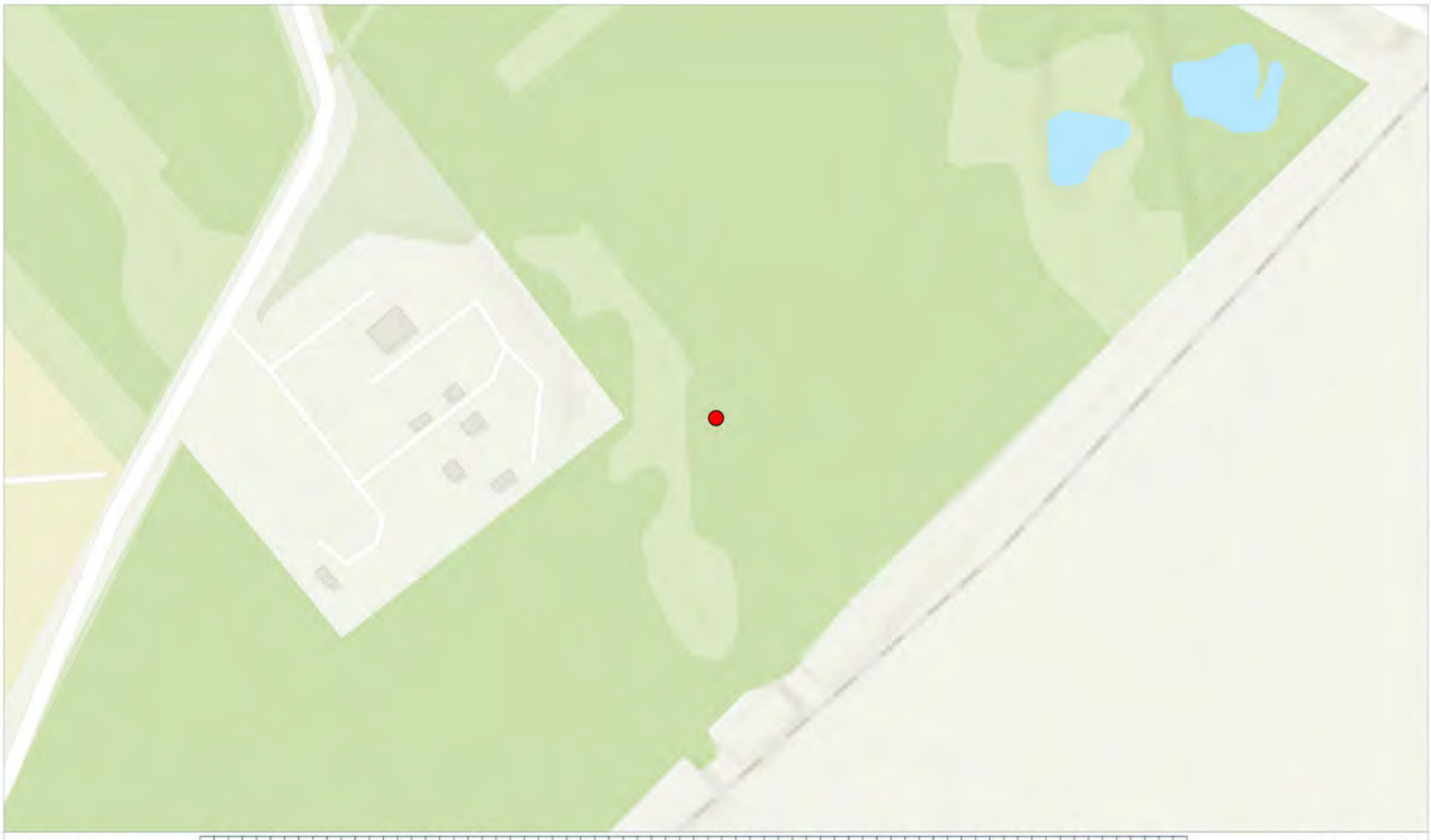

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113720.jpg
Easting: 447931.9048
Northing: 525045.0544

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447932, 525045

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.42

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	42 of 117
Sheet Size:	A4

Key:

Photo Location

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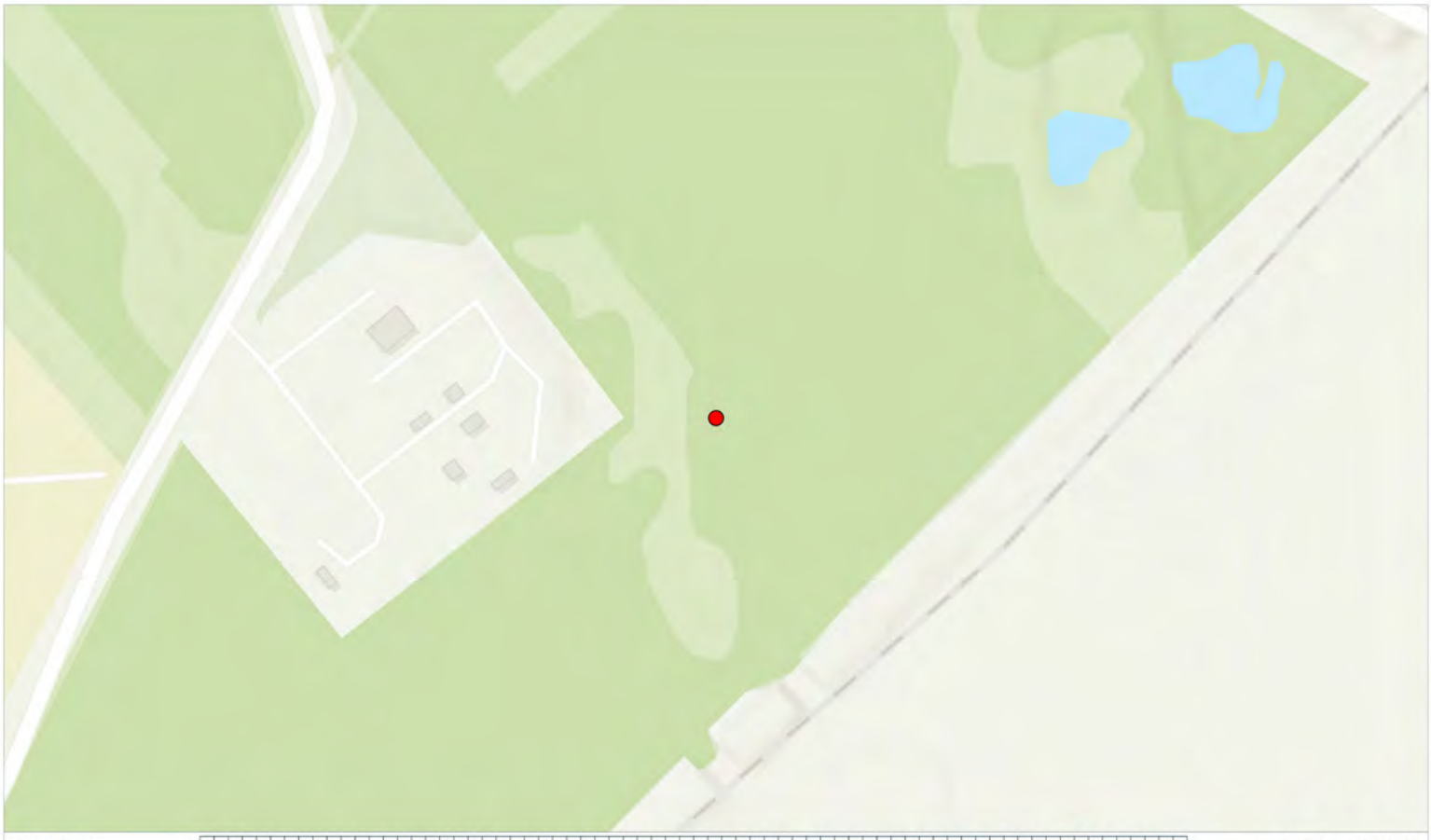

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113732.jpg
Easting: 447931.9048
Northing: 525045.0544

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447932, 525045

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.43

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Approved:	SW
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Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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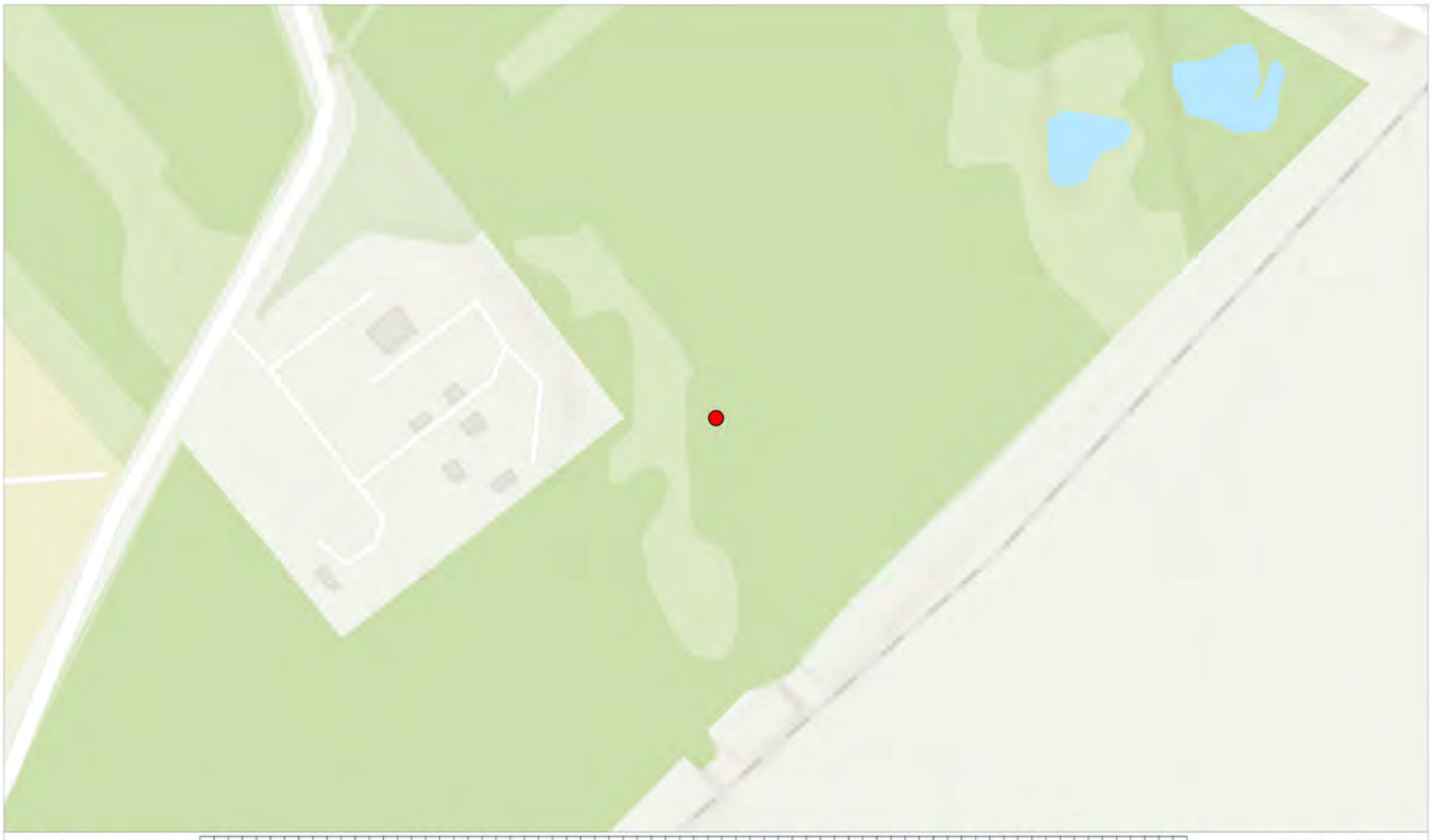

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113751.jpg
Easting: 447931.9048
Northing: 525045.0544

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447932, 525045

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.44

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Drawn:	HM
Approved:	SW
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Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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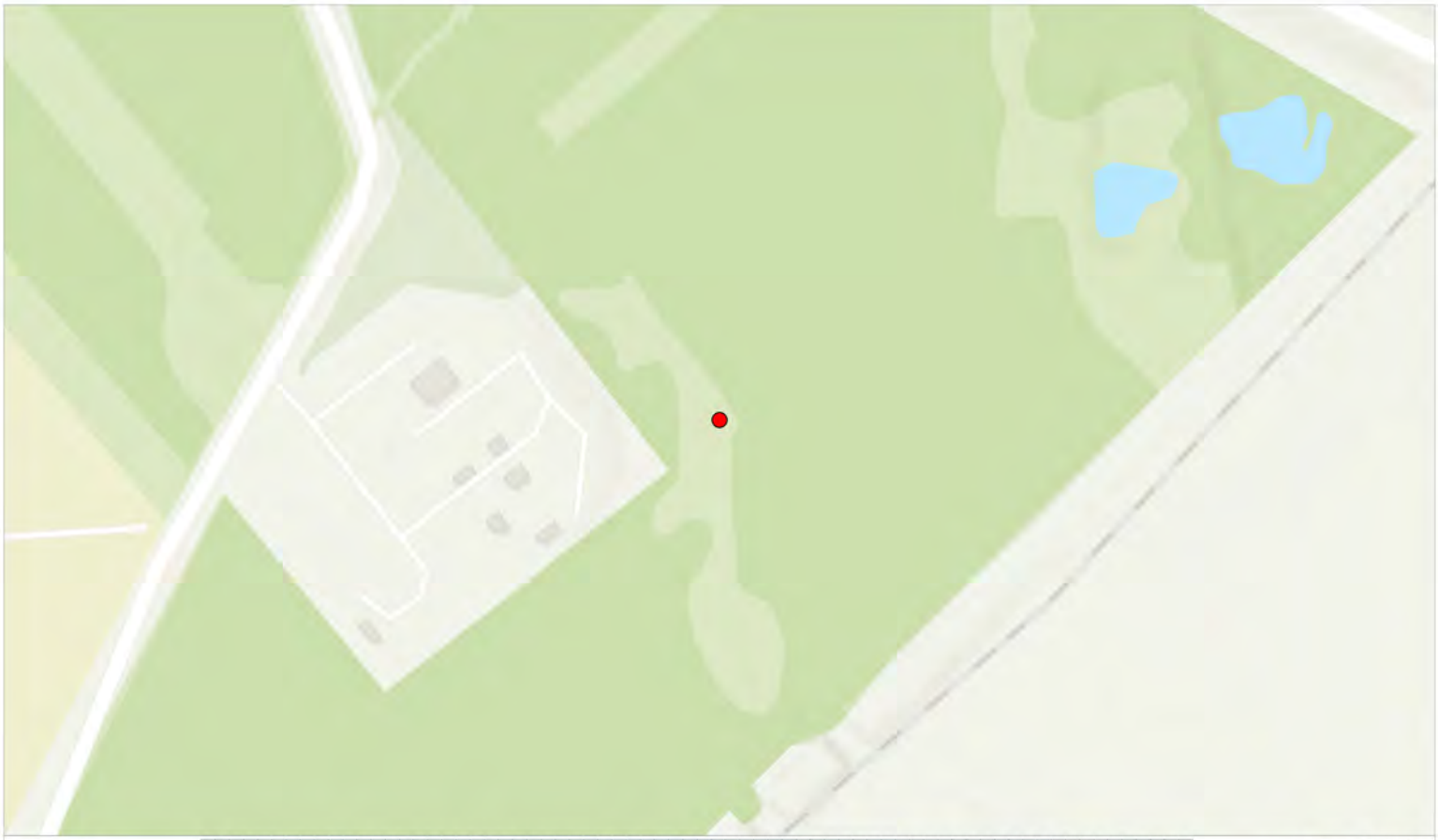

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113833.jpg
Easting: 447917.2884
Northing: 525063.0737

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447917, 525063

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.45

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Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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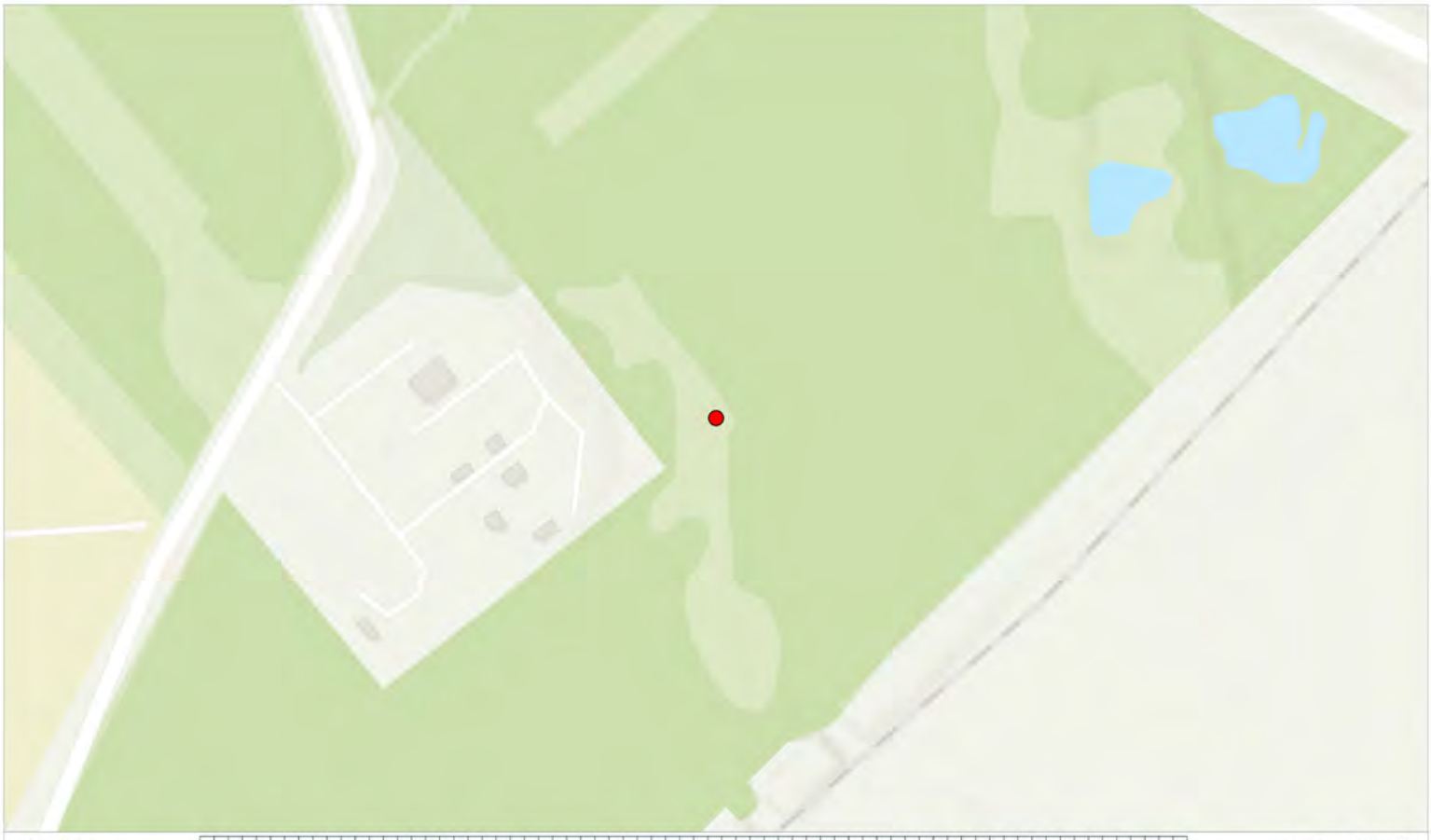

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113835.jpg
Easting: 447917.2884
Northing: 525063.0737

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447917, 525063

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.46

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Key:

Photo Location

Coordinate System: British National Grid
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Datum: OSGB 1936

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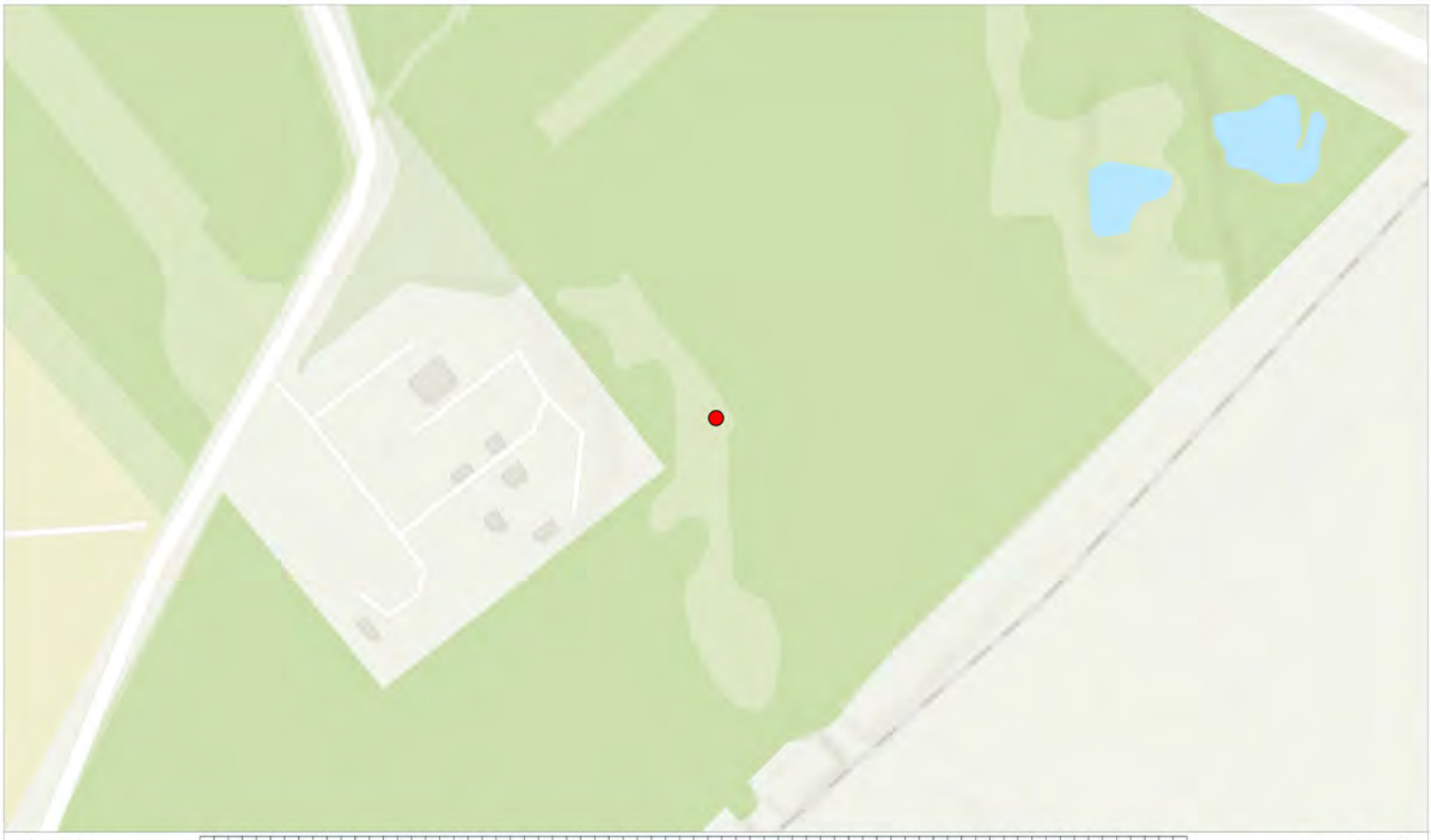

