Lighthouse GREEN FUELS

The Lighthouse Green Fuels Order

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Lighthouse Green Fuels Development Consent Order

Environmental Scoping Report

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1. Introduction

1.1 Background

Overview

1.1.1 The Applicant is planning to submit an application for a Development Consent Order (DCO) to construct, operate and decommission the Proposed Development on Land at Seal Sands Road, Stockton-on-Tees, TS2 1UB (the 'Site'). The Proposed Development is anticipated to be the UK's first commercial scale second generation Sustainable Aviation Fuel (SAF) production facility to be constructed and would comprise the following key elements:

a. Feedstock reception and storage;
b. Feedstock pre-treatment facility;
c. SAF Production Facility (producing SAF and renewable naphtha);
d. Product processing, storage and export pipelines.

1.1.2 To support the SAF production facilities, a number of ancillary or associated operations are required which are expected to be included in the DCO as associated development:

e. Marine Transport Infrastructure (Quay) for construction and operational purposes (feedstock import); and
f. Installation of pipelines for utilities (natural gas, industrial gases) and associated rail connection and utility corridors.

1.1.3 Electricity and steam are required for the Project. To minimise the carbon intensity of the produced SAF, the electricity and steam should be delivered by low-carbon sources. Therefore, it is proposed that these will primarily be supplied through an on-site biomass-fired Combined Heat and Power (CHP) plant. It is proposed that this CHP plant will have an electrical output capacity of up to approximately 200MWe, with additional steam production, and therefore is a Nationally Significant Infrastructure Project ('NSIP') in its own right as it surpasses the 50MW threshold for generating stations defined in section 15 of the Planning Act 2008. This activity is also included in the DCO application given its direct relationship to the main development.

1.1.4 The location and extent of the Proposed Development can be seen on **Figure 1.1** and **Figure 1.2**. The elements of the Proposed Development listed above are described in **Chapter 2: Proposed Development Description**.

1.1.5 The Proposed Development replaces that previously being considered under a previous DCO application that was being progressed on the former Lighthouse Green Fuels site off Huntsman Drive, Port Clarence, Stockton-on-Tees, TS2 1TT (Planning Inspectorate (PINS) ref. EN010150) for which statutory consultation took place between 16/05/2024 and 20/06/2024. That site development is no longer being progressed as it requires an increase in the area required to deliver the second generation SAF project and requires a site with the benefits of direct access to the tidal River Tees for feedstock deliv=ery.

1.1.6 Transport decarbonisation is one of the most significant challenges in achieving Net Zero ambitions, particularly the decarbonisation of aviation. Several decarbonisation routes have been proposed, however, SAF presents the only currently viable solution, offering significant greenhouse gas savings, whilst also being capable of being used within the existing distribution, storage and refuelling infrastructure for aviation and in current aircraft engines without modification.

1.1.7 Global demand for SAF is expected to grow at near exponential rates towards 2050 as countries across the world strive to achieve Net Zero. Demand is expected to reach between 330 – 445 million tonnes per annum (Mtpa) by 2050 (Ref 1).

1.1.8 Currently the UK uses approximately 12Mtpa of aviation fuel (2019 data) (Ref 443). To meet the UK's ambitions of 10% SAF uptake by 2030, 1.2Mtpa of low-carbon SAF are therefore required. This equates to ~14 plants of similar size to the Proposed Development being required to meet the demand. The Applicant and the UK Government believe that this demand is best met by domestic SAF production plants, rather than relying on imports.

1.1.9 The Applicant also considers that the UK is ideally placed as a key global aviation hub with access to permanent geological carbon stores and these benefits should be leveraged to allow the UK to become a world-leader in the production of low-carbon SAF. The growing market for SAF, alongside regulatory and Governmental support, has created an attractive location to construct large-scale SAF facilities within the UK.

The Applicant

1.1.10 LGF Projects Ltd. (LGFPL) (herein known as 'the Applicant') is a company wholly owned by Alfanar Energy Ltd. ('Alfanar'). Alfanar forms part of a privately-owned global project development, manufacturing, and engineering group with headquarters in Riyadh, Saudi Arabia, and is delivering the Project at Seal Sands, in the borough of Stockton-on-Tees, UK.

1.2 Requirement for Development Consent

1.2.1 Part 3 of the Planning Act 2008 defines which projects constitute Nationally Significant Infrastructure Projects (NSIPs). The SAF production facility does not automatically fall under the definition of a Nationally Significant Infrastructure Project (NSIP) although the associated development of the proposed up to approximately 200MWe on-site biomass/waste wood-fired CHP plant does comprise an NSIP as it is a generating station of greater than 50MW output capacity.

1.2.2 Therefore, on 12th August 2025, the Applicant formally requested a direction by the Secretary of State for the Department of Energy Security and Net Zero (DESNZ) under Section 35(1) of the Planning Act 2008 (as amended) ('2008 Act') (Ref 2) that the Proposed Development be treated as a nationally significant infrastructure project for which development consent is required.

1.2.3 The Applicant received a Direction dated 8th September 2025 from the Secretary of State under Sections 35(1) and 35ZA of the Planning Act (PA) 2008 ('the S35 Direction'), that the Proposed Development except for the biomass-fired CHP Plant should be treated as development for which development consent is required.

1.2.4 Section 105 of the PA 2008 relates to decision on applications where no National Policy Statement (NPS) has effect, that is, where there is no NPS in place relating to the specific type of development. In relation to the Proposed Development elements listed at the beginning of this Chapter there is no relevant NPS in place, therefore Section 105 of the PA 2008 establishes the decision making framework for the Secretary of State for these elements of the DCO Application. In such cases, Section 105 states that in deciding the application the Secretary of State must have regard to:

a. any relevant local impact report produced by the relevant local planning authority;

b. any matters prescribed in relation to development of the description to which the application relates; and

c. any other matters which the Secretary of State thinks are both important and relevant to their decision.

1.2.5 The S35 Direction states amongst other *things 'the Proposed Development sits within one of qualifying infrastructure fields […] energy'* and that the Proposed Development 'is nationally significant'. It therefore follows that NPS for Energy – Overarching National Policy Statement for energy (EN-1), and other energy NPS, is of importance and relevance to the determination under Section 105 of the PA 2008.

1.2.6 The on-site biomass-fired CHP Plant will have an electrical output capacity of up to approximately 200MWe, with additional steam production, and therefore is a NSIP in its own right as it surpasses the 50MW threshold for generating stations defined in Section 15 of the PA 2008. This activity was therefore not included in the Section 35 direction request, though it will form part of the DCO application as it linked but functionally subordinate to the principal development, the SAF Production Facility. The energy NPS, including NPS for Energy – Overarching National Policy Statement for energy (EN-1) and NPS for Renewable Energy Infrastructure (EN-3) (Ref 318), have direct effect upon this element of the Proposed Development and therefore Section 104 of the PA 2008 is the decision making framework for this element of the Proposed Development.

1.2.7 The NPS for natural gas supply infrastructure and gas and oil pipelines (EN-4) and NPS for Electricity Networks Infrastructure (EN-5) may also possess relevance in relation to the determination of pipeline and electrical connection elements, respectively, of the Proposed Development.

1.2.8 Due to the change in site, the Section 35 Direction for the previous DCO application (PINS ref. EN010150) issued by the Secretary of State for Energy Security and Net Zero on 25 October 2022, and varied on 23rd April 2024, is not being progressed.

1.3 Requirement for Environmental Impact Assessment

1.3.1 The process and content of an Environmental Impact Assessment (EIA) is summarised in Regulation 5 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('EIA Regulations') (Ref 4). Central to the process is the preparation of an Environmental Statement (ES) and the carrying out of associated procedural steps, including consultation, publicity, and notification.

1.3.2 The Proposed Development involves the construction and operation of a SAF production facility with associated CHP plant and constitutes EIA development in part because the on-site biomass-fired CHP plant of up to approximately 200MWe is covered under Schedule 2 of the EIA Regulations (2017) under 3(a) "Industrial installations for the production of electricity, steam and hot water - if exceeding 0.5ha". As the Proposed Development requires development consent pursuant to the 2008 Act, the processes set out, and documents stated within The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) (2009 Regulations) must be followed and prepared. This includes "the environmental statement required … and any scoping or screening opinions or directions".

1.3.3 A Regulation 8 (of the EIA Regulations) (Ref 4) notification has been submitted to the Secretary of State along with this EIA Scoping Report and confirms that the Applicant intends to submit an application for development consent, which will include an ES.

1.4 Purpose of the EIA Scoping Report

1.4.1 The purpose of this EIA Scoping Report is to ensure that the EIA is focused on the key potential impacts of the Proposed Development that are likely to give rise to significant effects, and to obtain agreement on the EIA approach and scope. As well as identifying elements to be considered in the EIA, this Report also identifies those elements that are not considered necessary to be assessed further. This approach is in line with the general aim to undertake proportionate EIA, as advocated by industry best practice and as set out in paragraph 5.10 of PINS Advice Note 7 (Ref 7).

1.4.2 This Report seeks to establish the overall framework for the EIA for the Proposed Development in relation to the environmental impacts and associated effects, with the ES to be based on this EIA Scoping Report and the Scoping Opinion subsequently received. The exact scope of the EIA will also be influenced by the on-going design evolution of the Proposed Development, baseline data collection (e.g. field surveys etc.) and consultation with stakeholders. Where further evidence justifies a change to the scope of the EIA, this will be explained in the ES along with confirmation that the change has been agreed with relevant consultees.

1.4.3 The following topics are contained within this EIA Scoping Report:

- **Chapter 5: Air Quality;**
- **Chapter 6: Noise and Vibration;**
- **Chapter 7: Terrestrial Ecology;**
- **Chapter 8: Freshwater and Marine Ecology;**
- **Chapter 9: Water Environment and Flood Risk;**
- **Chapter 10: Landscape and Visual;**
- **Chapter 11: Cultural Heritage;**
- **Chapter 12: Greenhouse Gases;**
- **Chapter 13: Climate Change Resilience;**
- **Chapter 14: Materials and Waste;**
- **Chapter 15: Socioeconomics;**
- **Chapter 16: Population and Human Health;**
- **Chapter 17: Geology and Soils;**
- **Chapter 18: Traffic and Movement;**
- **Chapter 19: Major Accidents and Disasters;**
- **Chapter 20: Marine Navigation; and**
- **Chapter 21: Cumulative Effects.**

1.4.4 The EIA Regulations (Regulation 10(3)) prescribe the information that a request for an EIA Scoping Opinion must include (Ref 8) Table 1.1 presents those information requirements and where each can be found in this Report.

Table 1.1: Information Required to Accompany a Request for a Scoping Opinion

Information Required	Location Within This Report
An overview of the conditions present on site and in the surrounding area, together with a brief overview of the relevant planning policy context.	**Chapter 1: Introduction;** **Chapter 2: Proposed Development Description;** **Chapter 3: Proposed Development Site.**
Outline of the scope and assessment methodology (including the significance criteria to be adopted) for assessing the likely significant environmental effects to be employed for each aspect to be reported in the ES.	**Chapter 1: Introduction**
The approach to dealing with alternatives.	**Chapter 1: Introduction**
The approach to undertaking the cumulative assessment.	**Chapter 21: Cumulative Effects**
The proposed approach to the EIA and an appraisal of the key environmental aspects and matters to be covered in the EIA (i.e., 'scoped in') and the aspects and maters not requiring further consideration (i.e., 'scoped out').	**Chapters 5 - 21** of this Report
The proposed structure and format of the ES which will comprise three main parts: a. Volume 1 – Main Text and Figures b. Volume 2 – Technical Appendices c. Volume 3 – Non-Technical Summary	

1.4.5 The outputs of the EIA will be presented in two stages:

a. a Preliminary Environmental Information Report (PEIR) will be produced in connection with the formal statutory consultation for the Proposed Development. The PEIR will be based on the Secretary of State's Scoping Opinion and will present the current understanding of the potential likely significant effects of the Proposed Development at the time of the consultation and its purpose will be to provide information that enables interested parties, including members of the public, local authorities and statutory bodies, to understand the likely environmental effects so that they can provide meaningful feedback; and
b. the PEIR will be followed by the ES, which will be produced as part of the application for a DCO for the Proposed Development. The ES will incorporate feedback from the Statutory Consultation and report on a detailed assessment of the likely significant effects resulting from the Proposed Development, the proposed mitigation measures to be implemented and the residual effects anticipated to arise following the implementation of that mitigation.

1.5 Consideration of Alternatives

1.5.1 Regulation 14(2)(d) of the EIA Regulations (Ref 10) states that an ES should include:

1.5.2 "a description of the reasonable alternatives studied by the applicant, which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment."

1.5.3 It is anticipated that alternatives will be considered in the ES regarding:

a. alternative sites for the development;
b. the technology selection and layout of the Proposed Development;
c. the route corridors for industrial gas connections compared to using an on-site Air Separation Unit;
d. the route corridor for wastewater pipeline for off-site treatment and discharge.

1.5.4 Where alternatives are examined and assessed during the pre-application process, details of the options and reasons for selection (or otherwise) will be included within the ES for the Proposed Development. Where, at the time of application, alternatives still exist for any particular element of the Proposed Development, the assessments to be included within the EIA and presented in the ES will consider and assess the 'worst case' impacts, in accordance with the Rochdale Envelope approach outlined in PINS Advice Note 9 (Ref 15).

1.6 Additional Documentation

1.6.1 A number of supporting application documents which will not form part of the ES, but which will be relied upon and referred to within the ES, will be submitted as part of the application for a DCO, including:

a. Report to Inform Habitats Regulations Assessment;
b. Biodiversity Net Gain Assessment;

c. Water Framework Directive Assessment including consideration of Nutrient Neutrality;
d. Flood Risk Assessment;
e. Transport Assessment; and
f. Marine Navigation Risk Assessment.

1.7 Assumptions and Limitations

1.7.1 At the time of preparing this EIA Scoping Report, the Proposed Development design continues to evolve and is currently at the Front End Engineering Design (FEED) Stage, and it is recognised that:

a. The layout of the Proposed Development within the Site Boundary is yet to be finalised; and
b. Potential areas for ecological mitigation and biodiversity net gain are yet to be confirmed.

1.7.2 In addition, a number of the design aspects and features of the Proposed Development cannot be confirmed until the engineering, procurement and construction contractor has been appointed. For example, the building sizes may vary depending on the contractor selected and their specific configuration and selection of plant. Focussed use of the Rochdale Envelope approach will therefore be adopted to define appropriate design parameters for use in the EIA as set out in both the PEIR and Environmental Statement.

2. The Proposed Development Description

2.1 Overview of the Proposed Development

2.1.1 The Proposed Development is expected to be the UK's first commercial scale, 2nd generation SAF production facility. The plant would be one of the largest of its kind in Europe, converting over 1.5 million tonnes of sustainably sourced biomass feedstock (including agricultural residues) into over 180 million litres of advanced SAF and approximately 30 million litres of renewable naphtha per annum. SAF produced by the plant will contribute to the UK's SAF Mandate targets.

2.1.2 The Proposed Development is to be built on a site located in Seal Sands off Seal Sands Road in Stockton-on-Tees Borough. This site has been carefully chosen by the Applicant due to its size and proximity to necessary infrastructure required to support the SAF production, notably access to the River Tees for construction and operational logistics, proximity to the Northern Endurance Partnership (NEP) carbon dioxide transport and storage infrastructure and proximity to marine and rail facilities for SAF and renewable naphtha export. The 'Main Site' is located to the north-east of the former Lighthouse Green Fuels site, off Huntsman Drive, Port Clarence, Stockton-on-Tees (PINS ref. EN010150).

2.1.3 The indicative proposed Order Limits for the Proposed Development (the 'Site') are shown on **Figure 1.2**. The Proposed Development Site encompasses an area of approximately 218 hectares. The site is divided into the Main Site, where the SAF production facility will be located, and associated access and utility connection corridors. The Main Site occupied by the SAF production facility is currently an irregularly shaped largely brownfield industrial site, the majority of which was previously occupied by the now demolished INEOS Nitriles chemical plant and includes a closed and vegetated landfill site to the west and undeveloped land to the north.

2.1.4 Statutory consultation regarding the Proposed Development and its potential environmental effects will be undertaken by the Applicant, expected to be between December 2025 and January 2026. Supporting Preliminary Environmental Information will be provided to inform that consultation period and process.

2.1.5 The proposed SAF production facility represents First of a Kind technology intended to help decarbonise aviation and support the UK's transition to a Net Zero future. Whilst the design of the Proposed Development is being progressed (currently at the FEED stage), the DCO application will utilise a design envelope developed using Rochdale Envelope principles set out in the Planning Inspectorate Advice Note 9: Use of the Rochdale Envelope.

2.2 Components of the Proposed Development

2.2.1 The Proposed Development comprises several processing steps which are discussed in turn below:

a. Feedstock delivery and storage;

b. Feedstock pre-treatment;
c. SAF production; and
d. Product processing, storage and export.

2.2.2 Electricity and steam will be generated on-site from an on-site biomass-fired CHP plant of up to approximately 200MWe.

2.2.3 It will be necessary to construct a new quay in the River Tees as associated development. The quay would be used to facilitate delivery of modular plant and materials by ship during construction and for import of feedstock by ship during operation.

2.2.4 These are supported by the following utility provisions and connections:

a. SAF and renewable naphtha export pipelines to rail and marine loading facilities;
b. Natural gas connection;
c. Oxygen and nitrogen connections, or alternatively, an on-site Air Separation Unit (ASU);
d. Water connections for the provision of raw water for processing operations and potable water;
e. Process wastewater discharge connection to an off-site treatment facility' and
f. Attenuated clean surface water discharge to the River Tees.

2.2.5 In addition, there is the potential for the following future connections (which do not form part of this application):

g. future CO_2 connection to NEP's CO_2 collection, compression and export and storage infrastructure; and
h. future H_2 connection to proposed H2Teesside hydrogen distribution infrastructure.

Feedstock and Delivery

2.2.6 The Proposed Development will use sustainably sourced biomass (which may include agricultural residues) to produce SAF. It is intended that this feedstock will be delivered to Site primarily by ship and offloaded at the quay within the Site boundary. A proportion of the waste wood may be imported to the site by road using heavy goods vehicles (HGV). Having direct access to a quay to enable deliveries of the feedstock is therefore highly beneficial since it avoids double handling of that feedstock prior to use.

2.2.7 The biomass to be used in the Proposed Development must meet the strict sustainability criteria specified in the SAF Mandate Eligibility Criteria. These standards stipulate that the feedstock must be considered a "waste or residue" to qualify for the SAF Mandate. The biomass comprises waste wood, unusable wood from sustainably managed forest plantations, sawmill residues and waste and residues from agriculture. The biomass sourcing is independently certified and audited.

Utilities

2.2.8 Electricity and steam are required to operate the SAF production facility. These will be supplied by a new on-site biomass-fired Combined Heat and Power (CHP) plant; in part

this is to ensure low-carbon electricity is used in the SAF production. The on-site CHP will be sized to produce up to approximately 200MWe of electrical output with additional steam production and consequently, based on this size, it will exceed the 50MWe output threshold specified in the Planning Act; the biomass CHP will therefore be identified as a Nationally Significant Infrastructure Project. If a separate electrical connection outside the site is required, this does not form part of the proposed development, and the relevant undertaker will rely either on their statutory powers or obtain the relevant consents prior to connection.

2.2.9 Natural gas will be required during plant start-up and as auxiliary fuel for some processes during operation. It is proposed to utilise an on-site natural gas connection located within or close to the Main Site and within the proposed DCO boundary.

2.2.10 Oxygen (O_2) and nitrogen (N_2) are required for the operation of the SAF production facility. O_2 and low-pressure N_2 will either be provided by on-site connections through agreement with third party providers or from an on-site ASU. A new connection to South Tees for a supply of high-pressure nitrogen will use new above or below ground pipelines in North Tees which will then connect into an existing pipeline which crosses under the Tees. In South Tees the pipeline will be newly constructed and follow existing pipeline routes and may include both underground and above ground construction.

2.2.11 It is proposed that process water and potable water will be supplied to Site via existing on-site raw water and potable mains water connections to Northumbrian Water Limited (NWL) water supply infrastructure. During design these connections will be assessed and the means of connection modified if required.

Wastewater Treatment

2.2.12 The Proposed Development will recycle water back into the process wherever possible, using on-site treatment facilities. Waste effluent will be exported for treatment by interconnecting 2 existing pipelines, one running north from the main site which is connected to an existing pipeline running east to west which passes under the Tees through an existing tunnel. In South Tees this pipeline continues from the tunnel head house along the existing pipeline corridor along the north bank of the Dabholm Gut. This pipeline will then be connected to NWL's Bran Sands Wastewater Treatment Plant (WwTP) using a section of newly constructed pipeline. The Proposed Development will ensure adequate treatment and appropriate disposal of the effluent, in particular considering the nitrogen loading to the Tees Transitional Waterbody.

2.2.13 Currently, Bran Sands WwTP discharges treated effluent to the Dabholm Gut which then discharges to the Tees Estuary. NWL are proposing constructing a long sea outfall underground northward from Bran Sands WwTP to Tees Bay (comprising approximately 3km onshore and 4.5km offshore pipeline). This proposed pipeline aims to divert treated effluent discharges from the Tees Estuary to the North Sea and to so reduce nutrient nitrogen concentrations within the Tees Transitional Waterbody and Tees Bay. When operational, this long sea outfall would discharge treated effluent from industries within Teesside including Lighthouse Green Fuels.

2.3 Process Description

2.3.1 This section provides an overview of the SAF production process which is also depicted in **Figure 2.1** below. Sustainably sourced biomass feedstock arriving at the site will be transferred to the onsite storage. It will then be either conveyed to the biomass-fired CHP plant or for thermal pretreatment before transfer to the Gasification Facility where it will be converted into syngas.

2.3.2 Within the Syngas Clean-Up and Compression section are several adsorbent and catalytic processes designed to remove residual contaminants from the syngas and adjust the ratio of hydrogen to carbon monoxide, generating an ultra-pure gas for conversion to liquid products in the Fischer-Tropsch (FT) Reactor. The Syngas Clean-Up and Compression also features an acid gas removal unit (AGRU). This removes acid gases to increase the hydrogen and carbon monoxide content in the syngas. CO_2 is stripped from the syngas, purified and vented via the emission stacks. Sulphur-containing off-gases from the AGRU will be treated in a thermal oxidiser followed by caustic scrubbing.

2.3.3 Ultra-clean syngas will be converted into long-chain hydrocarbon waxes and other light hydrocarbon species in the FT Reactor. Hydrocarbon waxes will be upgraded in an on-site hydrocracker, producing a mixed hydrocarbon stream. Conventional fractionation technology is used to separate the desired final synthetic paraffinic kerosene (SPK, known also as SAF) product and by-product renewable naphtha which is used as a chemical feedstock.

2.3.4 SAF and renewable naphtha will be sent to a small buffer storage where it will be tested and quality checked before being transferred to bulk liquid storage on Site. Products will then be transferred by newly constructed pipelines to off-site marine/rail loading facilities in Seal Sands and North Tees respectively for export. Road tanker loading facilities on-site will also be required for HGV export of small volumes of products or waste streams (approximately 10 tankers per week) and for removal of out of specification material or other wastes.

2.4 Emissions to Air

2.4.1 There will be several releases points to air from the Proposed Development including:

a. flares for the combustion of any abnormal emissions or emergency venting from the SAF production facility;
b. a thermal oxidiser will be part of the syngas cleanup equipment treatment, and which will also be used to dispose of other gas streams that cannot be reprocessed;
c. the biomass-fired CHP plant stack(s);
d. feedstock thermal pretreatment stack(s);
e. venting of CO_2 from the gasification island and syngas cleanup; and
f. various minor process vents for example on storage vessels and conveying pipelines within the plant.

2.5 Material Storage and Handling

2.5.1 Feedstock will predominantly be delivered by ship straight to Site. A variety of feedstocks are likely to be processed, and these will be segregated and stored in a combination of silos and covered stores depending on the nature of the material and any permit obligations.

2.5.2 Feedstock will typically be transferred into the process via covered conveyors, either directly from the storage or charged via mobile plant. Feedstock for SAF production will be transferred from storage before thermal pretreatment and SAF production. Feedstock for combustion in the CHP will be transferred directly from storage to the CHP plant.

2.5.3 The SAF process, pre-treatment units and the CHP plant will all produce solid waste streams which will be handled, treated and disposed of in accordance with permitting requirements and waste legislation, with recycling of the waste streams back into the process where possible.

2.5.4 SAF and renewable naphtha finished product will be temporarily stored on Site in dedicated tanks before export by pipeline to local rail/marine transport facilities for onward processing and blending prior to distribution to UK airports.

2.6 Works to Quayside

2.6.1 Works will be required to construct the quayside to allow docking and unloading of modules/construction materials during construction and feedstock during operation. These will involve decommissioning and removal of the existing jetties, new quay construction and dredging for the berthing pocket and access channel.

2.7 Site Access

2.7.1 Construction and operational access to the Main Site and associated utility connections in North Tees will be via Seal Sands Road which connects to the trunk road network via the A1185 and the A689/A19.

2.7.2 In South Tees, construction and operation access for utility connections would be from the Wilton International North Gate located off the A1085 Steelhouse Gate Roundabout and then via the internal road network to Dabholm Gut, or alternatively, via the A1053, Tees Dock Road.