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113837.jpg
Easting: 447917.2884
Northing: 525063.0737

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447917, 525063

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.47

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Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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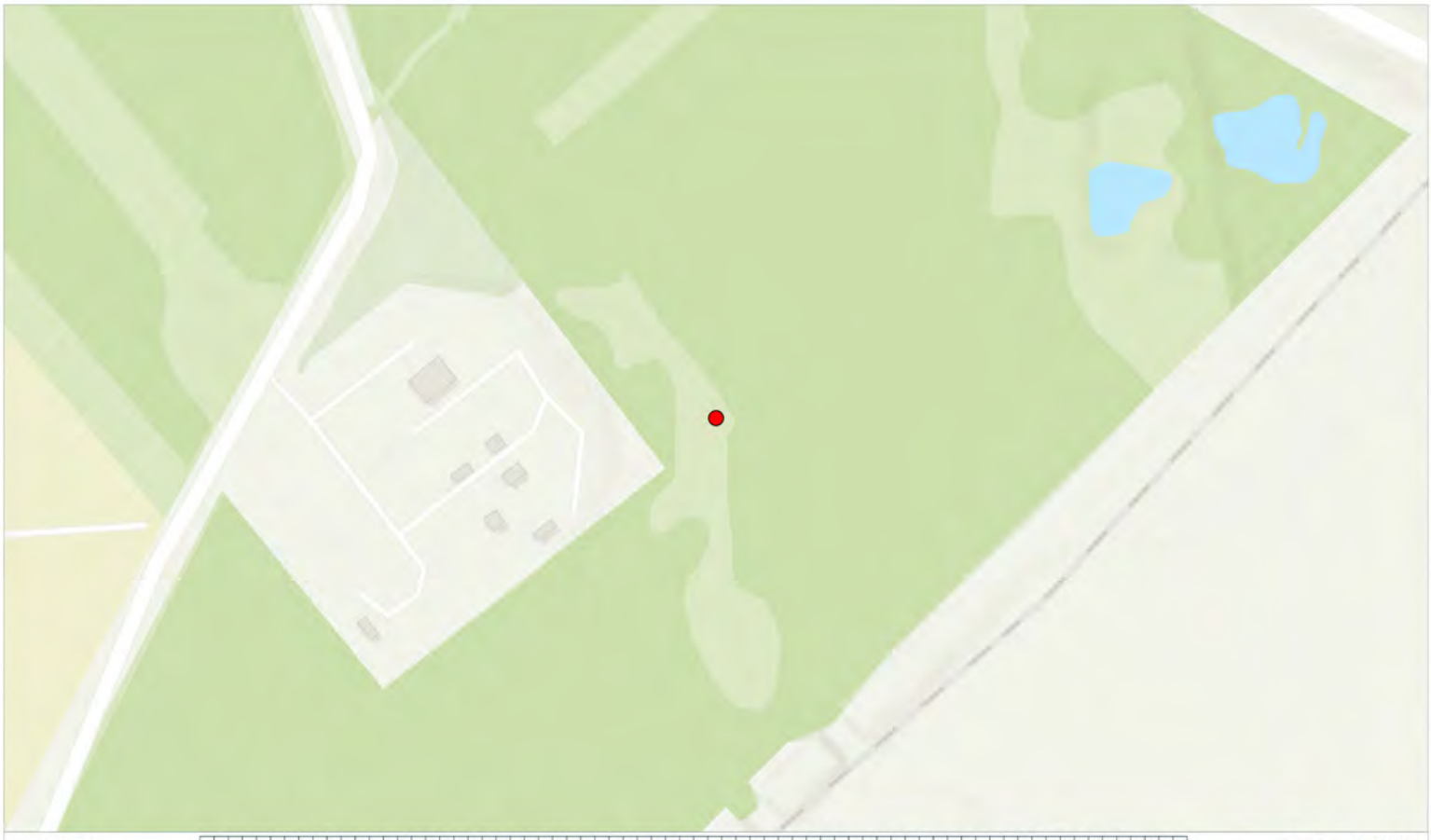

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113856.jpg
Easting: 447917.2884
Northing: 525063.0737

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447917, 525063

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.48

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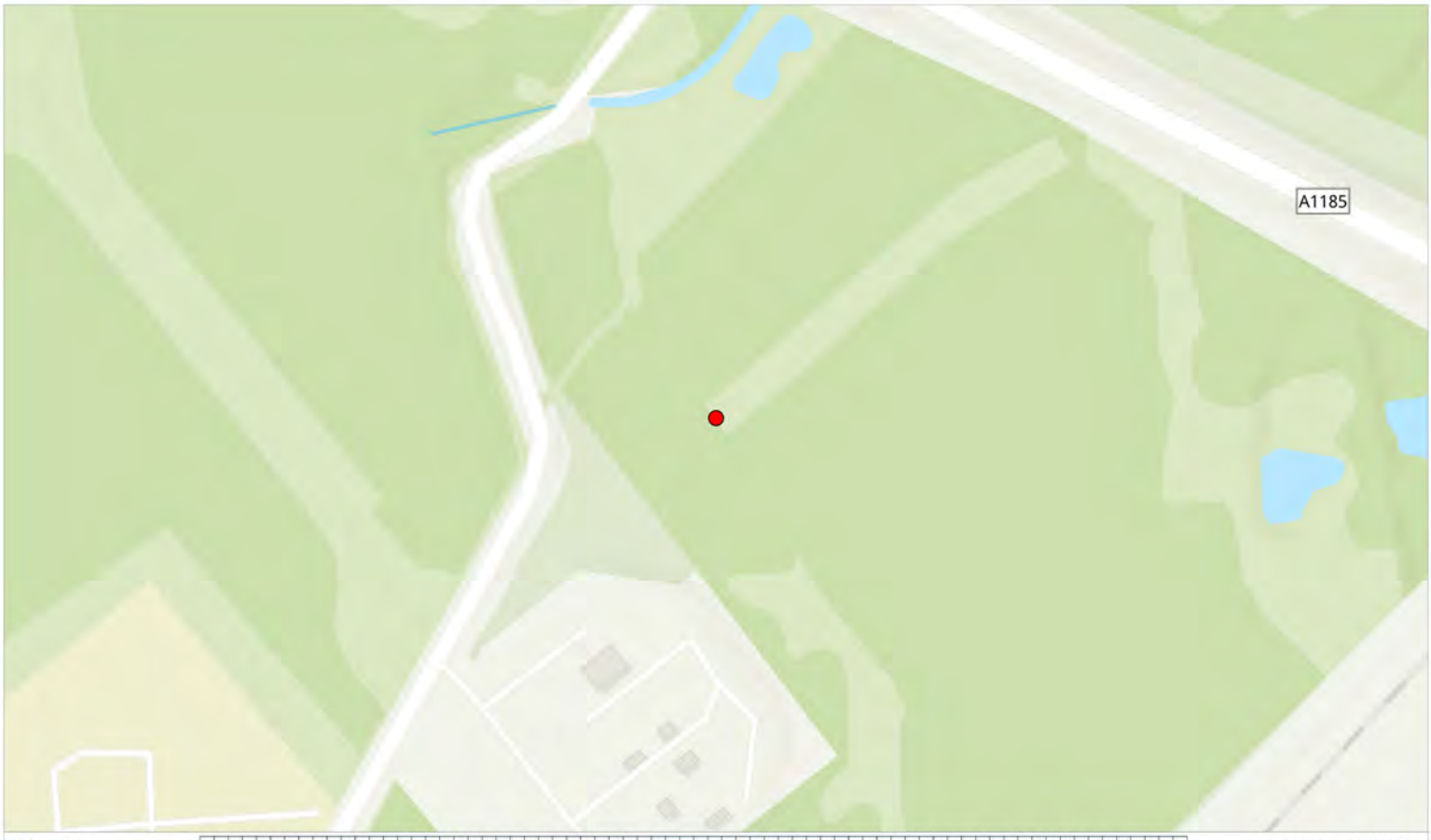

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113913.jpg
Easting: 447856.1582
Northing: 525164.815

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447856, 525165

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.49

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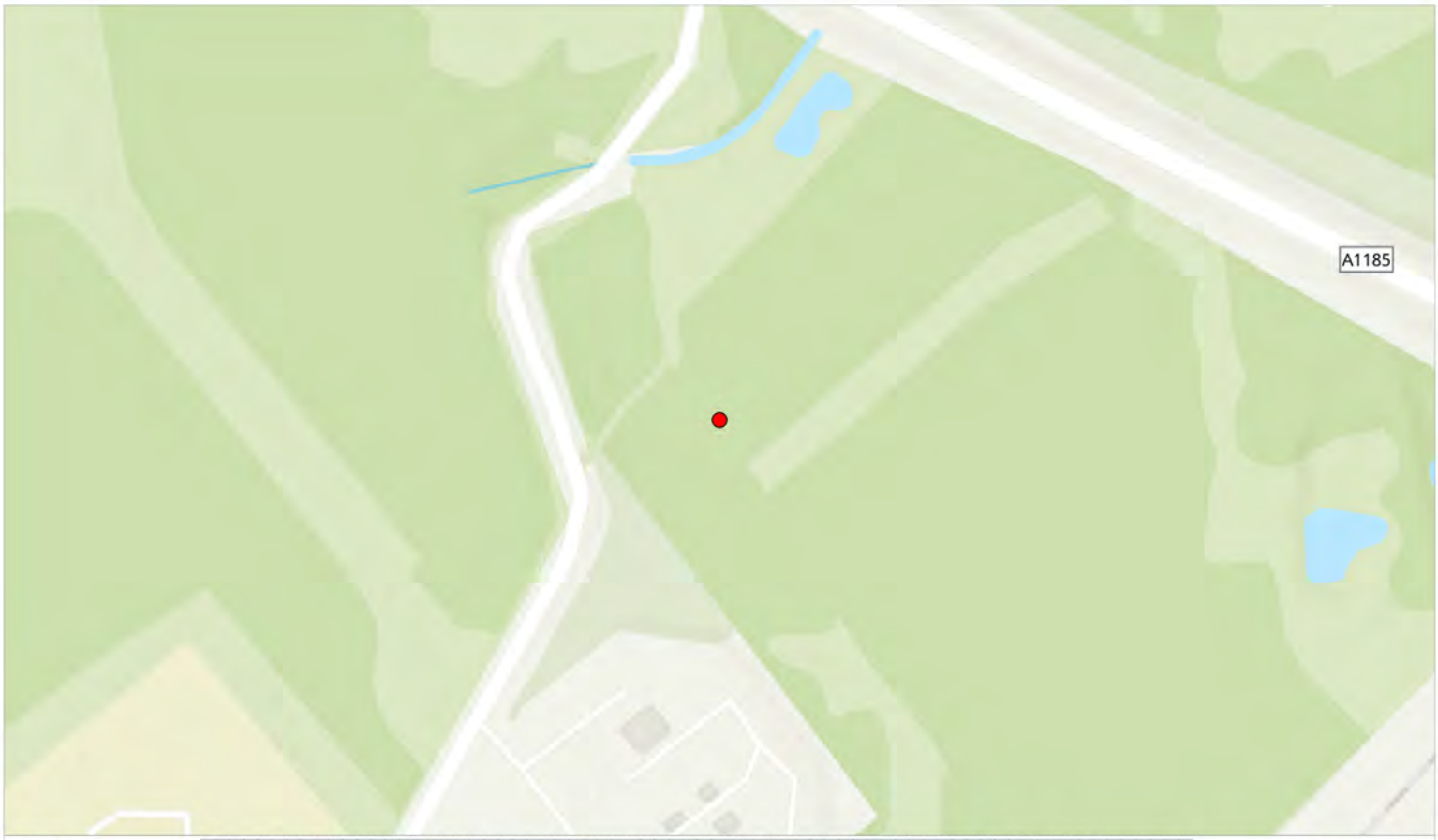

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_113950.jpg
Easting: 447843.1386
Northing: 525185.0783

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447843, 525185

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.50

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Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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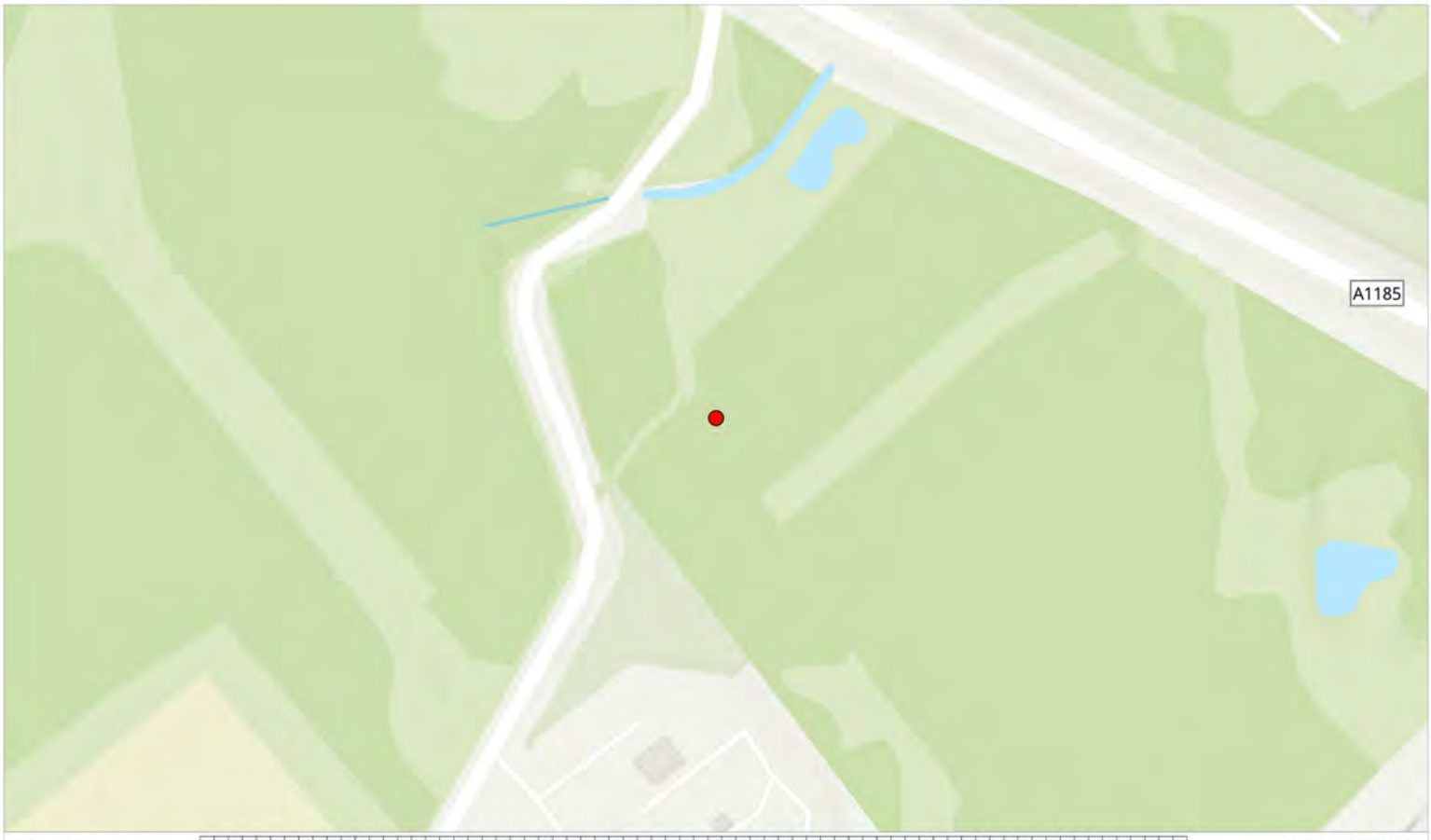

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_114023.jpg
Easting: 447836.9831
Northing: 525197.4439

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447837, 525197

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.51

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Key:

Photo Location

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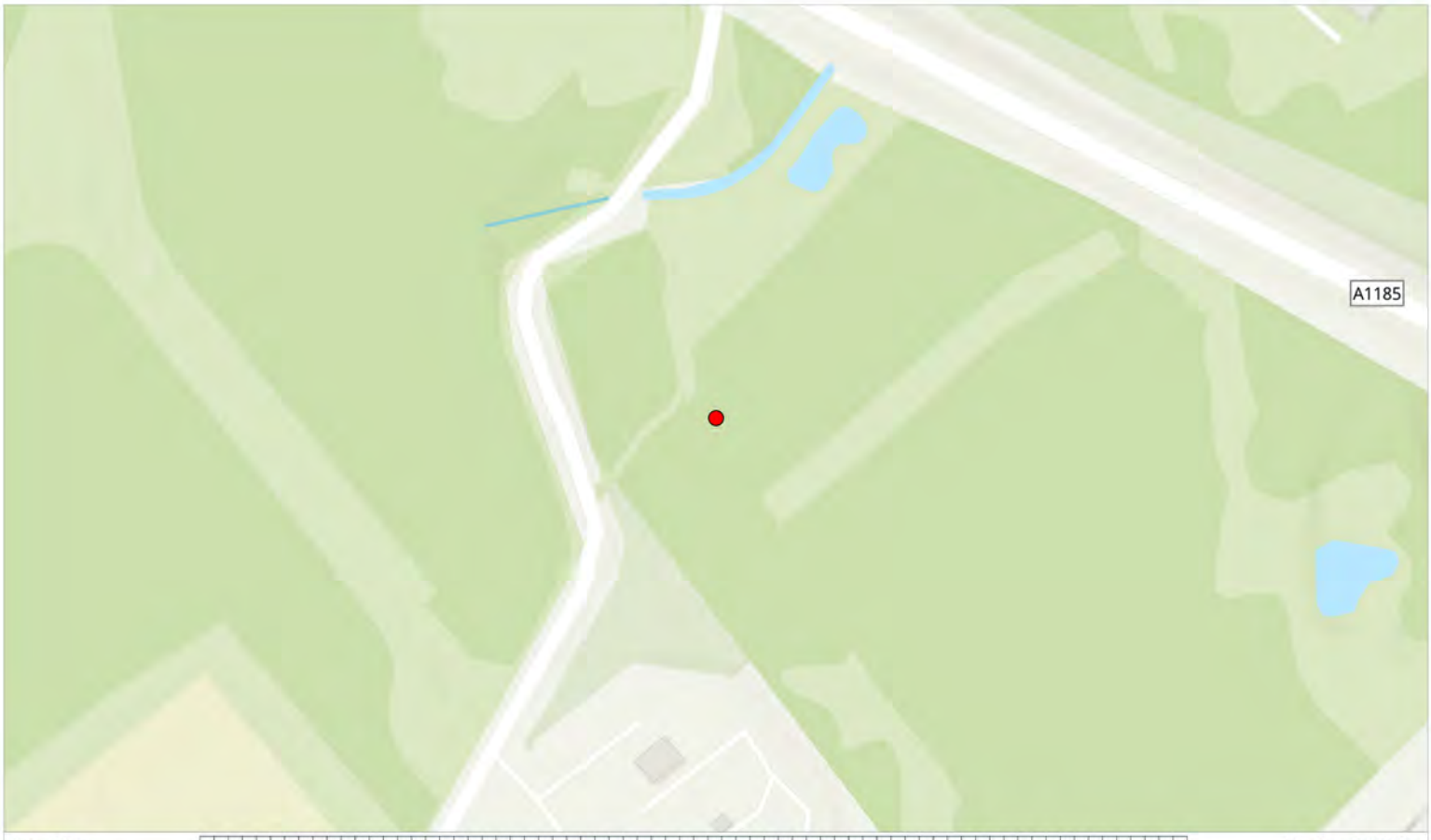

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_114029.jpg
Easting: 447836.9831
Northing: 525197.4439

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447837, 525197

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.52

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Photo Location

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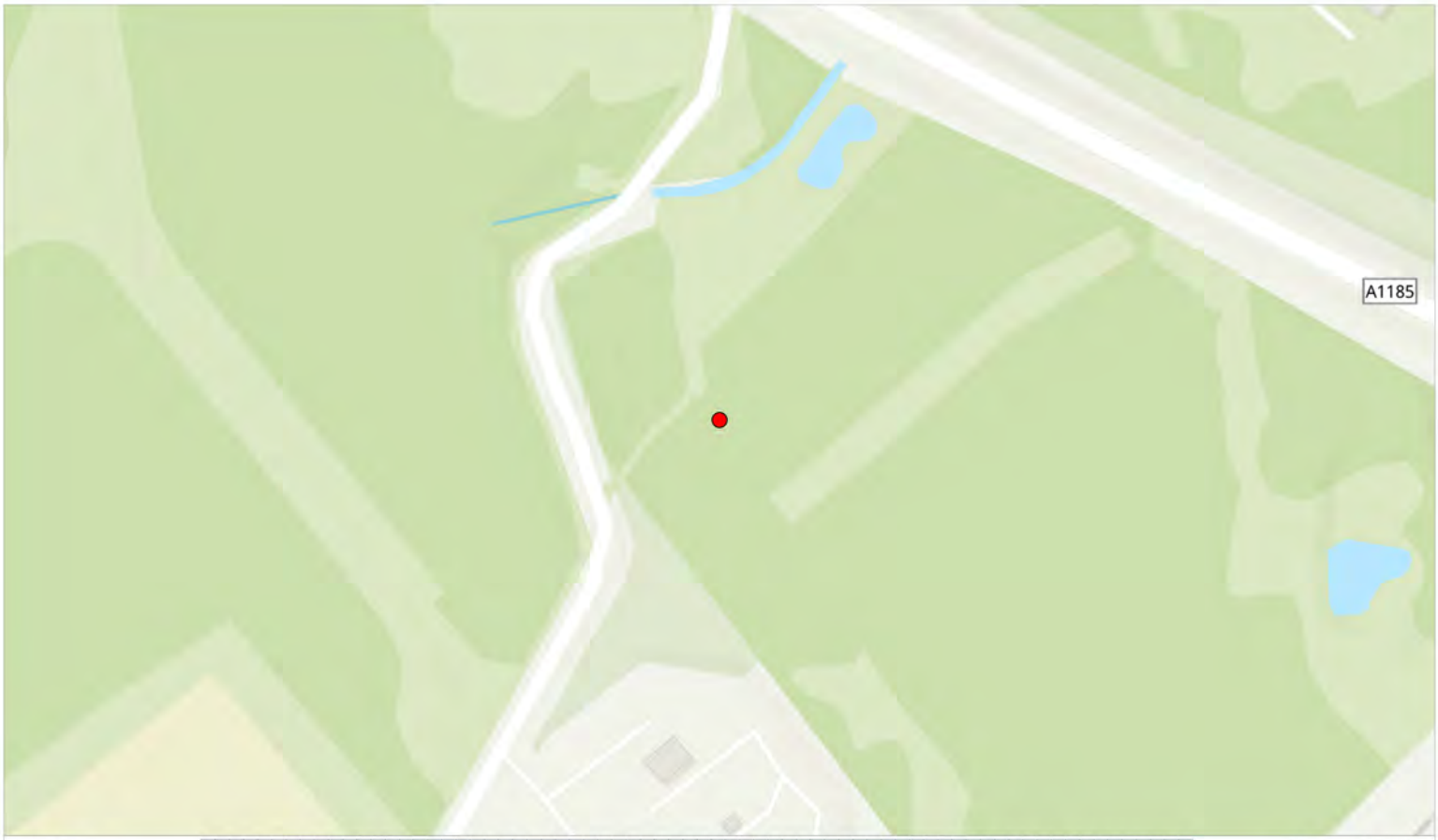