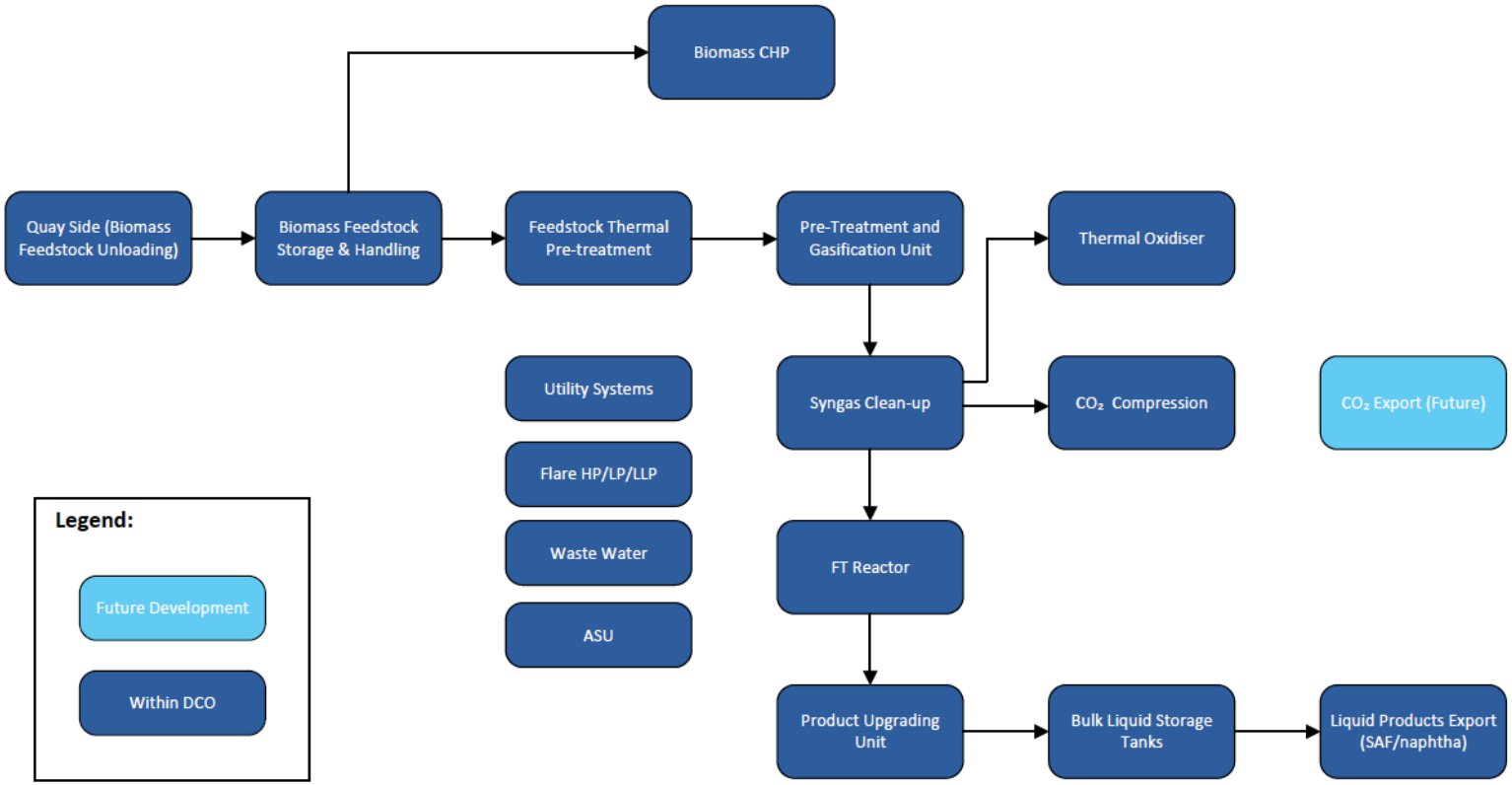


Figure 2.1: SAF Production Process

2.8 Site Clearance and Preparation

2.8.1 Aerial imagery from Google Maps shows that the former INEOS site has been cleared but that concrete hardstanding remains in-situ. Redevelopment will require breakout of surface and buried concrete followed by crushing and grading for use as recycled aggregate to fill any voids requiring backfilling. Subject to discussions with the Environment Agency, this would potentially fall under a Deposit for Recovery permit. Subject to ground investigation, other remedial works may also be required and existing piles may need to be removed in advance of development.

2.8.2 Development over parts of the former landfill site may require use of rafts or piled foundations, protection measures from vapour and ground gases, management of contaminated groundwater (which may include use of in ground barriers) and hot spot removal. This will be confirmed by ground investigation and risk assessment and subsequent design of remedial works should they be required.

2.9 Construction

2.9.1 In order to optimise the construction schedule and minimise disruption, modular off-site construction will be undertaken for key plant components allowing those modules to be delivered to site by ship and offloaded on the quay within the Site, thereby reducing construction Abnormal Indivisible Loads (AIL) and HGV traffic on the road network and optimising site construction programme duration. Areas of third-party land will be used for temporary construction laydown areas.

3. The Proposed Development Site

3.1 The Site Location

3.1.1 The Main Site is located in the industrial area of Seal Sands, approximately 5km east of Billingham town centre and 4km north-east of Middlesbrough town centre in Teesside. It is sited on the north bank of the River Tees roughly 3km south west of Teesmouth (see **Figure 1.1**). The Main Site is located south west of Navigator Terminals Seal Sands, to the north-east of Navigator North Tees Inland Terminal. Access and utility corridors (see below) lie to the north and south of Dabholm Gut, to the east to Bran Sands, and to Lackenby to the south east.

3.1.2 The Main Site is immediately bounded by the River Tees to the east and is surrounded by the Seal Sands/North Tees industrial area. The Main Site lies:

a. to the east of the Central Area Transmission System (CATS) gas processing terminal and Whitetower Energy Ltd;
b. to the south west of Navigator Terminals Seal Sands bulk storage terminal;
c. to the north-east of Navigator North Tees Inland Terminal;
d. to the south of KD Pharma pharmaceutical manufacturing plant and Lianhetech chemical plant;
e. to the north of BOC, SABIC, N+P Subcoal Production Teesside and the non-operational Tees Valley 1 & 2 energy from waste plants; and
f. close to the consented Northern Endurance Partnership CO_2 Gathering Network corridor and the proposed H2Tesside hydrogen pipeline corridor which both run north-south through the east of the Main Site and then westward along its southern boundary.

3.1.3 The Main Site lies south of Seal Sands Road. The majority of the Main Site was formerly occupied by the INEOS Nitriles plant. The site has been cleared and now largely consists of concrete hardstanding with some vegetated areas. In the east, along the frontage with the River Tees are two jetties formerly used for loading/unloading operations at the former facility.

3.1.4 The western end of the Main Site is a closed and vegetated landfill site which is also vegetated. The land north of Seal Sands Road is also vegetated with grass and woodland scrub part of which is included in the proposed DCO as a construction laydown area and potential area for development of an on-site ASU if required. Available historical maps indicate that this part of Seal Sands does not appear to have been previously developed and is therefore greenfield land. There is no irreplaceable habitat present within the main site.

3.1.5 Immediately west of the Main Site are a gas processing terminal and peaking generation plant beyond which are the Saltholme brinefields operated by SABIC. On the south-bank of the Tees is a man-made drainage channel off the Tees called the Dabholm Gut. This is to the south of Bran Sands Lagoon, the closed former ICI landfill site at Bran Sands and the operational Bran Sands WwTP. To the southeast of

Dabholm Gut is Teesport one of the largest ports in the UK which is operated by PD Ports.

3.1.6 The River Tees, a tidal estuary, lies adjacent to the east of the Main Site. Around 2.6km to the north of the Site is the mouth of the River Tees. The coastline at Tees Bay is approximately 3km to the north-east of the Site bordered by a coastal dune system (Coatham Dunes) which extends to the southeast along the coastline toward Redcar and the north west towards Hartlepool. The River Tees, Bran Sands and Coatham Dunes and coastline are variously included in the Teesmouth and Cleveland Coast Special Protection Area ('SPA'), Ramsar Site and Site of Special Scientific Interest ('SSSI').

3.1.7 The Main Site is close to the following nationally and internationally designated conservation sites (**Figure 3.1)**:

a. Teesmouth and Cleveland Coast SPA (Main Site adjacent, quay works within);
b. Teesmouth National Nature Reserve ('NNR') (600m north-east);
c. Teesmouth and Cleveland Coast Ramsar Site (300m north); and
d. Teesmouth and Cleveland Coast SSSI (Main Site adjacent, quay works within).

3.1.8 The proposed site boundary has five access and utility corridors:

a. Pipeline connection from the Main Site for export of SAF and renewable naphtha to local marine or rail loading infrastructure;
b. Wastewater connection corridor running northeast and then east from the Main Site, then crossing under the Tees in an existing pipeline within an existing tunnel which then follows the existing pipeline corridor on the north bank of the Dabholm Gut before a new pipeline connection to Bran Sands WwTP;
c. High pressure nitrogen pipeline corridor running north east from the Main Site to connect with an existing pipeline crossing of the Tees and then a new pipeline connection along the south bank of the Dabholm Gut to an existing third party ASU at Lackenby;
d. Construction & operational vehicular access corridor from Wilton International North Gate to the north bank of Dabholm Gut using the internal road network on the South Bank of the Tees; and
e. Construction & operational vehicular access corridor from Tees Dock Road on the South Bank of the Tees to the south bank of Dabholm Gut.

3.1.9 To the north-east of the Site on the south bank of the Tees is land formerly part of the former Redcar steelworks (which is now demolished) and forming part of the Teesworks development site. Whilst currently vacant, part of Teesworks has been granted development consent for the Net Zero Teesside project; a carbon capture enabled power station and associated carbon dioxide compression facility. The consented Northern Endurance Partnership CO_2 Gathering Network will route from the Net Zero Teesside site, under the Tees and through the east of and then along the southern boundary of the Main Site.

3.1.10 Teesworks is also the proposed location for the H2Teesside blue hydrogen project which is the subject of a Development Consent Order application. The Examining Authority's recommendation for that project was sent on 28th May 2025 to the Secretary

of State for DESNZ for his decision. The route of the proposed H2Teesside hydrogen distribution pipeline also runs along the eastern and southern boundaries of the Main Site.

3.1.11 The Main Site is connected to the public highway network via Seal Sands road which joins Seaton Carew Road (A178) at Seal Sands Roundabout. The western arm of this roundabout links to the A1185 which connects to the trunk road network via the A689 and A19 north of Billingham. Seaton Carew Road runs north to Hartlepool and south to Port Clarence off Seal Sands Roundabout. The A19 and A1(M) provide north-south links into the strategic road network. The A19 links to Hartlepool, Peterlee and Sunderland to the north, and to Thirsk and York and the A1(M) to the south.

3.1.12 Darlington Station is located approximately 25km to the south west and is on the East Coast Mainline which provides north-south rail links to London Kings Cross and to Durham, Newcastle and Scotland. Darlington Station is connected to Stockton-on-Tees then and Billingham via the Durham coastline which connects Stockton to Newcastle via Hartlepool and Sunderland. There are stations on this rail line at Stockton and Billingham.

3.1.13 The nearest Air Quality Management Area (AQMA) to the site is the Scarborough AQMA, which is extends to the village of Staithes, approximately 23km to the south east of the site.

3.1.14 The closest residential receptors to the Main Site are Port Clarence (approximately 2.8km to the south west) and Cowpen Bewley (approximately 3.5km to the west). Residential properties in the residential area of Dormanstown are also located approximately 200m from the road access from the Wilton International Gate off the A1085 in South Tees.

3.1.15 The nearest listed buildings are:

a. the Grade II listed Haverton Hill and Port Clarence War Memorial on Port Clarence Road in Port Clarence 2.8km south west of the Main Site; and
b. five Grade II and 1 Grade II* listed properties in Cowpen Bewley 3.5km west of the Main Site.

3.1.16 The nearest conservation area is Cowpen Bewley Conservation area, which is approximately 3.5km west of the Main Site.

3.1.17 The Teesmouth and Cleveland Coast SPA, Ramsar Site and SSSI designations surround the Seal Sands area and are immediately adjacent to the east of the site. In the west these designations are a minimum of 230m away from the Main Site and 580m to the north. Together, the designations cover areas of land to the north, west, east, south and southeast of the site including the coastline, and extend to cover the River Tees, Bran Sands Lagoon and Dabholm Gut. This area includes intertidal sand and mudflat, saltmarsh and freshwater grazing marsh, saline lagoons, sand dunes and shingle, rocky shore and shallow coastal waters that are able to support national and international bird species.

4. Planning and Energy Policy

4.1 Introduction

4.1.1 This chapter of the EIA Scoping Report provides an overview of the planning and energy policies of relevance to the Proposed Development, and where those policies identify the need for the Proposed Development.

4.1.2 The application for development consent will include a Planning Statement that will set out in more detail the policy of relevance to the Proposed Development and include an assessment of how it complies with that policy.

4.1.3 The following planning and energy policy is relevant to the Proposed Development:

a. National Policy Statements for Energy;
b. Energy and Climate Change Policy;
c. The National Planning Policy Framework;
d. Local Planning Policy; and
e. Marine Policy

4.1.4 These are considered throughout this chapter.

4.2 National Policy Statements for Energy

4.2.1 Under The Planning Act 2008 (PA 2008) regime, the policy framework for examining and determining applications for development consent is provided by National Policy Statements (NPSs). The NPSs are the primary policy used by the relevant Secretary of State to examine and determine applications for Nationally Significant Infrastructure Projects (NSIPs).

4.2.2 Section 104 of the PA 2008 provides that, in deciding the application for a Development Consent Order (DCO), the Secretary of State must have regard to:

a. any relevant NPSs;
b. the appropriate marine policy documents;
c. any matters prescribed in relation to development of the description to which the application relates; and
d. any other matters the Secretary of State thinks are both important and relevant to their decision.

4.2.3 The Secretary of State must decide the application in accordance with any relevant NPS unless it would:

a. lead to the UK being in breach of its international obligations;
b. be in breach of any statutory duty that applies to the Secretary of State;
c. be unlawful;
d. result in the adverse impacts of the development outweighing the benefits; or

e. be contrary to any condition prescribing how decisions regarding an NSIP application are to be taken.

4.2.4 As stated in Chapter 1, on 8th September 2025, the Secretary of State issued a Direction under Sections 35(1) and 35ZA of the PA 2008, that the Proposed Development except for the biomass-fired CHP Plant should be treated as development for which development consent is required.

4.2.5 The S35 Direction request stated that the Proposed Development comprised the following elements:

a. Feedstock reception and storage.
b. Feedstock pre-treatment.
c. SAF production.
d. Product processing, storage and export.

4.2.6 To support the SAF production activities, a number of ancillary or associated operations are required (which are expected to be included in the DCO as associated development under section 115 or ancillary matters under section 120(3)):

a. A new quay will be developed on the river Tees;
b. Combined Heat and Power (CHP) plant (see below);
c. Installation of pipelines for utilities including for the supply of raw water, potable water, natural gas, oxygen and nitrogen to the process. Natural gas will be required during plant start-up and as auxiliary fuel for some processes during operation;
d. Installation of pipelines for export of finished product to local marine or rail loading infrastructure;
e. Installation of new and repurposing of existing pipeline(s) including for off-site process wastewater treatment and discharge;
f. Installation or modification of electricity connection(s) to provide electricity to the Site;
g. Installation of an on-site Air Separation Unit (ASU) for provision of oxygen and nitrogen to the process;
h. Feedstock, intermediates, and product bulk storage; and
i. Ancillary matters in accordance with S120(3) of the Planning Act 2008.

4.2.7 Section 105 of the PA 2008 relates to decision on applications where no NPS has effect, that is, where there is no NPS in place relating to the specific type of development. No elements of the Proposed Development, listed in paragraph 4.2.5, fall under the listed activities in Section 14 of the Planning Act 2008 and there is no relevant NPS in place relating to this type of development, therefore Section 105 of the PA 2008 establishes the decision making framework for the Secretary of State for these elements of the DCO Application.

4.2.8 In such cases, Section 105 states that in deciding the application the Secretary of State must have regard to any relevant local impact report produced by the relevant local planning authority; any matters prescribed in relation to development of the description to which the application relates; and any other matters which the Secretary of State thinks are both important and relevant to their decision.

4.2.9 The on-site biomass-fired CHP Plant will have an electrical output capacity of up to approximately 200MWe, with additional steam production, and therefore is a NSIP in its own right as it surpasses the 50MW threshold for generating stations defined in section 15 of the PA 2008. This activity was therefore not included in the Section 35 direction request, though it will form part of the DCO application as it linked but functionally subordinate to the principal development, the SAF production facility. The energy NPS are relevant to this part of the Proposed Development and therefore Section 104 of the PA 2008 is the decision making framework for this part of the Proposed Development.

4.3 Status of NPSs

4.3.1 The current NPSs for energy infrastructure were published by the Government on 22 November 2023 and were designated on 17 January 2024. The NPSs are therefore relevant policy for applications for development consent submitted and accepted for examination following their designation.

4.3.2 The following energy NPSs which are relevant to the Proposed Development are:

a. NPS for Energy – Overarching National Policy Statement for energy (EN-1);
b. NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
c. NPS for Renewable Energy Infrastructure (EN-3)
d. NPS for natural gas supply infrastructure and gas and oil pipelines (EN-4); and
e. NPS for Electricity Networks Infrastructure (EN-5).

Overarching National Policy Statement for Energy (EN-1) (Ref 36)

4.3.3 The relevant sections of EN-1 are summarised in the following paragraphs:

4.3.4 Paragraph 2.1.3 of EN-1 states that “To produce the energy required for the UK and ensure it can be transported to where it is needed, a significant amount of infrastructure is needed at both local and national scale. High quality infrastructure is crucial for economic growth, boosting productivity and competitiveness”.

4.3.5 Paragraph 3.3.3 states that “To ensure that there is sufficient electricity to meet demand, new electricity infrastructure will have to be built to replace output from retiring plants and to ensure we can meet increased demand”.

4.3.6 Paragraph 3.3.58 emphasises that “Given the urgent need for new electricity infrastructure and the time it takes for electricity NSIPs to move from design conception to operation, there is an urgent need for new (and particularly low-carbon) electricity NSIPs to be brought forward as soon as possible, given the crucial role of electricity as the UK decarbonises its economy.”

4.3.7 Paragraph 3.4.4 recognises that “We need a diverse mix of gas supply infrastructure including pipelines, storage and reception facilities in order to meet our energy objectives”.

4.3.8 Section 4.2 of EN-1 'The critical national priority for low-carbon infrastructure' outlines at paragraph 4.2.1 that the government has fully committed by 2035, subject to security of supply, to underpin its 2050 net zero ambitions."

4.3.9 Paragraph 4.2.2 explains that "the UK's strategy to increase supply of low-carbon energy is dependent on deployment of renewable and nuclear power generation, alongside hydrogen and CCUS. Our energy security and net zero ambitions will only be delivered if we can enable the development of new low-carbon sources of energy at speed and scale."

4.3.10 With smart and strategic planning paragraph 4.2.3 adds that "the UK can maintain high environmental standards and minimise impacts while increasing the levels of deployment at the scale and pace needed to meet our energy security and net zero ambitions."

4.3.11 Paragraph 4.2.4 explains that the "Government has therefore concluded that there is a critical national priority (CNP) for the provision of nationally significant low-carbon infrastructure". It is outlined in paragraph 4.2.5 that this includes for electricity generation, all onshore generation that does not involve fossil fuel combustion including other plants that convert residual waste into energy, providing they meet existing definition of low-carbon.

4.3.12 Section 4.8 sets out the considerations of Combined Heat and Power (CHP), with paragraph 4.4.8 stating that: "Using less fuel to generate the same amount of heat and power, reduces emissions, particularly CO_2. The government has therefore committed to promoting Good Quality CHP […]."

National Policy Statement for Renewable Energy Infrastructure (EN-3) (Ref 318)

4.3.13 Section 2.7 of EN-3 covers energy from biomass and/or waste and recognises that biomass combustion for electricity generation plays an important role in meeting the UK's energy needs and supports the decarbonisation of the sector.

4.3.14 Section 2.7 identifies the assessment principles specific to biomass combustion plants. Paragraph 2.7.9 states that multi modal transport is encouraged and it is expected that material will be transported by water where possible. Paragraph 2.7.14 recognises the need to prioritise biomass use to applications where it can deliver greenhouse gas (GHG) emission reductions in hard-to-decarbonise sectors, without other viable alternatives, to comply with our net zero and wider environmental goals. Paragraphs 2.7.24 to 2.7.26 also state that applicants should provide details in respect of the layout and composition of combustion buildings and supporting balance of plant.

4.3.15 In addition to the assessment principles and generic impacts covered by EN-1, section 2.7 lists the impacts specific to biomass plants although notes that this is not an exhaustive list. Impacts include air quality, landscape and visual, noise and vibration, odour, residue and waste management, water quality.

4.3.16 With regards to technical considerations, paragraph 2.7.74 states that the sustainability of biomass that will be combusted is an important consideration for the Secretary of State. Paragraph 2.7.77 states that the Secretary of State should not grant consent to a proposed biomass fuelled generating station unless they are satisfied that the operator will (so far as it can reasonably be expected to do so) ensure that the biomass or bioliquid fuel it burns meets applicable Renewables Obligation, Contract for Difference, or any successor incentive regime sustainability criteria, whether or not support is being claimed.

National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Ref 91)

4.3.17 NPS EN-4, taken together with EN-1, provides the primary policy for decisions by the Secretary of State on applications it receives for natural gas supply infrastructure and gas and oil pipelines as stated in paragraph 1.6 of EN-4.

4.3.18 NPS EN-4 covers the general assessment of proposals including factors influencing site selection and design, climate change adaptation, 'good design', hazardous substances, control of major accident hazards and borehole sites, as well as the technology-specific information for the applicant assessment, mitigation and the Secretary of State's decision making

National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 92)

4.3.19 Paragraph 1.1.1 of EN-5 recognises that "The security and reliability of the UK's current and future energy supply is highly dependent on having an electricity network which will enable the new electricity generation, storage, and interconnection infrastructure that our country needs to meet the rapid increase in electricity demand required to transition to net zero, while maintaining energy security."

4.3.20 Paragraph 1.1.5 states that "As identified in EN-1 government has concluded that there is a critical national priority (CNP) for the provision of nationally significant low-carbon infrastructure.

2025 Draft Updates to the Energy National Policy Statements (Ref 444)

4.3.21 On 24 April 2025 the Government published revised drafts of certain energy NPSs for public consultation (the '2025 Draft Update NPSs'). Insofar as it relates to the Proposed Development, consideration has been given to the following:

a. EN-1: Overarching National Policy Statement for energy;
b. EN-3: National Policy Statement for Renewable Energy Infrastructure; and
c. EN-5: National Policy Statement for electricity networks infrastructure.

4.3.22 Through these updates the Government seeks to strengthen the process for delivering major new infrastructure in England and Wales and reinforce their ambition to deliver Clean Power by 2030 and net zero. The Government carried out a consultation on these updates which closed on 29 May 2025.

4.3.23 While the 2024 suite of NPSs for energy described earlier remain relevant policy and have effect for NSIP applications for the purposes of the PA 2008, the 2025 Draft Update NPSs are potentially capable of being important and relevant considerations in the decision-making process.

4.3.24 With regards to Draft EN-3, Energy from Waste (EfW) projects will no longer benefit from CNP policy as they do not meet the definition of a clean power technology in the Clean Power 2030 Action Plan. The Assessment principles and decision making criteria for EfW projects in Section 2.7 of Draft EN-3 have also been amended to ensure that new EfW projects meets a clearly defined need to help lower non-recyclable waste.

4.3.25 As it relates to Draft EN-5, the inclusion of Clean Power 2030 has broadened the scope to reflect the need for new network infrastructure in relation to all forms of clean energy (paragraphs 1.1.4 and 2.2.3). Paragraph 1.1.8 of Draft EN-5 also attaches heightened urgency to the pace at which network development and new electricity infrastructure must be deployed in order to meet decarbonisation targets.

4.4 Marine Policy Statements & Plans

UK Marine Policy Statement (March 2011) (Ref 445)

4.4.1 Section 104 of the PA 2008 requires the Secretary of State to have regard to "*…the appropriate marine policy documents…*" relevant to the biomass-fired CHP Plant and biomass fed SAF production facility. It is considered that such documents would also be important and relevant considerations under section 105.A number of elements of the Proposed Development involve works within the UK Marine Area, under the tidal River Tees.

4.4.2 The appropriate marine policy documents are defined at Section 59 of 'The Marine and Coastal Access Act 2009. These include any marine policy statement which is in effect and to the extent that a decision relates to a marine plan area, any marine plan which is in effect for that area (Section 59(3) and (5)).

4.4.3 The UK Marine Policy Statement ('MPS'), adopted in March 2011, provides the policy framework for preparing marine plans and taking decisions affecting the marine environment. It has been prepared and adopted for the purposes of Section 44 of the Marine and Coastal Access Act (MCAA) 2009 and is intended to sit alongside terrestrial consenting regimes, including the PA 2008 regime. The MPS was subject to updates in September 2020 relating to how references to EU law should be interpreted from 1 January 2021 following the UK's withdrawal from the EU.

4.4.4 Chapter 2 of the MPS outlines the vision for the UK marine area, the high-level approach to marine planning and general principles for decision making covering economic, social, and environmental considerations. It also covers detailed considerations relevant to developments such as marine ecology and biodiversity; air quality; noise; water quality and resources; seascape; historic environment; climate change adaptation and mitigation; and coastal change and flooding.

4.4.5 UK MPS, adopted in March 2011, provides the policy framework for preparing marine plans and taking decisions affecting the marine environment. It has been prepared and adopted for the purposes of Section 44 of the MCAA 2009 and is intended to sit alongside terrestrial consenting regimes, including the PA 2008 regime. The MPS was subject to updates in September 2020 relating to how references to European Union (EU) law should be interpreted from 1 January 2021 following the UK's withdrawal from the EU.

4.4.6 Chapter 3 of the MPS sets out the policy objectives for key activities that take place in the marine environment. Section 3.3 deals specifically with 'Energy production and infrastructure development'. Paragraph 3.3.1 notes that a secure, sustainable, and affordable supply of energy is of central importance to the economic and social well-being of the UK. Paragraph 3.3.4 sets out issues that decision maker should take into account when examining and determining applications for energy infrastructure.

Guidance to the Marine Policy Statement 2021 (Ref 446)

4.4.7 The Guidance which was updated in September 2020 is jointly agreed by the policy authorities and explains how references to EU law in the UK Marine Policy Statement (MPS) should be interpreted from 1 January 2021 following the UK's withdrawal from the EU.

4.4.8 The European Union (Withdrawal) Act 2018 will convert many EU measures into UK law. Former EU measures converted into UK law are referred to as 'retained EU law' with statutory instruments amending the retained EU law to ensure it is operable.

4.4.9 References in the MPS to EC or EU legislation, EU legislative requirements, European legislation and EU requirements are to be read as references to retained EU law from 1 January 2021.

North-east Inshore and North-east Offshore Marine Plan (June 2021) (Ref 198)

4.4.10 Marine plans are intended to set out detailed policy and spatial guidance for a particular area. The UK is divided into a number of marine planning regions with associated plan authorities that are responsible for preparing marine plans. In England the Marine Management Organisation (MMO) is the plan authority. Marine plans are a material consideration.

4.4.11 The Site lies within the 'North-east Inshore Marine Area', which stretches from Flamborough Head in Yorkshire to the Scottish Border. The Plan Area has three main tidal rivers, including the River Tees.

4.4.12 The North-east Marine Plan is intended to provide a strategic approach to decision making, considering future use and providing a clear approach to managing resources, activities and interactions within the area. In referring to Teesside, Tyneside and Wearside (paragraph 14), the Plan identifies that these are industrial areas, with important manufacturing heritage. North Sea oil and gas reserves mean that oil and gas production and processing are important activities in the North-east Marine Plan areas, with product being transferred to shore via pipelines, for example at Teesside.

4.4.13 Table 2 of the Plan contains a number of policies. There are no specific policies on waste to fuel aviation fuel facilities.

4.4.14 Policy NE-INF-1 supports appropriate land-based infrastructure which facilitates marine activity and vice versa.

4.4.15 Policy NE-INF-2 supports the protection of landing facilities in the north-east inshore marine area and confirms these are critical for enabling industries. By protecting existing landing facilities, identifying the difference in safeguarding, NE-INF-2 mirrors similar provisions in terrestrial planning and supports the continued operation of vital existing landing facilities.

4.4.16 Policy NE-CO-1 supports proposals that optimise the use of space and incorporate opportunities for co-existence and cooperation with existing activities. It acknowledges that the north-east marine plan areas, and in particular the inshore area, are likely to be busier in the future, and use of the space may become limited. The policy ensures that new proposals will avoid creating conflicts and to minimise their footprint where possible.

4.4.17 Policy REN-1 confirms that proposals that enable the provision of renewable energy technologies and associated supply chains, will be supported. Renewable energy technologies contribute to the diversification and decarbonisation of the electricity grid. NE-REN-2 protects areas identified for energy developments from other activities that could affect the sites ability to generate energy. It enables the development of safe, profitable and efficient marine businesses.

4.4.18 Supporting development associated with industrial clusters also aims to enhance connectivity between marine operations and land infrastructure. This policy will also benefit employment in coastal communities near industrial clusters, supporting the NE INF1 and NE -EMP -1 policies.

4.4.19 It is considered that the Proposed Scheme is consistent with policy contained within the UK Marine Policy Statement and the North-east Marine Plan.

4.5 Energy and Climate Change Policy

4.5.1 As noted above, Sections 104 and 105 of the Planning Act 2008 (Ref 2) set out the matters that the Secretary of State must have regard to in determining applications for development consent, which can include any other matters which the Secretary of State thinks are “important and relevant” to their decision. Other matters that the Secretary of State may consider important and relevant include recent UK energy and climate change policy.

4.5.2 The Proposed Development will manufacture and distribute second generation SAF (i.e. manufactured from various types of non-food biomass) to be used primarily to help the UK meet its carbon reduction targets for aviation and help fulfil the UK Government’s SAF Mandate of 10% of aviation fuel being SAF by 2030.

4.5.3 The UK Government's SAF Mandate sets out a clear ambition for net-zero aviation by 2050, with all domestic flights achieving net zero by 2040.The SAF Mandate is implemented by The Renewable Transport Fuel Obligations (Sustainable Aviation Fuel) Order 2024 which came into force 1st January 2025.

4.5.4 The SAF policy that is relevant includes:

a. Clean Growth Strategy (October 2017, updated April 2018)(Ref 21)
b. The Ten Point Plan for a Green Industrial Revolution (November 2020)(Ref 22);
c. Industrial Decarbonisation Strategy (March 2021)(Ref 24);
d. Jet Zero Strategy (July 2022, updated August 2022)(Ref 27);
e. The Pro Pathway to Net Zero aviation: developing the UK sustainable aviation fuel mandate (April 2024) (Ref 29).

The Clean Growth Strategy

4.5.5 The 'Clean Growth Strategy - Leading the way to a low-carbon future'(Ref 21), was published in October 2017 (and amended in April 2018). The Clean Growth Strategy (the 'CGS') sets out the aims of the Government to deliver increased economic growth while reducing carbon emissions. It estimates that the low-carbon economy could grow 11% per year between 2015 and 2030, four times faster than the projected growth of the economy as a whole.

4.5.6 The Executive Summary (page 9) confirms that for the UK to achieve its fourth and fifth carbon budgets (2023 - 2027 and 2028 - 2032) it will be necessary to drive a significant acceleration in the pace of decarbonisation. The Executive Summary sets out a number of key policies and proposals (pages 12 - 16) relating to 'Improving Business and Industry Efficiency' and "Accelerating the Shift to Low-carbon Transport".

4.5.7 Page 85 sets out the Government's ambitions for a low-carbon transport sector and outlines its ambition to modernise the aviation sector through "support for sustainable alternative fuels, improved efficiency and new technologies". Later in this Chapter, the Government confirms that it "will set targets to support development of advanced fuels suitable for HGVs and aviation" and extend the Renewable Transport Fuel Obligations (RTFO) scheme.

4.5.8 Chapter 4 of the deals with different sectors of the UK economy. Page 64 sets out the various proposals to improve business and industry efficiency and states the Government will require industry and make progress in switching to low-carbon fuels such as sustainable biomass. The Clean Growth Strategy subsequently recognises that biomass will play an important transitional role, alongside improvements in the efficiency of our economy (page 93).

The Ten Point Plan for an Industrial Revolution

4.5.9 'The Ten Point Plan for a Green Industrial Revolution – Building back better, supporting green jobs, and accelerating our path to net zero', was published on 18 November 2020 (Ref 22) and is aimed at delivering a 'Green Industrial Revolution' in the UK, with the foreword by the then Prime Minister stating that the Plan will aim to mobilise £12 billion

of government investment and potentially three times as much from the private sector, to create and support up to 250,000 green jobs.

4.5.10 'Point 6: Jet Zero and Green Ships' sets out immediate steps to drive the uptake of sustainable aviation fuels. A Jet Zero Council has been established as a sector-wide partnership to accelerate the development and adoption of new technologies to help develop a strategy to reach net zero aviation. In addition, £15 million is being invested into FlyZero which is a 12-month study into the strategic, technical and commercial issues in designing and developing zero emission aircraft that could enter service in 2030. Furthermore, a £15 million competition was held to support the production of SAF in the UK, in which the Applicant was awarded funding. A consultation also ran from 30 March 2023 to 22 June 2023 on a Sustainable Aviation Fuel mandate to blend greener fuels into kerosene, which will create a market-led demand for these alternative fuels.

4.5.11 'Point 10: Green Finance and Innovation' sets out the vision for the UK to be a global leader in the technologies needed to decarbonise our economies and transition to net zero. It states 'To accelerate the commercialisation of innovative low-carbon technologies, systems and processes in the power, buildings, and industrial sectors, we will launch the £1 billion Net Zero Innovation Portfolio. The portfolio will focus on ten priority areas that correspond with this Ten Point Plan, including… energy storage and flexibility; bioenergy; industrial fuel switching…' Point 10 also highlights that there will be £100 million provided for Energy Storage and Flexibility innovation challenges.

Jet Zero Strategy (July 2022)

4.5.12 Jet Zero Strategy (Ref 27) includes a 5-year delivery plan, setting out how the Government will achieve net zero aviation by 2050. The Strategy sets out the Government's vision for decarbonising aviation, focussing on the development of technologies in a way that maintains the benefits of air travel, especially post COVID 19, whilst maximising the opportunities that decarbonisation can bring for the UK.

4.5.13 The Strategy points out that SAF is currently commercially available, but not at the scale that is required to decarbonise the aviation sector. Therefore, the Government is committed to having at least five UK SAF production facilities under construction by 2025 and a SAF mandate in place with a target of at least 10% SAF by 2030. It also emphasises the Government's proactivity in "*looking at how to create the long-term conditions for investable projects in the UK, by continuing to engage stakeholders to gather key evidence and determine what further measures industry or government might be able to take*".

4.5.14 The Jet Zero Strategy: one year on was published in August 2022 to highlight the key successes. The report confirms that the Jet Zero Strategy will continue to be reviewed every 5 years.

4.5.15 Across the three guiding principles and six core policy measures in the Jet Zero Strategy as well as the next steps going forward. Among its successes within SAF, the report counted the publications of the second SAF Mandate consultation, outlining the proposed detailed design of a scheme that will seek to generate demand for SAF and further round of Advanced Fuels Fund, making a further £55.8m available to support UK

SAF projects through to construction. The report's next steps set a target for 2025 to bring the SAF mandate into force and complete the funding period for projects supported by the Advanced Fuels Fund.

Pathway to Net Zero Aviation; Developing the UK Sustainable Aviation Fuel Mandate (April 2024)

4.5.16 The UK SAF mandate (Ref 29) has emerged from the ambitions of the Jet Zero Strategy to increase the scale of SAF. It aims to secure demand for SAF and achieve GHG emissions savings by obligating the supply of an increasing amount of SAF in the overall UK aviation fuel mix. The SAF mandate could deliver up to 6.3 million tonnes of carbon savings per year by 2040.

4.5.17 The SAF Mandate starts in 2025 at 2% of total UK jet fuel demand, increasing linearly to 10% in 2030 and then to 22% in 2040. From 2040, the obligation will remain at 22% of total UK jet fuel demand until there is greater certainty regarding SAF supply. These measures are formalised through the Renewable Transport Fuel Obligations (Sustainable Aviation Fuel) Order 2024.

4.5.18 The Proposed Development will also support the overarching objective of the Government to continue transitioning the UK to a low-carbon economy and meeting the legally binding target of net zero GHG emissions by 2050. The recent energy and climate change policy that are relevant include:

a. The Climate Change Act 2008 (2050 Target Amendment) Order (June 2019) (Ref 41);
b. The Energy White Paper (December 2020)(Ref 23);
c. Net Zero Strategy: Build Back Greener (October 2021, updated April 2022)(Ref 25);
d. Biomass Policy Statement (November 2021) (Ref 30);
e. British Energy Security Strategy (April 2022) (Ref 26);
f. Powering Up Britain (March 2023, updated April 2023)(Ref 28);
g. Biomass Strategy 2023 (Ref 31);
h. The Second National Infrastructure Assessment (October 2023); and
i. Clean Power 2030 Action Plan (December 2024)(Ref 32).

The Climate Change Act 2008 (2050 Target Amendment) Order

4.5.19 The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (June 2019) (Ref 41) enshrines in law the Government's commitment to achieve 'net zero' in terms of GHG emissions by 2050. This is in line with the recommendations of the Committee for Climate Change ('CCC').

The Energy White Paper (December 2020)

4.5.20 The Energy White Paper 'Powering our Net Zero Future' ('EWP') (Ref 23) was presented to Parliament in December 2020 and builds on the Ten Point Plan. At the core of the EWP is the commitment to tackle climate change and achieve net zero. The EWP seeks to put in place a strategy for the wider energy system that transforms energy, supports a green recovery and creates a fair deal for consumers (page 4). As

with the Ten Point Plan, the EWP confirms the Government's support for new hydrogen technologies and CCUS drawing upon the resources provided by the North Sea.

4.5.21 The Government estimates (Introduction, page 15) that the measures in the EWP could reduce emissions across power, industry and buildings by up to 230Mt CO_2 in the period to 2032 and enable further savings in other sectors such as transport. In doing so, these measures could support up to 220,000 jobs per year by 2030. These figures include the energy measures from the Ten Point Plan as well as additional measures set out in the EWP. However, the EWP recognises that more will need to be done to meet key milestones on the journey to net zero.

4.5.22 The EWP (pages 16 to 17) provides an overview of the Government's key commitments to put the UK on a course to net zero. These are grouped under a number of headings and include:

4.5.23 Increasing the ambition in our Industrial Clusters Mission four-fold, aiming to deliver four low-carbon clusters by 2030 and at least one fully net zero cluster by 2040.

4.5.24 Investing £1 billion up to 2025 to facilitate the deployment of CCUS [Carbon Capture, Usage & Storage] in two industrial clusters by the mid-2020s, and a further two clusters by 2030, supporting our ambition to capture 10 Mt per year by the end of the decade."

4.5.25 Chapter 2 'Power' of the EWP sets out how it is proposed to decarbonise the power sector in terms of generation of electricity. This includes an expansion of other low-cost renewable technologies in addition to offshore wind. This proposal is aligned with the Ten Point Plan which suggests continuing to hold regular Contracts or Difference (CfD) auction rounds every two years to bring forward a range of low-cost renewable technologies. Subject to projects coming forward, the intention is to double the capacity awarded in the last round with the aim to deploy around 12GW of low-cost renewable generation.

4.5.26 Chapter 2 also sets out the how it is proposed to achieve net zero aviation, including establishing the Jet Zero Council to accelerate the development and adoption of new technologies, and investing £15 million into FlyZero as well as running a £15 million competition to support the production of sustainable aviation fuels in the UK, which is aligned with Point 6 set out in the Ten Point Plan.

4.5.27 Chapter 5 'Industrial Energy' sets out the goal for emissions from industry to fall by around 90% from today's levels by 2050. In order to achieve this (page 118) the Government: "…*will: Create a sustainable future for UK manufacturing industry through improved energy efficiency and the adoption of clean energy technologies*"

4.5.28 The EWP confirms that manufacturing and refineries, which form the bulk of industrial emissions, still account for around 1% of the UK's GHG emissions. About half of those emissions are concentrated in the UK's six major industrial clusters. This includes Teesside (see EWP Figure 8.1 on page 121 of the EWP) which accounts for 3.9Mt CO_2e of emissions (2018 figures).

4.5.29 In order to transform industrial energy, the EWP (page 122) states that we cannot rely on energy efficiency alone to reduce emission in line with the Government's 2050 goal. Manufacturing industry will also need to capture its carbon for onward transport and storage and switch from using fossil fuels to low-carbon alternatives.

4.5.30 In order to bring about change in the industry, the EWP includes a commitment (page 124) to increase the 'Industrial Clusters Mission' to support the delivery of four low-carbon industrial clusters by 2030 and at least one fully net zero cluster by 2040.

Industrial Decarbonisation Strategy (March 2021)

4.5.31 The Industrial Decarbonisation Strategy (Ref 24) is the first strategy published by a major economy, which sets out how industry can be decarbonised in line with net zero, while remaining competitive and without pushing emissions abroad. It builds on the Ten Point Plan and sets out the Government's vision for a prosperous, low-carbon UK industrial sector by 2050, and aims to provide industry with the long-term certainty it needs to invest in decarbonisation.

4.5.32 The Ministerial Foreword (page 6) emphasises that the 2020s will be crucial to industrial decarbonisation, with the UK needing to deploy key technologies such as Carbon Capture Usage and Storage (CCUS) while beginning the journey of switching from fossil fuel combustion to low-carbon alternatives such as electricity and bioenergy.

4.5.33 Chapter 4 'Adopting low-regret technologies and building infrastructure' states "To be on track to deliver net zero, we expect that the minimum, in all future scenarios, is 20TWh per year of fossil fuel use replaced with low-carbon alternatives in 2030". It goes onto state that "Current evidence strongly suggests that, given limited sustainable biomass supply, we may need to prioritise the use of biomass where it can be combined with carbon capture and storage (BECCS), resulting in negative emissions".

Net Zero Strategy: Build Back Greener (October 2021)

4.5.34 The 'Net Zero Strategy: Build Back Greener' (Ref 25) expands on key commitments in the Ten Point Plan and the EWP and sets out the next steps the Government proposes to take to cut emissions, seize green economic opportunities and leverage further private investment into net zero. The Strategy sets an indicative delivery pathway for emissions reductions to 2037 by sector. It is intended to put the UK on the path for Carbon Budget 6 and ultimately on course for net zero by 2050.

4.5.35 One of the key policies set out in relation to transport is to "Aim to become a world-leader in zero emission flight and kick-starting the commercialisation of the UK sustainable aviation fuel (SAF) so people can fly, and connect without guilt. Our ambition is to enable delivery of 10% SAF by 2030 and will be supporting UK industry with £180 million funding for the development of SAF production facilities". This policy is aligned with Point 6 set out in the Ten Point Plan.

Biomass Policy Statement

4.5.36 The Biomass Policy Statement was published in November 2021(Ref 30) identifies the priority sectors and applications of biomass across the economy to deliver net zero by 2050. Section 2.4 sets out biomass's role in a low carbon transport sector. This section states that SAF are one of the key levers available to government and industry to accelerate the transition to net zero aviation and can achieve life-cycle GHG emissions savings of over 70% compared with conventional jet fuel, when fully replacing kerosene. The Policy Statement states that the Government has introduced a world-leading, comprehensive programme of interventions aiming to commercialise the domestic SAF industry and deliver carbon savings. On top of competition funding, we have recently consulted on a UK SAF blending mandate British Energy Security Strategy (April 2022)

4.5.37 The British Energy Security Strategy was published in April 2022 (Ref 26) largely in response to soaring energy prices as a result of a sudden surge in demand following the COVID-19 pandemic, compounded by the Russian invasion of Ukraine. Much of the focus of the Energy Strategy is upon providing financial assistance to families and businesses struggling with higher energy bills, but it also looks at improved energy efficiency, reducing the amount of energy we need and addressing the underlying vulnerability to international oil and gas prices by reducing the UK's dependence on imported oil and gas.

4.5.38 The Strategy aims to expand the UK's renewable capacity by investing in the North Sea so that we are not wholly dependent on other countries for fuel, from industrial production to net zero aviation.

Powering Up Britain (March 2023)

4.5.39 The DESNZ published 'Powering up Britain' (Ref 28Ref 28) and constituent documents in March 2023 which include 'Powering up Britain: Energy Security Plan' and 'Powering Up Britain: Net Zero Growth Plan.'

4.5.40 "Powering up Britain" sets out the Government's priority to be energy independent in light with the invasion in Ukraine. It highlights the Government's mission to replace fossil fuels with renewable energy. It also confirms that the Government is making positive progress towards zero emission flights.

4.5.41 'Powering Up Britain: Net Zero Growth Plan' further sets out the steps that the DESNZ is taking to ensure the UK is more energy independent, secure and resilient. It recognises the targeted public investment that the Government has delivered for SAFs, for example, through the Advanced Fuels Fund. The Plan sets out key commitments in the transport sector, which include welcoming the Independent Review of Net Zero's recognition of the important role for low-carbon fuels (LCFs) in decarbonising sectors such as aviation and maritime. It states, "*We continue to make progress delivering on our ambitions for a thriving domestic sustainable aviation fuel (SAF) market, supported by a comprehensive policy package that includes a further consultation on our SAF mandate, responding to the Government-commissioned independent evaluation of developing a sustainable long-term UK SAF industry, and launching a second application window for the £165 million Advanced Fuels Fund*".

Biomass Strategy

4.5.42 The purpose of the Biomass Strategy (Ref 31) is to set out the role biomass can play in reaching net zero, what government is doing to enable that objective and where further action is needed. The document examines the sustainability, availability, priority uses as well as uses in different sectors of the economy.

4.5.43 Section 7.5 addresses the use of biomass within transport and recognises that currently biofuel is mainly incentivised by the UK RTFO. Page 171 reaffirms the position that biomass in the transport sector will need to be increasingly focused in areas and transport modes with limited alternatives to the use of liquid and gaseous fuels. This includes aviation and maritime, which are likely to require low-carbon fuels beyond 2050. To further reduce emissions, carbon capture and storage technologies will increasingly need to be applied to biofuel production processes, particularly in SAF production. Page 172 confirms that the UK Government is exploring opportunities to accelerate the commercialisation of UK SAF facilities such as through the Advanced Fuels Fund.

The Second National Infrastructure Assessment (October 2023)

4.5.44 The National Infrastructure Commission (NIC) is an executive agency of the HM Treasury established in 2017 which provides the government with impartial, expert advice on major long term infrastructure challenges. The Commission advises government on all sectors of economic infrastructure, defined as: energy, transport, water and wastewater (drainage and sewerage), waste, flood risk management and digital communications. One of the key outputs of the NIC is to produce a five-year analysis report of the UK's long term economic infrastructure needs.

4.5.45 On 18 October 2023 the Second National Infrastructure Assessment (NIA2) was published which established a number of recommendations for the government in relation to National Infrastructure.

4.5.46 A common thread of the recommendations under the energy and reaching net zero section of the report is for the UK to decarbonise by continuing to move away from fossil fuels and instead moving to technology that directly generates electricity.

Clean Power 2030 Action Plan

4.5.47 On 13 December 2024 the Government published the Clean Power Action plan (Ref 32Ref 32) to meet its clean power target with clean sources producing at least as much power as Great Britain consumes in total over a typical weather year and at least 95% of Great Britain's generation with a maximum of 5% from unabated gas. The Clean Power Action Plan recognises that a clean power system will include and require low-carbon dispatchable power such as gas with CCUS and other innovative technologies.

4.6 National Planning Policy Framework

4.6.1 The National Planning Policy Framework (NPPF), introduced in March 2012 (last updated December 2024) (Ref 38), sets out the Government's planning policies for England. It is a material consideration in planning decisions. Although paragraph 5 of the NPPF confirms that NSIPs are to be determined in accordance with the decision-making framework of the PA 2008 and relevant NPSs, decisions on NSIPs should also take account of any other matters that are "relevant", which may include the NPPF. The NPPF is supported by the Planning Practice Guidance (PPG), which provides more detailed guidance on various aspects of planning.

4.6.2 Section 2 'Achieving sustainable development' confirms (paragraph 7) that the purpose of the planning system is to contribute to the achievement of sustainable development, summarised as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". Paragraph 8 goes on to identify three overarching objectives to the achievement of sustainable development, which are interdependent and need to be pursued in mutually supportive ways. These are:

a. An Economic Objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
b. A Social Objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well- being; and
c. An Environmental Objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low-carbon economy.

4.6.3 The NPPF is supportive of infrastructure projects. One of the methods of fulfilling the objective of sustainable development listed at paragraph 8 under 'a) an economic objective' is through the "provision of infrastructure". Central to the NPPF is 'a presumption in favour of sustainable development', which is set out in Paragraph 11.

4.6.4 Paragraph 161 in Section 14 'Meeting the challenge of climate change, flooding and coastal change' states that:

4.6.5 "The planning system should support the transition to net zero by 2050 and take full account of all climate impacts including overheating, water scarcity, storm and flood risks and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low-carbon energy and associated infrastructure".

4.6.6 Paragraph 168 states that when determining applications for all forms of renewable and low-carbon energy developments and their associated infrastructure, local planning

authorities should not require applicants to demonstrate the overall need for renewable or low-carbon energy and give significant weight to the benefits associated with renewable and low-carbon energy generation and the proposals contribution to a net zero future.

4.6.7 NPPF policies of particular relevance include:

a. Building a strong, competitive economy;
b. Making effective use of land;
c. Meeting the challenge of climate change, flooding and coastal change; and
d. Conserving and enhancing the natural environment.

National Planning Policy for Waste

4.6.8 The National Planning Policy for Waste (NPPW) (Ref 157Ref 157) sets out specific waste planning policies for England. The document highlights how the waste ambitions can be achieved through "helping to secure the re-use, recovery or disposal of waste without endangering human health and without harming the environment".

4.6.9 Paragraphs 4 and 5 of the NPPW give regard to the suitability of sites. Paragraph 4 identifies that waste planning authorities should consider a broad range of locations including industrial sites, looking for opportunities to co-locate waste management facilities together and with complementary activities; and give priority to the re-use of previously-developed land, sites identified for employment uses, and redundant agricultural and forestry buildings and their curtilages. Paragraph 5 identifies that sites should be assessed against policies in the NPPW, physical and environmental constraints, the capacity of existing and potential transport infrastructure and the cumulative impact of existing and proposed waste disposal facilities on the well-being of the local community.

4.6.10 Paragraph 7 states that when determining applications waste planning authorities should consider the likely environmental impacts and locational implications of any advice on health from the relevant health bodies.

4.7 Local Planning Policy

Development Plan Documents

4.7.1 The SAF production facility, located in the Main Site is located within the administrative boundary of Stockton-on-Tees Borough Council (STBC). The DCO Order limits also includes land within the administrative boundary of Redcar & Cleveland Borough Council (RCBC).

4.7.2 The relevant development plan documents (DPDs) for the Site are therefore as follows:

a. STBC Local Plan (adopted January 2019) (Ref 55);
b. STBC Local Plan Policies Map (adopted 30 January 2019) (Ref 56);
c. Redcar & Cleveland Local Plan (adopted May 2018) (Ref 33);
d. Redcar & Cleveland Local Plan: Policies Map (adopted May 2018)(Ref 34); and,

e. The Tees Valley Joint Minerals and Waste DPDs (adopted September 2011) (Ref 35).

4.7.3 The Tees Valley Joint Minerals and Waste DPDs comprise a Minerals and Waste Core Strategy DPD and a Minerals and Waste Policies and Sites DPD. The Joint Minerals and Waste DPDs were prepared together by Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton-on-Tees. The Joint Minerals and Waste DPD is of limited relevance to the Proposed Development.

Planning Allocations/Designations

4.7.4 The key planning allocations/designation and related policies (based upon the relevant policies maps) that apply to the Site are listed below:

4.7.5 The key planning allocations/ designations and associated policies contained in the STBC Local Plan that apply to the Site:

a. Specialist Use Locations – Policies SD4 and EG4;
b. Specialist Employment Allocations – Policies SD4 and EG4;
c. Limits to Development – Policies SD3, SD4 and SD5.

4.7.6 The key planning allocations/ designations and associated policies that apply to the Redcar and Cleveland extent of the Site from the Redcar and Cleveland Local Plan are as follows:

a. Development limits – Policy SD3
b. South Tees Development Corporation – Policies LS4 and ED6;
c. General location for Large Waste Management Facilities – Policy MWC8;
d. 30km wind farm safeguarding area for Durham Tees Valley Airport– Policy SD6;;
e. 6km Special Protection Area (SPA) Buffer Zone- Policy N4.

4.7.7 The key planning allocations/ designations and associated policies contained in the Tees Valley Joint Minerals and Waste DPDs (adopted September 2011) that apply to the Site:

a. Safeguarding of Minerals Resources from sterilisation- Salt- Policy MWC4;and
b. Safeguarding of Minerals Resources from sterilisation- Gypsum- Policy MWC4; Local Geological Sites (LGS)- Policy N4.

Neighbourhood Plans

4.7.8 There are no adopted and emerging neighbourhood plans within RCBC or STBC that apply to the Proposed Development.

Local Plan Guidance

4.7.9 RCBC has also produced ‘The South Tees Area Supplementary Planning Document’ (‘SPD’) (adopted May 2018). Although this is not a DPD, it is an SPD and therefore is a material planning consideration to be taken into account in respect of development proposals being advanced within South Tees Area.

4.8 Key Policy Summary

4.8.1 Table 4.1 below details key policies from the STBC Local Plan 2019 (Ref 55); of relevance to the Proposed Development.