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_114106.jpg
Easting: 447834.846
Northing: 525196.3085

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447835, 525196

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.53

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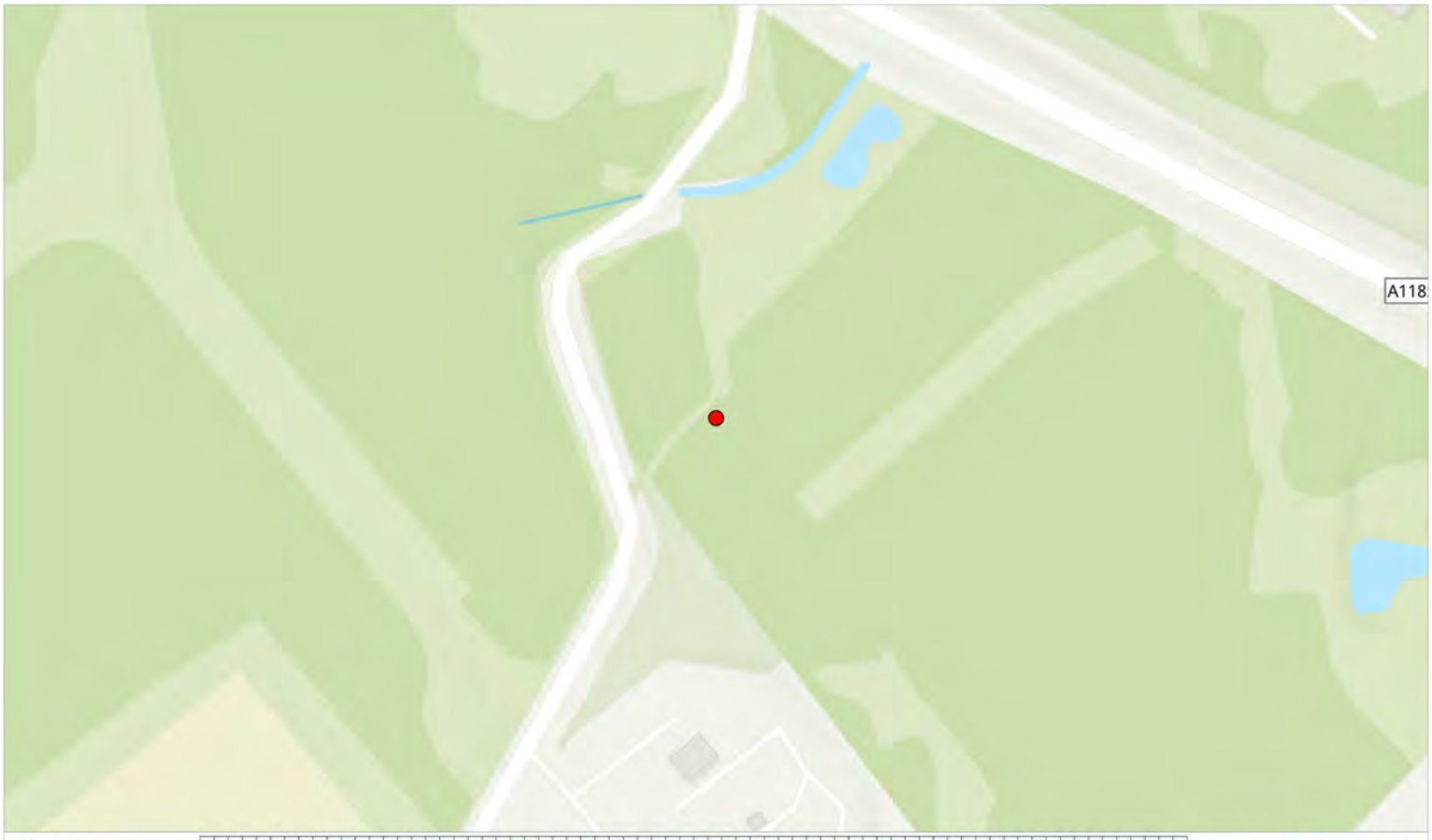

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_114151.jpg
Easting: 447824.7223
Northing: 525196.5699

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447825, 525197

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.54

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Coordinate System: British National Grid
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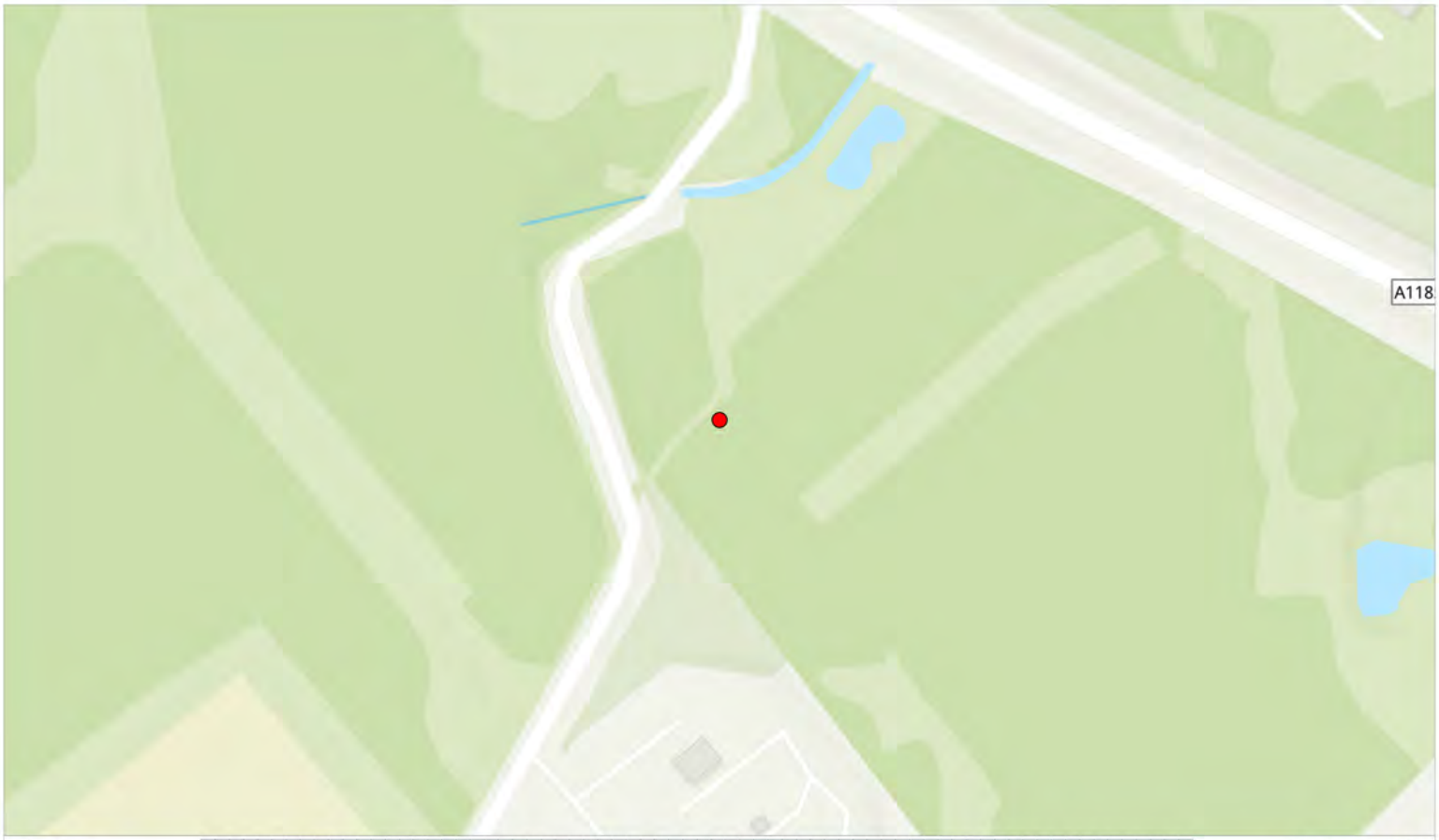

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_114154.jpg
Easting: 447824.7223
Northing: 525196.5699

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447825, 525197

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.55

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Drawn:	HM
Approved:	SW
Sheet No:	55 of 117
Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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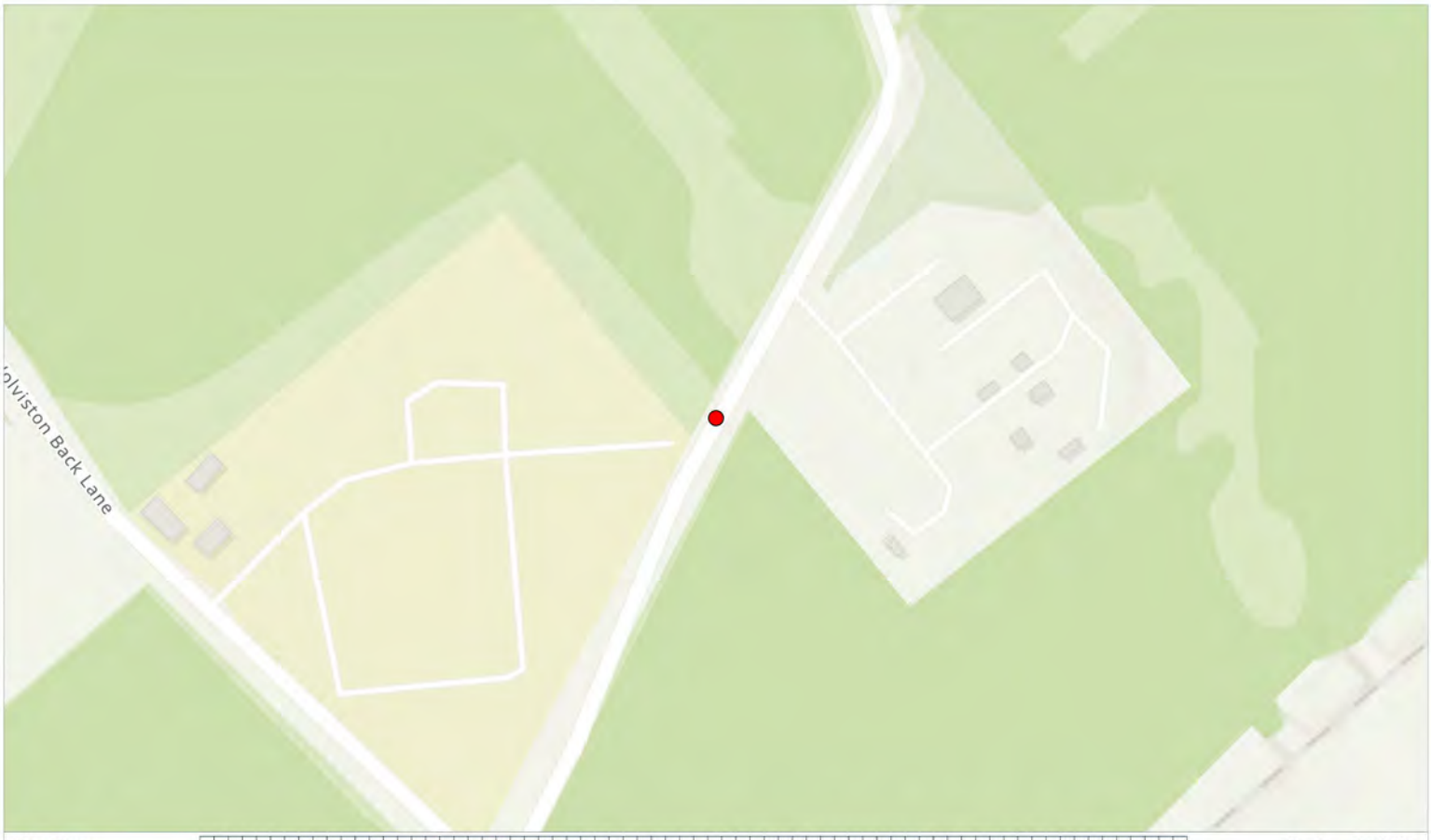

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_115144.jpg
Easting: 447730.741
Northing: 525034.0363

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447731, 525034

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.56

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Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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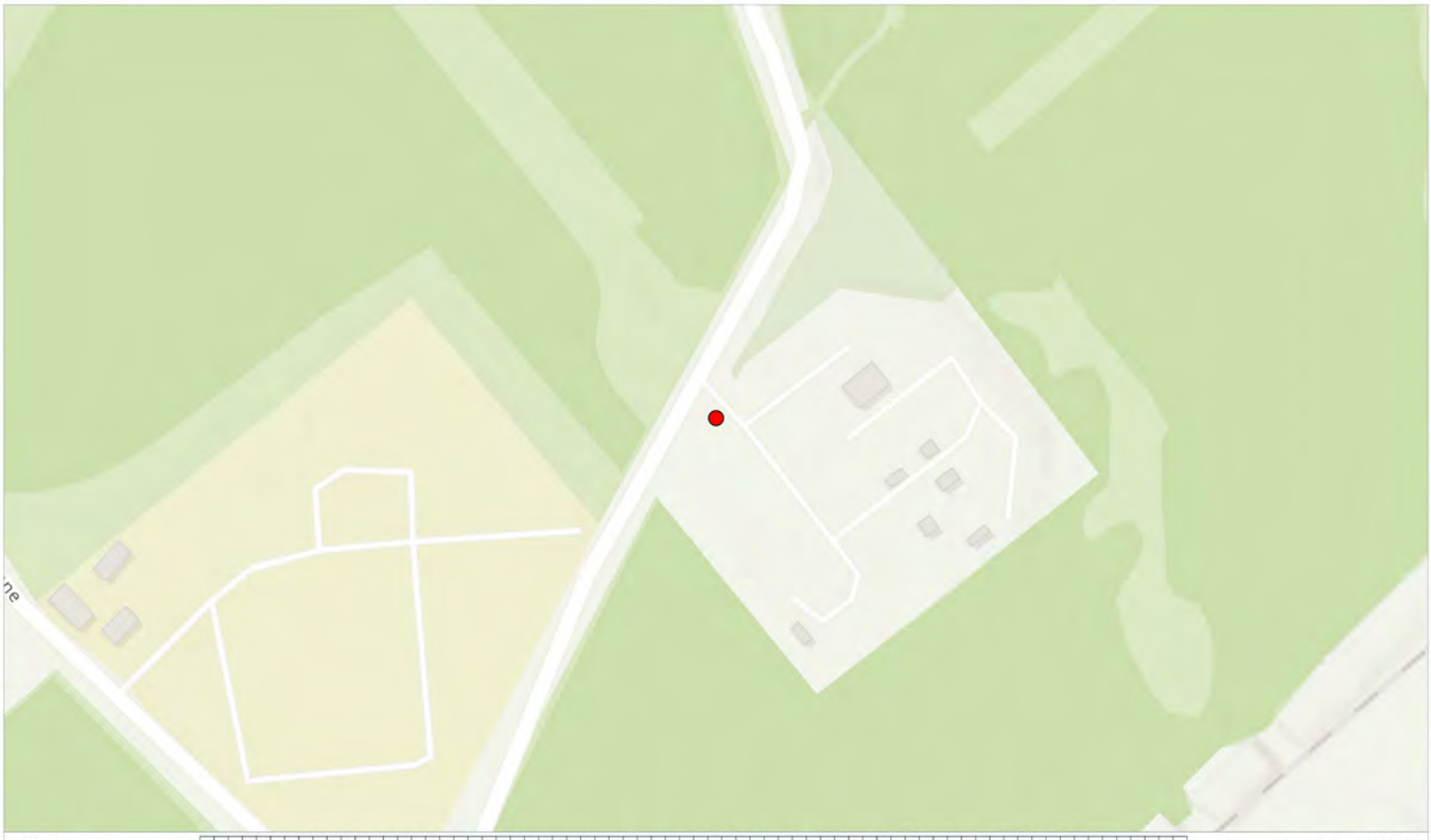

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_115833.jpg
Easting: 447763.462
Northing: 525064.9838

Additional Comments:

Existing Sites



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447763, 525065

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.57

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Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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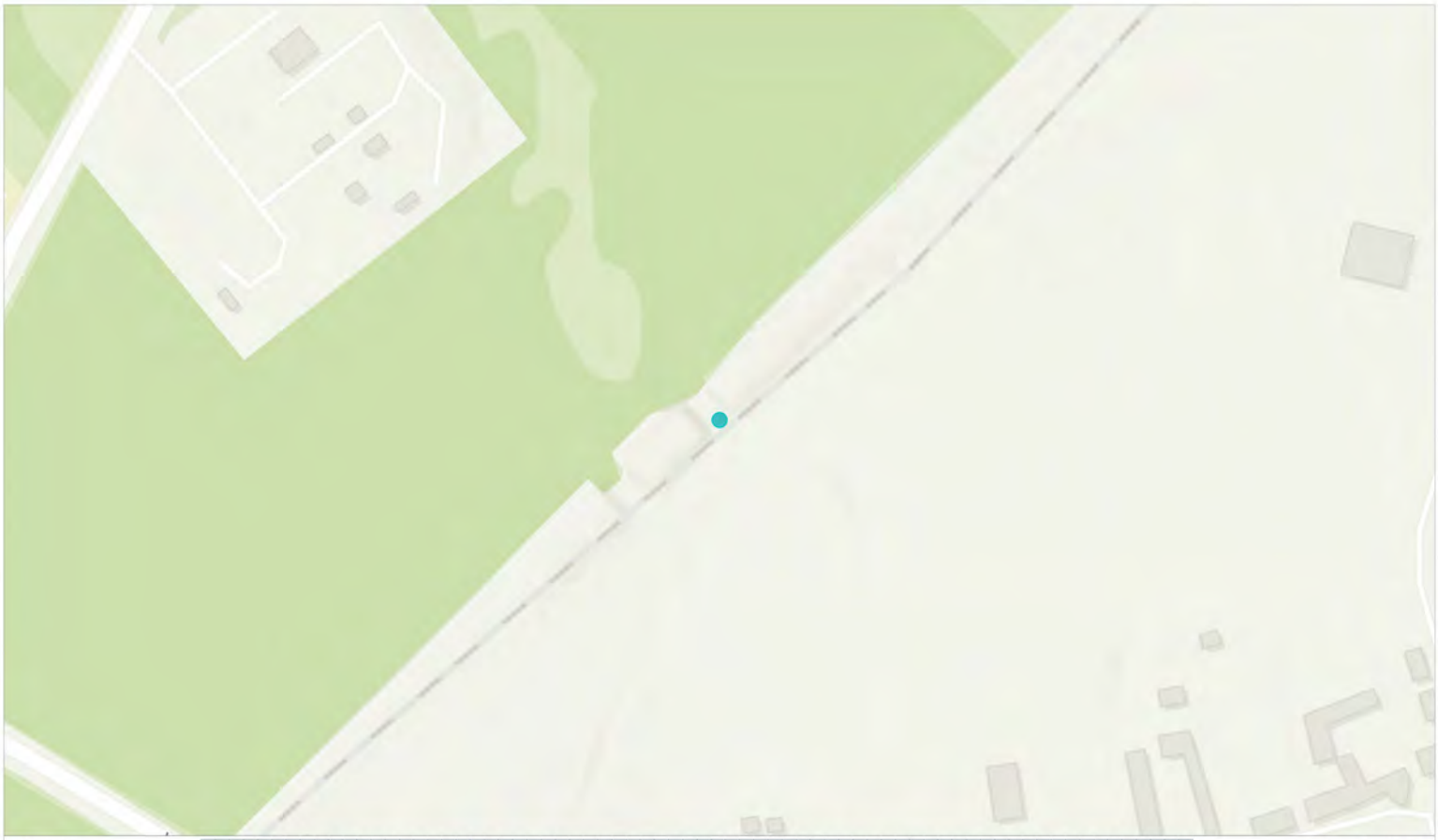

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112554.jpg
Easting: 447967.0655
Northing: 524946.1896

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447967, 524946

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.58

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Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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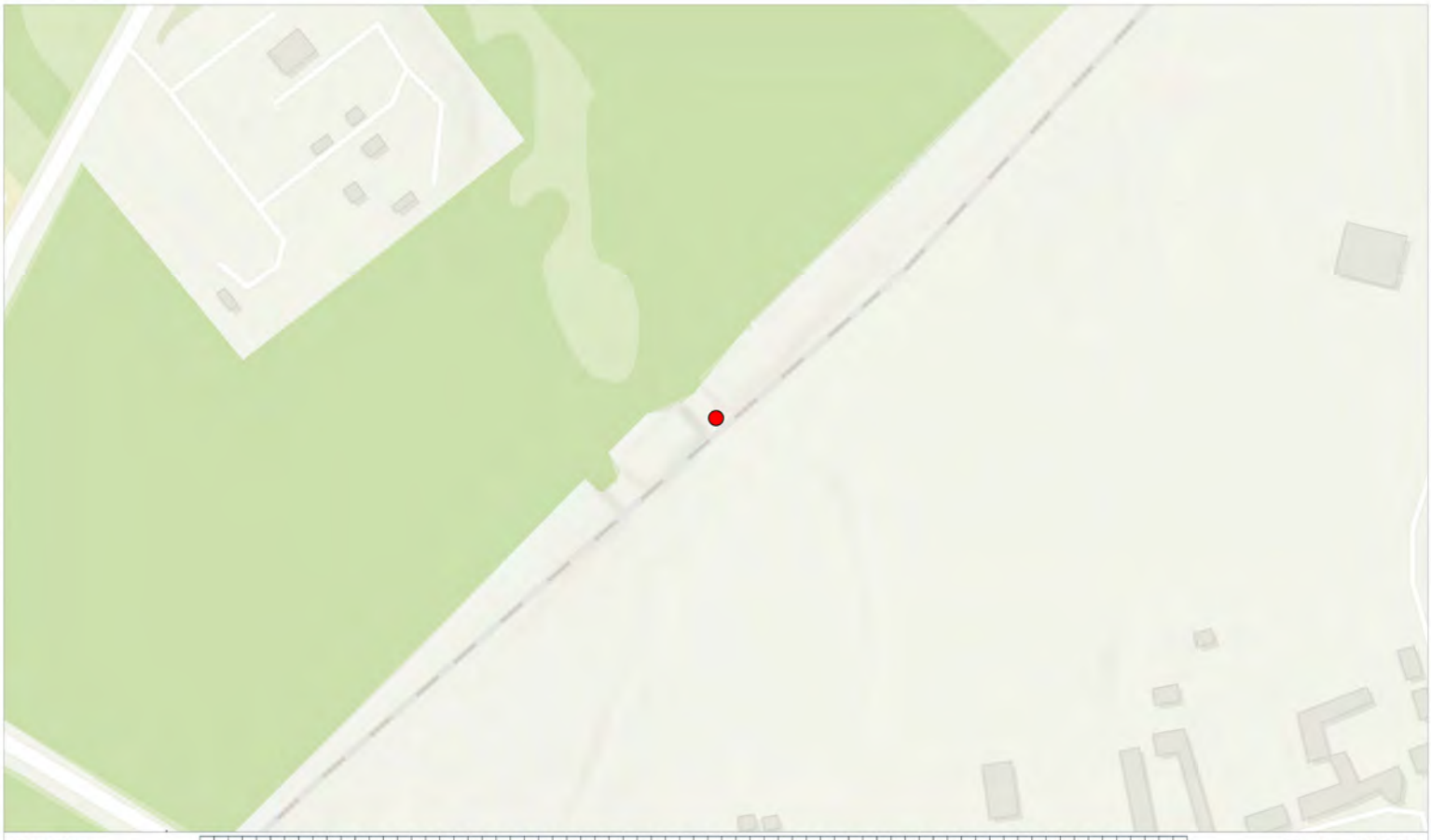