Table 4.1: Stockton-on-Tees Borough Council Local Plan 2019 – Key Policies Summary

Policy	Policy Summary
Policy EG4 – Seal Sands, North Tees and Billingham	Policy EG4 directs proposals for hazardous installations, uses related to the process industries, or emerging specialist sectors to three locations including North Tees and Seal Sands although proposals will recognise the cumulative importance for bird species associated with the Teesmouth and Cleveland Coast SPA and Ramsar site. Proposals for port and river-based uses will be directed to sites and premises at Billingham Riverside. This includes operational facilities, River based logistics, storage marine maintenance and energy generation.
Policy ENV 1 – Energy Efficiency	The Council will encourage all development to minimise the effects of climate change Measures include promoting zero carbon development, energy reduction efficiency, renewable or low-carbon. All major developments will demonstrate how they have reduced GHG emissions.
Policy ENV 2 – Renewable and Low-carbon Energy Generation	Planning applications for energy generation from renewable and low-carbon sources, other than wind energy generation, will be considered against the principles in Policy SD8. Proposals should be supported by a comprehensive assessment of the landscape, visual and any other impacts of the proposal. Developers should, where appropriate, provide a satisfactory scheme to restore a site.
Policy ENV 3 – Decentralised Energy Generation and Supply	The Council will promote and support decentralised energy such as District Heat and Power Networks" through a number of methods. All major development should investigate their use as part of the feasibility assessment and energy statement.
Policy ENV4 – Reducing and Mitigating Flood Risk	All new development will be directed towards areas of the lowest flood risk to minimise the risk of flooding from all sources and will mitigate any such risk through design and implementing sustainable drainage (SuDS) principles. Development on land in Flood Zones 2 or 3 will only be permitted following: a. The successful completion of the Sequential and Exception Tests (where required); and b. A site specific flood risk assessment, demonstrating development will be safe over the lifetime of the development, including access and egress, without increasing flood risk elsewhere and where possible reducing flood risk overall. Site specific flood risk assessments will be required in accordance with national policy.
Policy ENV5 – Preserve, Protect and Enhance Ecological Networks, Biodiversity and Geodiversity	The Council will protect and enhance the biodiversity and geological resources within the Borough. Development proposals will be supported where they enhance nature conservation and management, preserve the character of the natural environment, and maximise opportunities for biodiversity and geological conservation particularly in or adjacent to Biodiversity Opportunity Areas in the River Tees Corridor, Teesmouth and Central Farmland Landscape Areas.

Policy	Policy Summary
	Ecological networks and wildlife corridors will be protected, enhanced, and extended. Development that is likely to have an adverse effect on a Nationally designated sites, including broader impacts on the national network of Sites of Special Scientific Interest (SSSI) and combined effects with other development, will not normally be allowed. Development proposals should seek to achieve net gains in biodiversity wherever possible.
Policy ENV6 – Green Infrastructure, Open Space, Green Wedges and Agricultural Land	The Council will protect and support the enhancement, creation and management of all green infrastructure. Proposals should illustrate how the Proposed Scheme will be satisfactorily integrated into the surrounding area in a manner appropriate to the surrounding townscape and landscape setting and enhances the wider green infrastructure network. The loss of open space or open space, will not be supported unless it is demonstrated to satisfy 5 criteria Development proposals will be expected to demonstrate that they avoid the 'best and most versatile' agricultural land unless the benefits outweigh the need to protect such land for agricultural purposes.
Policy ENV7 – Ground, Air, Water, Noise and Light Pollution	All development proposals that may cause groundwater, surface water, air (including odour), noise or light pollution either individually or cumulatively will be required to incorporate measures as appropriate to prevent or reduce their pollution so as not to cause unacceptable impacts. Potential significant pollution either individually or cumulatively should be accompanied by an assessment of the likely impacts. Residual effects on human health or the environment will not be permitted.
Policy HE1 – Conservation and Enjoyment of the Historic Environment	The Council will maintain and promote the use of Historic Environment Records and Review and regularly update the SPD4 Conservation and Historic Environment Folder or any successor.
Policy HE2 – Conserving and Enhancing Stockton's Heritage Assets	Development with the potential to affect heritage assets should be supported by an appropriate assessment and seek to conserve heritage assets and archaeological remains.
Policy HE3 – Stockton & Darlington Railway	Proposal for development on or adjacent to the line(s) should show how the proposal has regard to the preservation of any physical remains along the route(s) and their interpretation on the ground and otherwise respects and interprets the route(s) where those remains no longer exist.
Policy SD1 – Presumption in favour of Sustainable Development	The Council will work proactively with applicants jointly to find solutions which mean that proposals for sustainable development can be approved wherever possible.
Policy SD2 – Strategic Development Needs	This policy identifies strategic growth needs for the period 2017/18 to 2031/32, which will be met through new sustainable development and infrastructure provision.

Policy	Policy Summary
Policy SD4 – Economic Growth Strategy; Specialist Uses	This policy directs economic development to appropriate locations to ensure sustainable growth. It also supports redevelopment of brownfield and derelict sites. Proposals for the redevelopment of previously developed land, in particular prominent sites which have been derelict for a significant period of time, will be supported. The policy also seeks to direct and safeguard specialist industrial uses to the Seal Sands, North Tees and Billingham Chemical Complex. Furthermore Port related development and other suitable economic growth uses, will be encouraged at Billingham Riverside.
Policy SD5 – Natural, Built and Historic Environment	To ensure the conservation and enhancement of the environment alongside meeting the challenge of climate change the Council will Conserve and enhance the natural, built, and historic environment through a variety of methods (including the Teesmouth and Cleveland Coast Special Protection Area and Ramsar)
Policy SD6 – Transport and Infrastructure Strategy	This policy seeks to ensure the road network is safe and there are reliable journey times, the Council will prioritise and deliver targeted improvements at key points on the local road network and work in conjunction with Highways England to deliver improvements at priority strategic locations on the strategic road network.
Policy SD7 – Infrastructure Delivery and Viability	This policy seeks to deliver infrastructure to address service deficiencies and meet demand from growth through planning obligation or Community Infrastructure Levy. Viability evidence will be needed where this cannot be achieved.
Policy SD8 – Sustainable Design Principles	The Council will seek new development to be designed to the highest possible standard, taking into consideration the context of the surrounding area. All proposals will be designed for public safety and crime reduction, incorporating, where appropriate, advice from the Health and Safety Executive, Secured by Design, or other appropriate design standards.

4.8.2 In January 2024, STBC's Full Council meeting agreed for a new Local Plan be undertaken. STBC anticipate that work on the Local Plan will begin in September 2025, with formal commencement on the plan to follow in 2026, with adoption expected in March 2029.

4.8.3 Table 4.2 below details key below outlines the key policies from the Redcar & Cleveland Local Plan 2018 (Ref 33) of relevance to the Proposed Development.

Table 4.2: Redcar and Cleveland Borough Council Local Plan 2018: Key Policies Summary

Policy	Policy Consideration
Policy SD3- Development Limits.	Within development limits, development will be supported, subject to meeting other policies in the Local Plan. Development beyond development limits, as defined on the Policies Map, will be restricted to thirteen categories.
Policy SD6- Renewable and	Renewable and low-carbon energy schemes will be supported and encouraged, and will be approved where their impact is, or can be made, acceptable.

Policy	Policy Consideration
Low-carbon Energy	Incorporation of renewable energy into a major application will also be supported. Renewable energy developments will not be allowed within, or where they are likely to have an adverse effect - alone, or in combination with other plans or projects - on designated ecological sites or on priority species, unless they meet the exceptions criteria set out in Policy N4. Development proposals for the generation of renewable energy will not be granted if there would be any adverse impacts on airport radar, unless mitigation is possible and a scheme for its provision is agreed with the airport affected.
Policy LS4- South Tees Spatial Strategy	The South Tees Spatial Strategy includes Wilton International; Teesport; South Tees Development Corporation area, South Tees Industrial; and Estates and Business. This Spatial Strategy contains a number of aims categorised into Economy, Connectivity and Environment. Within Economy the aims include to grow the environmental and recycling sector and encourage clean and more efficient industry in the South Tees area to help reduce carbon dioxide emissions and risk of environmental pollution.
Policy ED6- Promoting Economic Growth	This policy identifies existing business locations in the borough which will continue to be developed and safeguarded for employment uses including specialist industries. The policy requires applications to demonstrate that there will be no adverse effects on the integrity of the Teesmouth and Cleveland Coast SPA and Ramsar site, or other European designated nature conservation sites either alone or cumulatively and need to secure mitigation where necessary.
Policy MWC4: Safeguarding of Minerals Resources from Sterilisation	Within the minerals safeguarding areas, non-minerals development will only be permitted where the future extraction of the mineral resource would not be sterilised or there is evidence that the mineral has been sufficiently depleted; or the mineral will be extracted prior to development; or mineral resource preservation is outweighed by the benefits of the application.
Policy MWC8: General Locations for Waste Management Sites	Sustainable waste management will be delivered through a combination of large sites, which include clusters of waste management and processing facilities, and small sites for individual waste facilities. Allocations and proposals for large waste management facilities should be located in the land located around Teesport, Smiths Dock Road and the eastern end of Dockside Road (Middlesbrough and Redcar and Cleveland); around the Graythorp and Haverton Hill Road areas (Hartlepool and Stockton-on-Tees); and around the Port Clarence, Cowpen Marsh and Seal Sands areas (Hartlepool and Stockton-on-Tees). In determining the suitability of a site within these areas, consideration will be given to the potential impact on the protected European species associated with the Teesmouth and Cleveland Coast Special Protection Area and Ramsar Site and any functional land required to support them. Where likely adverse impacts are identified, avoidance or appropriate mitigation measures may be required. Allocations and proposals will be directed away from areas at risk of flooding. In considering sites.
Policy N2 – Green Infrastructure	The policy aims to protect and enhance the green infrastructure network and incorporate green infrastructure into developments. The policy also requires Green infrastructure to be designed to high standards. The policy identified strategic green infrastructure corridors and strategic gap which maintain the separate identity and character of individual settlements and to

Policy	Policy Consideration
	prevent their coalescence. Development will not be permitted where it conflicts with these stated aims
Policy N4- Biodiversity and Geological Conservation	This policy seeks to protect and enhance the borough's biodiversity and geological resources and will supports applications which enhance and preserve theses resources. The policy draws attention to the Biodiversity Opportunity Areas in the wider Tees Corridor, Teesmouth, East Cleveland and Middlesbrough Beck Valleys areas. The Council will also protect and preserve local, national and international priority species and habitats and promote their restoration, re-creation and recovery. Proposals will be considered in accordance with the status of biodiversity and geodiversity sites within the hierarchy.
Policy SD1- Sustainable Development	This policy confirms the Council will take a positive approach that reflects the presumption in favour of sustainable development and work proactively with applicants to secure developments that improve the economic, social and environmental conditions and to find solutions that enable proposals to be approved wherever possible.
Policy SD 2 – Locational Policy	Development will be directed to the most sustainable locations in the borough. The majority of development will be focused in the urban and coastal areas.
Policy SD4- General Development principles	This policy sets out the general development principles used to assess an application including compliance with the local plan's policies, no significant adverse environmental or amenities and does not increase flood risk.
Policy SD7- Flood and Water Management	This policy requires development to account for flood risk and avoid inappropriate development in areas at current or future risk. Development in areas at risk of flooding, will be granted where all of the following criteria are met: a. the proposal meets the sequential and exception tests (where required) in relation to the National Planning Policy Framework; b. a site specific flood risk assessment demonstrates that the development will be safe, including the access and egress, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall; and c. new site drainage systems are well designed, taking account of events that exceed the normal design standard (e.g. consideration of flood flow routing and utilising temporary storage areas).
Policy TA 1 Transport and New Development	The Council and its partners will ensure that the transport requirements of new development, commensurate to the scale and type of development, are taken into account and seek to promote sustainable travel to minimise environmental impacts. Future transport provision should take into account traffic forecasts. This should reflect existing demand and take account of other developments as well as trip reductions predicted as a result of the implementation of demand management measures identified in the Local Transport Plan (LTP).

4.9 The Levelling Up and Regeneration Act

National Development Management Policies

4.9.1 On 26 October 2023 the Levelling Up and Regeneration Act (Ref 57) came into force which seeks to introduce a number of changes to the Planning system in England.

4.9.2 Amongst the changes is the introduction of national development management policy ('NDMP'), which is defined in Section 94 of the Act as a policy (however expressed) of the Secretary of State in relation to the development or use of land in England, or any part of England, which the Secretary of State by direction designates as a national development management policy.

4.9.3 Paragraph (5C) of Section 93 of the Act is clear that if to any extent the development plan conflicts with a NDMP, the conflict must be resolved in favour of the NDMP. As noted above, Sections 104 and 105 of the Planning Act 2008 (Ref 2) set out the matters that the Secretary of State must have regard to in determining applications for development consent, which can include any other matters which the Secretary of State thinks are "important and relevant" to their decision. The Levelling Up and Regeneration Act is a matter that the Secretary of State may consider important and relevant in his determination of the DCO application.

4.9.4 It is envisaged that strategic priorities and issues of national importance would be set out within this document which could for example include net zero policies that it would be difficult to develop evidence to support at a district level, but which are nationally important. A national policy on carbon measurement and reduction is also being considered that the Levelling Up and Regeneration Act.

4.9.5 In February 2024 the government has published commencement regulations for the Levelling Up and Regeneration Act to progress the implementation of a number of the Act's planning provisions, including the national development management policies (NDMPs). At the present time there are no draft or published NDMPs.

5. Air Quality

5.1 Introduction

5.1.1 This chapter considers the impacts of the Proposed Development on air quality during construction, operation and decommissioning, and any potential significant effects. It sets out the proposed methodology for the air quality assessment and identifies those impacts that can be scoped out of the assessment. Where impacts are not scoped out, further assessment would be presented in the ES.

5.2 Policy, Legislation, and Guidance

5.2.1 The policy, legislation and guidance relevant to the assessment of the Proposed Development is shown in Table 5.1.

Table 5.1: Air Quality – Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Overarching National Policy Statement NPS for Energy (EN-1) 2024 (Ref 36)	The Overarching NPS for Energy (EN-1) 2024 makes reference to issues of air quality on the basis of emissions from generating stations or associated plant and discusses the potential for eutrophication of habitats as a result of nutrient deposition from emissions. It also references new $PM_{2.5}$ targets set under the Environment Act 2021. Additionally, it states that the Secretary of State must consider duties under other legislation including duties under the Environment Act 2021 in relation to environmental targets and have regard to policies set out in the Government's Environmental Improvement Plan in decision making.
National Policy Statement for Renewable Energy Infrastructure (EN-3) 2023 (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed. The NPS for Renewable Energy requires that applicants should include in the ES an assessment of the air emissions resulting from the proposed infrastructure and demonstrate compliance with the relevant regulations, including NOx, SOx, non-methane volatile organic compounds (NMVOC), $PM_{2.5}$ and PM_{10}.
National Planning Policy Framework (Ref 38)	The National Planning Policy Framework (NPPF) states that the planning system should manage growth such that local air quality should be improved. Decisions on planning should take into account the presence of AQMA and Clean Air Zones (CAZ) and the cumulative impacts from multiple local developments. Opportunities to improve air quality should be identified and encouraged through measures at the design stage and within the planning system.
The Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2) (Ref 52)	The AQS for England, Scotland, Wales and Northern Ireland was produced in response to the requirements described in the Environment Act 1995 for the production of an air quality strategy. The 2007 strategy is now due for update and as part of the Environment Act 2021 will be updated with a frequency of five years and approved within 12 months of review.

Policy / Legislation / Guidance	Description
Clean Air Strategy 2019 (Ref 53)	The Clean Air Strategy was produced by the UK Government in response to numerous, successful court challenges to the Government's strategy to improve air quality. The strategy identifies sources of air pollution at a national level and outlines aspirations for improvement.
Environmental Improvement Plan 2023 (Ref 54)	The Environmental Improvement Plan sets out the intended legally binding, long-term targets that both reduce concentrations of, and drive down human exposure to $PM_{2.5}$. Secondary legislation is required for these to be implemented in law. The interim and long-term targets are: By the end of January 2028: a. The highest annual mean concentration in the most recent full calendar year must not exceed 12 µg/m³ of $PM_{2.5}$. b. Compared to 2018, the reduction in population exposure to $PM_{2.5}$ in the most recent full calendar year must be 22% or greater. By the end of 2040: a. A maximum Annual Mean Concentration Target (AMCT) of 10 µg/m³ for $PM_{2.5}$ should be achieved. b. Population exposure to $PM_{2.5}$ should be reduced by 35% compared to 2018 levels.
Stockton-on-Tees Borough Council (Ref 55)	The STBC local plan makes reference to air quality under the following policies: a. Policy SD5 – Natural, Built and Historic Environment b. Policy ENV7 – Ground, Air, Water, Noise and Light Pollution
Redcar and Cleveland Borough Council (Ref 33)	The RCBC local plan makes reference to air quality under the following policies: a. Policy LS 4 – South Tees Spatial Strategy Policy TA 3 – Sustainable Transport Networks
Middlesbrough Council Local Development Framework Core Strategy (Ref 58)	The Middlesbrough Council local plan makes reference to air quality under the following policies and objectives: a. Policy CS4 – Sustainable Development b. Policy DC1 – General Development c. Spatial Objective 8 regarding the improvement of connectivity in Middlesborough d. Spatial Objective 9 regarding sustainable levels of economic growth
Legislation	
The Air Quality (Miscellaneous Amendment and Revocation of Retained Direct EU Legislation) (EU Exit) Regulations 2018 (Ref 59)	The Air Quality (Miscellaneous Amendment and Revocation of Retained Direct EU Legislation) (EU Exit) Regulations 2018 ensured the continuity of legislation following the UK exit from the European Union, previous air quality legislation having been driven by the requirements of European Union Directive 2008/50/EC.
The Environmental (Miscellaneous Amendments) (EU Exit) Regulations 2020 (Ref 60)	The Environmental (Miscellaneous Amendments) (EU Exit) Regulations 2020 ensured continued compliance with the retained European Union air quality regulations through the introduction of a limit value for $PM_{2.5}$ of 20 µg/m³.

Policy / Legislation / Guidance	Description
The Air Quality (England) Regulations 2000 - SI 2000 928 (Ref 61)	The Air Quality (England) Regulations 2000 set the initial limits for the acceptable concentrations for pollutants in ambient air and the dates by which they must be achieved.
The Air Quality (England) (Amendment) Regulations 2002- SI 2002 3043 (Ref 62)	The Air Quality (England) Regulations 2000 were amended by the Air Quality (England) (Amendment) Regulations 2002 by prescribing new air quality objectives for benzene and carbon monoxide.
The Air Quality Standards Regulations 2010 – SI 2010 1001 (Ref 63)	The Air Quality Standards Regulations 2010 transcribed into English Law the requirements of Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe. This updated the limits for acceptable concentrations for pollutants in ambient air and set the reporting requirements for member states to the European Commission.
Environment Act 1995 (Ref 64)	The Environment Act 1995 requires the UK Government and Devolved Administrations to produce the national Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS) containing standards, objectives and measures for improving air quality, and to keep these policies under review.
Environment Act 2021 (Ref 65)	The Environment Act 2021 aims to deliver cleaner air by requiring the government to set targets on air quality and by updating its National Air Quality Strategy. The Act set a legally binding duty on the government to bring forward at least two new air quality targets by 31 October 2022.
Guidance	
Institute of Air Quality Management (IAQM) Land-Use Planning & Development Control: Planning For Air Quality v1.2 (Ref 66)	The IAQM Planning Guidance provides guidance for the assessment of air quality in a number of areas. Screening criteria are provided, along with guidance on levels of impact and the assessment of significance specific to air quality. Guidance is provided on the expected content and level of detail in an air quality assessment.
IAQM Guidance on the Assessment of Dust from Demolition and Construction v1.1 (Ref 67)	The guidance provides a method for the assessment of the risk of dust impacts from activities related to demolition and construction sites. The method is semi-qualitative in that it requires numerical inputs for the number of nearby receptors and local air pollutant concentrations, which are then applied to subjective criteria such as perceived amenity in order to arrive at a level of risk. The assessed risk can then be used to prescribe site specific mitigation measures in order to ensure that the actual risk of dust impacts is reduced to zero.
National Planning Practice Guidance: Air Quality Guidance (Ref 68)	The UK Government guidance provides information on the position of air quality assessment within the UK planning systems and required content and detail that should be included in an air quality assessment. The guidance is very broad in its approach with more detail being provided by the IAQM.
Defra and the Devolved Administrations Local Air Quality Management Technical Guidance (TG22) (LAQM.TG(22)) (Ref 69)	The Local Air Quality Management (LAQM).TG(22) document provides the necessary guidance for the treatment of air quality monitoring and modelling. Methodologies are provided for the commissioning and operation of monitoring programmes and the treatment of collected data, along with the use of background concentrations and monitored concentrations in the calibration of modelled pollutant predictions.
Defra and the Environment	This guidance produced by the Environment Agency and Defra outlines the

Policy / Legislation / Guidance	Description
Agency Air emissions risk assessment for your environmental permit (Ref 70)	steps to be taken for an assessment of air quality relevant to Environmental Assessment Levels (EALs) and the limits and target values within the Air Quality Standards Regulations. The assessment is aimed specifically at the Environmental Permitting process for industrial installations.
IAQM A Guide to the assessment of air quality impacts on designated nature conservation sites Version 1.1 (Ref 71)	The IAQM guidance for air quality impacts on designated nature sites summarises the current methodologies and provides information on a number of pieces of case law regarding deposition of air pollutants to ecologically valuable areas. A suggested assessment process is presented which incorporates the cooperation of both air quality specialists and ecological specialists.
Environment Agency AQTAG06 Technical Guidance on Detailed Modelling Approach for an Appropriate Assessment for Emissions to Air (Ref 72)	The Defra technical guidance contains screening criteria for assessment, and the accepted factors for the conversion of pollutants in ambient air to deposition to the surfaces found in designated nature conservation sites. The guidance is written for the assessment of Habitat sites (formerly Natura2000 sites) however is considered applicable to all nature conservation sites.
Joint Nature Conservation Committee (JNCC) Report No. 665: Nitrogen Futures (Ref 73)	The report from the JNCC provides the national projections for concentrations of NH_3 in ambient air and rates of deposition for nutrient nitrogen from ambient air. The report presents a number of potential future scenarios, and as a conservative measure the Business As Usual (not meeting the National Emissions Ceiling Regulations) scenario is used for projections in this report.
IAQM Guidance on the assessment of odour for planning (Ref 74)	The guidance from the IAQM provides a summary on the assessment of odour following a review of available guidance from the relevant authorities and devolved administrations. A summary of odour benchmarks and potential impact descriptors for odour impacts are provided along with a summary of the benefits and shortfalls of various odour monitoring techniques.
Environment Agency H4 Odour Management (Ref 75)	The Environment Agency issued guidance note H4 in order to aid compliance with Environmental Permits related to odour emissions. The guidance provides information on the expected content of an odour management plan, and provides guidance on assessment, monitoring techniques and control measures.
World Health Organisation Air Quality Guidelines for Europe (Ref 77)	Guidelines for pollutant exposure produced by the World Health Organisation (WHO) together with the International Programme on Chemical Safety and the European Commission.

5.2.2 The current ambient air quality limit and objective values for key pollutants from the legislation and policy in Table 5.1 are shown in Table 5.2. Table 5.3 shows a list of the pollutants that may be released from the processes carried out at the Proposed Development and the associated EALs, as prescribed by the Environment Agency (Ref 109), are also shown in Table 5.3 and will be applied in the assessment of impacts, as appropriate.

Table 5.2: Air Pollutant Limit and Objective Values

Pollutant	Objective/Limit Value	Measure as	Date to be Achieved by and Maintained Thereafter		
			AQS	Regulations	2008/50/EC
Nitrogen dioxide (NO2)	200µg/m³ Not to be exceeded more than 18 times a year	1 hour mean	31-Dec-05	31-Dec-05	01-Jan-10
	40µg/m³	Annual mean	31-Dec-05	31-Dec-05	01-Jan-10
Oxides of nitrogen (NOX)	30µg/m³ For the protection of vegetation	Annual mean	31-Dec-00	31-Dec-00	19-Jul-01
Particulate matter (PM10), aerodynamic diameter up to 10µm	50µg/m³ Not to be exceeded more than 35 times in a year	24 hour mean	31-Dec-10	11-Jun-10	-
	40µg/m³	Annual mean	31-Dec-10	11-Jun-10	-
Particulate matter ($PM_{2.5}$), aerodynamic diameter up to 2.5µm	20µg/m³	Annual mean	-	10-Dec-20	-
Sulphur dioxide (SO_2)	266µg/m³ Not to be exceeded more than 35 times a year	15 minute mean	31-Dec-05	-	-
	350µg/m³ Not to be exceeded more than 24 times a year	1 hour mean	31-Dec-04	31-Dec-04	01-Jan-05
	125µg/m³ Not to be exceeded more than 3 times a year	24 hour mean	31-Dec-04	31-Dec-04	01-Jan-05
	20µg/m³ For the protection of vegetation	Annual and Winter average	31-Dec-00	31-Dec-00	19-Jul-01

Table 5.3: Environmental Assessment Limits for Metals and Trace Elements

Trace Element	Defined By	Environmental Assessment Level	Averaging Period
Ammonia (NH_3)	EAL	2,500µg/m³	1 hour mean
		180µg/m³	Annual mean
Lead (Pb)	Objective Value	0.25µg/m³	Annual mean
	Limit Value	0.5µg/m³	Annual mean
Arsenic (As)	Target Value	6ng/m³	Running annual mean
Cadmium (Cd)	Target Value	5ng/m³	Annual mean
Nickel (Ni)	EAL	0.7µg/m³	1 hour mean
	Target Value	20ng/m³	Annual mean
Chromium III (Cr)	EAL	2.0µg/m³	24 hour mean
Copper (Cu)	EAL	0.05µg/m³	24 hour mean
Zinc (Zn) (as zinc oxide (ZnO_2)	EAL	1,000µg/m³	1 hour mean
	EAL	50µg/m³	Annual mean
Selenium (Sn)	EAL	2µg/m³	24 hour mean
Manganese (Mn)	EAL	1,500µg/m³	1 hour mean
	EAL	0.15µg/m³	Annual mean
naphthalene	EAL	3µg/m³	24 hour mean

Trace Element	Defined By	Environmental Assessment Level	Averaging Period
Bromine (Br)	EAL	70µg/m³	1 hour mean
Chlorine (Cl)	EAL	290µg/m³	1 hour mean
Antimony (Sb)	EAL	150µg/m³	1 hour mean
	EAL	5µg/m³	Annual mean
Acetaldehyde	EAL	9,200µg/m³	1 hour mean
	EAL	370µg/m³	Annual mean
Formaldehyde	EAL	100µg/m³	30 minute mean
	EAL	5µg/m³	Annual mean

5.3 Study Area

Construction Stage

5.3.1 During the construction stage the study area for the assessment of impacts is defined by the criteria in the IAQM Guidance on the Assessment of Dust from Demolition and Construction (Ref 67). An assessment of the risk of dust impacts is required where there is:

a. A human receptor within 250m of the construction site boundary or within 50m of the routes used by construction traffic on the public highway up to 250m from the site entrance; or
b. An ecological receptor within 50m of the construction site boundary or within 50m of the routes used by construction traffic on the public highway up to 250m from the site entrance.

Operation Stage

Human Receptors

5.3.2 For the assessment of operational impacts there is no specific guidance on the required study area for the assessment of impacts on human receptors, therefore a proportionate approach is applied using professional judgement, which may vary in subsequent stages of assessment. For the scoping report a distance of 2km from the site boundary is used on the basis that significant impacts from combustion plant typically do not result in significant human health impacts beyond this distance.

Ecological Receptors

5.3.3 For the assessment of operational impacts on ecological receptors, a study area of 15km from the site boundary is applied according to the guidance provided in AQTAG06 (Ref 72) and the Environment Agency (Ref 70) for large combustion plant for both European and nationally designated sites. A study area of 2km for locally designated sites will be applied, in line with the guidance (Ref 71).

5.4 Baseline Conditions and Future Baseline

Baseline

Local Air Quality Management

5.4.1 The Proposed Development is located primarily within the local authority area of Stockton-on-Tees but also extends into RCBC and is close to the border of. Middlesborough Council.

5.4.2 The following local authorities are also present within the 15km study area but not adjacent to the Proposed Development:

a. Hartlepool Borough Council;
b. Darlington Borough Council;
c. Durham County Council;
d. Hambleton District (North Yorkshire); and
e. Scarborough District (North Yorkshire).

5.4.3 Due to the distance or location of these local authorities, no significant effects are expected within these areas. Should detailed analysis at subsequent stages of the environmental assessment process show that effects upon local air quality in these areas is possible, then a more detailed assessment will be presented.

5.4.4 The baseline monitoring datasets in this section have been sourced from available local authority data and Defra base mapping. Defra publishes background pollutant mapping for every 1km x 1km Ordnance Survey (OS) grid square across the UK for NO_2, NO_x, PM_{10}, $PM_{2.5}$. Data for the base year of 2021 has been derived, and projections for future years are available, however data for 2021 will be used for the assessment, assuming

no correction factors applied for more recent years, and therefore it is considered to represent worst case background concentrations for the assessment.

5.4.5 The most recent Defra background data for monitoring of CO and SO_2 in the vicinity of the Proposed Development are for the reference year 2001. Defra no longer produces up to date background data for these pollutants but advocates the use of the UK Pollution Climate Mapping (PCM) data available for CO and SO_2 from 2010 for use in assessments.

Stockton-on-Tees

5.4.6 LAQM information has been taken from the 2024 Air Quality Annual Status Report (ASR) (Ref 80), which states that there are no AQMAs declared for Stockton-on-Tees.

5.4.7 The 2024 ASR identifies the principal source of air pollution in the area as emissions from vehicle traffic. It also notes that there are numerous businesses within the borough regulated by the Environment Agency and the local authority under the Environmental Permitting Regulations.

5.4.8 Monitoring is undertaken through the use of automatic monitors at three sites, and passive diffusion tubes at 13 sites. The nearest automatic monitoring site is UKA00153 (Billingham), an industrial monitoring site located approximately 5.7km west. The annual mean NO_2 concentration recorded at this site in 2023, the latest year with available data, was 12.4µg/m^3. In the last five years, the highest recorded annual mean NO_2 concentration was 16.5µg/m^3 in 2019. Both of these values are substantially below the annual mean NO_2 air quality objective of 40µg/m^3.

5.4.9 All other monitoring sites recorded NO_2 concentrations under the objective value of 40µg/m^3 between 2020 and 2023. A single exceedance of the objective was experienced in 2019 at Yarm Road, adjacent to the A66 trunk road where a concentration of 40.4µg/m^3 was recorded, however this location is approximately 9km from the Proposed Development so cannot be considered representative of local air quality at the Proposed Development location.

5.4.10 There are no Stockton-on-Tees air quality monitoring locations within the operational impacts 2km study area for the Proposed Development and therefore all of the monitoring undertaken is considered too remote to be representative of local air quality at the Proposed Development location but are useful to provide context to the local air quality.

Redcar and Cleveland

5.4.11 The 2024 ASR (Ref 82) for Redcar and Cleveland states that air quality in the borough is considered to be good and in compliance with the UK objectives. It recognised that whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution. There are currently no AQMAs declared for Redcar and Cleveland.

5.4.12 The nearest monitoring locations to the Proposed Development site are in Redcar and Cleveland, being the roadside diffusion tube monitoring site R27 (West Lane) at 3.1km south and the suburban diffusion tube monitoring site R51 (Broadway) at 3.5km south. Neither of these sites recorded an annual mean NO_2 concentration above the air quality objective, with the maximum concentration recorded being 24.8 µg/m^3 at R27 in 2019.

5.4.13 Redcar Dormanstown is the nearest automatic monitoring site to the Proposed Development, that records NO_2, PM_{10} and $PM_{2.5}$ and is situated 4.5km to the east of the Proposed Development site. No exceedances of the NO_2 or PM_{10} annual mean of 40µg/m^3 were recorded between 2018 and 2023, which the highest NOx value of 11µg/m^3 recorded in 2021 and the highest PM_{10} value of 14µg/m^3 recorded in 2019, 2021 and 2022. Equally, there were no recorded exceedances of the $PM_{2.5}$ air quality objective of 20µg/m^3 or the interim target of 12µg/m^3, with the maximum recorded value being 9.8µg/m^3 in 2019.

5.4.14 Due to the distance between these monitoring locations and the Proposed Development site, they are not considered to be representative of air quality conditions at the Proposed Development but are useful to provide context to the local air quality.

Middlesborough

5.4.15 The 2024 ASR for Middlesborough (Ref 81) notes that air quality in the borough has been steadily improving since recording began. Data from the automatic monitoring undertaken in the borough shows a sustained improvement in concentrations of NO_2, PM_{10} and $PM_{2.5}$ between 2019 and 2023.

5.4.16 Middlesborough currently undertakes monitoring at two continuous, automatic sites and at 23 sites for NO_2 passive diffusion tubes. All of the monitoring undertaken in Middlesborough is too remote from the Proposed Development to be considered representative of conditions at the site of the Proposed Development.

5.4.17 There are currently no AQMAs declared for Middlesborough.

Hartlepool

5.4.18 The 2022 ASR (Ref 84) states that air quality in the borough is generally considered to be good in areas where the public are regularly exposed on the basis that monitored concentrations of air pollutants are below the UK objective values.

5.4.19 Concentrations of both NO_2 and PM_{10} recorded in 2019 are both substantially below the annual limit value of 40µg/m³ common to both pollutants.

5.4.20 There are currently no AQMAs declared for Hartlepool.

Summary

5.4.21 Given the distance of the available monitoring sites to the Proposed Development, it is proposed that Defra background data is used in the assessment. The most recent base

mapping for 2021 will be used and in order to ensure a conservative assessment is carried out, the projections for future years will not be applied, given that these generally show an improvement (reduction) in background concentrations over time.

Ecological Impacts

5.4.22 For the purpose of assessing the impact of the deposition of combustion pollutants, background information will be obtained from the Air Pollution Information Service (APIS) website (Ref 86).

5.5 Sensitive Receptors

Human Receptors

5.5.1 The location of human receptors has been determined using open online mapping (Ref 87), at locations where the relevant air quality objective and limit values would apply.

5.5.2 There are no human health receptors within 2km of the location of the Proposed Development, with the closest residential areas outside of the 2km Study Area including:

a. Port Clarence (2.2 km South west);
b. Cowpen Bewley (3.6km West);
c. Greatham (3.0km North west);
d. Seaton Carew (4.8km North);
e. Warrenby (4km East); and
f. South Bank (2.7km South).

5.5.3 The locations presented above are a non-exhaustive list which may be modified as the project design evolves.

5.5.4 The nearest AQMA is the Scarborough AQMA, approximately 23km to the south east of the Proposed Development. Given the distance to the AQMA, it is considered unlikely that the AQMA would be affected by the Proposed Development.

Ecological Receptors

5.5.5 Relevant ecological receptors identified within the 15km study area have been determined from Natural England datasets (Ref 88). These include:

a. Teesmouth and Cleveland Coast SPA, Ramsar and SSSI which are directly adjacent to the Proposed Development;
b. North York Moors SPA, SAC and SSSI located approximately 10km south east of the Proposed Site;
c. Northumbria Coast SPA and Ramsar, located approximately 13km north west of the Proposed Site;
d. Durham Coast SAC and SSSI, located approximately 13km north west of the Proposed Site;
e. Lovell Hill Pools SSSI;

f. Saltburn Gill SSSI;
g. Hart Bog SSSI;
h. Braircroft Pasture SSSI;
i. Pike Whin Bog SSSI; and
j. Whitton Bridge Pasture SSSI.

5.5.6 In addition, there is one National Nature Reserve (NNR), Teesmouth NNR, within 2km of the Proposed Development being located approximately 0.6km north west of the Proposed Site.

5.6 Design, Mitigation, and Enhancement Measures

Construction Phase

5.6.1 The construction dust risk assessment will follow the IAQM guidance (Ref 67) which assumes an unmitigated scenario for the construction programme. The level of risk derived in the unmitigated scenario is then used to assign project, process or location specific mitigation measures according to the risk of dust impacts. Typical mitigation measures include but are not limited to:

a. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation;
b. Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site;
c. Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas;
d. Ensure all on-road vehicles comply with the requirements of the relevant standards;
e. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
f. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
g. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
h. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority; and
i. Carry out regular site inspections to monitor compliance with the DMP.

Operation Phase

5.6.2 There will be numerous operational process emissions from the SAF production facility. Adherence to the conditions of the Environmental Permit, that will be required to enable the operation of the Proposed Development will also ensure that mitigation functions correctly though stipulated conditions for the operation of the plant. The pollutants anticipated to be controlled by the permit include those in Table 5.2 and Table 5.3, however the final controls will be defined by the Environment Agency upon determination of the Environmental Permit. Abatement systems will be developed to control regulated pollutants where required, including NOx, SO_2, VOC's, Particulate Matter etc.

5.7 Description of Potential Likely Significant Effects

Construction Phase

5.7.1 The construction of the Proposed Development has the potential to result in the following impacts:

a. Nuisance dust deposition at nearby designated nature conservation sites and residential receptors;
b. Changes in local concentrations of NO_X NO_2 and particulate matter as a result of the operation of:
   1. construction vehicles on the public highway
   2. employee travel to and from the Proposed Development location
c. Changes in local concentrations of NO_X, NO_2, SO_X and particulate matter as a result of the flows of marine construction traffic on the River Tees.

Operation Phase

5.7.2 Operational impacts have the potential to be in the form of changes in the local concentrations of air pollutants. These might include:

a. Changes in concentrations of NO_X, NO_2, particulate matter, NH_3, trace elements and heavy metals as a result of industrial emissions from the SAF production and energy generation process and other associated support processes at the Proposed Development;
b. Emission of VOCs and naphthalene due to evaporation from SAF and renewable naphtha during storage and transfer;
c. Changes in concentrations of NO_X, NO_2, SO_X and particulate matter as a result of:
   1. marine or rail transportation processes associated with the Proposed Development;
   2. employee transport to and from the location of the Proposed Development; and
   3. movement of operational consumables and waste streams by road.

5.7.3 Each of these changes may affect both human receptors in terms of changes in concentrations relevant to the limit and objective values in place for the protection of human health, and changes in the ambient concentrations of pollutants and rates of pollutant and nutrient deposition in place for the protection of vegetation.

5.8 Proposed Assessment Methodology

5.8.1 The assessment of the risk of construction dust impacts will be undertaken according to the guidance provided by the IAQM (Ref 67). The assessment takes into account the site activities of site clearance (including processing of e.g. concrete), earthworks, construction and trackout of construction vehicles on the public highway. The assessment will take account of the number and proximity of both human receptors and designated conservation sites according to the screening criteria defining the study area.

5.8.2 Where traffic data can be supplied for construction vehicles on the public highway and marine traffic on the River Tees these will be screened against criteria for changes in

flows in the IAQM Planning Guidance (Ref 66) and LAQM.TG(22) (Ref 67) respectively. Should assessment of these elements be required following screening then dispersion modelling will be undertaken using ADMS-Roads for construction traffic emissions and ADMS should marine traffic emissions subsequently meet the screening criteria to be scoped back in, for the following scenarios:

a. Baseline (for the purpose of model validation);
b. Peak construction year without construction traffic; and
c. Peak construction year with construction traffic.

5.8.3 The model will make predictions at discrete human receptor locations within 200m of the emission sources.

Operation

5.8.4 Operational impacts from the Proposed Development will be assessed using the ADMS gaussian plume dispersion modelling software from Cambridge Environmental Research Consultants.

5.8.5 The Proposed Development is located in a complex area that incorporates a variety of land uses, together with the complex coastal and inter-tidal effects on meteorology that can result in frequent, local temperature inversions and sea mists. The ADMS model can be run with variable terrain and surface roughness in order to simulate such complex situations, and average sea surface temperatures can be applied through the use of the coastline module within the program.

5.8.6 **Chapter 2: The Proposed Development Description** details a number of potential emission sources within the Proposed Development, not all of which may be emitting constantly, and those that are, may vary in intensity of emissions with time, quality and quantity of feedstock, storage capacity and product demand.

5.8.7 The ADMS software allows for the inclusion of time -variable and emission-variable scenarios to be included in the dispersion model should they be required. The ADMS model will be used to calculate pollutant concentration predictions from the Proposed Development at local human receptors which will be compared to the limit and objective values for the predictions made.

5.8.8 Where predictions for NO_X are made, a conversion to NO_2 will be made based on the following worst-case Environment Agency criteria (Ref 89):

a. 35% of NO_X is converted to NO_2 for short-term (hourly) average predictions; and
b. 70% of NO_X is converted to NO_2 for long-term (annual) average predictions.

5.8.9 Receptor predictions will be made at discrete receptor locations expected to be identified through the use of OS datasets, however the effectiveness of this will be monitored through the use of an additional coarse receptor grid up to 10km from the Proposed Development to determine the maximum extent of changes in the concentrations of air pollutants.

5.8.10 Generated operational phase road traffic movements are unlikely to be sufficient in number to warrant detailed assessment. It is therefore not proposed to assess the operational road traffic emissions.

Designated Nature Conservation Sites

5.8.11 The modelling of deposition as a result of NO_X , SO_2 and NH_3 emissions will be undertaken following guidance provided by the IAQM (Ref 73) and using the outputs from the ADMS modelling with the application of factors to calculate the rate of nutrient deposition according to the pollutants modelled. The deposition velocities and factors that allow calculation of the rate of deposition can be found in the Environment Agency AQTAG06 guidance (Ref 72).

5.8.12 Impact predictions will be made using a regular grid of receptors for those sites nearest and adjacent to the Proposed Development such that isopleths can be produced to locate the areas of greatest impact. For more remote sites a receptor on the nearest site boundary point to the Proposed Development will be used.

Cumulative Effects

5.8.13 An accurate assessment of cumulative effects would require detailed emission data from all other industrial processes within the study area. This information may not be available for all planned schemes depending on where they are in the planning process. Where information is available from existing planning applications, an assessment of cumulative effects will be carried out.

5.8.14 For the assessment of designated sites, it is a specific requirement to assess in combination effects as defined in paragraph 5.2.4 of the IAQM guidance ‘A guide to the assessment of air quality impacts on designated nature conservation sites.’ (Ref 71). These effects are cumulative air quality impacts of the project or plan being authorised with other relevant projects and plans that are in the public domain. The methodology to assess these impacts are likely to focus on areas with elevated background and/or baseline concentrations and will be agreed in consultation with Natural England.

5.9 Significance of Effect Criteria

Construction Phase

5.9.1 A final judgement on the significance of effects from the construction of the Proposed Development will be made following the IAQM guidance (Ref 66) which states that where appropriate mitigation measures are put in place as determined from the dust risk assessment, it is expected that the impacts of the construction should be negligible and not significant.

5.9.2 The dust risk assessment process and mitigation are intended to be used dynamically throughout the construction process in order to account for unforeseen creation of nuisance dust, complaints received, and observations from site walkovers.

5.9.3 Significance will be determined through the use magnitude of impact criteria defined by the IAQM (Ref 66) for long-term and short-term impacts in Tables 5.4 and 5.5.

5.9.4 The long-term impact criteria for ambient air pollutants are shown in Table 5.4.

Table 5.4: IAQM Long-term Effect Impact Descriptors

Long-term Average Concentration at Receptor in Assessment Year	Change in Concentration Relative to the Air Quality Assessment Level (AQAL)			
	1%	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

5.9.5 The descriptors in Table 5.4 should only be used on long-term (annual) pollutant predictions at individual receptor locations and should be based on model predictions and whole number percentage changes in emissions against the limit or objective value for the given pollutant. The AQAL is the appropriate limit or objective value for a pollutant or the Environment Agency EALs.

5.9.6 For short-term impacts on ambient air pollutant concentrations, the IAQM (Ref 66) prescribes the criteria shown in Table 5.5.

Table 5.5: IAQM Short-term Effect Impact Descriptors

Peak Short-term Process Concentration Range Relevant to the AQAL	Magnitude Descriptor	Severity Descriptor
11-20% of AQAL	Small	Slight
21-50% of AQAL	Medium	Moderate
>51% of AQAL	Large	Substantial

5.9.7 The significance of the effect can be determined through the use of the impact descriptors for short- and long-term impacts whilst also taking account a number of factors such as, but not limited to:

a. The general sensitivity of the receiving environment;
b. The presence of AQMA;
c. The existing and future air quality in the receiving environment in the absence of the Proposed Development; and

d. The extent of current and future population exposure to air pollutants.

5.9.8 The determination of significance of impacts is made on the basis of professional judgement of all the factors from the model outputs and receiving environment. Negligible or Slight effects may be judged as significant if they are sufficiently numerous and geographically concentrated such that cumulatively they might cause a measure of harm to human health. Conversely, moderate or substantial effects may not be judged as significant if they are few in number and sufficiently isolated that the overall risk to human health could be considered to be negligible.

5.9.9 Where an assessment of odour is required, impact and effect descriptors will be determined based on the relative offensiveness benchmarks for the source of odour in the relevant odour-emitting plant or equipment. A judgement of significance will be determined based on model outputs, the general sensitivity of the receiving environment and the established presence of any other odour-emitting process in the area of the Proposed Development.

Designated Nature Conservation Sites

5.9.10 In consultation with Natural England, the assessment of impacts from concentrations of NH_3 and changes to the rates of nutrient nitrogen deposition will be based upon the 1% insignificance criteria against Critical Loads and Critical Levels referred to in the IAQM guidance (Ref 71) and AQTAG06 (Ref 72). Should this criterion be triggered at any location then the results will be considered further to determine the significance of the impact based on the type and condition of the habitats and species present.

Construction

5.9.11 Cumulative Effects from the construction of the Proposed Development will be undertaken through a review of all local planning applications with the potential to be under active construction in parallel with the Proposed Development within a 250m radius following the suggested mitigation measure in the IAQM guidance (Ref 68) to coordinate construction activities and construction traffic movements on the public highway with all sites within a 250m radius of the construction site boundary.

Operation

5.9.12 The significant of cumulative effects on air quality within the study area will be made using the same criteria from the IAQM guidance (Institute of Air Quality Management, 2017) on the assumption that the emissions from industrial processes and other sources of air pollutants within the study area are accounted for in the Defra background pollutant datasets (Ref 85).

5.10 Limitations and Assumptions

5.10.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

a. The methodology proposed will be based on design data calculated for all processes listed in **Chapter 2: The Proposed Development Description**;
b. The construction dust risk assessment assumes the use of site plans and construction methodologies/method statements together with assumptions on the types and quantities of materials required and details of any site preparation or earthworks; and
c. Cumulative emission sources are accounted for in the Defra background air pollutant datasets.

6. Noise and Vibration

6.1 Introduction

6.1.1 This chapter considers the impacts of noise and vibration during construction and operation of the Proposed Development and any potential significant effects. It sets out the proposed methodology for the noise and vibration assessment and identifies those impacts that can be scoped out of the assessment. Where necessary, further assessment will be presented in the ES.

6.1.2 A desktop review of the Site and surrounding area has identified sensitive human receptors and ecological receptors. This chapter focuses on the noise and vibration assessment for sensitive human receptors. The noise and vibration assessment of ecological receptors is provided within **Chapter 7: Terrestrial Ecology** and **Chapter 8: Marine and Freshwater Ecology**.

6.2 Policy, Legislation, and Guidance

6.2.1 The policy, legislation, and guidance relevant to the assessment of the Proposed Development is shown in Table 6.1. Documents relevant to ecological receptors are summarised in Table 7.1 and Table 8.1.

Table 6.1: Noise and Vibration – Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Noise Policy Statement for England (NPSE) 2010 (Ref 341Ref 341)	The NPSE was published on 15 March 2010. It sets out the long-term vision for government noise policy, to promote good health and a good quality of life through the management of noise.
National Planning Policy Framework (NPPF) 2024 (Ref 38)	Last updated in December 2024, the NPPF sets out the Government's planning policies for England and how these are expected to be applied.
Overarching National Policy Statement (NPS) For Energy (EN-1) 2024 (Ref 36Ref 36)	This document sets out that operational noise including ancillary activities associated with development, such as increased road traffic movements or other forms of transportation, should be assessed using the principles of the relevant British Standards where appropriate.
National Policy Statement (NPS) for Renewable Energy Infrastructure (EN-3) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed. This document states that where the project is likely to have noise and vibration impacts the applicant must undertake an assessment as required in Section 5.12 of EN-1. It requires that the Secretary of State should consider the noise and vibration impacts according to Section 5.12 in EN-1 and be satisfied that noise and vibration will be adequately mitigated through requirements attached to the consent.

Policy / Legislation / Guidance	Description
Legislation	
Control of Pollution Act, 1974 (CoPA) (Ref 173Ref 173)	CoPA (Ref 173) gives local authorities powers to control noise from construction sites and enable developers to apply for prior consent for construction works. Section 72 of that Act defines what is meant by "best practicable means" and requires that regard be had to relevant codes of practice, one of which is British Standard BS 5228 (parts 1 and 2).
Environmental Protection Act 1990 (Ref 171Ref 172)	The Environmental Protection Act 1990 deals with noise and vibration as a statutory nuisance (but does not directly apply to construction works) and sets out requirements for certain prescribed industrial processes to be controlled (by environmental permits), primarily to control pollution other than noise and vibration.
Guidance	
BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 1: Noise (Ref 340Ref 340)	This document provides a prediction methodology for construction noise, gives construction plant noise data, determines the approach taken to evaluate noise levels from the construction works and provides basic methods for noise control, amongst other things.
BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration (Ref 338Ref 338)	This document determines the approach taken to evaluate and control vibration from the construction works.
Design Manual for Roads and Bridges (DMRB) LA 111 - Noise and vibration. Revision 2 (Ref 342Ref 342)	This document determines the approach taken to evaluate noise and vibration levels during the construction, operation and maintenance of highways projects. Although this is not a highways project, the methodology used to appraise the effects of construction traffic is deemed to be appropriate.
Calculation of Road Traffic Noise 1988 (CRTN)	Details the prediction methodology for noise from road traffic.
BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (Ref 346Ref 346)	This document is used for measuring, predicting and assessing the impact of noise from industrial processes and plant, including mobile plant operating on the site
Institute of Environmental Management and Assessment (IEMA) – Guidelines for environmental noise impact assessment:	The 'IEMA Guidelines' address the principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. The guidelines provide specific support on how noise impact assessment fits within the EIA process.

Policy / Legislation / Guidance	Description
October 2014. (Ref 345)	
Planning Practice Guidance: Noise (Ref 345Ref 345)	Advises on how planning can manage potential noise impacts in new development. The guidance also introduces the concept of the assessment of effects on health and wellbeing.

6.3 Study Area

6.3.1 The Study Areas for sensitive human receptors are:

a. For construction noise, a Study Area of 300m from the Site will be adopted. This is the distance beyond which BS 5228-1:2009+A1:2014 (Ref 340Ref 340) states than noise predictions should 'be treated with caution'. It is considered sufficient to ensure that all potentially significant noise effects will be identified and addressed.
b. For construction vibration, a Study Area of 100m from the closest construction activity with the potential to generate vibration will be adopted. This is the distance up to which the data was analysed that underpins the empirical predictors for vibration given in BS 5228 2:2009+A1:2014 (Ref 338Ref 338) . Furthermore, DMRB LA111 (Ref 342Ref 342) states; "A study area of 100m from the closest construction activity with the potential to generate vibration is normally sufficient to encompass vibration sensitive receptors."
c. For construction traffic noise, a 50m Study Area from public roads with an expected increase of 1 dB(A) or more due to construction traffic will be adopted. This is in line with the guidance in DMRB LA111 (Ref 342Ref 342) which does not require the assessment of effects at receptors more than 50m from works.
d. For operational noise from fixed plant and equipment, a Study Area of 1km from the Site will be adopted. This is considered sufficient to ensure that all potentially significant noise effects will be identified and addressed. Sources of operational noise from the Proposed Development are anticipated to be located at a distance of greater than 800m from the nearest human receptors. At those receptors, it is anticipated that the noise environment will be dominated by other sources such as road traffic, and that, due to the distance between the source and receiver, noise from the operation of the Proposed Development will not lead to a significant effect.
e. For operational vibration from fixed plant and equipment, a Study Area of 100m from the Site will be adopted. This is considered sufficient to ensure that all potentially significant vibration effects will be identified and addressed. Sources of operational vibration from the Proposed Development are anticipated to be located at a distance of greater than 800m and therefore will not lead to a significant effect. It is proposed to scope out operational vibration from fixed plant and equipment.

6.3.2 Professional judgement may be used to amend these Study Areas, as appropriate.

6.4 Baseline Conditions and Future Baseline

6.4.1 The Main Site is remote from larger areas of residential receptors, with the nearest residential NSR located approximately 2.8km to the south west (residential properties

on Saltview Terrace in Port Clarence), 2.9km to the north west (Marsh House Farm, Greatham) and 4.2km to the east (Marsh Farmhouse, Warrenby). The nearest residential settlements are South Bank (approximately 2.8km south west) and Redcar (approximately 5km east), including Warrenby and Dormanstown (approximately 4km east).

6.4.2 Project specific baseline sound level monitoring will be carried out to inform the noise and vibration assessment for the Proposed Development, if required.