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112556.jpg
Easting: 447967.0596
Northing: 524946.746

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447967, 524947

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.59

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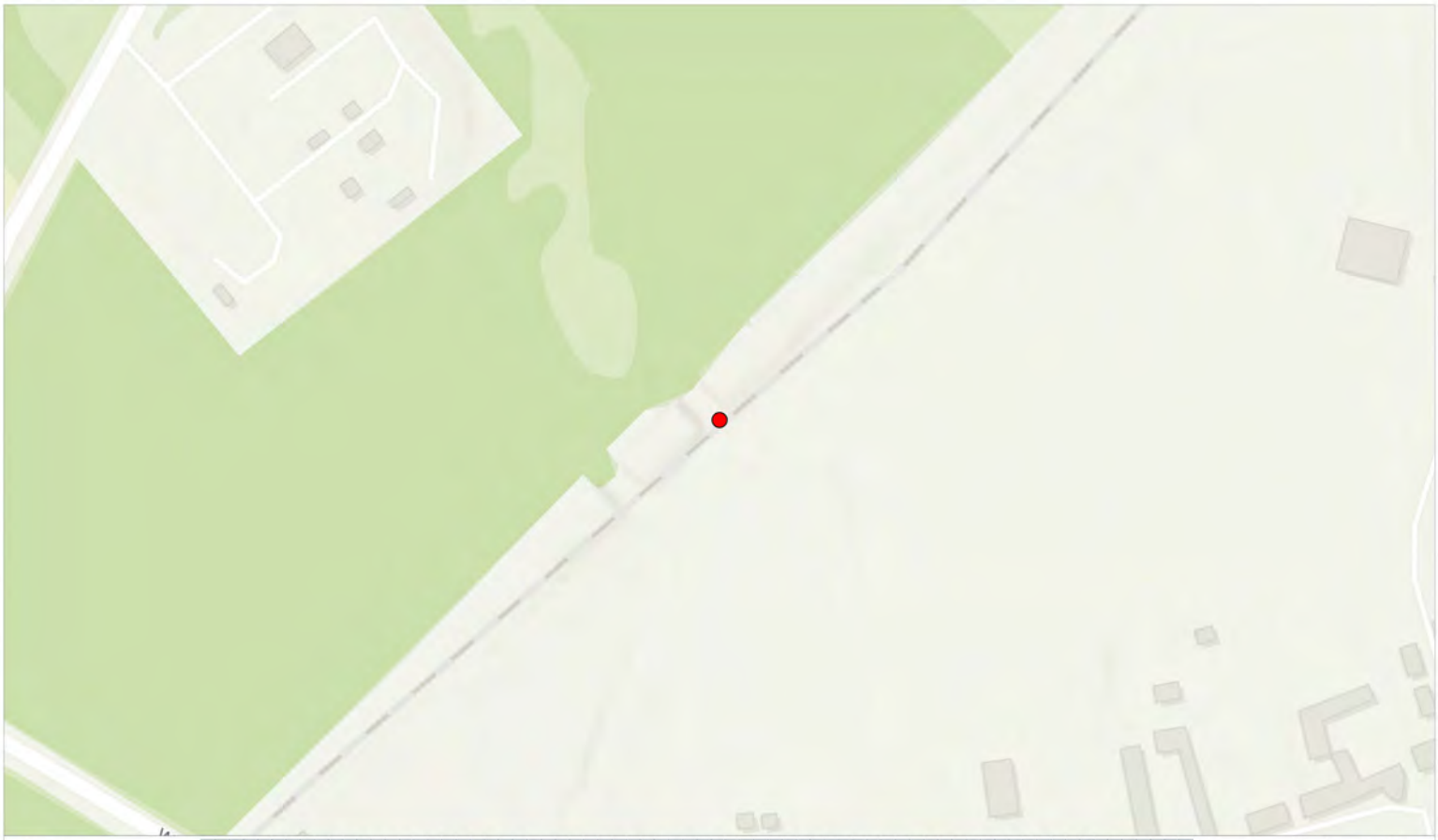

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112604.jpg
Easting: 447968.8049
Northing: 524944.7278

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447969, 524945

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.60

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Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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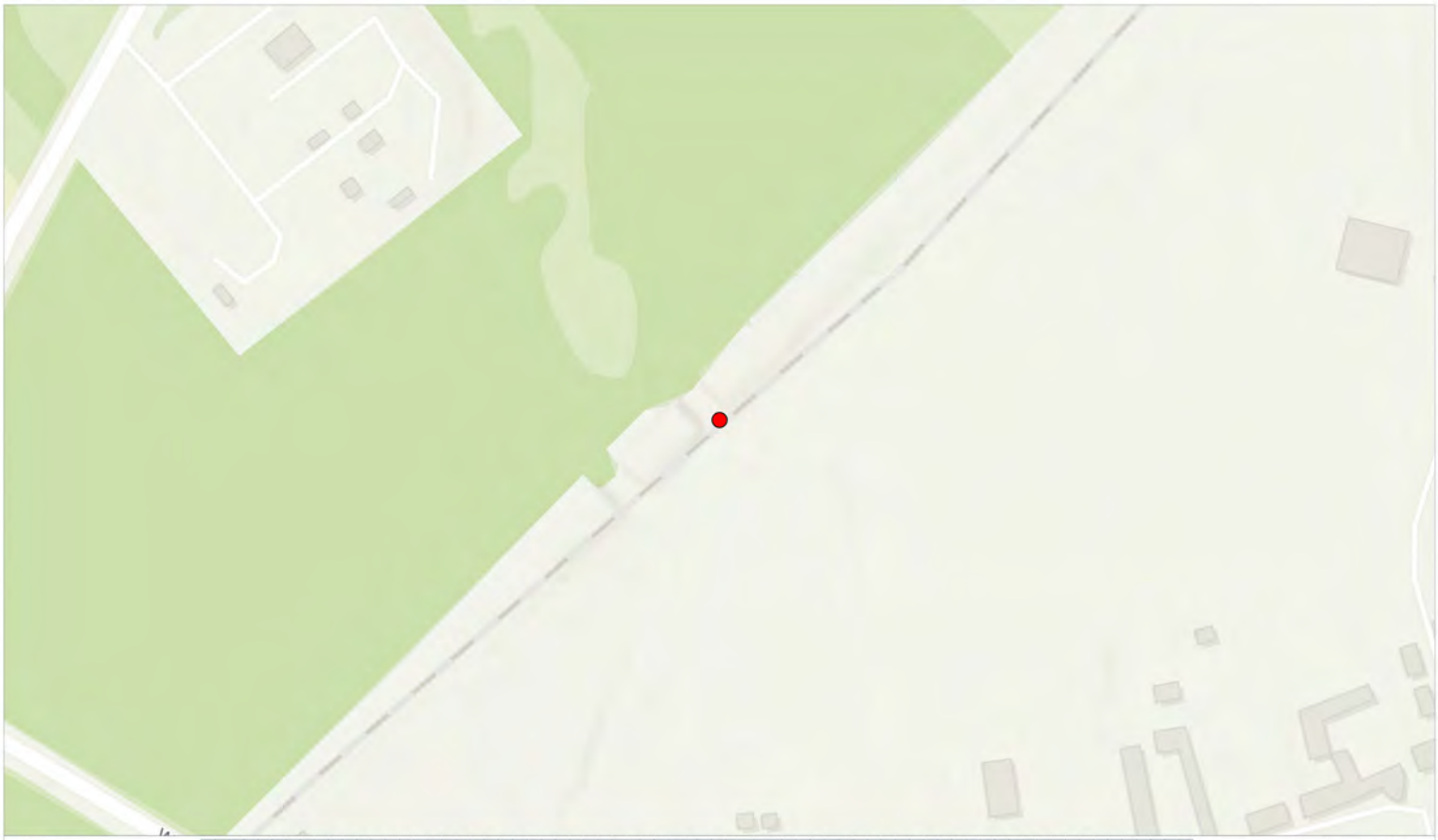

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112608.jpg
Easting: 447968.8049
Northing: 524944.7278

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447969, 524945

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.61

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Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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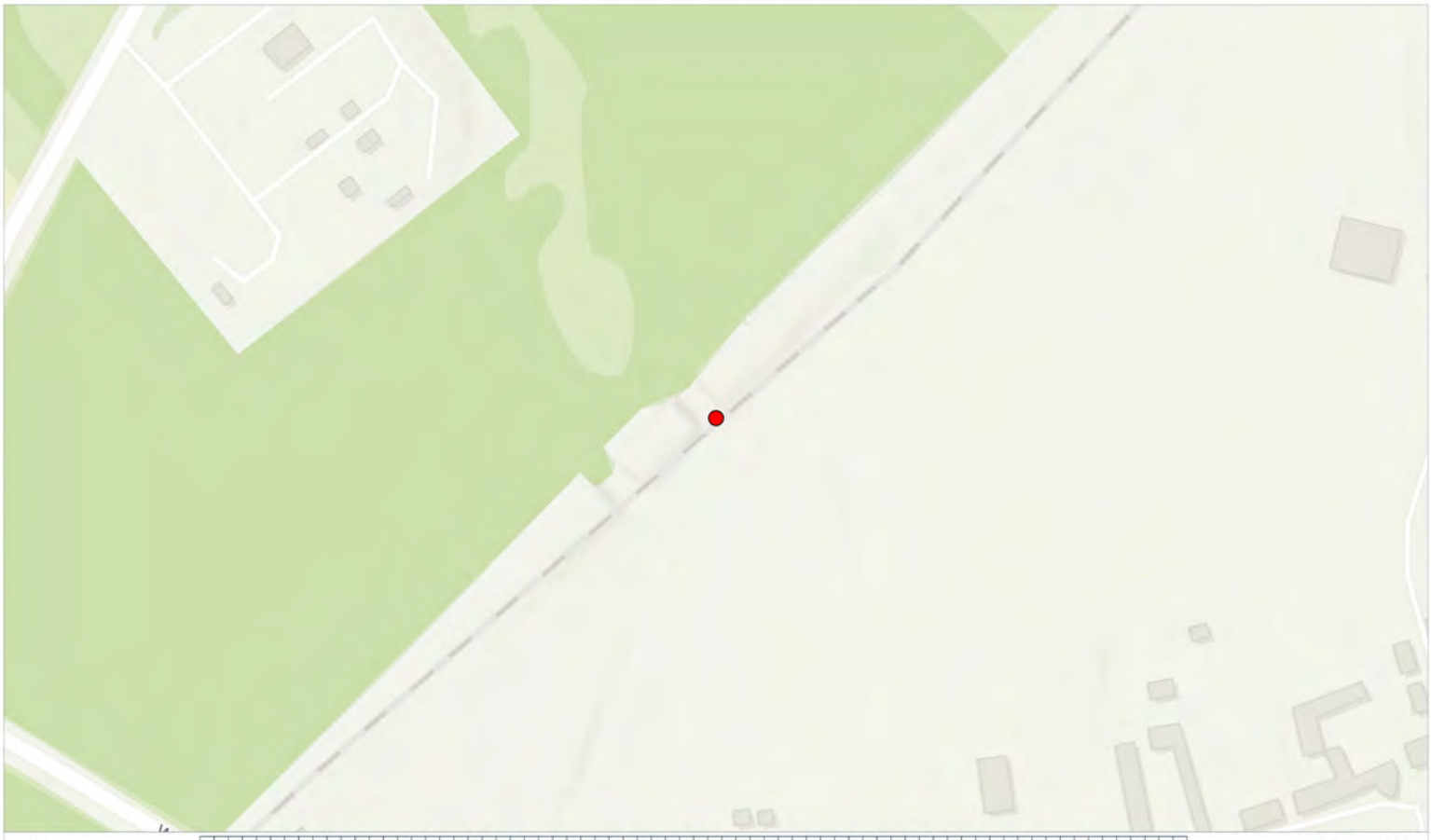

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112623.jpg
Easting: 447968.8049
Northing: 524944.7278

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447969, 524945

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.62

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Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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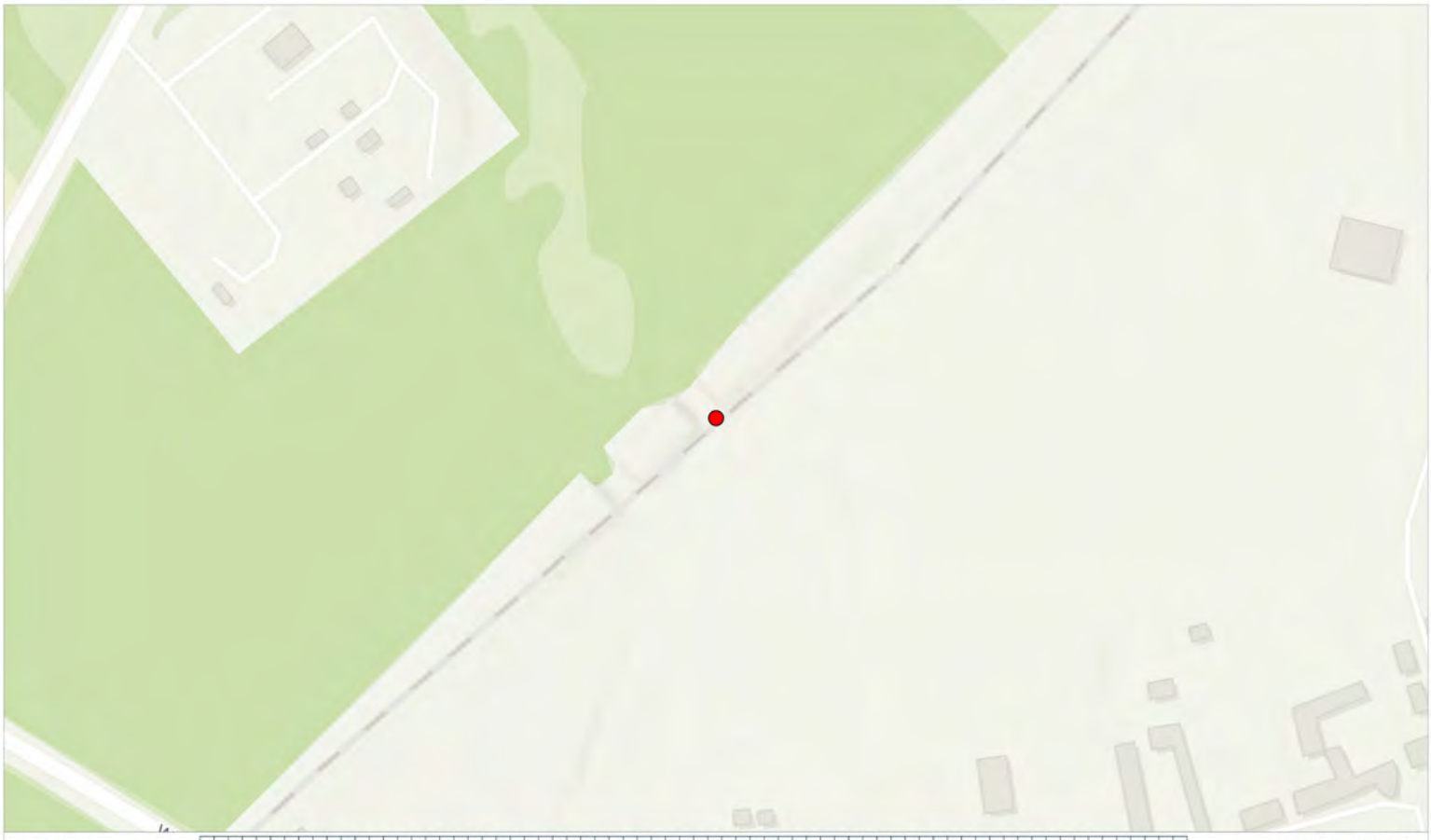

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_112635.jpg
Easting: 447968.8049
Northing: 524944.7278

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447969, 524945

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.63

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Key:

Photo Location

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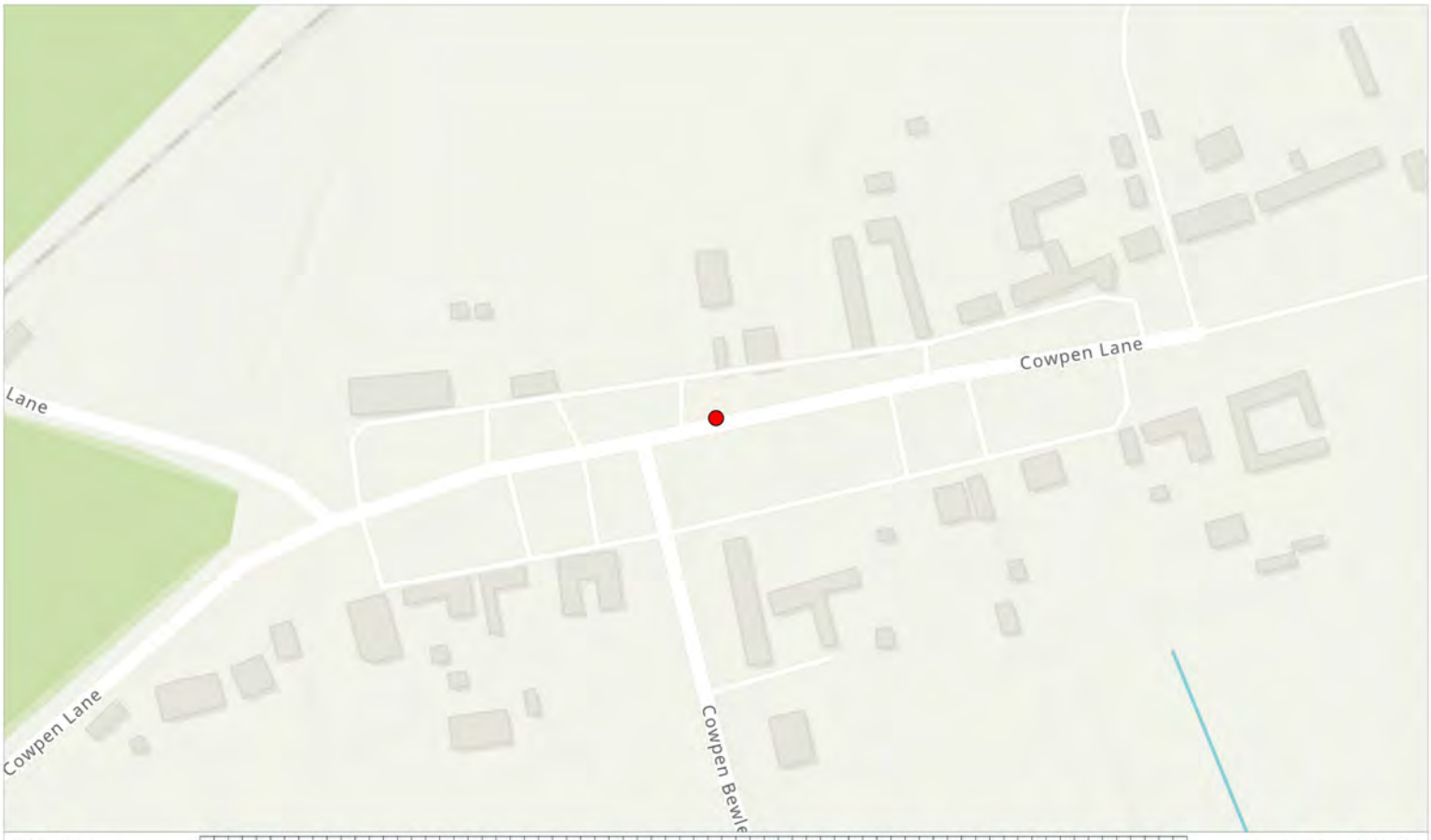

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_123613.jpg
Easting: 448069.0791
Northing: 524765.3115