6.4.3 Consultation with STBC and RCBC will be undertaken to determine NSRs and the suitability of existing data available for reuse (e.g. from the NZT and H2T Projects). The extent of the Study Area is defined to include the NSRs/communities in each direction from the Proposed Development Site, that may be affected by noise or vibration during construction or operation of the Proposed Development.

6.4.4 The results of the baseline sound surveys will be reviewed and discussed with the LPA to determine whether further baseline monitoring is required. The monitoring locations will also be reviewed to ensure sufficient data is gathered to inform the application for the Environmental Permit for the Production Facility. Surveys will be scheduled to avoid periods where known noisy activities are taking place in the area, such as construction or demolition works, to not affect the data gathered.

Baseline

6.4.5 It is anticipated that the existing sound environment at the nearest sensitive human receptors at Saltview Terrace, Port Clarence, Marsh House Farm, Greatham and Marsh Farmhouse, Warrenby will be dominated by industrial noise with a road traffic contribution. The sound environment at South Bank, Warrenby and Dormanstown are likely to be dominated by road traffic with a contribution from existing industrial sources. Noise generated by construction and demolition activities associated with the redevelopment of the Teesworks site may also contribute to the existing sound environment at the nearest sensitive human receptors in Warrenby, particularly during lulls in road traffic during the night-time period.

6.4.6 Noise baseline information will be developed further during the PEIR and ES processes, including undertaking a baseline sound level surveys at representative human receptors should they be required. In common with most projects, a baseline vibration survey will not be undertaken since vibration assessment is dependent only on absolute levels of vibration and not assessed relative to any background.

Future Baseline

6.4.7 With the exception of H2Teesside, H2NE, TFRP, Ethane2Power, PD Ports and Navigator Terminals and the consented Net Zero Teesside and Woodsmith developments, some of which include works on Seal Sands adjacent to the Site boundary, it is not anticipated that any major Proposed Developments are in the planning process which would substantially change the future baseline sound levels.

6.4.8 Future baseline sound levels at sensitive human receptors would be determined by any changes in road traffic movements and other sources associated with nearby developments.

Sensitive Receptors

6.4.9 The Proposed Development and the industrial premises surrounding the main Site are not considered to be noise and vibration sensitive receptors. Sensitive human receptors are places where the public may be exposed to noise and vibration arising from the Proposed Development.

6.4.10 Human receptors, with approximate distances to the main Site, are:

a. Residential properties Saltview Terrace, Port Clarence, 2.2km to the south west;
b. Residential Marsh House Farm, Greatham 2.9km to the north west;
c. Residential Marsh Farmhouse in Warrenby 4.2km to the east;
d. Residential properties in South Bank approximately 2.8km south;
e. Residential properties in Cowpen Bewley, approximately 3.6 km west;
f. Residential properties in Redcar approximately 5km to the east; and
g. Warrenby and Dormanstown approximately 4km to the south east.

6.4.11 The closest of these human receptors are approximately 2.2km to the south west at Port Clarence.

6.5 Design, Mitigation, and Enhancement Measures

6.5.1 Relevant design, mitigation and enhancement measures will be identified in the ES. For human receptors, the mitigation measures outlined below will be considered.

Construction Phase

6.5.2 Opportunities for mitigation during construction of the Proposed Development are likely to include embedded mitigation measures to be set out in the Construction Environmental Management Plan (CEMP), associated Noise Management Plans, and best practicable means as defined in the Control of Pollution Act, 1974 (Ref 173Ref 173), which will be detailed in the ES. Best practice mitigation measures during construction are anticipated to include:

a. Prior consent agreement for any works outside core hours, where there is potential for significant adverse effects;
b. Potential seasonal restrictions on some construction activities and avoiding undertaking noisy activities at night;
c. Contact details for nominated site contacts will be provided for local residents to raise complaints and who will engage with local residents;
d. Use of modularised construction;
e. Selection of quiet and low noise equipment and methodologies;
f. Optimal location of acoustic screening if required to minimise adverse noise effects;
g. Optimal location of equipment on site to minimise noise disturbance;
h. The provision of acoustic enclosures around static plant, where necessary; and
i. Use of less intrusive alarms, such as broadband vehicle reversing warnings.

Operation Phase

6.5.3 The Overarching NPS for Energy EN-1 (Ref 36) states that mitigation measures may include:

a. engineering methods, such as noise reduction at point of generation;
b. considerations related to the layout, for instance to ensure adequate distance between source and sensitive receptor; and
c. administrative restrictions, for example by specifying noise limits.

6.5.4 Mitigation measures during the operation phase are anticipated to include:

a. selecting the location of plant and equipment on site to minimise potential noise impacts;
b. noise limits on the operation phase;
c. careful selection of the plant to be operated at the site, e.g., selecting plant with low sound power levels; and
d. noise-attenuating barriers in the form of either acoustic screens and/or earth bunds.

6.6 Description of Potential Likely Significant Effects

Construction Phase

6.6.1 The following have the potential to give rise to significant effects and have been scoped in for the proposed assessment for human receptors:

a. disturbance as a result of noise and vibration generated by on-site construction activities including in the marine environment as a result of development of the quay (including piling); and
b. changes in road traffic noise as a result of development generated construction traffic on the local road network.

6.6.2 Underwater noise is likely to be caused by demolition of two jetties and construction works for the new quay (including piling). This is scoped into the assessment and is described in **Chapter 8: Marine and Freshwater Ecology.**

6.6.3 Potential noise and vibration effects arising from the construction phase of the Proposed Development will be temporary in nature.

6.6.4 The following is not considered to have the potential to give rise to significant effects and has been scoped out of the proposed assessment for human receptors:

a. vibration as a result of development generated construction traffic on the local road network.

Operation Phase

6.6.5 The following have the potential to give rise to significant effects and have been scoped in for the proposed assessment for human receptors:

a. noise and vibration from commercial and fixed plant; and

b. noise from ship delivery and unloading activities; and
c. changes in rail noise and vibration as a result of development generated rail movements to and from the existing Navigator North Tees Inland Terminal near Port Clarence.

6.6.6 It is anticipated that any potential noise and vibration effects arising from the operation phase of the Proposed Development will be of long-term nature, until decommissioning.

6.6.7 The following is not considered to have the potential to give rise to significant effects and has been scoped out of the proposed assessment for human receptors:

a. Changes in road traffic noise as a result of development generated operational traffic on the local road network.

6.6.8 A summary of the potential likely significant effects scoped in and out of the assessment for human receptors are set out in Table 6.2.

Table 6.2: Elements Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Noise and vibration impacts arising from construction	Construction	X		Works are anticipated to take place within the specified 300m and 100m Study Areas for noise and vibration respectively. It is, therefore, anticipated that significant effects are possible.
Road traffic noise impacts arising from construction	Construction	X		Construction traffic movements are anticipated near noise-sensitive receptors in Dormanstown. It is, therefore, anticipated that significant effects are possible.
Construction traffic vibration impacts arising from construction	Construction		X	The vibration generated by construction traffic vehicles would be similar to the vibration caused by any other similar vehicles that could legally use the route. It is, therefore, anticipated that significant effects are unlikely to occur.
Underwater noise impacts arising from construction	Construction	X		Demolition of jetties and quay construction (including piling) could impact on aquatic ecology. It is, therefore, anticipated that significant effects are possible.
Noise impacts arising from operation	Operation	X		Sources of operational noise from the Proposed Development (the Main Site and ship unloading) are anticipated to be located more than 800m from the nearest human receptors. At those receptors, it is anticipated that the noise environment will be dominated by other sources such as road traffic However, due to the possibility of low frequency noise impacts, operational noise is scoped in.
Vibration impacts arising	Operation		X	Sources of operational vibration from the Proposed Development are anticipated to be located at more than 800m from the nearest

Element	Phase	Scoped In	Scoped Out	Justification
from operation				human receptors. It is anticipated that, due to the distance between source and receiver, vibration from the operation of the Proposed Development is unlikely to lead to a significant effect.
Road traffic impacts arising from operation	Operation		X	It is anticipated that changes to traffic flows will be minimal. It is, therefore, anticipated that significant effects are unlikely

6.6.9 Further information on the proposed construction and operational traffic movements is provided in **Chapter 18: Traffic and Movement**.

6.7 Proposed Assessment Methodology

6.7.1 The adopted assessment methodology for sensitive human receptors will be applied to demonstrate compliance with national policy and allow determination of whether significant environmental effects are likely to arise as a result of the Proposed Development. The adopted assessment methodology draws upon the policies and guidance in **Chapter 4: Planning and Energy Policy** as applicable to each impact being assessed.

Baseline Sound Levels

6.7.2 A detailed baseline sound level survey will be undertaken, if required, to establish the prevailing conditions at sensitive human receptors in the vicinity of the Proposed Development. Measurements will be undertaken at up to four locations at representative sensitive receptors potentially affected by the Proposed Development.

6.7.3 If a survey is required, it is anticipated that this would be undertaken over at least one week, including at least one weekend, for both daytime and night-time periods. This will be discussed and agreed with the Environment Health Departments of STBC, RCBC and Hartlepool Borough Council (HBC). All measurements will be carried out using sound level meters compliant with Class 1 specification, as set out in BS EN 61672-1: 2013 (Ref 344Ref 344). All measurement equipment will be installed by a consultant competent in environmental sound level monitoring, and in general accordance with the principles of BS 7445-2: 1991 (Ref 343Ref 343).

6.7.4 In common with most projects, a baseline vibration survey will not be undertaken since vibration assessment is dependent only on absolute levels of vibration and not assessed relative to any background.

Construction Phase

Construction Noise

6.7.5 Construction noise will be assessed using the guidance and the ABC method in BS 5228:2009+A1:2014 Part 1 (Ref 340Ref 340). The results of the baseline survey will be used to determine appropriate construction noise thresholds for likely significant effects to occur. Predictions of noise from construction will be assessed against those thresholds. Predictions will be undertaken for a sample of the closest sensitive human receptors for each relevant construction phase of the Proposed Development.

6.7.6 Underwater noise will be assessed to predict zones of influence around the piling works relevant to the hearing thresholds relevant to the aquatic species that may be present.

6.7.7 Appropriate mitigation measures will be presented, including best practicable means and the good practice recommendations presented in BS 5228-1 (Ref 340Ref 340).

Construction Vibration

6.7.8 Construction vibration would be assessed using the guidance in BS 5228:2009+A1:2014 Part 2 (Ref 338Ref 338) and DMRB LA 111 (Ref 342Ref 342) as appropriate. For a sample of construction activities that have the potential to produce vibration (e.g. piling and compaction activities), vibration impact (i.e. human exposure) will be determined at a series of set-back distances for the sensitive human receptors. Appropriate mitigation measures will be presented, including best practicable means and the good practice recommendations presented in BS 5228-2 (Ref 338Ref 338).

Construction Traffic Noise

6.7.9 The assessment of temporary construction traffic noise on the public highway will be carried out using the guidance in DMRB LA111 (Ref 342Ref 342). This will involve a desktop study informed by predicted traffic movements. Noise level calculations will be undertaken in accordance with the methodology contained within CRTN and the associated noise changes due to the construction traffic would be assessed.

6.7.10 Whilst routes for construction traffic are yet to be finalised and anticipated levels of construction traffic unknown, professional judgement will be used to determine whether the study area needs to be redefined. This will include consideration of distance between routes and sensitive receptors, times of day for the vehicle movements and the existing noise environment at the receptors.

Operation Phase

Development Generated Noise

6.7.11 The assessment of fixed plant noise will be carried out using a detailed acoustic model of the Proposed Development to predict levels at the NSR. The model will take account of the sound source characteristics, the geometrical propagation effects and environmental acoustic effects. Noise levels will be calculated from both proposed external plant and breakout of sound from plant within buildings

6.7.12 The acoustic model will be developed using the SoundPLAN 9.1 software suite to assess each proposed layout option for the Proposed Development. SoundPLAN implements the noise prediction method ISO 9613-2: 2024 ‘Acoustics - Attenuation of sound during propagation outdoors’ (Ref 361Ref 361). The ISO 9613-2:2024 prediction method assumes that the wind direction is always from source to receiver, which gives a reasonable worst case at all NSR.

6.7.13 The noise model will consist of a three-dimensional representation of the Site and its surroundings. Operational noise modelling will be based on the preliminary plant equipment layouts and sound power level data developed by the client.

6.7.14 Topographical features and buildings that may influence the transmission of sound from the Proposed Development to NSR will be included in the noise model. A digital terrain model will be created using ground elevation spot height data, to position buildings and other noise sources relative to the ground. Areas of acoustically soft and hard ground will be identified from the OS MasterMap Topographic Layer and modelled accordingly.

6.8 Significance of Effect Criteria

6.8.1 The following paragraphs set out the methodology for determining the magnitude of impact criteria for the noise and vibration assessment. The proposed significance of effects criteria, based on the magnitude of impacts, are set out at the end of this section.

Construction Phase

Construction Noise

6.8.2 For construction noise, the significance of effect criteria are derived from the guidance in BS 5228-1 (Ref 340Ref 340). The Standard provides methods for determining the significance of construction noise levels by considering the change in the ambient noise level that would arise as a result of the construction operations.

6.8.3 Annex E of BS 5228-1 (Ref 340Ref 340) describes the ‘ABC’ method of assessment, which is proposed to establish the threshold of potential significant effects. These thresholds are based on baseline environmental sound measurements and predicted construction noise levels at locations representative of sensitive receptors.

6.8.4 Underwater noise criteria will be based upon published information and guidance on hearing thresholds for relevant aquatic species.

6.8.5 It is noted that the potential impacts associated with decommissioning activities are likely to be comparable to those for construction activities.

6.8.6 Having established whether there is a potential significant effect using the ‘ABC’ method, the final assessment of significance is made by considering the following:

a. Exceedance over the established thresholds of potential significant effect;

b. The levels of noise exposure and character of existing sound environment;
c. The sensitivity of receptors;
d. Combined exposure to construction noise and vibration;
e. The duration of the construction impact;
f. Effectiveness of mitigation measures that may be provided; and
g. Professional judgement.

Construction Vibration

6.8.7 For construction vibration, the significance of effect criteria are derived from the guidance in BS 5228-2 (Ref 338Ref 338), which presents guidance on the assessment of vibration impacts upon human receptors and risk of building damage. Once the levels of vibration due to the proposed construction works have been established, an assessment of significance will be made according to Annex B of BS5228-2 (Ref 338Ref 338) The predicted vibration levels will be used to screen the requirement for further investigation using BS6472-1 (Ref 363Ref 363) and BS7385-2 (Ref 364Ref 364).

6.8.8 The identification of likely significant effects will be based upon:

a. Likelihood of exceedance over the established thresholds of significant effect;
b. The sensitivity of receptors;
c. The duration of the construction vibration impact; and
d. Professional judgement.

Construction Traffic Noise

6.8.9 For construction traffic noise operating on the public road network, the magnitude of impact criteria are based upon the classification of noise level changes caused by the additional construction traffic, quantified as the basic noise level (BNL), as detailed within the LA 111 (Ref 342Ref 342). The results of the predictions will be used as a screening exercise to determine whether changes in traffic flow and composition during construction works are likely to give rise to a noise level change of more than 1dB(A); this being the lowest perceptible change in road traffic noise.

6.8.10 The identification of likely significant effects will be based upon:

a. The change in traffic noise levels resulting at assessed receptors;
b. The levels of noise exposure and character of existing sound environment;
c. The sensitivity of receptors;
d. The duration of the construction traffic impact; and
e. Professional judgement.

Operation Phase

Noise Fixed Plant Noise and Ship Unloading

6.8.11 Based upon the sound levels predicted from the computer model, an assessment of potential noise impact at nearby NSR will be undertaken using the guidance in BS 4142:2014+A1:2019 (Ref 346Ref 346).

6.8.12 A key aspect of the BS 4142 (BSI, 2014c) (Ref 346Ref 346) assessment procedure is a comparison between the background sound level in the vicinity of residential locations and the rating level of the sound source under consideration. The relevant parameters are the background sound level ($L_{A90,T}$) and the rating level ($L_{Ar,Tr}$) of the plant source.

6.8.13 The rating level accounts for the presence of acoustic characteristics such as tonality and impulsivity.

6.8.14 The assessment compares the background sound level and the rating level to assess likely significance:

a. Typically, the greater the difference, the greater the magnitude of impact.
b. A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c. A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
d. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

6.8.15 BS 4142 (Ref 346Ref 346) requires that the rating level of the noise source under assessment be considered in the context of the environment when defining the overall significance of the impact. Consultation with relevant stakeholders will be undertaken to agree on the noise limits for operational noise sources. Where appropriate, consideration will be given to guidance in NANR45 (Ref 362) for risks of low frequency noise disturbance. The identification of a likely significant effects will be based upon:

a. Likelihood of exceedance over the established thresholds of significant effect;
b. Level and character of the existing sound environment;
c. The sensitivity of receptors; and
d. Professional judgement

6.9 Limitations and Assumptions

6.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

a. Noise surveys are proposed on the basis that the noise climate during early stages of the EIA process will be representative of the typical baseline conditions. Should any events indicate that a baseline noise survey has the potential to capture conditions that are not typical, then an alternative approach will be discussed and agreed with the Environmental Health Department of STBC; RCBC and HBC.
b. The underwater noise baseline data will be obtained from a desktop study.
c. The assessment presented in the PIER and ES will include the latest design information available at the time of our submission. Where design information is not available, reasonable worst-case assumptions will be made.

7. Terrestrial Ecology

7.1 Introduction

7.1.1 This chapter considers the impacts of the Proposed Development on terrestrial ecology during construction and operation, and any potential significant effects. It sets out the proposed methodology for the terrestrial ecology assessment and identifies those impacts that can be scoped out of the assessment. Where necessary, further assessment would be presented in the ES.

7.1.2 This assessment does not duplicate information set out in **Chapter 8: Freshwater and Marine Ecology**.

7.2 Consultation

7.2.1 Consultation was undertaken with the statutory body Natural England for the previous Huntsman Drive site, via their Discretionary Advice Service to discuss certain aspects of the terrestrial ecology assessment and help refine the scope and, in particular, the Study Area (see Section 7.4).

7.2.2 Additional technical engagement and consultation will be carried out with statutory and non-statutory bodies and other organisations as advised by the EIA Scoping Opinion, once received. Relevant stakeholders will be contacted regarding the Proposed Development design and any considered avoidance and/or mitigation strategies, including:

a. Royal Society for the Protection of Birds (RSPB);
b. Environment Agency;
c. Stockton-on-Tees Borough Council;
d. Redcar and Cleveland Borough Council;
e. Natural England; and
f. Other relevant nature conservation bodies, as necessary.

7.3 Policy, Legislation, and Guidance

7.3.1 The scope of the terrestrial ecology assessment to be presented in the ES will be informed by relevant legislation, local planning policies, national and Local Biodiversity Action Plans (LBAP) which are applicable to Section 41 priority species/habitats and the baseline conditions within the Proposed Development.

7.3.2 A summary of the international, national and local legislation, planning policy and guidance relevant to the terrestrial ecology assessment for the Proposed Development is set out in Table 7.1.

Table 7.1: Terrestrial Ecology – Summary of Key Policy, Legislation and Guidance

Policy/Legislation/Guidance	Description
Policy	
Overarching National Policy Statement (NPS) for Energy (EN-1) 2024 (Ref 36)	NPS EN-1 contains a number of policy statements of key relevance for the purpose of the assessment of environmental impacts on ecological features. Key policies relate to: 1. Although achieving biodiversity net gain is not currently an obligation on applicants, Schedule 15 of the Environment Act 2021 contains provisions which, when commenced, mean the Secretary of State may not grant an application for a Development Consent Order unless satisfied that a biodiversity gain objective is met in relation to the onshore development in England to which the application relates (Paragraph 4.6.1). 2. Consideration of whether a project may have a significant effect on a European site, or any site afforded the same protection, such as Ramsar sites (Paragraphs 5.4.4 to 5.4.6). 3. Avoiding granting planning consent in the first instance where a Proposed Development is likely to have an adverse effect of a Site of Special Scientific Interest (SSSI), either alone or in combination with other developments. An exception should only be made where the benefits (including need) of the development clearly outweigh any adverse effects (Paragraph 5.4.7 and 5.4.8). 4. If a proposal is likely to have significant impacts on a Marine Conservation Zones (MCZs), an MCZ Assessment should be undertaken as per the requirements under section 126 of the Marine and Coastal Access Act 2009 (Paragraph 5.4.9) 5. It is important that relevant guidance on managing environmental impacts of infrastructure in marine protected areas is followed, and that equal consideration of the effect of proposals should be given to all MPAs regardless of the legislation they were designated under (Paragraph 5.4.11). 6. The important role played by sites of regional and local biodiversity value, including Local Nature Reserves (LNRs) and Local Wildlife Sites (LWS), in meeting overall national biodiversity targets (Paragraph 5.4.12). 7. Avoidance of the loss of ancient woodland and veteran trees (Paragraph 5.4.15). 8. The use of planning obligations to ensure that other species and habitats of principal conservation importance are protected from the adverse effects of development (Paragraph 5.4.16).
The NOS for Renewable Energy Infrastructure (EN-3) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed. Paragraphs 2.3.6-8 in this NPS EN-3 outline the how national designations will be considered by the Secretary of State in

Policy/Legislation/Guidance	Description
	decision making.
The NPS for Natural Gas Electricity Generating Infrastructure (EN-2) 2024 (Ref 51)	This NPS is made under the Planning Act 2008 and applies to all natural gas-fired generation NSIPs, which in England includes generating stations with over 50MW. In England it will also apply to natural gas generation proposals that are directed into the NSIP regime under Section 35 of the Planning Act 2008. This NPS does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS unless stated otherwise.
The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) 2024 Ref 91)	This NPS covers nationally significant natural gas and oil infrastructure including underground gas storage and LNG facilities, gas reception facilities, gas transporter pipelines (onshore) and pipelines over 16.093km (10 miles) long. This NPS does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS unless stated otherwise.
The NPS for Electricity Networks Infrastructure (EN-5) 2024 (Ref 92)	This NPS covers above ground electricity lines: a. whose nominal voltage is expected to be 132kV or above (other than a 132kV line associated with the construction or extension of a devolved Welsh generating station); b. whose length is greater than 2km; c. that are not a replacement line falling within Section 16(3)(ab) of the 2008 Act; and d. that are not otherwise exempted for reasons set out in Sections 16(3)(b) and (c), (3A) and (3B) of the 2008 Act. This NPS does not seek to repeat the material set out in EN-1 or EN-3. EN-1 applies to all applications covered by this NPS unless stated otherwise.
The National Planning Policy Framework (NPPF) 2024 (Ref 38)	The NPPF sets out the Government's planning policies for England and Wales and how these are expected to be applied. The Framework acts as guidance for local planning authorities and decision-makers, both in drawing up plans and making decisions about planning applications. Section 15 of the framework 'Conserving and enhancing the natural environment' incorporates policies requiring that development impacts on both terrestrial and marine biodiversity are minimised. Section 15, Paragraph 187 states that planning policies and decisions should: 1. Planning policies and decisions should contribute to and enhance the natural and local environment by: a. protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

Policy/Legislation/Guidance	Description
	b. recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; c. maintaining the character of the undeveloped coast, while improving public access to it where appropriate; d. minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures and incorporating features which support priority or threatened species such as swifts, bats and hedgehogs; e. preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and f. remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate. Section 15, Paragraph 193 states that local planning authorities should apply the following principles when determining planning applications: a. if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; b. development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest; c. development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and d. development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for

Policy/Legislation/Guidance	Description
	biodiversity or enhance public access to nature where this is appropriate.
Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their impact within the Planning System 2005 (Ref 93)	This circular provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England. It complements the NPPF and defines statutory nature conservation sites and protected species as a material consideration in the planning process.
Redcar and Cleveland Borough Council - Local Plan - Adopted May 2018 (Ref 33).	The Local Plan sets out the RCBC' policies and proposals to guide planning decisions and establishes the framework for sustainable economic growth and development of the Borough by 2032. Policy N 4 - Biodiversity and Geological Conservation states that: 1. Internationally Important Sites - Priority will be given to protecting our internationally important sites, including the Teesmouth and Cleveland Coast Special Protection Area/Ramsar and European Marine Site, and the North York Moors Special Protection Area and Special Area of Conservation. Development that is not directly related to the management of the site, but which is likely to have a significant effect on any internationally designated site, irrespective of its location and when considered both alone and in combination with other plans and projects, will be subject to an Appropriate Assessment. a. Nationally Important Sites - Development that is likely to have an adverse impact on nationally important SSSI sites, including broader impacts on the national network and combined effects with other development, will not normally be allowed. Where an adverse effect on the site's notified interest features is likely, an exception will only be made where: the benefits of the development, at this site, clearly outweigh both any adverse impact on the features of the site that makes it of special scientific interest, and any broader impacts on the network of SSSIs; no reasonable alternatives are available; and mitigation, or where necessary compensation, is provided for the impact. b. Locally Important Sites - Development that is likely to have an adverse impact on Local Sites (Local Wildlife Sites and Local Geological Sites) or Local Nature Reserves will only be approved where: the benefits clearly outweigh any adverse impact on the site; no reasonable alternatives are available; and mitigation, or where necessary compensation, is provided for the impact. c. Wildlife corridors and other habitat networks will be protected and enhanced, particularly hedgerows, watercourses and linking habitat

Policy/Legislation/Guidance	Description
	features. Opportunities to deculvert watercourses will be encouraged.
Stockton-on-Tees Borough Council – Local Plan – Adopted January 2019 (Ref 55)	The Local Plan sets out the Council's policies and proposals to guide planning decisions and establishes the framework for the sustainable economic growth and development of the Borough by 2032. Policy EN5 - Preserve, Protect and Enhance Ecological Networks, Biodiversity and Geodiversity states that: 1. The Council will protect and enhance the biodiversity and geological resources within the Borough. Development proposals will be supported where they enhance nature conservation and management, preserve the character of the natural environment and maximise opportunities for biodiversity and geological conservation particularly in or adjacent to Biodiversity Opportunity Areas in the River Tees Corridor Teesmouth and Central Farmland Landscape Areas., 2. The Council will preserve, restore and re-create priority habitats alongside the protection and recovery of priority species. 3. Ecological networks and wildlife corridors will be protected, enhanced and extended. A principal aim will be to link sites of biodiversity importance by avoiding or repairing the fragmentation and isolation of natural habitats. 4. Sites designated for nature or geological conservation will be protected and, where appropriate enhanced, taking into account the following hierarchy and considerations: a. Internationally designated sites – Development that is not directly connected with or necessary to the management of the site, but which is likely to have a significant effect on any internationally designated site, irrespective of its location and when considered both alone and in combination with other plans and projects, will be subject to an Appropriate Assessment. Development requiring Appropriate Assessment will only be allowed where: i. It can be determined through Appropriate Assessment, taking into account mitigation, the proposal would not result in adverse effects on the site's integrity, either alone or in combination with other plans or projects; or ii. as a last resort, where, in light of negative Appropriate Assessment there are no alternatives and the development is of overriding public interest, appropriate compensatory measures must be secured. b. Nationally designated sites - Development that is likely to have an adverse effect on a site, including broader impacts on the national network of Sites of Special Scientific Interest (SSSI) and combined effects with other development, will not normally be allowed. Where