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 448069, 524765

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.64

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Sheet Size:	A4

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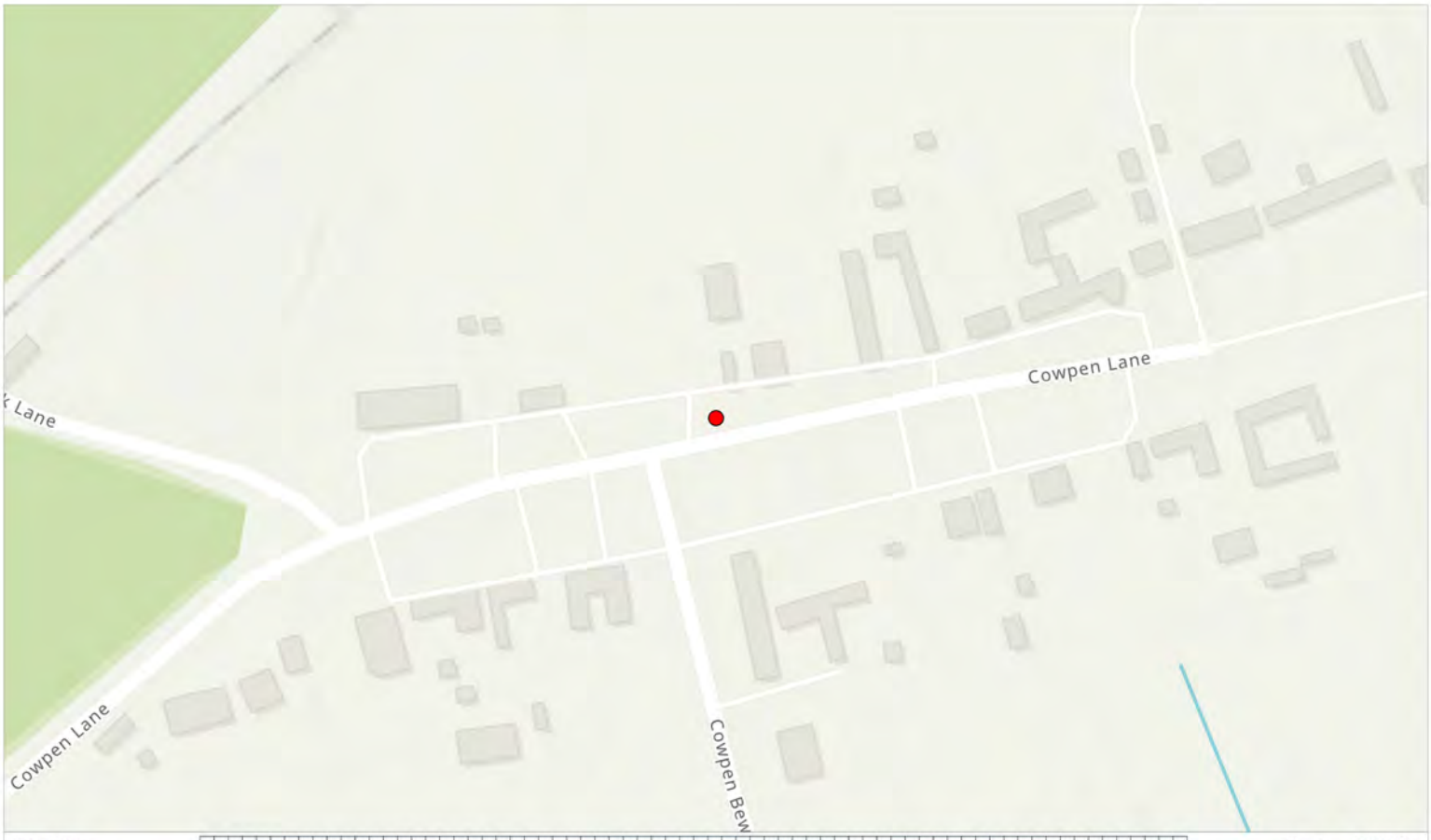

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_123617.jpg
Easting: 448066.2297
Northing: 524770.2893

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 448066, 524770

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.65

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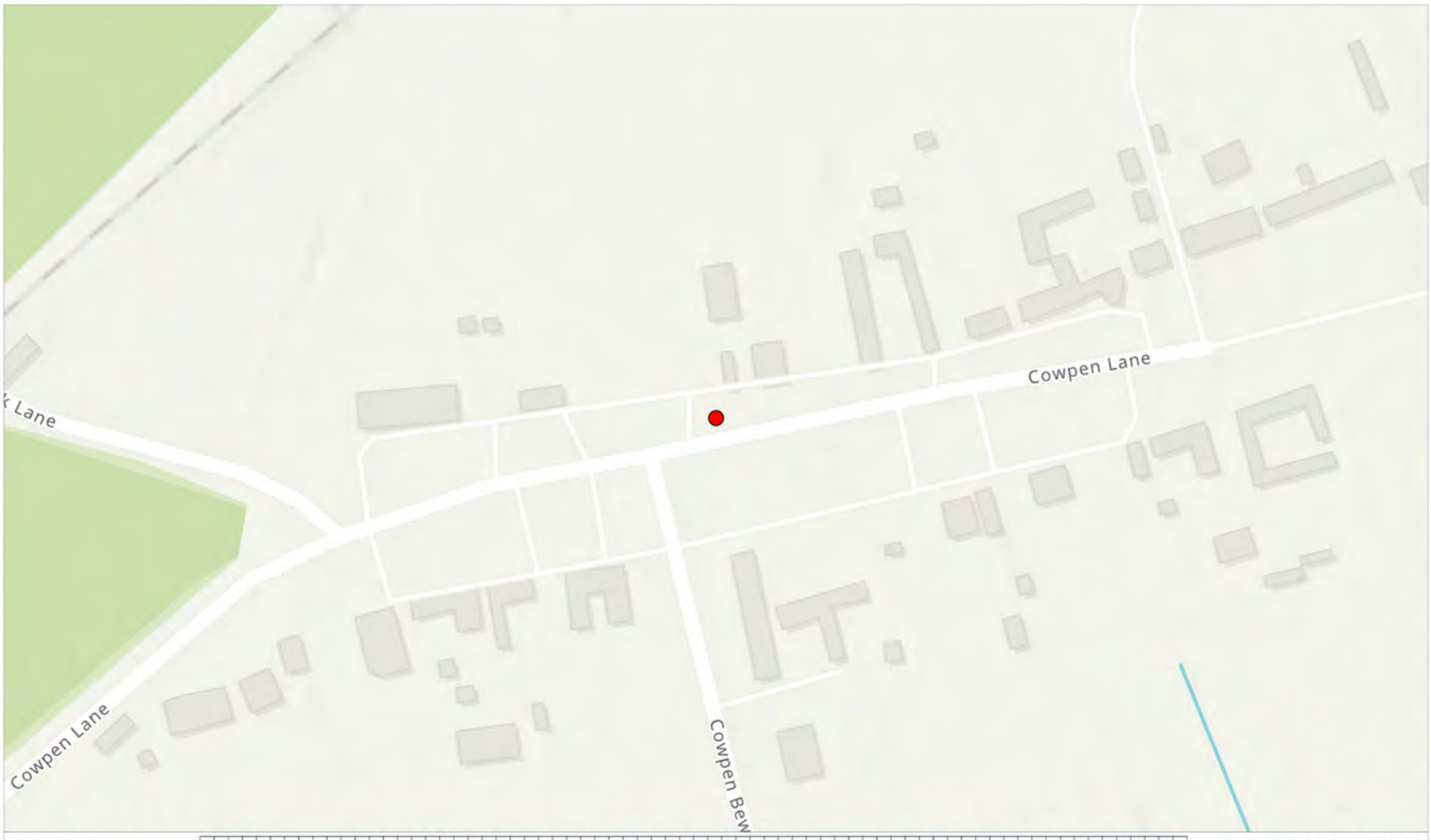

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_123621.jpg
Easting: 448066.2297
Northing: 524770.2893

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 448066, 524770

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.66

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Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
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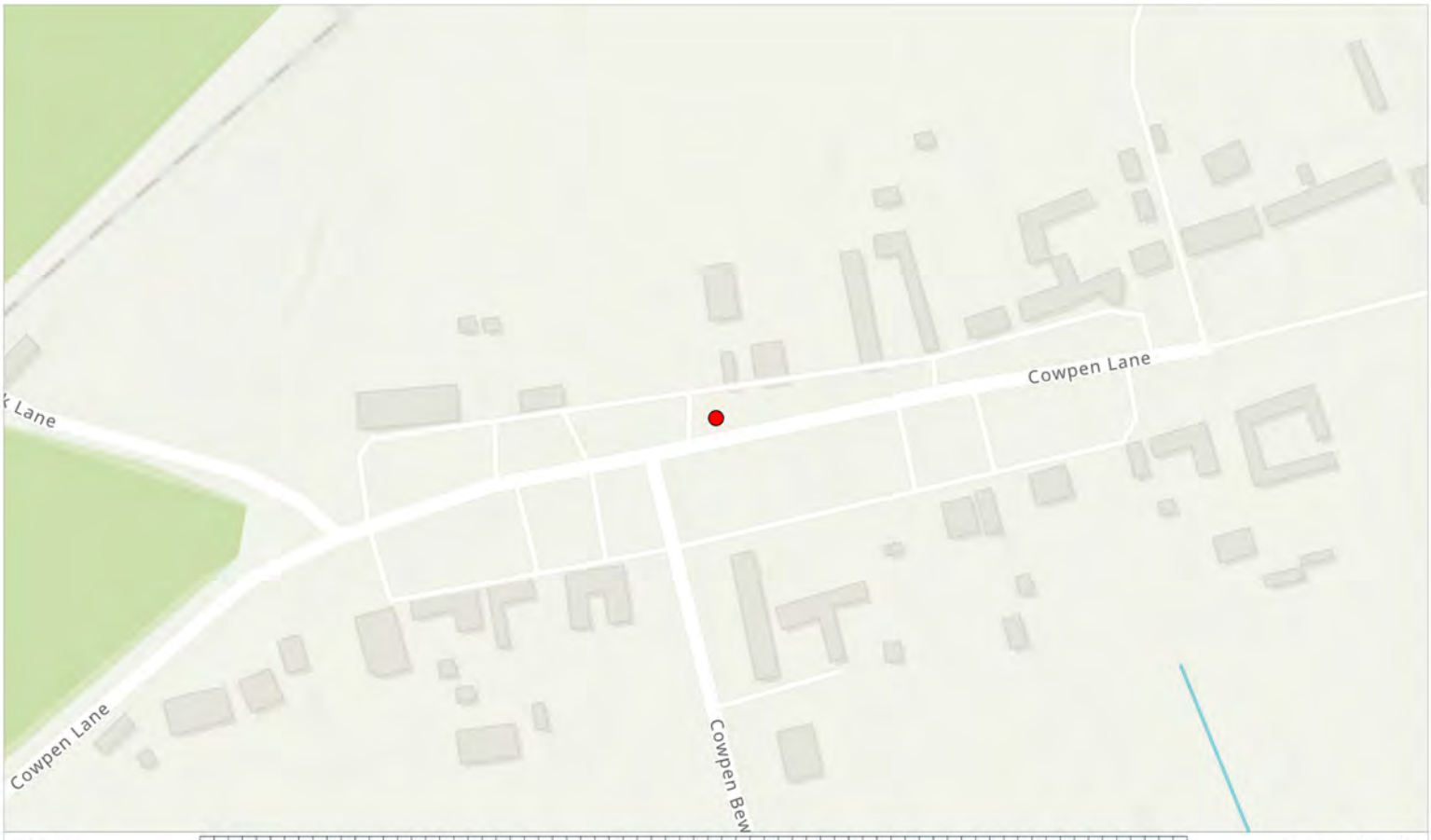

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_123631.jpg
Easting: 448066.2297
Northing: 524770.2893

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 448066, 524770

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.67

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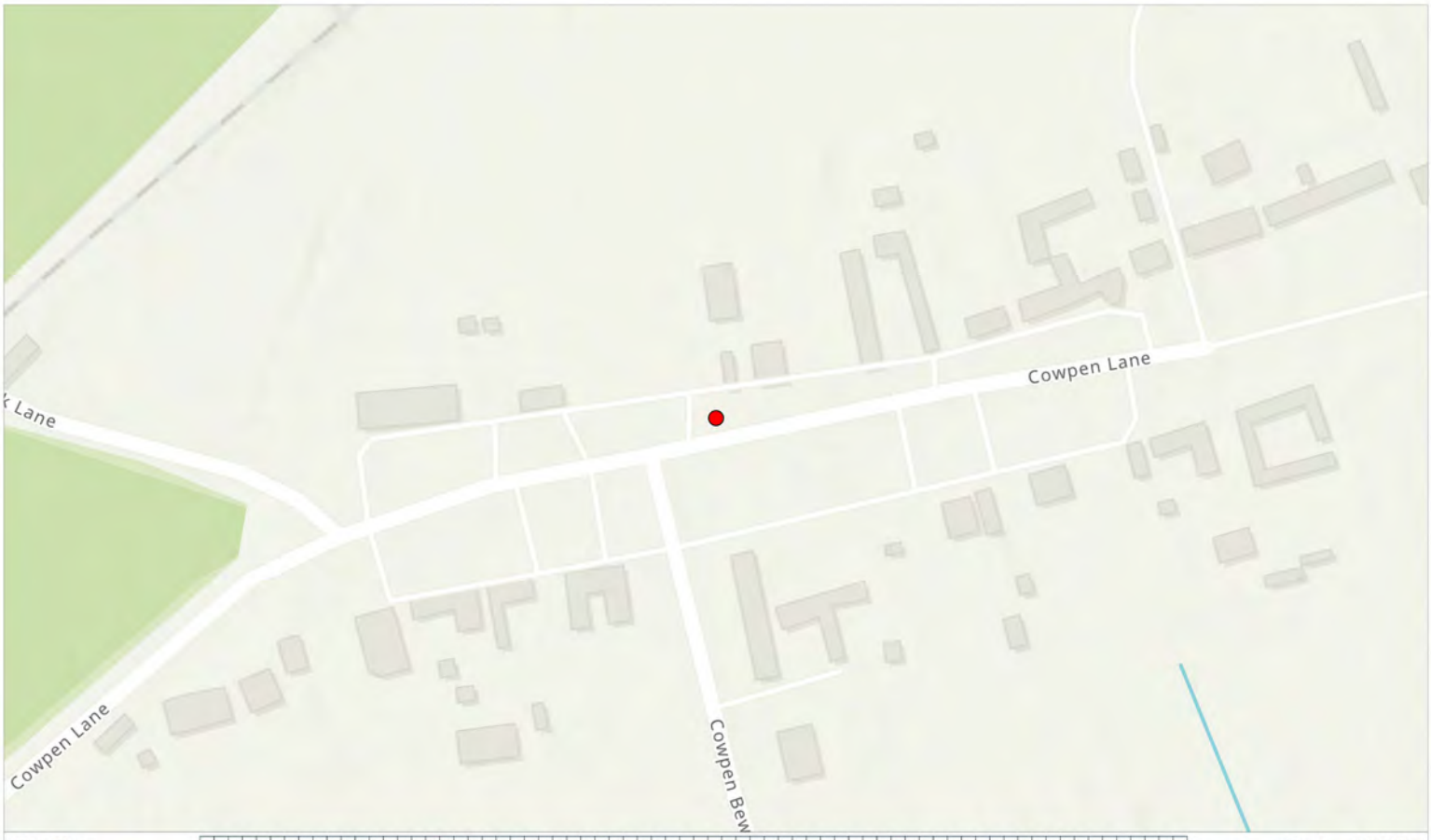

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_123635.jpg
Easting: 448066.2297
Northing: 524770.2893

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 448066, 524770

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.68

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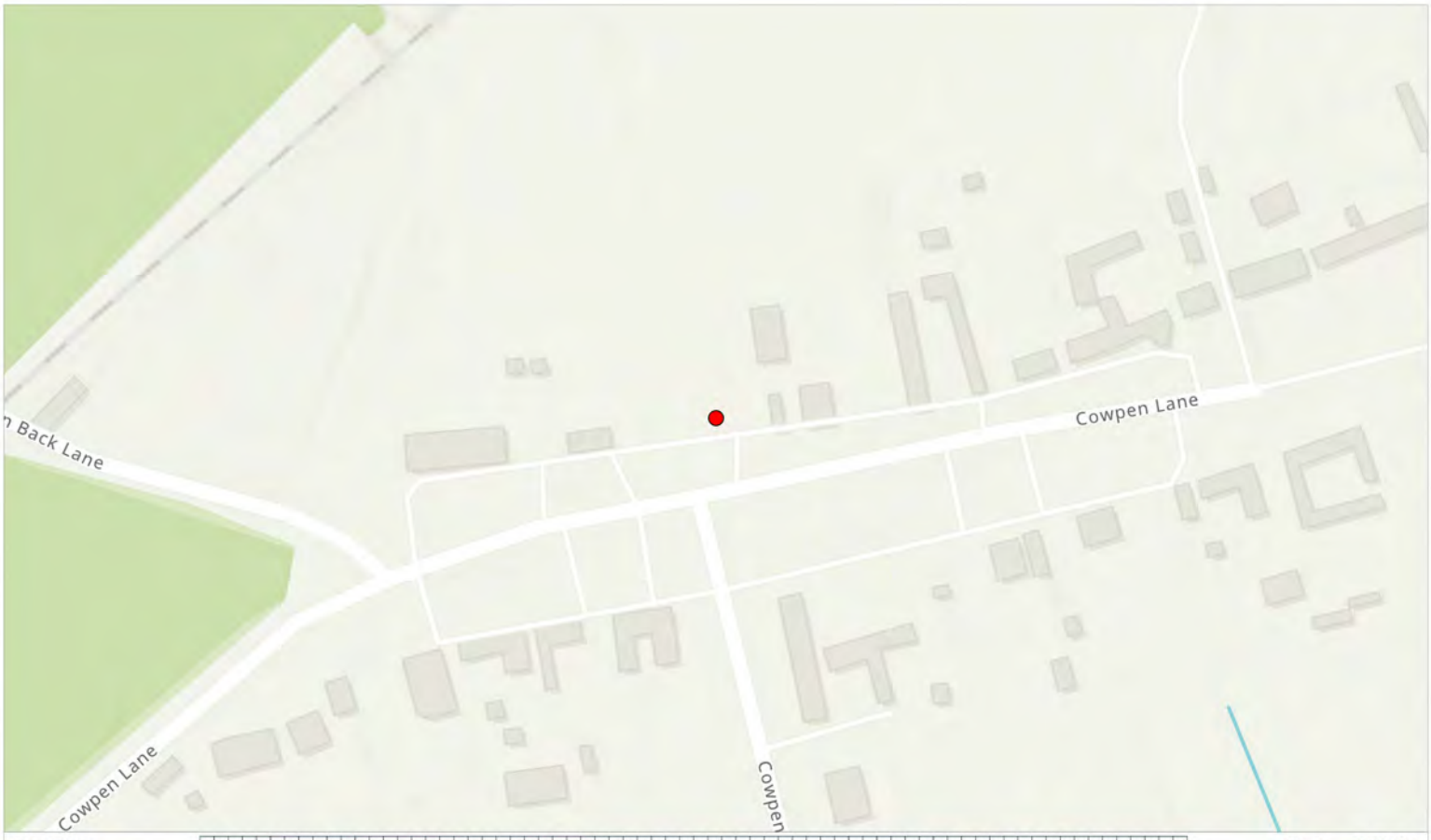

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_124156.jpg
Easting: 448049.2808
Northing: 524785.1341

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 448049, 524785

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.69

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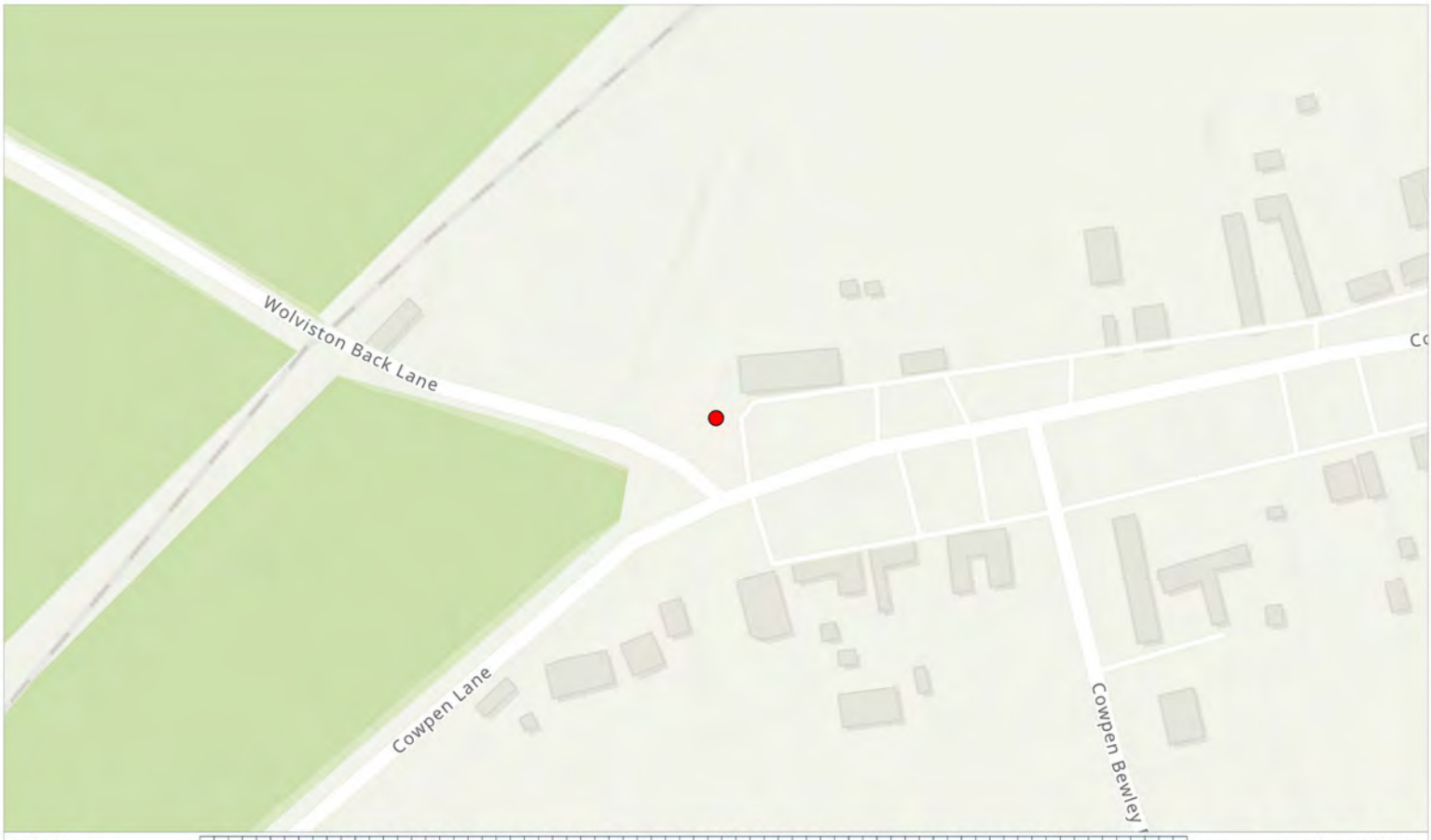

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_124442.jpg
Easting: 447930.8415
Northing: 524757.3644