Policy/Legislation/Guidance	Description
	an adverse effect on the site's notified interest features is likely, a development will only be allowed where: i. the benefits of the development, at this site, clearly outweigh both any adverse impact on the sites notified interest features, and any broader impacts on the national network of SSSI's; ii. no reasonable alternatives are available; and iii. mitigation, or where necessary compensation, is provided for the impact. c. Locally designated sites: Development that would have an adverse effect on a site(s) will not be permitted unless the benefits of the development clearly outweigh the harm to the conservation interest of the site and no reasonable alternatives are available. All options should be explored for retaining the most valuable parts of the sites interest as part of the development proposal with particular consideration given to conserving irreplaceable features or habitats, and those that cannot readily be recreated within a reasonably short timescale. 5. Development proposals should seek to achieve net gains in biodiversity wherever possible. It will be important for biodiversity and geodiversity to be considered at an early stage in the design process so that harm can be avoided and wherever possible enhancement achieved. Detrimental impacts of development on biodiversity and geodiversity, whether individual or cumulative should be avoided. Where this is not possible, mitigation and lastly compensation, must be provided as appropriate. The Council will consider the potential for a strategic approach to biodiversity offsetting in conjunction with the Tees Valley Local Nature Partnership and in line with the above hierarchy. 6. When proposing habitat creation it will be important to consider existing habitats and species as well as opportunities identified in the relevant Biodiversity Opportunity Areas. This will assist in ensuring proposals accord with the 'landscape scale' approach and support ecological networks. 7. Existing trees, woodlands and hedgerows which are important to the character and appearance of the local area or are of nature conservation value will be protected wherever possible. Where loss is unavoidable, replacement of appropriate scale and species will be sought on site, where practicable.
Tees Valley Biodiversity Action Plan (BAP) (2012) (Ref 94)	The Tees Valley Nature Partnership is a collection of organisations and individuals working together to conserve, enhance and promote biodiversity in the Tees Valley region. The current Tees Valley BAP has been in place since January 2012 and covers the local authority areas of Hartlepool, Stockton, Middlesbrough, Redcar, and Cleveland. The aim of the TVBAP is to identify sub-regional priorities for nature conservation and propose actions to conserve/maintain/enhance/increase locally important species and

Policy/Legislation/Guidance	Description
	habitats.
Legislation	
The Wildlife and Countryside Act 1981 (as amended) (WCA) (Ref 95)	This is the primary legislation for the protection of animals, plants and habitats in the UK. This legislation covers three main areas: a. wildlife protection, including protection of wild birds, their eggs and nests, protection of other animal and protection of plants; b. nature conservation, countryside and National Parks; and c. public rights of way (PRoW).
The Countryside and Rights of Way (CRoW) Act (Ref 96)	The CRoW Act has amended the WCA in England and Wales, strengthening the protection afforded to SSSIs and the legal protection for threatened species. It adds the word 'reckless' to the wording of the offences listed under Section 9(4) of the WCA. This alteration makes it an offence to recklessly commit an offence, where previously an offence had to be intentional to result in a breach of legislation.
The Natural Environment and Rural Communities (NERC) Act 2006 (Ref 97)	Designed to help achieve a rich and diverse natural environment and thriving rural communities through modernised and simplified arrangements for delivering Government policy. The NERC Act established a new independent body (Natural England) responsible for conserving, enhancing, and managing England's natural environment for the benefit of current and future generations, thereby contributing to sustainable development. The NERC Act made amendments to both the WCA and the CRoW Act. Section 40 of the NERC Act imposes a duty on public authorities to "*in exercising (their) functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity*". Section 41 of the NERC Act requires the Secretary of State to: "*publish a list of the living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity*". These are referred to as Habitats/Species of Principal Importance (HoPI/SoPI).
The Conservation of Habitats and Species Regulations 2017 (as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) ('the Habitats Regulations') (Ref 98)	The Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations') consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Habitats Regulations transpose The Habitats Directive (EC Directive 92/43/EEC) into national law. They also transpose elements of The Birds Directive in England and Wales. All species listed under Annex IV of the Habitats Directive require strict protection and are known as European Protected Species (EPS). Under Regulation 42 of the Habitats Regulations, it is unlawful to: a. deliberately kill, capture or disturb;

Policy/Legislation/Guidance	Description
	1. deliberately take or destroy the eggs of; and 2. damage or destroy the breeding site/resting place of any species protected under this legislation. If it is determined that impacts to an EPS during a development are unavoidable then the works may need to be carried out under a site-specific mitigation licence from the Statutory Nature Conservation Organisation, in this case Natural England. Certain EPS are also listed under Annex II of the Habitats Directive and are afforded protection by the establishment of core areas of habitat known as Special Areas of Conservation (SACs). In addition, all bird species listed under Annex I of the Birds Directive are rare or vulnerable and afforded protection by the classification of Special Protection Areas (SPAs). This means that 'Annex II species' under the Habitats Directive and Annex I bird species under the Birds Directive are a relevant consideration are rare or vulnerable and afforded protection by the classification of Special Protection Areas (SPAs). This means that 'Annex II species' under the Habitats Directive and Annex I bird species under the Birds Directive are a relevant consideration in a Habitats Regulations Assessment (HRA). Following the UK's exit from the EU, the Habitats Regulations were amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The changes made were only those necessary to ensure that they remain operable now that the UK has left the EU.
The Ramsar Convention (Ref 99).	The UK is a signatory to the Ramsar Convention. The Convention has three main 'pillars' of activity: the designation of wetlands of international importance as Ramsar sites, the promotion of the wise use of all wetlands in the territory of each country, and international co-operation with other countries. The UK has chosen to underpin the designation of its Ramsar sites through prior notification of these areas as SSSIs in England. Accordingly, these receive statutory protection under the WCA 1981 (as amended) (see above). The UK Government has also issued policy statements relating to the special status of Ramsar sites. This extends the same protection at a policy level to listed Ramsar sites in respect of new development as that afforded to SACs & SPAs.
The Environment Act 2021 (Ref 100)	The Environment Act 2021 has two main functions: a. To give a legal framework for environmental governance in the UK. b. To bring in measures for improvement of the environment in relation to waste, resource efficiency, air quality, water, nature and biodiversity, and conservation. The Act includes provisions to strengthen and improve the existing duty on public bodies to conserve and enhance biodiversity, including mandating Biodiversity Net Gain (BNG) through the planning system. Schedule 14 of the Act makes provision for BNG to be a condition of planning permission in England. Schedule 14 specifies that biodiversity gains are to be assessed using the metric published by

Policy/Legislation/Guidance	Description
	the Secretary of State and a 10% gain will be mandatory. The Act includes this requirement for NSIPs, being secured under Section 99 and Schedule 15. It is expected that the mandatory requirement for a 10% gain for NSIPs will come into force in 2026. The vast majority of this Act does not make any immediate changes for organisations other than regulators. Changes to duties for businesses and other organisations are expected in subsequent legislation made under this Act.
Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024 (Ref 101)	UK statutory instrument that supports the implementation of BNG under the Environment Act 2021, specifically in relation to irreplaceable habitats. Irreplaceable habitats are those that are: • very difficult or impossible to recreate once lost; and/or • Often have high ecological value, due to their age, uniqueness, or biodiversity. Examples include: • Ancient woodland • Veteran trees • Blanket bog • Limestone pavements • Coastal sand dunes • Saltmarshes and lowland fens
Protection of Badgers Act 1992 (Ref 102)	The Protection of Badgers Act makes it illegal to wilfully take, kill, injure, possess or ill-treat a badger. Under the Act, badger setts are also protected against intentional or reckless interference. Sett interference includes damaging or destroying a sett, obstructing access to any part of the sett, and disturbing a badger whilst it is occupying a sett. The Act defines a badger sett as “any structure or place, which displays signs indicating the current use by a badger” and Natural England takes this definition to include seasonally- used setts that are not occupied but that show signs of recent use by badgers. If impacts to badgers or their setts are unavoidable during a development then authorised sett disturbance requires a mitigation licence, issued by Natural England.
Council Directive (92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) 1992 (Ref 103)	The Habitats Directive provides legal protection for habitats and species of European importance. This Directive was transposed into UK law by the Conservation of Habitats and Species Regulations 2017.
Council Directive (2009/147/EC) on the Conservation of Wild Birds (Birds Directive) 2009 (Ref 104)	The European Union meets its obligations for bird species under the Bern Convention and Bonn Convention and more generally by means of Directive 2009/147/EC (Birds Directive) on the

Policy/Legislation/Guidance	Description
	conservation of wild birds. In the UK, the provisions of the Birds Directive are implemented through the WCA 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as well as other legislation related to land and sea). The main provisions of the Directive include: the maintenance of populations of all wild bird species across their natural range; the establishment of a general scheme of protection for all wild birds; requirements to ensure that introduction of non-native birds do not threaten other biodiversity; and the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance (Article 4). Together with Special Area of Conservation (SACs) designated under the Habitats Directive, SPAs form a network of European protected areas known as Natura 2000.
Invasive Alien Species (Enforcement and Permitting) Order 2019 (Ref 105)	The Invasive Alien Species Order (IASO) 2019 transposes EU legislation (Regulation (EU) No 1143/2014), which was introduced into UK law on the 1 December 2019. Listed in the Order are species of concern that are banned from being imported, transported, sold, used, kept, bred/grown, or released into the environment or allowed to reproduce. Signal crayfish, amongst other invasive non-native crayfish species, are included in the Order. Transport of live invasive crayfish species from any site is illegal under the legislation. Management, development, maintenance, or other works at sites which have invasive crayfish species present therefore require practical and legal consideration that may have associated cost implications. These also extend to conservation actions surrounding the eradication of invasive crayfish species present at site. Regarding crayfish, the legislation superseded the 'The Prohibition of Keeping of Live Fish (Crayfish) Order 1996.' Regulation of the legislation is enforced by Natural England. Regarding crayfish, the legislation superseded the 'The Prohibition of Keeping of Live Fish (Crayfish) Order 1996.' Regulation of the legislation is enforced by Natural England in England. Eight plant species are identified within IASO (2019) as being widely spread in England and Wales and therefore require management. This includes, but is not limited to Nuttall's waterweed, Himalayan balsam, curly waterweed, and floating pennywort. This has implications for works at any site where such invasive plant species are present, and appropriate management controls are required.
Guidance	
Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Ref 106).	The terrestrial ecology assessment has been undertaken using the approach detailed in the CIEEM Guidelines for Ecological Impact Assessment (EcIA), hereafter referred to as 'the CIEEM EcIA guidelines'. These guidelines represent the current best practice for assessing the ecological impacts of development projects. These guidelines have been amended in September 2019, April

Policy/Legislation/Guidance	Description
	2022 and September 2024.
CIEEM (2017). Guidelines for Preliminary Ecological Appraisal (PEA) (Ref 107)	The terrestrial ecology assessment has been undertaken with consideration of CIEEM guidance for PEAs. The purpose of this guidance is to set out the appropriate approach to undertaking PEAs and the appropriate application of such assessments within the planning process.
CIEEM (2020). Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK. (Ref 116)	These guidelines have been developed by UK biodiversity data specialists and are aimed at those who are using biodiversity data to support the development planning process (e.g. local planning authorities (LPAs) and ecological consultants). The guidelines provide guidance on when and where it is advisable to source and use biodiversity data, particularly in relation to developments.
Guidance on Nationally Significant Infrastructure Projects: Advice on Habitat Regulations Assessments (HRA) (Ref 108)	The terrestrial ecology assessment has been undertaken with consideration of the Planning Inspectorate's guidance which summarises the applicant and decision maker obligations under the Habitats Regulations in the context of Nationally Significant Infrastructure Projects (NSIPs).
Air emissions risk assessment for your environmental permit (Ref 109)	The terrestrial ecology assessment has been undertaken with consideration of the Environment Agency and Department for Environment, Food & Rural Affairs guidance regarding the impact of emissions on protected conservation areas.
BS 42020: 2013 Biodiversity — Code of practice for planning and development (Ref 110)	BS 42020: 2013 provides recommendations for making sure that decisions taken at each step of the planning process are informed by appropriate ecological information.
BS 5837:2012 – Trees in relation to design, demolition and construction – Recommendations (Ref 111).	BS 5837:2012 gives recommendations and guidance on the relationship between trees and the design, demolition and construction process. It sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.
Natural England/Forestry Commission (2022). Ancient woodland, ancient trees and veteran trees: advice for making planning decisions (Ref 112).	This best practice guidance provides principles to adopt with specific reference to protection measures for ancient/veteran trees.

7.4 Study Area

7.4.1 The Site includes the Main Site forming part of the Proposed Development, as well as access routes, temporary compounds and working areas required to construct and operate the Proposed Development.

7.4.2 The Study Area for the Proposed Development, with regard to terrestrial ecology, is defined as the area in which impacts arising from construction, operation and/or decommissioning could lead to significant effects for terrestrial ecological receptors. For

the purpose of this assessment, it is necessary to apply Study Areas of varying sizes depending on the terrestrial ecological feature under assessment and, in most cases, these will extend beyond the Site. These are referred to as Zones of Influence (ZoI) for each terrestrial ecological receptor.

7.4.3 ZoI have been defined based on current best practice guidelines (summarised in Table 7.2 below) and currently available project information. In some cases, ZoI have been defined on a precautionary basis using professional judgement alongside current guidance and available project information. This is to ensure a sufficient geographical area has been assessed to allow all reasonably foreseeable impacts to be taken into account. As the terrestrial ecology assessment progresses and further information becomes available, both in terms of survey results and project details/design, it is considered that one or more of the ZoI may be subject to refinement later in the project lifecycle.

7.4.4 It is proposed that further consultation will be undertaken with Natural England, as well as with STBC and RCBC, to discuss the proposed approach to field surveys and assessment, with agreed ZoI.

Table 7.2: Terrestrial Biodiversity Zones of Influence

Receptor	Zone of Influence (Inclusive of the Site)
Statutory designated sites of international importance.	Within 15km of the Site (extending to 30km for SACs where bats are the qualifying interest).
Statutory designated sites of national importance.	Within 10km of the Site (SSSI). Within 2km of the Site (NNR).
Statutory designated sites of local importance.	Within 2km of the Site.
Non-statutory designated sites.	Within 2km of the Site.
HoPI, woodland listed on the Ancient Woodland Inventory (AWI), veteran and ancient trees.	Within 2km of the Site.
Historic European Protected Species (EPS) licences granted.	Within 2km of the Site.
Mapped waterbodies and watercourses.	Within 250m of the Site.
Habitats (all).	Within 25m of the Site.
Protected and notable species.	Various (detailed in Section 7.7, below).

7.5 Desk Study

7.5.1 A full desk study will be completed for the Site and wider ZoI as part of the PEA, following best practice guidelines (Ref 107). The desk study will include a review of publicly available resources and databases received through stakeholder consultation. Data was sought from, but not limited to, the following organisations:

a. Multi-Agency Geographic Information for the Countryside (MAGIC (magic.defra.gov.uk) (Ref 113);
b. Environmental Records Information Centre for the North-east of England (ERIC NE) (Ref 114);
c. British Trust of Ornithology's (BTO) Wetland Bird Survey (WeBS) data (Ref 115); and
d. Local bat, badger, bird etc. groups.

7.5.2 This data will be used to determine the presence of protected sites, biological records of protected and/or notable species including Species of Principle Importance (SoPI) (as defined by the NERC Act 2006 (Ref 97)), Habitats of Principal Importance (HoPI) (Ref 98), ancient/veteran trees listed on the Ancient Tree Inventory (ATI) and woodland listed on the Ancient Woodland Inventory (AWI) (Ref 112) as well as any other relevant data within 2km of the Site. The ZoI are outlined in Table 7.2.

7.6 Field Survey

7.6.1 Table 7.3 below, details relevant survey buffers (i.e. ZoI) from the Site for the ecological receptors (habitats, species and species groups) mentioned above, along with relevant current good practice guidelines that have been used to determine the ZoI.

Table 7.3: Receptor, Survey Buffer and Reference to Best Practice Guidelines (*TBC Following Consultation with Natural England*)

Ecological Feature	Survey Buffer (ZoI) Beyond Site	Good Practice Guidelines Reference
Habitats	25m	UK Habitat Classification (UKHab) Lid (2023) (Ref 117Ref 117) Rodwell (2006) (Ref 118Ref 118)
Badger	50m	CIEEM (2013a) (Ref 119Ref 119) Harris et al. (1989) (Ref 120Ref 120) Roper (2010) (Ref 121Ref 121) Scottish Natural Heritage (2003) (Ref 122Ref 122) Delahay et al. (2000) (Ref 123Ref 123) Natural England (2009a) (Ref 124Ref 124) Natural England (2009b) (Ref 125Ref 125)
Bats	30m	Collins (ed.) (2023) (Ref 126Ref 126) CIEEM (2013b) (Ref 127Ref 127)
Birds – breeding and non-breeding	250m (as agreed with Natural England)	Bird Survey & Assessment Steering Group. (2025) (Ref 128Ref 128) Gilbert et al. (1998) (Ref 129Ref 129) Hardey et al. (2013) (Ref 130Ref 130) Shawyer (2011) (Ref 131Ref 131) Fuller (1980) (Ref 132Ref 132) Bibby et al. (2000) (Ref 133Ref 133)
Otter	100m	Chanin (2003) (Ref 134Ref 134) Findlay and White (2025) (Ref 135Ref 135) CIEEM (2013c) (Ref 136Ref 136)
Water Vole	100m	Strachan et al. (2011) (Ref 137Ref 137) Dean et al. (2016) (Ref 138Ref 138) Dean (2021) (Ref 139Ref 139) CIEEM (2013d) (Ref 140Ref 140)
Reptiles	Site	Joint Nature Conservation Committee (2004). (Ref 141Ref 141) Froglife (1999) (Ref 142Ref 142) Gent and Gibson (2003) (Ref 143Ref 143) CIEEM (2013e) (Ref 144Ref 144)
Amphibians	250m	Oldham et al. (2000) (Ref 145Ref 145) English Nature (2001) (Ref 146Ref 146) Gent and Gibson (2003) (Ref 147Ref 147) Amphibian and Reptile Groups of the United Kingdom (ARG UK) (2010) (Ref 148Ref 148) CIEEM (2013f) (Ref 149Ref 149)
Other Notable Terrestrial Mammals	Site	Brown hare: Trewhella (2011) (Ref 150Ref 150) CIEEM (2013g) (Ref 151Ref 151)

Ecological Feature	Survey Buffer (ZoI) Beyond Site	Good Practice Guidelines Reference
		Hedgehog: CIEEM (2013h) (Ref 152Ref 152) Harvest mouse: Bullion et al. (2012) (Ref 153Ref 153)
Terrestrial Invertebrates	Site	Drake et al. (2007) (Ref 154Ref 154) Lush et al. (2013) (Ref 155Ref 155) Natural England (2005) (Ref 156Ref 156)
Trees (Arboriculture)	15m	BS 5837:2012 (Ref 111Ref 112) Natural England/Forestry Commission (2022). (Ref 157Ref 113)

7.7 Baseline Conditions

7.7.1 The baseline conditions for the terrestrial ecology assessment are to be defined through a full desk study, PEA and a series of field surveys. The data sources referred to in Section 7.5 will be consulted to inform the baseline review.

7.7.2 Based on the findings from the PEA and the desk study completed in Section 7.9 to Section 7.11, a series of habitat and species-specific surveys will be undertaken in advance of the PEIR. These surveys will be focussed upon important ecological receptors and will take place within their respective ZoIs as stated in Table 7.3.

7.7.3 The Site and surrounding areas consist of various former and current industrial facilities and associated access roads as well as various semi-natural habitats, including grasslands, wetlands, broadleaved woodlands, sparsely vegetated land, scrub and open mosaic habitat. These habitats have been assessed to be of low to high ecological value. This is based on a review of available imagery using Google Earth, the PEA and professional judgement. The habitat types present, typically offer limited biodiversity value due to them being regularly disturbed, however, those undisturbed areas can offer opportunities for protected and notable UK wildlife to shelter, forage or breed. This assessment will be verified or modified as necessary, during field surveys being undertaken.

7.7.4 As mentioned in Section 7.1, this assessment does not duplicate information set out in **Chapter 8: Freshwater and Marine Ecology**. Baseline information for the marine and freshwater ecology assessment can be found in the aforementioned chapter.

7.8 Future Baseline

7.8.1 Climate change and flood risk (described in detail in **Chapter 9: Water Environment and Flood Risk** and **Chapter 13: Climate Change Resilience**), natural succession of habitats, the introduction of new receptors into an area and the continued operation of existing developments can all influence future baseline. This may result in a change of habitat type over time.

7.8.2 Areas more likely to flood, including designated sites, may change to habitats typical of wetter environments such as wetlands and marshes. Habitats may also alter as a result of increased occurrence of droughts, milder winters, increase in storm events etc.

7.8.3 Invasive species can colonise quickly where previously absent.

7.8.4 Water quality is expected to improve due to legislation requirements and interventions such as Nutrient Neutrality Policy and Water Framework Directive (WFD) targets, positively supporting terrestrial ecology.

7.8.5 In the absence of the Proposed Development, it is predicted that the habitat context and management of the Site would see natural succession of semi-natural habitats except where other new development schemes have the potential to change the future baseline. As no substantive changes in habitat context and condition are predicted, the species value of the Site and adjacent land is likely to remain consistent with the current baseline. Minor changes (upwards or downwards) in the distribution of some species, e.g. nesting birds, terrestrial invertebrates and bats, may occur in line with small-scale changes in habitat structure as a result of ecological succession or other natural processes. Any such changes are likely to be within the range of normal inter-annual variation in the distribution and abundance of species populations. In addition, potentially relevant protected species (e.g. badger) could establish in new locations where they would impose new working constraints, due to legislation protecting these species.

7.8.6 Any remedial works would be expected to be temporary, short term and localised in duration. Furthermore, remedial works would be required to be subject to appropriate mitigation measures, likely including measures outlined in a Noise Management Plan and DMP. Therefore, this would limit the potential for significant disturbance impacts to surrounding ecological receptors.

7.9 Designated Sites

7.9.1 All statutory and non-statutory designated sites described within this section are shown on **Figure 3.1**.

7.9.2 Statutory designated sites of international importance within 15km of the Site are described in Table 7.4.

Table 7.4: Internationally Important Statutory Designated Sites within 15km of the Site.

Site Name	Distance and Direction from the Site	Designated Features
Teesmouth and Cleveland Coast SPA	Within site	The site qualifies under Article 4 of the Birds Directive for the following reasons: The site regularly supports more than 1% of the Great Britain populations of five species listed in Annex I of the Birds Directive:

Site Name	Distance and Direction from the Site	Designated Features
		a. Pied avocet (*Recurvirostra avosetta*); b. Sandwich tern (*Thalasseus sandvicensis*); c. Common tern (*Sterna hirundo*); d. Little tern (*Sternula albifrons*); and e. Ruff (*Calidris pugnax*). The site regularly supports more than 1% of the biogeographic population of two regularly occurring migratory species not listed in Annex I of the Birds Directive; f. Red knot (*Calidris canutus*); and g. Common redshank (*Tringa totanus*). The site qualifies under Article 4 of the Birds Directive as it used regularly by over 20,000 waterfowl (waterfowl as defined by the Ramsar Convention) or 20,000 seabirds in any season.
Teesmouth and Cleveland Coast Ramsar	Within site	Teesmouth and Cleveland Coast Ramsar site is designated as a wetland of international importance because: The site qualifies under Ramsar criterion 5 as it is regularly used by over 20,000 waterbirds in any season; The site qualifies under criterion 6 as it is regularly used by 1% or more of the biogeographic populations of the following bird species in any season: a. Red knot; and b. Common redshank.
North York Moors SPA	10.10km south east	The site qualifies under article 4.1 of the Birds Directive as it is used regularly by 1% or more of the Great Britain population of two species listed in Annex I of the Birds Directive in any season: a. Merlin (Falco columbarius); and b. European golden plover (*Pluvialis apricaria*).
North York Moors SAC	10.10km south east	The site is designated under article 4(4) of the Habitats Directive as it hosts the following habitats listed in Annex I of the Habitats Directive: a. Blanket bogs* b. European dry heaths c. Northern Atlantic wet heaths with *Erica tetralix*. (Wet heathland with cross-leaved heath)
Northumbria Coast SPA	13.45km north west	The site qualifies under Article 4 of the Birds Directive for the following reasons: The site regularly supports more than 1% of the GB populations of two species listed in Annex I of the Birds Directive: a. Arctic tern (*Sterna paradisaea*); and b. Little tern

Site Name	Distance and Direction from the Site	Designated Features
		The site regularly supports more than 1% of the biogeographical population of two regularly occurring migratory species not listed in Annex I of the Birds Directive: a. Turnstone (*Arenaria interpres*); and b. Purple sandpiper (*Calidris maritima*)
Northumbria Coast Ramsar	13.45km north west	The site supports internationally important wintering populations of turnstone and purple sandpiper.
Durham Coast SAC	13.45km north west	The site is designated under article 4(4) of the Habitats Directive as it hosts the following habitats listed in Annex I of the Habitats Directive: a. Vegetated sea cliffs of the Atlantic and Baltic coasts

7.9.3 There are no proposed Ramsar Sites or potential SPAs within 15km of the Site. Statutory designated sites of national importance within 10km of the Site are described in Table 7.5. Statutory designated sites of local importance within 2km of the Site are described in Table 7.6. Non-statutory designated sites within 2km of the Site are described in Table 7.7.

7.10 Habitats

7.10.1 The desk study assessment identified no ancient woodland within 2km of the Site. HoPI were identified within the Site; comprising mudflats as well as coastal and floodplain grazing marsh. In addition to these, areas of deciduous woodland, lowland fens, saline lagoons, coastal saltmarsh, coastal sand dunes and reedbeds were also identified within 2km of the Site. The PEA will identify the habitats within the Main Site

Table 7.5: Nationally Important Statutory Designated Sites within 10km of the Site.