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447931, 524757

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.70

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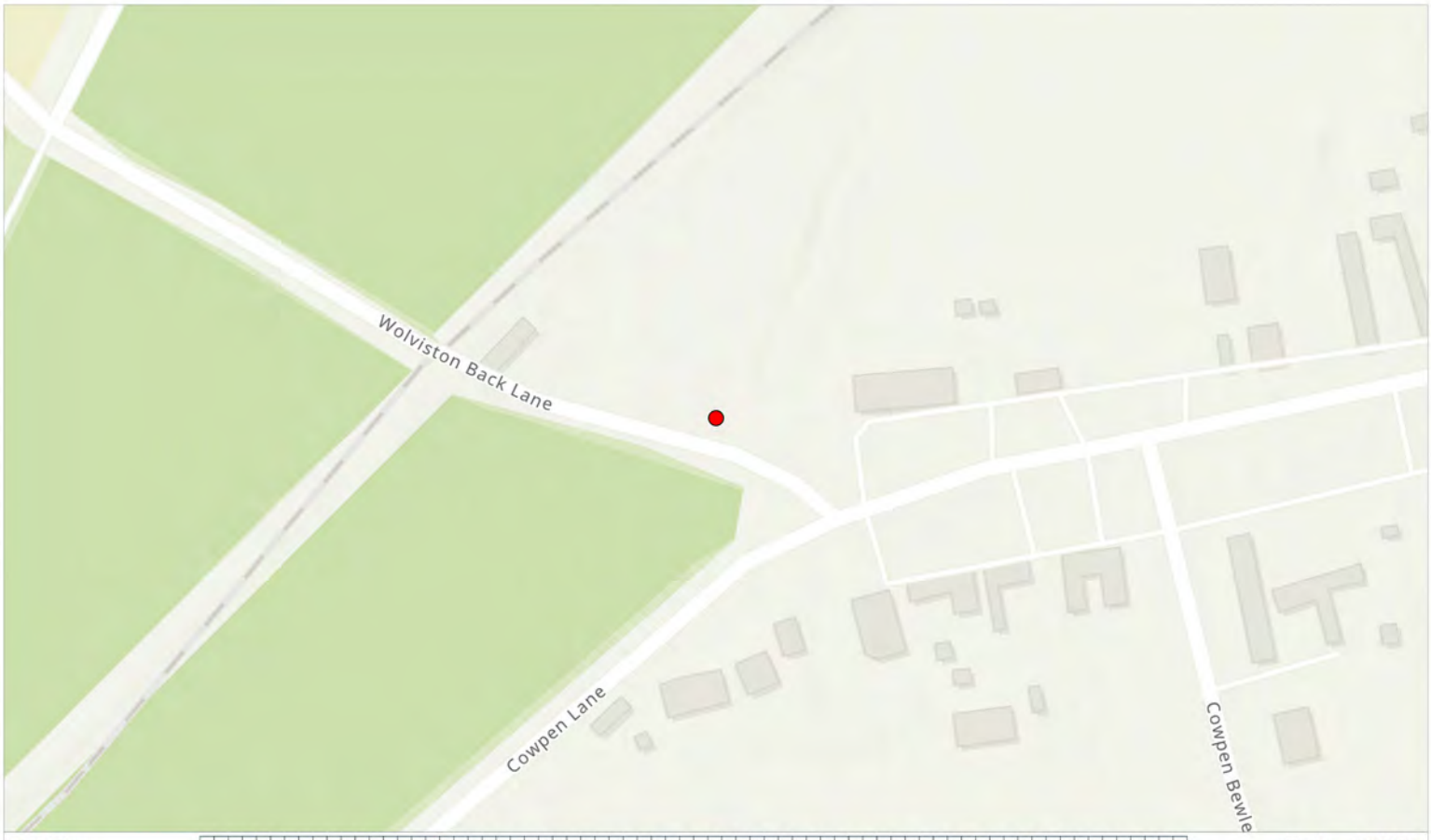

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_124512.jpg
Easting: 447890.1907
Northing: 524764.1577

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447890, 524764

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.71

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Datum: OSGB 1936

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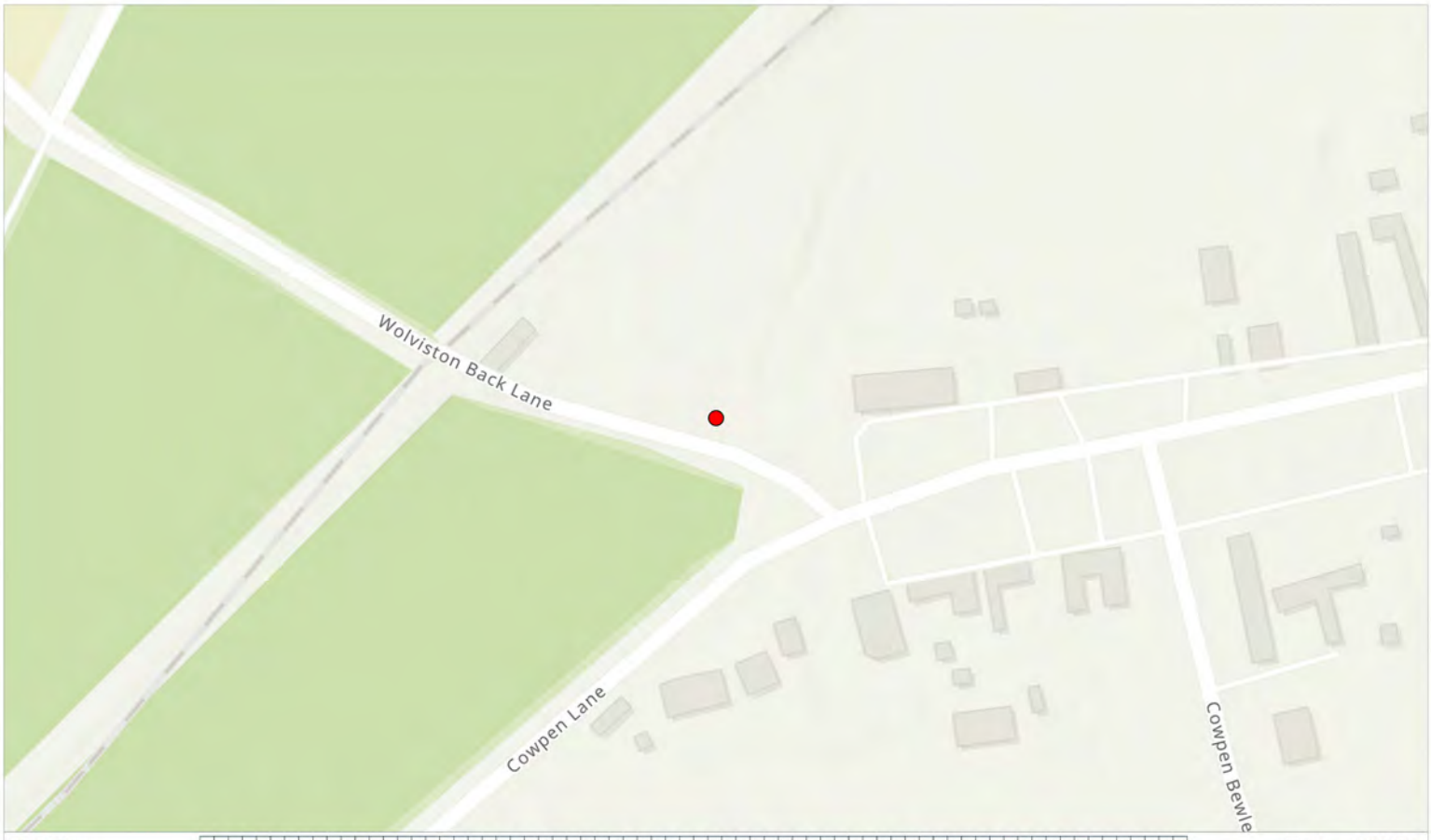

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_124514.jpg
Easting: 447890.2087
Northing: 524764.1547

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447890, 524764

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

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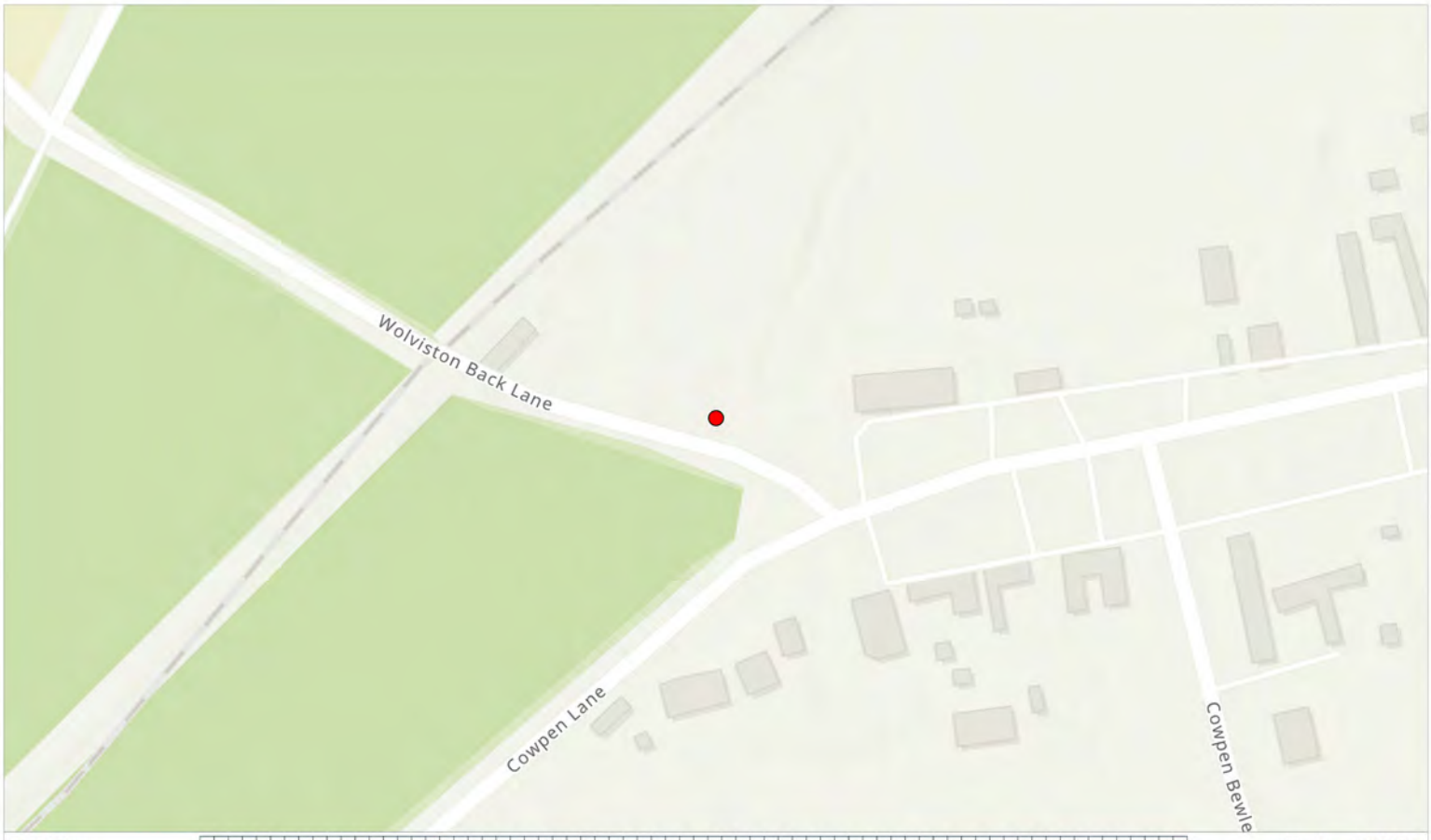

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_124516.jpg
Easting: 447890.1907
Northing: 524764.1577

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447890, 524764

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

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Photo Location

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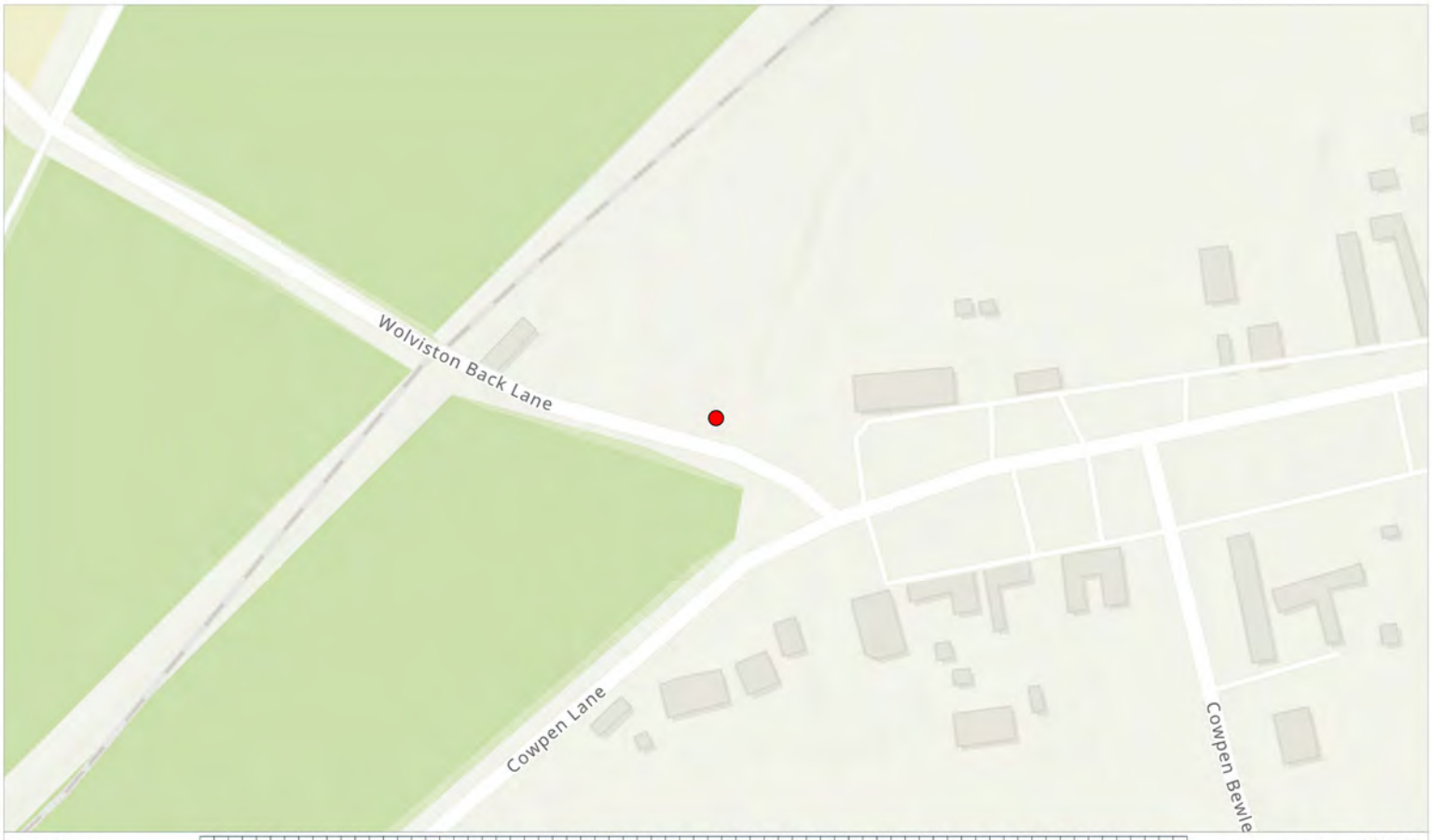

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_124519.jpg
Easting: 447890.1907
Northing: 524764.1577

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447890, 524764

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

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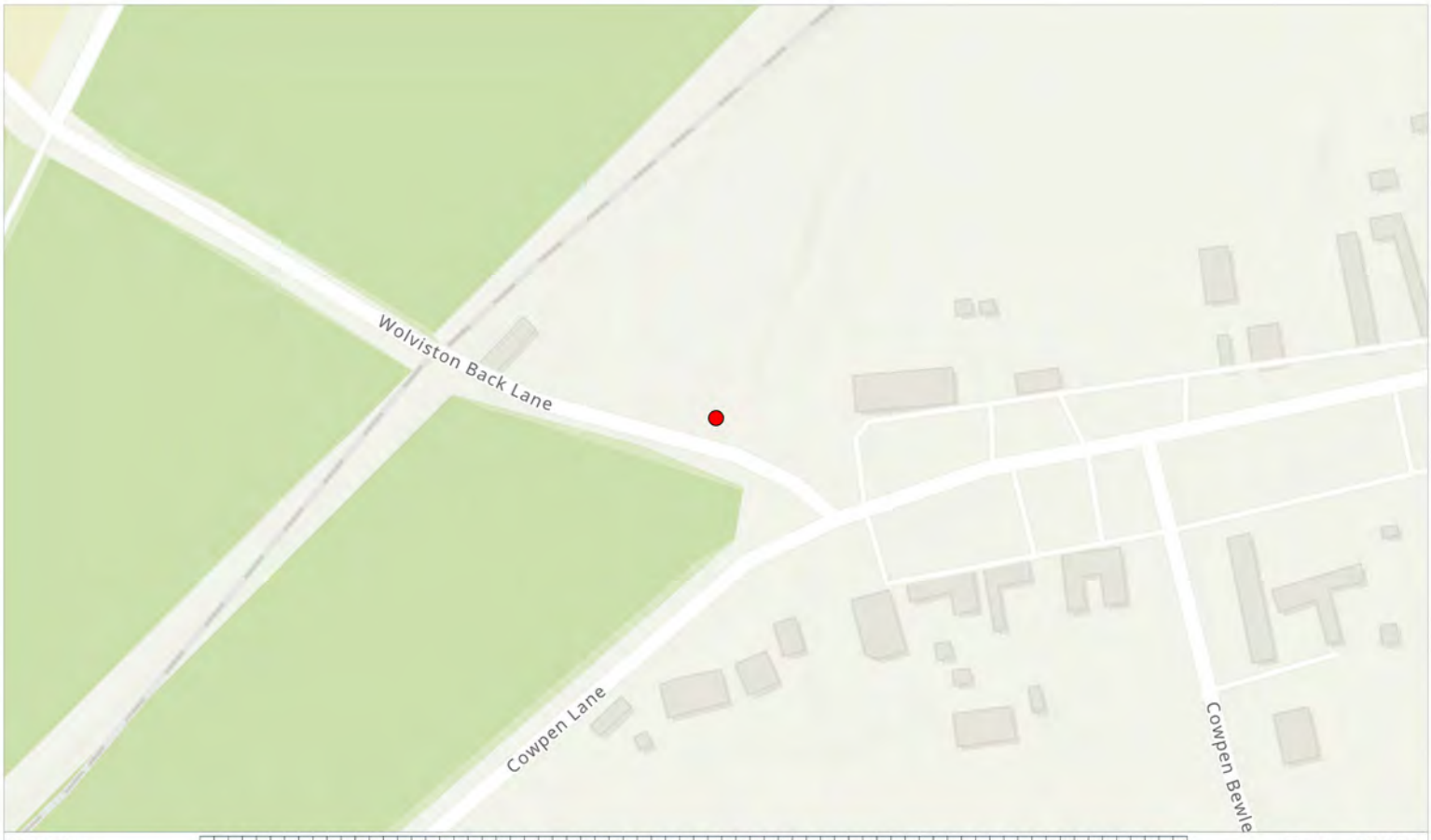

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_124521.jpg
Easting: 447890.1907
Northing: 524764.1577

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447890, 524764

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.75

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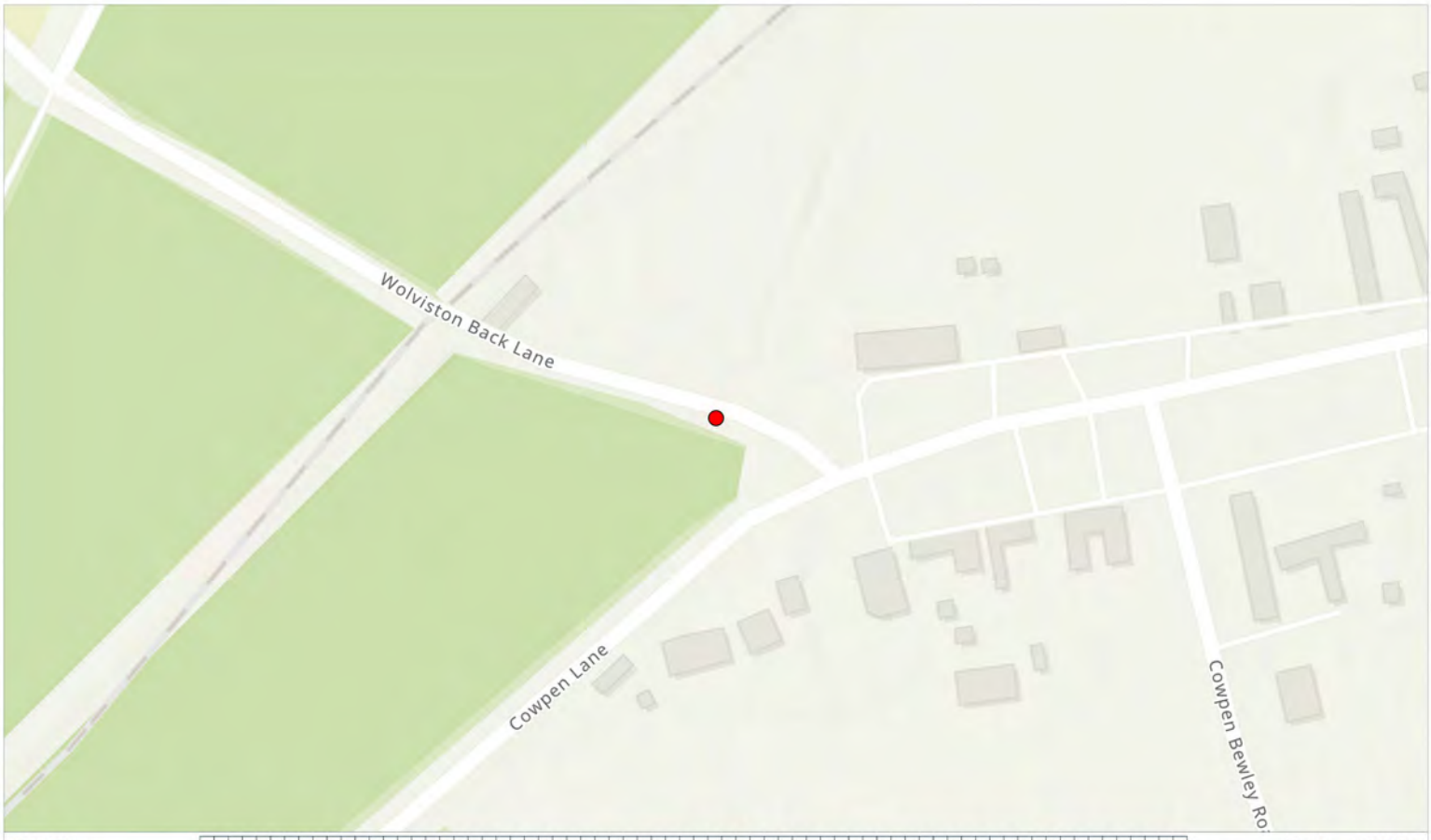

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_124553.jpg
Easting: 447889.3782
Northing: 524749.3169

Additional Comments:

Field 1



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447889, 524749

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

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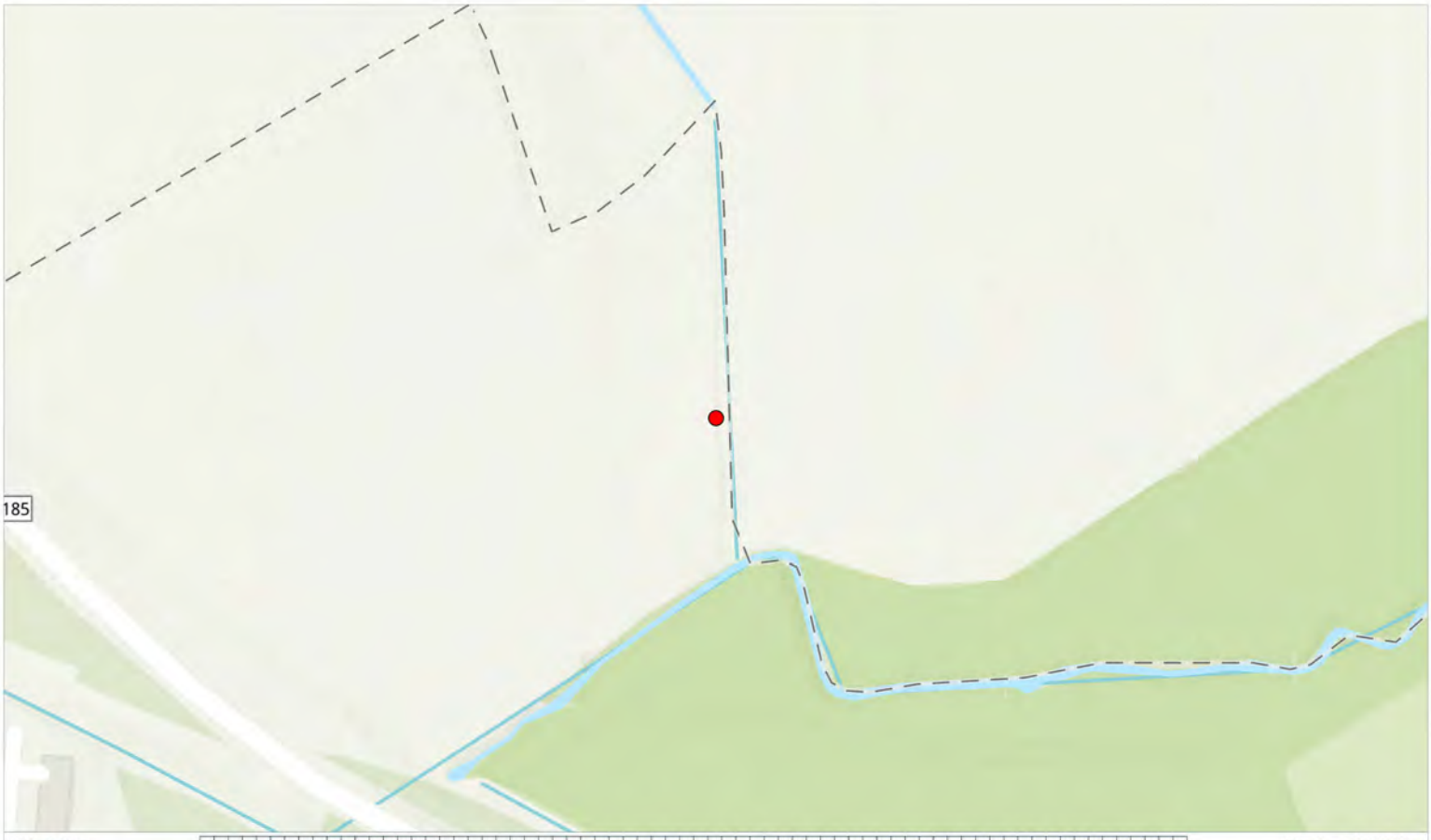

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_152949.jpg
Easting: 447385.5757
Northing: 525788.2193

Additional Comments:

Field 2



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447386, 525788

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.77

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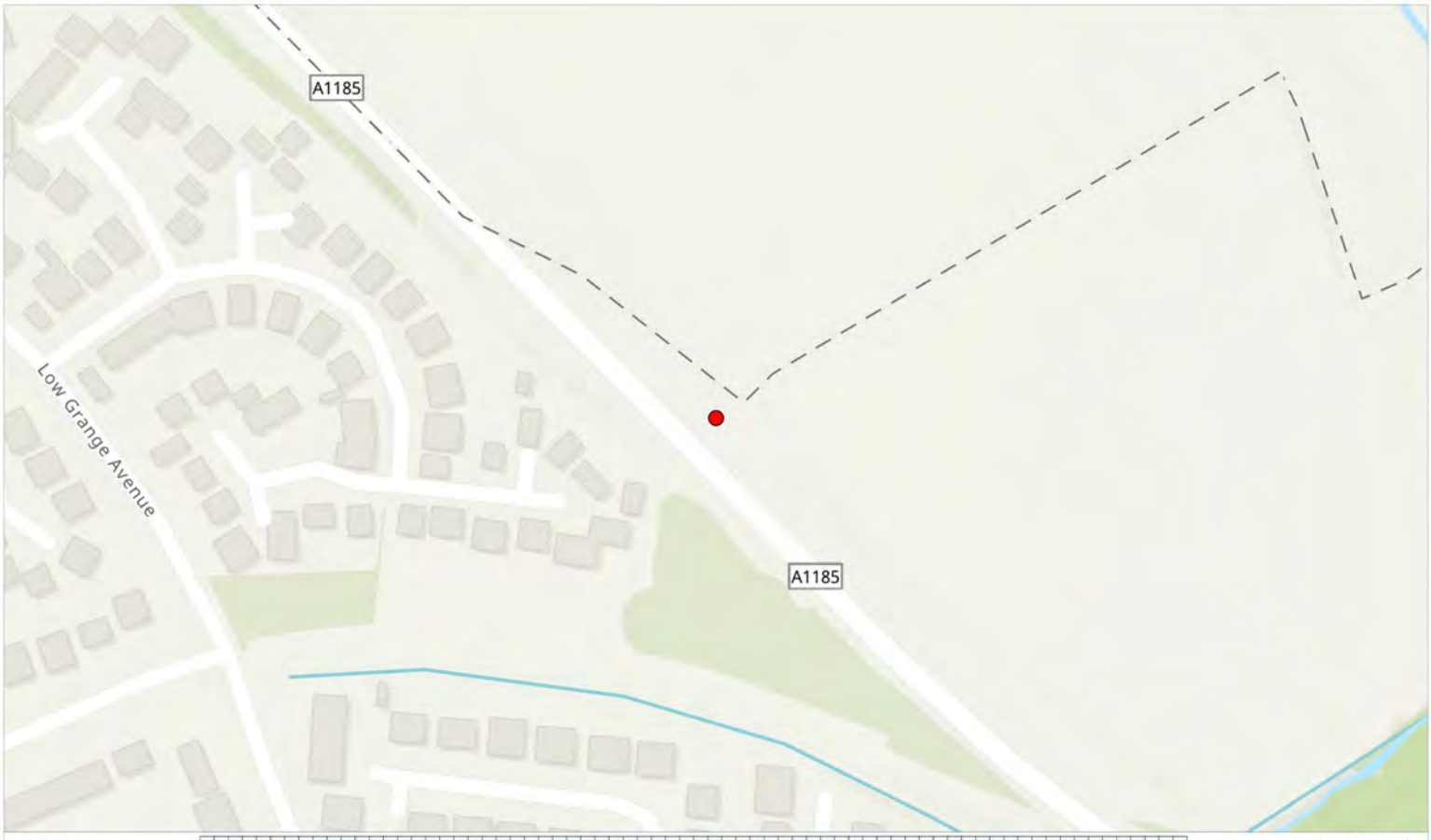

Site Plan: 0 25 50 100 150 200 250 300 350 Metres Scale: 1:2500

Photo Information:

Image Name: 20240104_155945.jpg
Easting: 447098.2885
Northing: 525812.0306

Additional Comments:

Field 2



Interest: N/A

Location: Cowpen Bewley, Billingham, Stockton-on-Tees, TS23 3NF

Coords: 447098, 525812

Scheme Name: H2 Teesside

Drawing Name: Record of Condition Plan

Drawing No: 22004379_PLN_ROC_307.78

Rev	Date	Description
-	08.01.2024	First Issue

Drawn:	HM
Approved:	SW
Sheet No:	78 of 117
Sheet Size:	A4

Key:

Photo Location

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

DALCOUR MACLAREN

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Document Path: C:\Users\hugo.moore\Dalcour Maclaren\H2Teesside 22004379 - Geomatics\01 DM Plans\Pro Plans\20240105_22004379_PLN_ROC_307.1\20240105_22004379_PLN_ROC_307.aprx

APPENDIX 14.6: TARGETED COWPEN BEWLEY CONSULTATION – EMAIL DATED 2 FEBRUARY 2024 TO STBC

[redacted]

From: [redacted]
Sent: 02 February 2024 15:52
To: [redacted]
Cc:
Subject: H2Teesside - Replacement Open Space Land

Dear [redacted]
Thank you for your time to discuss the H2 Teesside Project and the need for an open space replacement site near Cowpen Bewley Woodland Park on Friday's Teams call. After reflecting on our conversation, the project team have evaluated the benefits and drawbacks of both sites.

We have concluded that site two, owned by the Church Commissioners, is the preferred option for open space replacement land given its direct access from the Highway and the Woodland Park and we will be taking this site forward into our DCO application.

Site one has been discounted due to:

- the likely different commercial standing of the owner;
- being adjacent to Cowpen Bewley village, where we know the Residents Association is keen to protect the nature and historic setting of the village;
- being located within a conservation area and contains ridge and furrow; and
- presenting practical challenges in relation to the rights and crossing of the railway via the footpath, calling into question its suitability as an addition to the Woodland Park.

In light of this, we would like to seek Stockton on Tees Borough Council's support for this site going forward.
I can confirm that prior to the submission of the DCO application, the Project will:

- be writing to you, in your status as a land interest, with a formal consultation letter in respect of the inclusion of additional land within the Order limits in relation to the replacement open space land. This is necessary because, to access the land owned by the Church Commissioners, the Project will need to utilise an existing access point from the A1185, which is on land which is in the Council's ownership; and
- be writing to the residents of Cowpen Bewley, the parts of Billingham east of Marsh House Avenue, and Billingham Town Council, explaining this addition to the project's Order limits, but also explaining that, in light of comments at previous consultations, the Project has been able to reduce the extent of the Order limits adjacent to the village, and inviting any comments that they may have on these matters. We will also send the Council this letter in its role as LPA for comment.

In relation to the replacement open space, the project can also confirm that the DCO will provide the formal mechanism for the open space status of the affected land to be transferred to the replacement land, and that the scheme for the laying out of the replacement land for the Woodland Park purposes will be subject to the Council's approval.

I can also confirm that the management responsibilities of the eventually acquired land would be passed onto STBC, however the project will put in place a mechanism for the Council to be compensated for the additional costs of managing that replacement land compared to the affected land. This will likely be through a section 106 type mechanism, but this will be confirmed in due course in the DCO application.

Please let me know if you have any further questions or require additional clarification on this matter.

We look forward to hearing from you soon.
Kind regards,

[redacted]

[redacted]
BA, MRTPI
Senior Planner

[redacted]

dwd-ltd.co.uk

Chartered Surveyors & Town Planners
69 Carter Lane, London, EC4V 5EQ

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APPENDIX 14.7: TARGETED COWPEN BEWLEY CONSULTATION – EMAIL DATED 7 FEBRUARY 2024 TO STBC

H2 Teesside Project: potential land acquisition

Note: the plans and aerial photos in this document are not to scale

SBC has identified two alternative sites which we believe offer greater potential benefits compared to the two options put forward to date. While these are not in the immediate vicinity of Cowpen Bewley the acquisition of either of these sites could be justified on the basis that the Borough's 2017 Open Space Assessment (extract below) shows that Billingham is already relatively well provided for in terms of natural and semi-natural open space provision. So we might argue that there is not necessarily a need for local mitigation for the loss of natural / semi-natural green space. Instead, by providing that mitigation in another area of the Borough we would deliver greater public and environmental benefits.

Table 3.12: Current provision against recommended Stockton-on-Tees quantity standard

Stockton-on-Tees Standard	Urban Parks		Natural & semi-natural		Amenity greenspace		Allotments	
	0.66		2.24		1.29		0.20	
	Current provision	+ / -	Current provision	+ / -	Current provision	+ / -	Current provision	+ / -
Billingham	0.24	- 0.42	2.93	+ 0.69	2.21	+ 0.92	0.22	+ 0.02
Eaglescliffe	4.95	+ 4.29	2.89	+ 0.65	1.24	- 0.05	0.96	+ 0.76
Ingleby Barwick	0.13	- 0.53	2.49	+ 0.25	0.50	- 0.79	-	- 0.20
Rural	-	- 0.66	35.36	+33.12	0.79	- 0.50	0.29	+ 0.09
Stockton	0.67	+ 0.01	3.11	+ 0.87	1.05	- 0.24	0.09	- 0.11
Thornaby	0.76	+ 0.10	1.91	- 0.33	1.53	+ 0.24	0.32	+ 0.12
Wynyard	-	- 0.66	-	- 2.24	1.21	- 0.08	-	- 0.20
Yarm	-	- 0.66	0.78	- 1.46	1.66	+ 0.39	0.47	+ 0.27

Alternative 1: Wynyard Woodland Park (4.68Ha)

This land would connect two sections of an existing country park, providing significant amenity benefits in aswell as opportunities for habitat creation.





Alternative 2: Blakeston Lane (7.6 Ha)

Whilst the Council have a desire for 7.6ha in this location a minimum of 4ha would be accepted, with priority for land towards Blakeston Lane (south east of site) so access can be achieved. This could be utilised to meet various openspace purposes

We understand much of the site is currently unregistered but we understand the landowners agent is Jonathan Wallis jonathan@jonathanwalliscs.co.uk / Jonathan Wallis Chartered Surveyor (jonathanwalliscs.co.uk)



[redacted]

From: [redacted]
Sent: 07 February 2024 17:17
To: [redacted]
Cc: [redacted]
Subject: RE: H2Teesside - Replacement Open Space Land 23/0508/NSIP
Attachments: H2 Teesside Project potential land acquisition v2.docx

This document was classified as: OFFICIAL

This document was classified as: OFFICIAL

Good Afternoon [redacted]

We have reviewed the information and out of your two options agree that Option 2 would be the best choice.

However, we have two areas of land that may be appropriate with the preferred option for SBC being Option 2 – I wonder if these can be given some consideration.

Many Thanks

[redacted]
Principal Planning Officer
Stockton-on-Tees Borough Council
[redacted]: www.stockton.gov.uk

From: [redacted]
Sent: 02 February 2024 15:52
To: [redacted]
Cc: [redacted]
Subject: H2Teesside - Replacement Open Space Land

Dear [redacted]
Thank you for your time to discuss the H2 Teesside Project and the need for an open space replacement site near Cowpen Bewley Woodland Park on Friday's Teams call. After reflecting on our conversation, the project team have evaluated the benefits and drawbacks of both sites.

We have concluded that site two, owned by the Church Commissioners, is the preferred option for open space replacement land given its direct access from the Highway and the Woodland Park and we will be taking this site forward into our DCO application.

Site one has been discounted due to:

- the likely different commercial standing of the owner;
- being adjacent to Cowpen Bewley village, where we know the Residents Association is keen to protect the nature and historic setting of the village;
- being located within a conservation area and contains ridge and furrow; and

- presenting practical challenges in relation to the rights and crossing of the railway via the footpath, calling into question its suitability as an addition to the Woodland Park.

In light of this, we would like to seek Stockton on Tees Borough Council's support for this site going forward.
I can confirm that prior to the submission of the DCO application, the Project will:

- be writing to you, in your status as a land interest, with a formal consultation letter in respect of the inclusion of additional land within the Order limits in relation to the replacement open space land. This is necessary because, to access the land owned by the Church Commissioners, the Project will need to utilise an existing access point from the A1185, which is on land which is in the Council's ownership; and
- be writing to the residents of Cowpen Bewley, the parts of Billingham east of Marsh House Avenue, and Billingham Town Council, explaining this addition to the project's Order limits, but also explaining that, in light of comments at previous consultations, the Project has been able to reduce the extent of the Order limits adjacent to the village, and inviting any comments that they may have on these matters. We will also send the Council this letter in its role as LPA for comment.

In relation to the replacement open space, the project can also confirm that the DCO will provide the formal mechanism for the open space status of the affected land to be transferred to the replacement land, and that the scheme for the laying out of the replacement land for the Woodland Park purposes will be subject to the Council's approval.

I can also confirm that the management responsibilities of the eventually acquired land would be passed onto STBC, however the project will put in place a mechanism for the Council to be compensated for the additional costs of managing that replacement land compared to the affected land. This will likely be through a section 106 type mechanism, but this will be confirmed in due course in the DCO application.

Please let me know if you have any further questions or require additional clarification on this matter.

We look forward to hearing from you soon.
Kind regards,

[redacted]

[redacted]
BA, MRTPI
Senior Planner

[redacted]
dwd-ltd.co.uk

Chartered Surveyors & Town Planners
69 Carter Lane, London, EC4V 5EQ

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Although we have endeavoured to ensure that this e mail and any attachments are free from any virus we would advise you to take any necessary steps to ensure that they are actually virus free.

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**.

APPENDIX 14.8: TARGETED COWPEN BEWLEY CONSULTATION – EMAIL DATED 8 FEBRUARY 2024 TO STBC

[redacted]

From: [redacted]
Sent: 08 February 2024 18:27
To: [redacted]
Cc: [redacted]

Subject: H2Teesside - Community Consultation in respect land within the vicinity of Cowpen Bewley
Attachments: H2Teesside - Community Letter - Clean - Updated date.pdf; Consultation Zone.JPG; H2T_Cowpen_Bewley_Replacement_OS_S42_44_STBC_Letter.pdf; 073 _ARDG_H2Teesside_LIP_Stockton_on_Tees_Borough_Council.pdf

Importance: High

Dear [redacted]

Further to recent discussions, I am writing to confirm that the Applicant, H2 Teesside Limited, will be launching a consultation this Friday (8th February 20243) in relation to two changes that are being made to the H2Teesside Project in advance of the submission of the application for development consent. These changes both relate to land within the vicinity of Cowpen Bewley Village.

The first change follows feedback from residents in Cowpen Bewley in relation to the proximity of the proposed hydrogen pipeline connection corridor to residential properties. The Applicant has reviewed the pipeline routing options in this area and has been able to reduce the area required to the east of the Village, with the Project Order Limits (the proposed Application Site Boundary) now being further from the eastern edge of the Village.

The second change relates to the addition of an area of land that the Applicant intends to integrate with Cowpen Bewley Woodland Park, in order to replace an area of the Woodland Park that is required for the Project. The Applicant is keen to work with Stockton-on-Tees Borough Council to agree how the replacement open space will be planted and laid out, in order to ensure that the replacement space is of at least the same standard as the land required for the Project.

The Applicant would like to thank the Council for the information provided (your email of 7th February) in relation to possible alternatives to the replacement land at Cowpen Bewley. However, having considered these alternatives, the Applicant is of the view that the land that they have suggested is preferable. The Applicant will set out the reasons for this in full within the application for development consent.

I have attached a copy of the letter that the Applicant is sending to residents in Cowpen Bewley and the east of Billingham on Friday, inviting their comments on the two changes, which is also accompanied by plans showing the two changes, which will also be available on the project website: www.h2teesside.co.uk. The attached JPG image shows the area within which residents will receive the letter and plans.

The Applicant has written separately to the Council (letter dated 8th February) with regard to the proposed replacement open space and to formerly seek the Council's views pursuant to s42 of the Planning Act 2008 by 10th March 2024. A copy of that letter and the accompanying plan is attached for ease of reference.

Please let me know if you have any questions.

Kind regards

[redacted]
BA (Hons) BPl. MRTPI
Joint Managing Director

Head of Planning, Energy & Infrastructure

[redacted]

dwd-ltd.co.uk

Chartered Surveyors & Town Planners
69 Carter Lane, London, EC4V 5EQ

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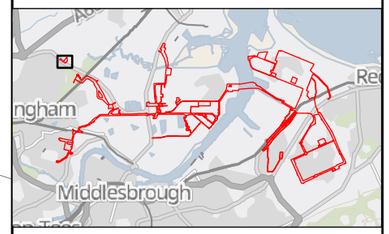
APPENDIX 14.9: TARGETED COWPEN BEWLEY CONSULTATION – SECTION 42 LETTERS DATED 8 FEBRUARY 2024

KEY PLAN



Key

- Revised Draft Order Limits
- Additional Land Area Required
- Land Interest Boundary

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Client: H2 Teesside

N

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title:

CONSULTATION ON REPLACEMENT OPEN SPACE
LAND INTEREST PLAN
CHURCH COMMISSIONERS FOR ENGLAND
SHEET 1 OF 1

Status: FINAL		Revision	000
		Date	08/02/2024
Scale: 1:1,750 @ A3	Spatial Reference System: British National Grid		
Drawn By: J.NEYE-SWIFT	Checked By: N/A	Approved By: J.WITHINGTON	

Metres: 0 25 50

Drawing reference: 073_ARDG_H2Teesside_LIC

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Plot Date: 08 February 2024 16:08
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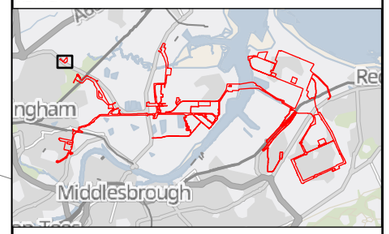
Plot Date: 08 February 2024 11:45
File Name: C:\Users\JakeN\Ardent Management Ltd\Projects - Aecom - H2 Teesside\P16 - GIS & CAD Files\073_ARDG_Teesside\ArcPro Projects\Re-Consultation Plans\073_ARDG_H2Teesside_LIC_Open_Space_David Martin.aprx

KEY PLAN



Key

- Revised Draft Order Limits
- Additional Land Area Required
- Land Interest Boundary

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Client: H2 Teesside

N

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title:

CONSULTATION ON REPLACEMENT OPEN SPACE
LAND INTEREST PLAN
DAVID MARTIN
SHEET 1 OF 1

Status: FINAL		Revision	000
		Date	08/02/2024
Scale: 1:1,750 @ A3	Spatial Reference System: British National Grid		
Metres: 0 25 50			
Drawn By: J.NEYE-SWIFT	Checked By: N/A	Approved By: J.WITHINGTON	

Drawing reference: 073_ARDG_H2Teesside_LIC

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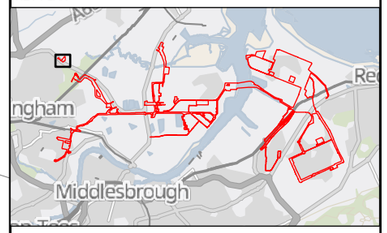
KEY PLAN



Key

- Revised Draft Order Limits
- Additional Land Area Required
- Land Interest Boundary

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Client

H2 Teesside

N

Designer

Ardent

Project

H2 TEESSIDE

Drawing Title

CONSULTATION ON REPLACEMENT OPEN SPACE
LAND INTEREST PLAN
STOCKTON-ON-TEES BOROUGH COUNCIL
SHEET 1 OF 1

Status	Revision
FINAL	000
	Date 02/02/2024
Scale 1:1,750 @ A3	Spatial Reference System: British National Grid

0 25 50 Metres

Drawn By	Checked By	Approved By
J.NEYE-SWIFT	N/A	J.WITHINGTON

Drawing reference: 073_ARDG_H2Teesside_LIC

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Plot Date: 02 February 2024 09:45
File Name: C:\Users\JakeN\Ardent Management Ltd\Projects - Aecom - H2 Teesside\P16 - GIS & CAD Files\073_ARDG_Teesside\ArcPro Projects\Re-Consultation Plans\073_ARDG_H2Teesside_LIC_Open_Space_Stockton on tees_20240131.aprx

Our Ref: 7256.22004379
Your Ref: 22004379
Date 8th February 2024

The Chief Executive
Church Commissioners For England
Church House
Great Smith Street
London
SW1P 3AZ

Harelands Courtyard Offices
Moor Road
Melsonby
North Yorkshire
DL10 5NY

M [redacted]
E [redacted]

Dear Sir/Madam,

Sections 42 and 44 of the Planning Act 2008
H2Teesside Project – Consultation on Replacement Open Space Land

You will be aware from prior correspondence that H2Teesside Limited, a bp company, is developing its H2Teesside Project ('the Project') and have instructed Dalcour Maclaren ('DM') to act on their behalf as land agents for the Project. DM will be the main point of contact for land-related matters on the Project.

H2Teesside is the subject of a Direction under section 35 of the Planning Act 2008 and, as such, will be applying for a Development Consent Order (DCO) under that Act. The Project involves the construction, operation and maintenance of a new Hydrogen Production Facility on the Teesworks site, with an associated hydrogen pipeline distribution network within Teesworks and to offtaker locations in the surrounding area, including at Cowpen Bewley; and other connections. Carbon dioxide (CO_2) captured by the Proposed Development will be transported by pipeline to the separately consented Northern Endurance Partnership infrastructure on the adjacent Net Zero Teesside site for high-pressure compression, offshore transport and underground storage.

You will have received correspondence in relation to two previous stages of statutory consultation for the Project, the second round of which concluded on Tuesday 23rd of January 2024.

We are writing to you, as we understand you hold the freehold interest in land off the A1185 at Billingham, for which the Project has now, post those previous rounds of consultation, identified that it requires for use as replacement open space land to replace existing open space land at Cowpen Bewley Woodland which is affected by the Project. The inclusion of this additional land within the Order Limits of is crucial in ensuring the successful delivery of the Project while also addressing environmental and community needs. The land affected is shown on the plan enclosed with this letter.

As a result, this letter is a formal consultation with you on this proposed addition to the Order limits, pursuant to sections 42 and 44 of the Planning Act 2008. We would welcome your response to this consultation letter so that we can have regard to your feedback in finalising the DCO application. Please respond to this letter using the details given below, by **11:59 on 10th March 2024.**

Email: info@h2teesside.net
Post: **Freepost H2TEESSIDE**
Telephone: **Freephone 0800 080 3028**
Project Website: www.h2teesside.co.uk

Our Ref: 7256.22004379
Your Ref: 22004379
Date 8th February 2024

[redacted]
Mill Hill Farm
Stockton Road
Castle Eden
Hartlepool
TS27 4SH

Harelands Courtyard Offices
Moor Road
Melsonby
North Yorkshire
DL10 5NY

M [redacted]
E [redacted]

Dear [redacted]

Sections 42 and 44 of the Planning Act 2008
H2Teesside Project – Consultation on Replacement Open Space Land

You may be aware that H2Teesside Limited, a bp company, is developing its H2Teesside Project ('the Project'). Dalcour Maclaren ('DM') have been instructed to act on their behalf as land agents for the Project. DM will be the main point of contact for land-related matters on the Project.

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The project has undertaken two previous stages of statutory consultation for the Project, the second round of which concluded on Tuesday 23rd of January 2024.

We are writing to you, as we understand you may hold an unregistered, leasehold interest in land off the A1185 at Billingham, for which the Project has now, post those previous rounds of consultation, identified that it requires for use as replacement open space land to replace existing open space land at Cowpen Bewley Woodland which is affected by the Project. The inclusion of this additional land within the Order Limits of is crucial in ensuring the successful delivery of the Project while also addressing environmental and community needs. The land affected is shown on the plan enclosed with this letter.

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Our Ref: 54450.22004379
Your Ref:
Date 8th February 2024

[redacted]
Principal Planning Officer
Stockton-on-Tees Borough Council
Municipal Building
Church Road
Stockton-on-Tees
TS18 1XE

Harelands Courtyard Offices
Moor Road
Melsonby
North Yorkshire
DL10 5NY

M [redacted]
E [redacted]

Email: [redacted]

Dear [redacted],

Sections 42 and 44 of the Planning Act 2008
H2Teesside Project – Consultation on Replacement Open Space Land

You will be aware from prior correspondence that H2Teesside Limited, a bp company, is developing its H2Teesside Project ('the Project') and have instructed Dalcour Maclaren ('DM') to act on their behalf as land agents for the Project. DM will be the main point of contact for land-related matters on the Project.

H2Teesside is the subject of a Direction under section 35 of the Planning Act 2008 and, as such, will be applying for a Development Consent Order (DCO) under that Act. The Project involves the construction, operation and maintenance of a new Hydrogen Production Facility on the Teesworks site, with an associated hydrogen pipeline distribution network within Teesworks and to offtaker locations in the surrounding area, including at Cowpen Bewley; and other connections. Carbon dioxide (CO_2) captured by the Proposed Development will be transported by pipeline to the separately consented Northern Endurance Partnership infrastructure on the adjacent Net Zero Teesside site for high-pressure compression, offshore transport and underground storage.

You will have received correspondence in relation to two previous stages of statutory consultation for the Project, the second round of which concluded on Tuesday 23rd of January 2024, and the Project had a recent meeting with you to discuss its impacts to open space and its proposals for providing replacement land.

Further to that meeting, we are writing to you, as we understand you hold the freehold interest in land off the A1185 at Billingham, for which the Project has now, post those previous rounds of consultation, identified that it requires for use of the existing access point from the highway to adjacent land proposed to be used as replacement open space land to replace existing open space land at Cowpen Bewley Woodland which is affected by the Project. The inclusion of this additional land within the Order Limits is crucial in ensuring the successful delivery of the Project while also addressing environmental and community needs. The land affected is shown on the plan enclosed with this letter.

As a result, this letter is a formal consultation with you on this proposed addition to the Order limits, pursuant to sections 42 and 44 of the Planning Act 2008. We would welcome your response to this consultation letter so that we can have regard to your feedback in finalising the DCO application. Please respond to this letter using the details given below, by **11:59 on 10th March 2024.**

APPENDIX 14.10: TARGETED COWPEN BEWLEY CONSULTATION – LETTER AND PLANS DATED 9 FEBRUARY 2024 TO LOCAL COMMUNITY

9 February 2024

H2Teesside – consultation on proposed amends to our proposals in the Cowpen Bewley and Billingham areas

Dear Sir/Madam,

As you may be aware, we're proposing to build a new blue hydrogen production facility on Teesside, known as H2Teesside. It aims to be one of the biggest blue hydrogen production facilities in the UK, delivering economic growth for Teesside and the domestically produced low carbon hydrogen that the UK needs.

We have held two rounds of consultation on our proposals. We have used the feedback, alongside further assessment and technical work, to develop and refine our proposals.

Following our previous rounds of consultation, we are now consulting on (i) a reduction to the Order Limits (i.e. the area within which the proposed project can be carried out) in Cowpen Bewley; and (ii) an addition to the Order Limits to the east of the A1185 Seal Sands Road. The addition to the Order Limits will enable the replacement of an area of Cowpen Bewley Woodland Park (which is also designated as open space) that is required for the construction and operation of the project, and so will no longer form part of the Woodland Park. These amends are described in more detail below and plans related are available on our project website: www.h2teesside.co.uk.

Proposed changes

Reduction to the Order Limits in Cowpen Bewley

Feedback to our previous consultations included comments in relation to the proximity of the Order Limits to residential properties in Cowpen Bewley. As a result, we have reviewed pipeline routing options in this area, taking account of the environmental and technical constraints that exist. Following that work, we have been able to reduce the extent of the Order Limits adjacent to the village, as shown by the hatched area on the enclosed plan titled 'Cowpen Bewley Order Limits Reduction Plan'.

As part of this consultation, we would welcome any comments you have on this reduction to the Order Limits.

Addition to the Order Limits for replacement open space land

As identified in the Preliminary Environmental Information Report shared as part of our previous consultations, H2Teesside requires an area of land at Cowpen Bewley Woodland Park. This area is located in and around the existing Gas Distribution Station site and the nearby railway line.

We have now identified a replacement area of land, as shown on the enclosed plan titled 'Cowpen Bewley Woodland Park – Land Lost and Proposed Replacement Land Proposal Plan'. We intend to integrate this land with Cowpen Bewley Woodland Park and make it publicly accessible, to replace the area required by the project. We will be working with Stockton on Tees Borough Council to agree the layout and planting of this land and ensure that it is of at least the same standard as the land required by the project. As part of this consultation, we would welcome any comments you have on the land identified.

Find out more and have your say

This consultation will run from 9 February 2024 until 10 March 2024.

You can find out more by:

- Viewing plans of the proposed amendments and previous consultation documents on our project website: www.h2teesside.co.uk
- Contacting us on our Freephone number 0800 0803028 or info@h2teesside.net to request printed versions of the plans.

You can respond to our consultation in the following ways:

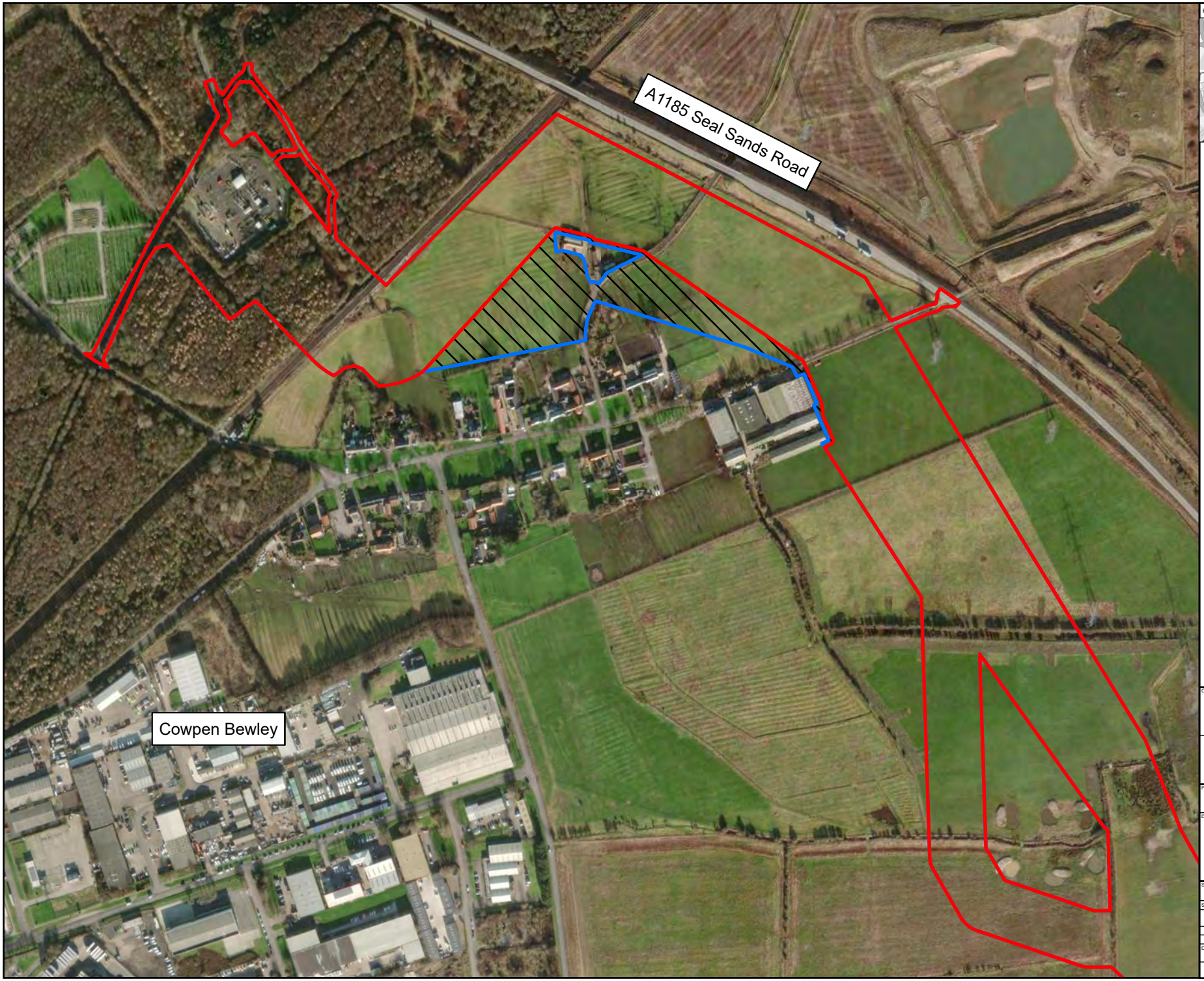
- Email: Send your response to info@h2teesside.net
- Post: Send your response to **FREEPOST H2Teesside**.

Please submit your feedback by **11.59pm on 10th March 2024**.

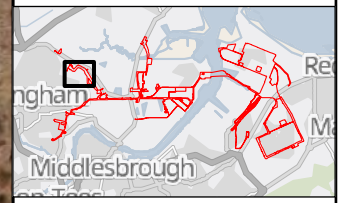
If you have any questions or need any further information, please contact the H2Teesside team on 0800 0803028 or info@h2teesside.net

Yours faithfully,

Matthew Williamson – on behalf of H2 Teesside Limited



KEY PLAN



Key

- Revised Draft Order Limits
- Order Limits shown at Previous Statutory Consultation
- Land Area Reduced

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Client: H2 Teesside

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title: COWPEN BEWLEY ORDER LIMITS REDUCTION PLAN

Status: FINAL			Revision: 000
			Date: 05/02/2024
Scale: 1:5,663 @ A3		Spatial Reference System: British National Grid	
Drawn By: J.NEYE-SWIFT	Checked By: N/A	Approved By: J.WITHINGTON	

Drawing reference: 073_ARDG_H2Teesside_LIC

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Plot Date: 05 February 2024 15:55
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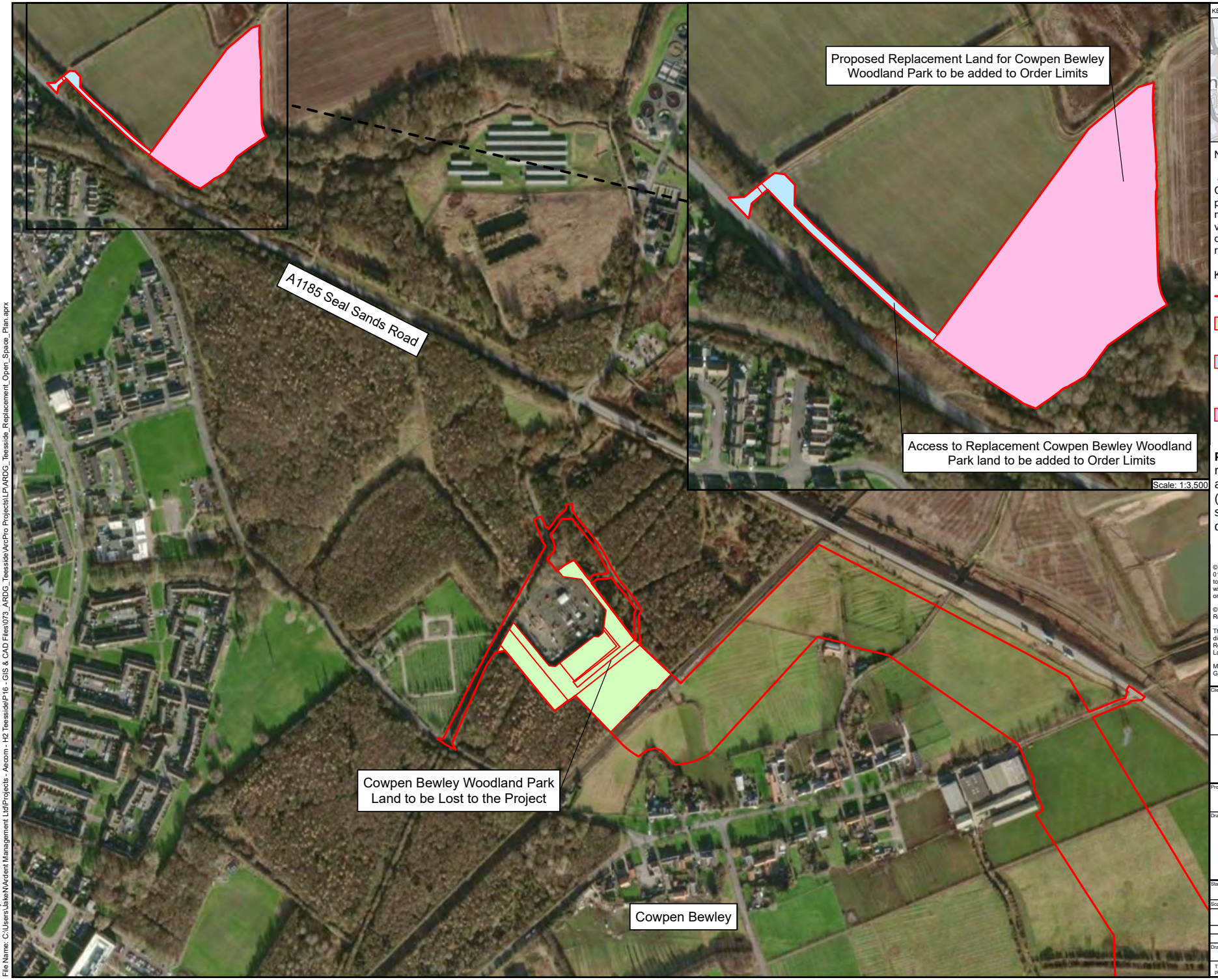

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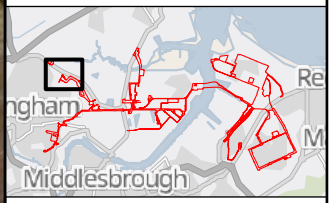

Notes:

- Other land within the Order Limits within Cowpen Bewley Woodland Park is proposed only for construction and maintenance access, using existing vehicular tracks, so is not 'lost' as a result of the project and does not need to be replaced

Key

- Order Limits
- Cowpen Bewley Woodland Park Land to be Lost to the Project
- Access to Replacement Cowpen Bewley Woodland Park land to be added to Order Limits
- Proposed Replacement Land for Cowpen Bewley Woodland Park to be added to Order Limits

Please note: The proposed area of replacement land is the same size as the area of land lost to the Project (approximately 4.85 acres). The two sections of this land plan are at different scales.

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Client: H2 Teesside

N

Designer: Ardent

Project: H2 TEESSIDE

Drawing Title: COWPEN BEWLEY WOODLAND PARK – LAND LOST AND PROPOSED REPLACEMENT LAND PROPOSAL PLAN SHEET 1 OF 1

Status: DRAFT		Revision	000
		Date	06/02/2024
Scale: 1:7,000 @ A1	Spatial Reference System: British National Grid		
0 50 100 200 Metres			
Drawn By: J.NEYE-SWIFT	Checked By: N/A	Approved By: J.WITHINGTON	

Drawing reference: ARDG_H2Teesside_Land_Plan_2500_A1

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Plot Date: 06 February 2024 10:34
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APPENDIX 16.1: EIA REGULATION 8(1)(B) NOTIFICATION LETTER TO PINS

Date: 30 March 2023
Your Ref: EN070010
Our Ref: 16373

6 New Bridge Street
London EC4V 6AB
T: 020 7489 0213
F: 020 7248 4743
E: info@dwdllp.com
W: dwdllp.com

[redacted]
Operations Manager – National Infrastructure (Energy)
National Infrastructure
The Planning Inspectorate
Temple Quay House
Bristol, BS1 6PN

Email: H2Teesside@planninginspectorate.gov.uk

Dear [redacted]

H2TEESSIDE PROJECT, LAND WITHIN THE BOROUGHS OF REDCAR AND CLEVELAND AND STOCKTON-ON-TEES, TEESSIDE AND WITHIN THE BOROUGH OF HARTLEPOOL, COUNTY DURHAM

THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 (AS AMENDED) – REGULATION 8(1)(B) 'NOTIFICATION OF INTENTION TO PROVIDE AN ENVIRONMENTAL STATEMENT' AND REGULATION 10(1) 'APPLICATION FOR A SCOPING OPINION'

I write on behalf of H2 Teesside Limited (the 'Applicant') in relation to the proposed construction and operation of the H2Teesside Project (the 'Project') on land within the boroughs of Redcar and Cleveland and Stockton-on-Tees, Teesside and within the borough of Hartlepool, County Durham.

The Project will be the UK's largest commercial-scale blue hydrogen production facility with a capacity of up to 1,200 megawatts ('MW') thermal. The Project will comprise a hydrogen production plant, which will use natural gas to produce hydrogen for use in a number of energy-related and industrial applications, a hydrogen distribution pipeline network (to supply the hydrogen to offtakers) and associated and ancillary development. The CO_2 generated by the Project during the hydrogen production process will be captured and compressed for onward transportation and storage, under agreement with the Northern Endurance Partnership (the 'NEP'), within the Endurance storage site, which is located approximately 145 kilometres offshore from Teesside under the North Sea.

The Secretary of State (the 'SoS') for Business, Energy and Industrial Strategy (now Energy Security and Net Zero) issued a direction under Section 35 of the Planning Act 2008 (the 'PA 2008') dated 22nd December 2022, confirming that the Project (as set out in the Applicant's direction request dated 5th December 2022), should be treated as development for which development consent under the PA 2008 is required.

The Applicant is proposing to submit an application to the SoS for Energy Security and Net Zero pursuant to Section 37 of the PA 2008, which will seek 'development consent' for the Project. It is currently anticipated that the application for development consent will be submitted in Quarter 4 2023.

This letter and the Environmental Impact Assessment ('EIA') Scoping Report, which is provided in electronic format, comprise the Applicant's formal notification of the SoS under Regulation 8(1)(b) of

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Registered Office: 6 New Bridge Street, London EC4V 6AB.fdsa

'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)' (the 'EIA Regulations') that it proposes to undertake an EIA in respect of the Project and will provide an Environmental Statement ('ES') to report the findings of the EIA.

The letter and the Scoping Report also represent the Applicant's formal application to the SoS under Regulation 10(1) of the EIA Regulations for a 'Scoping Opinion' as to the information to be provided within the ES that will form part of the application for development consent. The Scoping Report includes a plan sufficient to identify the site; a description of the nature and purpose of the Project; an explanation of the potential likely significant effects of the Project on the environment; and other information considered relevant by the Applicant.

The EIA Scoping Report can be downloaded via the following secure fileshare link: https://dwd.ctit.co/url/s78v2js5z84dyvd2

We look forward to receiving the SoS's EIA Scoping Opinion within the 42-day period prescribed by Regulation 10(6) of the EIA Regulations.

Please do not hesitate to contact me using the details set out below if you have any queries.

Yours sincerely,

[redacted]

[redacted]
Partner – Head of Planning
DWD on behalf of H2 Teesside Limited
[redacted]