Site Name	Distance and Direction from the Site	Designated Features
Teesmouth and Cleveland Coast SSSI	Within site	The Teesmouth and Cleveland Coast SSSI is of special interest for the following nationally important features that occur within and are supported by the wider mosaic of coastal and freshwater habitats: a. Jurassic geology; b. Quaternary geology; c. Sand dunes; d. Saltmarshes; e. Breeding harbour seals (*Phoca vitulina*); f. Breeding pied avocet, little tern and common tern; g. A diverse assemblage of breeding birds of sand dunes, saltmarsh and lowland open waters and their margins; h. Non-breeding shelduck (*Tadorna tadorna*), shoveler (*Spatula clypeata*), gadwall (*Mareca strepera*), ringed plover (*Charadrius hiaticula*), red knot, ruff, sanderling (*Calidris alba*), purple sandpiper, common redshank and sandwich tern; i. An assemblage of more than 20,000 waterbirds during the non-breeding season; and j. A diverse assemblage of invertebrates associated with sand dunes.
Teesmouth NNR	0.58km north	The Teesmouth NNR is designated for: a. >20,000 waterbird assemblage; b. Pied avocet (breeding); c. BAP breeding birds; including waders, grey partridge (*Perdix perdix*), skylark (*Alauda arvensis*), linnet (*Linaria cannabina*), and reed bunting (*Emberiza schoeniclus*); d. Harbour seal; e. Invertebrate assemblages; f. Red knot (non-breeding); g. Little tern (breeding); h. Lyme grass moth (*Photedes elymi*); i. Common redshank (non-breeding); j. Saltmarsh plant assemblages; k. Sand dune plant assemblages; l. Sanderling (non-breeding); m. Sandwich tern (post-breeding); n. Shelduck (winter); o. Tees Lowlands JCA feature; and p. World War II defensive structures - Blockhouses, tank traps

Site Name	Distance and Direction from the Site	Designated Features
Lovell Hill Pond SSSI	5.30km south east	Lovell Hill Pools is set within an undulating, well-wooded agricultural landscape to the north of the North York Moors. The site supports an outstanding assemblage of dragonflies and damselflies as well as populations of both great crested newt (*Triturus cristatus*) and smooth newt (*Lissotriton vulgaris*).
Saltburn Gill SSSI	9.66km east	Saltburn Gill is a steep sided coastal dene, incised into glacial clays, shales and sandstones of the Lower Jurassic period. The site comprises the eastern slopes of the gill which are of particular importance in supporting one of the few relatively undisturbed areas of mixed deciduous woodland in Cleveland.
Roseberry Topping SSSI	9.98km south east	As a geological site Roseberry Topping is famous for its Middle Jurassic plant bed deposited down about 170 million years ago. This has yielded a large assemblage of fossils totalling some seventy species, from which Hampshaw Thomas amassed his substantial collection. This is a nationally important palaeobotanical site

Table 7.6: Locally Important Statutory Designated Sites within 2km of the Site.

Site Name	Distance and Direction from the Site	Designated Features
Cowpen Bewley Woodland Country Park LNR	1.70km north west	Cowpen Bewley Woodland Country Park LNR is a rural designation managed by STBC. The 50 hectares (ha) site was reclaimed from former brickworks, landfill and ex-agricultural land. Although still in the early stages of growth, rapid development has led to the site's large variety of habitats and wildlife. These include grassland, a lake, a series of ponds and a beck flows around the boundary. The abundant wildlife consists of 80 species of bird, waterfowl, toads, newts and dragonflies in and around the ponds and 18 species of butterfly, hares, foxes and small mammals in the grassland

Table 7.7: Non-statutory Designated Sites within 2km of the Site (*Subject to Completion of Desk Study*).

Site Name	Distance and Direction from the Site	Designated Features
Eston Pumping Station LWS	Adjacent to Site	Mosaic of habitats.
Greenabella Marsh LWS	1.05km north west	Rough grassland with areas of wetland. Contiguous with the Teesmouth and Cleveland Coast SPA and Ramsar. Notable populations of amphibians, common lizard (*Zootoca vivipara*), birds, invertebrates including grayling butterfly (*Hipparchia semele*) and dingy skipper (*Erynnis tages*) have been recorded.

Site Name	Distance and Direction from the Site	Designated Features
Greatham Creek North Bank Saltmarsh LWS	1.17km north west	Small area of saltmarsh vegetation. Some ornithological interest but not sufficient to merit LWS status on its own. Vegetation is dominated by saltmarsh grass (*Puccinellia* sp.) with a narrow fringe of glasswort (*Salicornia* sp.).
Coatham Marsh LWS	1.45km north east	C1 Saltmarsh, C2 Coastal grasslands, E1 flushes, seepages, springs etc. G1 Neutral grasslands, U1 Urban grasslands, V2 Vascular Plants.
Cowpen Bewley Woodland Park LWS	1.70km north west	Former brickworks / landfill. Country park comprising new woodland, grassland, ponds and lakes. The site supports great crested-newt.
Phillips Tank Farm Grassland LWS	1.90km north west	Areas of industrial grassland with calcareous flora & wetland. Large population of dingy skipper (*Erynnis tages*). At least 4 amphibian species including great crested newt (*Triturus cristatus*) and water vole. The area supports c3.7% of total SPA bird numbers plus breeding lapwing (*Vanellus vanellus*).

7.11 Protected and Notable Species

7.11.1 Upon completion, the desk study will provide any records of protected/notable flora and fauna species, from the last ten years, within 2km of the Site.

7.11.2 The protected/notable species discussed below have been identified from professional judgement and experience of terrestrial ecological features within the Tees Valley.

Notable Flora

7.11.3 The PEA will identify all species of notable flora. None of the statutory or non-statutory designated sites within ZoI of the Site have specific floral species as their qualifying features. However, several designated sites have plant assemblages associated with saltmarsh, sand dunes and grassland habitats as qualifying features.

Amphibians

7.11.4 All amphibians are protected by law in the UK under Schedule 5 of WCA. Common toad (*Bufo bufo*) and great crested newt (GCN) are also SoPI in England under Section 41 of the NERC Act. GCN are also a species of local importance under the Tees Valley Biodiversity Action Plan (BAP).

7.11.5 Two of the statutory designated sites identified within ZoI of the Site; Lovell Hill Ponds SSSI and Cowpen Bewley Woodland Country Park LNR, list amphibian species as a designating feature. Three non-statutory designated sites within ZoI of the Site; Cowpen Bewley Woodland Park LWS, Greenabella Marsh LWS and Phillips Tank Farm Grasslands LWS, mention populations of amphibians within their citations. Phillips Tank Farm Grasslands LWS specifically notes a “large” population of GCN.

Badger

7.11.6 Badgers and their setts are protected by law in the UK under the Protection of Badgers Act 1992. None of the statutory and non-statutory designated sites identified within ZoIs of the Site listed badger as a designating feature.

Bats

7.11.7 British bat species are fully protected through their inclusion in Schedule 5 of the WCA 1981 (as amended) and in Schedule 2 of the Habitats Regulations. Under the legislation, it is an offence to:

a. Intentionally kill, injure, or take a bat;
b. Damage, destroy, or obstruct access to any structure or place that a bat uses for shelter or protection (this includes bat roosts, even if they are not currently occupied); and
c. Disturb a bat while it is occupying a roost.

7.11.8 Soprano pipistrelle (*Pipistrellus pygmaeus*) are also a SoPI in England under Section 41 of the NERC Act. All bat species, except common pipistrelle (*Pipistrellus pipistrellus*) are of local importance under the Tees Valley BAP.

7.11.9 None of the statutory and non-statutory designated sites identified within ZoIs of the Site listed bats as a designating feature.

Birds

7.11.10 Wild birds are protected under Part 1 Section 1 of the WCA; they are protected from being killed, injured or captured, while their nests and eggs are protected from being damaged, destroyed or taken. Additional protection is extended to species listed under Schedule 1 of the Act, meaning it is also an offence to disturb these species at or near the nest, or whilst they have dependent young.

7.11.11 WeBS data will be sought as part of the desk study to support the ES.

7.11.12 There are 59 bird SoPI under the NERC Act and 10 bird species of local importance under the Tees Valley BAP. Eight statutory and three non-statutory designated sites identified within ZoIs of the Site list bird species as a designating feature.

Terrestrial Invertebrates

7.11.13 All native invertebrate species are protected under the WCA (as amended). Under the legislation, it is an offence to:

a. Intentionally or recklessly disturb invertebrates while they occupy a structure or place used for shelter or protection; and
b. Obstruct access to a place of shelter or protection.

7.11.14 Some invertebrates, listed on Schedule 5 of the WCA (as amended) and/or listed as EPS under the Conservation of Habitats and Species Regulations 2017, have extra legal protection. For these invertebrate species it is also an offence to:

a. Deliberately kill, injure, disturb or capture them;
b. Destroy their eggs;
c. Damage of destroy their breeding sites and resting places (even when not present); and
d. Possess, control or transport them (alive or dead).

7.11.15 There are 413 terrestrial invertebrate SoPI under the NERC Act, including moths, butterflies, dragonflies and beetles, while there are nine species of local importance under the Tees Valley BAP which are only butterfly and moth species.

7.11.16 Four statutory designated sites identified within ZoI of the Site; Teesmouth and Cleveland Coast SSSI, Lovell Hill Ponds SSSI, Teesmouth NNR, and Cowpen Bewley Woodland Country Park LNR, list invertebrates as a qualifying feature. Two non-statutory designated sites within ZoI of the Site, Greenabella Marsh and Phillips Tank Farm Grasslands LWS, also list invertebrates as a designating feature.

Reptiles

7.11.17 All native reptile species in England are listed on Schedule 5 of the WCA. Partially protected species include common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), adder (*Vipera berus*), and grass snake (*Natrix helvetica*). These species receive protection against deliberate killing, injuring and sale; covered under the WCA subsections 9(1) and 9(5). Fully protected species are sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*).

7.11.18 Common lizard are also a SoPI under the NERC Act and a species of local importance under the Tees Valley BAP. None of the statutory designated sites identified within ZoIs of the Site list reptile species as a designating feature. One of the non-statutory designated sites within ZoI of the Site; Greenabella Marsh LWS, list reptiles and specifically common lizard as a designating feature.

Otter

7.11.19 Otters are listed under Schedule 5 of the WCA, providing protection against:

a. Killing, injuring, or taking an otter;
b. Damaging, destroying, or obstructing access to any structure or place used for shelter or protection by an otter; and
c. Disturbing an otter while it is in such a structure or place.

7.11.20 Otter are a SoPI under the NERC Act. None of the statutory and non-statutory designated sites identified within ZoIs of the Site listed otter as a designating feature.

Water Vole

7.11.21 Water vole are fully protected under Section 9 of Schedule 5 of the WCA. Protection was extended by the Countryside and Rights of Way Act 2000. Under this legislation, it is an offence to:

a. Intentionally kill, injure or take (capture) a water vole or possess or control a live or dead water vole, or any part of a water vole;
b. Intentionally or recklessly damage, destroy, or obstruct access to any structure or place used by water voles for shelter or protection (this includes their burrows); and
c. Disturb water voles while they are occupying such a place.

7.11.22 Water vole are also a SoPI under the NERC Act and a species of local importance under the Tees Valley BAP. None of the statutory designated sites identified within ZoIs of the Site, list water vole as a designating feature. One of the non-statutory designated sites within ZoIs of the Site; Phillips Tank Farm Grassland LWS, list water vole as a designating feature.

Other Terrestrial Mammals

7.11.23 Certain mammal species, such as Western European hedgehog (*Erinaceus europaeus*), are also partially protected under Schedule 5 and 6 of the WCA which makes it illegal to kill or capture them.

7.11.24 Brown hare, West European hedgehog and harvest mouse are SoPI under the NERC Act. In addition, brown hare and harvest mouse are species of local importance under the Tees Valley BAP. None of the statutory and non-statutory designated sites identified within ZoIs of the Proposed Development listed any of these terrestrial mammals as a designating feature.

7.12 Sensitive Ecological Features

7.12.1 The key ecological features to be included within the terrestrial ecology Section of the ES are:

a. Statutory designated sites of international importance, including, SPA, SAC and Ramsar Sites within a 15km ZoI of the Site (extending up to 30km where bats are the qualifying interest);
b. Statutory designated sites of national importance, including SSSI within a 10km ZoI and NNR within a 2km for the Site;
c. Statutory designated sites of local importance, including, LNR within a 2km ZoI of the Site;
d. Non-statutory designated sites, including LWS within 2km ZoI of the Site;
e. HoPI, AWI and ATI within 2km ZoI of the Site;
f. Habitats within the Site comprising grassland, heathland and shrub, urban (including open mosaic habitat), woodland, intertidal sediment, wetlands, individual trees, sparsely vegetated land, ponds and watercourses; and
g. Protected and notable species including amphibians (e.g. GCN), bats, breeding and non-breeding birds, terrestrial invertebrates, riparian mammals and other notable mammals (including brown hare and West European hedgehog).

7.13 Design, Mitigation, and Enhancement Measures

7.13.1 This section discusses design, mitigation and enhancement measures relevant to terrestrial ecology features only. Measures relating to marine and freshwater ecological receptors are discussed in **Chapter 8c: Freshwater and Marine Ecology**.

7.13.2 Avoidance and mitigation measures will be developed throughout the design process of the Proposed Development and as such the mitigation requirements will be detailed within the ES. As far as possible, adverse impacts on key ecological features, as listed above, will be avoided through the design of the Proposed Development. Where significant adverse impacts are not avoided through design, mitigation measures will be proposed where possible. In relation to protected species, Natural England mitigation licences will be obtained where required.

7.13.3 Where possible, any habitats of biodiversity value will be retained as part of the Proposed Development. Where this is not possible, appropriate compensation measures will be explored (e.g. development of new hedgerows, watercourses, and grassland, etc).

7.13.4 Based on the results of surveys and assessments to be completed, mitigation measures leading to the avoidance, reduction or compensation of significant effects will be identified prior to an evaluation of the effects of impacts. This will constitute 'embedded' mitigation within the Proposed Development design. Such mitigation measures will be included as part of the ES. Thereafter, any residual impacts identified following the implementation of embedded mitigation measures will be identified.

7.13.5 Monitoring requirements will also be explored, and requirements determined once full survey results have been interpreted, and full Proposed Development details are known. Any such requirements for mitigation and/or monitoring will be captured within the CEMP bespoke to the Proposed Development.

7.13.6 With regard to habitat compensation and enhancement, the principles of BNG will be considered and a BNG assessment undertaken.

7.13.7 Where needed, pre-construction surveys for protected and notable species will be undertaken a minimum of eight weeks in advance of any works commencing to allow for any necessary mitigation to be implemented.

7.13.8 Where possible, works should be carried out in advance of sensitive seasons for nearby terrestrial ecological features. In particular, works should be undertaken out of the breeding bird season (March to August inclusive) if breeding bird habitat is present.

7.13.9 The impact of INNS on any protected species and habitats will be considered at all phases of the Proposed Development and any necessary mitigation measures will be described within a Biosecurity Protocol or INNS Management Plan.

Construction Phase

7.13.10 An outline CEMP will be produced to support the DCO application and to reduce impacts on designated sites, habitats and species during the construction of the Proposed Development. The CEMP will be implemented to avoid, minimise or mitigate effects on the environment during the construction phases of the Proposed Development. The CEMP will include terrestrial ecology specific measures such as, but not limited to:

a. noise and vibration mitigation measures;
b. buffers surrounding sensitive habitats where construction activities are occurring; and
c. working methodology adaptations that prevent terrestrial ecological harm.

7.13.11 Mitigation measures during the construction phase are likely to include:

a. production of a CEMP, detailing standard best practice measures to be incorporated into construction, including:
    1. best practice measures for pollution prevention to minimise impacts on surrounding habitats (including water quality), such as the creation of suitable drainage and use of silt fences, where necessary;
    2. noise reduction measures on operational plant machinery and equipment;
    3. dust suppression measures; and
    4. use of sensitive lighting where any night works are required (e.g. positioned to avoid light-spill onto watercourses);
b. use of appropriate buffer zones to avoid direct impacts (e.g. to trees or significant disturbance to wildlife and their habitats, such as any active badger setts);
c. precautionary vegetation clearance, where necessary, to avoid significant impacts to species;
d. covering any open trenches to prevent wildlife from falling in and place a ramp to enable wildlife to escape;
e. secure fencing and screening of construction compounds and trenches, including those in proximity to ecologically valuable habitats (e.g. within 15m of watercourse);
f. maintaining a riparian buffer around all watercourses (minimum 10m from the bank top);
g. timing of works to avoid sensitive periods for certain species, e.g. avoiding clearance of suitable bird nesting habitat during nesting season;
h. retention of habitats of high biodiversity value; and
i. potential need for habitat creation and replacement (to be confirmed as the field surveys progress).

Operation Phase

7.13.12 Mitigation measures during the operation phase are likely to include:

a. appropriate design of the Proposed Development to minimise air quality and noise impacts on surrounding habitats, including statutory designated sites;
b. appropriate design of the Proposed Development to minimise water quality impacts on surrounding habitats; and
c. a sensitive lighting scheme for any permanent lighting to be installed as part of the Proposed Development, where process safety constraints allow.

Decommissioning Phase

7.13.13 Mitigation measures during the decommission phase are expected to be comparable to those for the construction phase and would be document and secured by a decommission plan.

7.14 Description of Potential Likely Significant Effects

7.14.1 At the time of writing this report it is not possible to accurately determine likely significant effects to the various receptors that may be impacted. As such, and on a precautionary basis, terrestrial ecological features have been scoped into the assessment unless there is sufficient desk study information to suggest that they are highly unlikely to be affected by the Proposed Development and/or appropriate mitigation measures can be confidently determined at this early stage.

Construction Phase

7.14.2 The construction phase will include site clearance and groundworks (enabling works), followed by construction activities themselves. These works have the potential for both short-term and permanent impacts, both direct and indirect, to habitats both within the Site and on surrounding areas. Direct impacts will include temporary or permanent loss of habitat and potential killing or injury of any protected or notable species present.

7.14.3 Disturbance impacts may be both direct and indirect and could include those from light spill, noise, vibration, visual disturbance, air pollution (such as dust deposition and pollution from traffic movements), water pollution (such as from run-off of chemicals) and the spread of INNS. This may negatively impact upon habitats and species through direct or indirect disturbance and/or result in habitat degradation in surrounding areas, including nearby designated sites.

7.14.4 Where appropriate, impacts will be assessed in detail across other chapters of the ES (such as the ES **Chapter 5: Air Quality**, ES **Chapter 8: Freshwater and Marine Ecology** and ES **Chapter 9: Water Environment and Flood Risk**) and cross-referenced in the ES **Chapter 7: Terrestrial Ecology**. Impacts will be assessed both in consideration of the Proposed Development alone and in combination with any other surrounding developments.

Operation Phase

7.14.5 Due to the nature of processes in the operational phase of the Proposed Development, direct impacts to terrestrial ecological receptors are considered unlikely. However, indirect impacts may be incurred, again through light spill, noise, vibration, visual disturbance (such as from gas flares), air pollution (during operation of the SAF production facility and pollution from traffic movements) and water pollution (such as from discharge of chemicals).

7.14.6 Operational impacts for the Proposed Development have not yet been defined, and although unlikely, due to the limited information available, it has had to be assumed that

significant effects have the potential to occur. Operational impacts associated with lighting, noise, vibration and visual disturbance, may negatively impact upon habitats and species through indirect disturbance.

7.14.7 In addition, air and water emissions resulting from the operation of the SAF production facility may result in habitat degradation in surrounding areas, including nearby designated sites. However, mitigation measures are being embedded into the design of the Proposed Development as far as practicable and will include the best available technology to reduce adverse impacts associated with air quality, in particular emissions of nitrogen oxides.

7.14.8 The SAF facility will be subject to an environmental permit which would strictly regulate air and water emissions and implement BAT in order to prevent/minimise emissions and impacts. The Proposed Development will also include its own wastewater treatment facilities to clean (and re-use as far as practicable) process water, with effluent being discharged to the nearby Bran Sands WwTP. Nitrogen loading and nitrogen deposition will be considered as part of the assessment.

Decommissioning Phase

7.14.9 The decommissioning phase will include site clearance. These works have the potential for both short-term and permanent impacts, both direct and indirect, to habitats within the Site and on surrounding areas. Direct impacts may include temporary or permanent loss of habitat and potential killing or injury of any protected or notable species present.

7.14.10 Disturbance impacts may be both direct and indirect and could include those from light spill, noise, vibration, visual disturbance, air pollution (such as dust deposition and pollution from traffic movements) and water pollution (such as from run-off of chemicals). This may negatively impact upon habitats and species through direct or indirect disturbance and/or result in habitat degradation in surrounding areas, including nearby designated sites.

7.15 Elements Scoped In or Out of the Assessment

7.15.1 Table 7.8 details those features to scoped in or out of the terrestrial ecology assessment. Each receptor/feature is accompanied by a justification for its inclusion or exclusion from further assessment. This will be reviewed following completion of the Preliminary Ecological Assessment.

Table 7.8: Elements Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Statutory designated sites – international	Construction, operation and decommissioning.	X		Habitats within the Teesmouth and Cleveland Coast SPA and Ramsar may be affected via air and water pollution events during both construction and operation. In addition, the qualifying bird species may be disturbed via

Element	Phase	Scoped In	Scoped Out	Justification
				noise, vibration, lighting and/or visual disturbance during construction and operation.
Statutory designated sites – national	Construction, operation and decommissioning.	X		Habitats within the Teesmouth and Cleveland Coast SSSI and Teesmouth NNR may be affected via air and water pollution events during both construction and operation. In addition, notable species of wildlife associated with these designations may be disturbed via noise, vibration, lighting and/or visual disturbance during construction and operation.
Statutory designated sites – local	Construction, operation and decommissioning.	X		Habitats within the Cowpen Bewley Woodland Country Park LNR may be affected via air and water pollution events during both construction and operation. In addition, notable species of wildlife associated with these designations may be disturbed via noise, vibration, lighting and/or visual disturbance during construction and operation
Non-statutory designated sites	Construction, operation and decommissioning.	X		No data has currently been received for non-statutory designated sites therefore these have been scoped in.
Habitats	Construction, operation and decommissioning.	X		The results of the PEA carried out as part of the assessment will be used to determine the presence or absence of Open Mosaic Habitat (OMH) and other notable habitats. If notable habitat is present, site clearance and construction activities associated with the Proposed Development will result in the loss of this habitat. In addition, activities during the operation of the Proposed Development may lead to the degradation of any adjacent notable areas of habitat present as a result of dust deposition, air pollution or other pollution events. As above, HPI that are present within the Site may incur some habitat loss resulting from site

Element	Phase	Scoped In	Scoped Out	Justification
				clearance activities during the construction phase, depending on the extent of clearance required. In addition, HPI adjacent to the Site may incur adverse effects during both construction and operation via dust deposition and pollution events.
Badger	Construction, operation and decommissioning.	X		No data has currently been obtained for this potential ecological receptor. Until a full PEA, detailed desk study and further surveys have been completed the receptor has been scoped in.
Bats	Construction, operation and decommissioning.	X		No data has currently been obtained for this potential ecological receptor. Until a full PEA, detailed desk study and further surveys have been completed the receptor has been scoped in.
Birds	Construction, operation and decommissioning.	X		No onsite data has currently been obtained for this potential ecological receptor (although there is extensive data on birds from nearby development proposals). Until a full PEA, detailed desk study and further surveys have been completed the receptor has been scoped in.
Amphibians	Construction, operation and decommissioning.	X		No data has currently been obtained for this potential ecological receptor. Until a full PEA, detailed desk study and further surveys have been completed the receptor has been scoped in.
Reptiles	Construction	X		No data has currently been obtained for this potential ecological receptor. Until a full PEA and detailed desk study have been completed the receptor has been scoped in.

Element	Phase	Scoped In	Scoped Out	Justification
Otter	Construction, operation and decommissioning	X		No data has currently been obtained for this potential ecological receptor, although the initial PEA of the Main Site concluded otters were unlikely present due to the lack of suitable habitat assemblages recorded. Until a full PEA and detailed desk study of the whole Site has been completed the receptor has been scoped in.
Water Vole	Construction, operation and decommissioning	X		No data has currently been received for this potential ecological receptor, although the initial PEA of the Main Site concluded otters were unlikely present due to the lack of suitable habitat assemblages recorded. Until a full PEA and detailed desk study of the Site has been completed the receptor has been scoped in.
Terrestrial Invertebrates	Construction, operation and decommissioning	X		No data has currently been received for this potential ecological receptor. Until a full PEA, detailed desk study and further surveys have been completed the receptor has been scoped in.

7.16 Proposed Assessment Methodology

7.16.1 The assessment methodology is common across all elements of the Proposed Development and will be undertaken in accordance with the CIEEM EcIA guidelines (Ref 236). These guidelines represent the current best practice for assessing the ecological impact of development projects. Other industry best practice guidance that will be followed when undertaking the assessment is referenced in Section 7.3.

7.16.2 Consideration will also be given to standard EIA terminology, where the significance level attributed to each effect has been assessed based on the sensitivity of the affected IEFs and the magnitude of change arising from the Proposed Development. The sensitivity of the affected receptor is assessed on a scale of very high, high, medium, low, and negligible and the magnitude of change is assessed on a scale of large, medium, small, negligible and no change.

7.16.3 The assessment of likely significant environmental effects as a result of the Proposed Development will consider the construction, operation and decommissioning phases.

7.16.4 The impact process involves:

a. identifying and characterising impacts and their effects;
b. incorporating measures to avoid and mitigate adverse effects;
c. assessing the significance of any residual effects after embedded mitigation;
d. identifying appropriate additional mitigation measures and any compensation measures to offset significant residual effects; and
e. identifying opportunities for ecological enhancement.

7.16.5 This assessment will be presented in the form of an ES chapter and adjacent assessments, including an HRA and BNG assessment. The assessment includes potential impacts on each receptor identified as an Important Ecological Feature (IEF, discussed further under 'Determining Importance', below), identifying potential impacts and effects during the construction and operational phases of the project, with impacts and effects characterised in accordance with the following criteria:

a. **Positive or negative** – whether the impact/effect will improve or reduce the quality of the baseline habitat present;
b. **Extent** – the spatial or geographical area over which the impact/effect may occur,
c. **Magnitude** – the size, amount, intensity or volume of the impact/effect, defined on a quantifiable basis, such as an area or percentage of habitat to be lost;
d. **Duration** – the length of time an impact/effect is expected to last, relative to the particular timeframe for the species/habitat being considered and defined as short, medium or long-term and permanent or temporary. Short- term is considered to be up to one year; medium-term is considered to be between one and 10 years and long-term is considered to be greater than 10 years;
e. **Frequency and timing** – the frequency of a particular activity may change its impact/effect, e.g., one-off or infrequent disturbance is less likely significantly affect a particular species present within a habitat, whereas regular disturbance is more likely to have a significant effect. Similarly, the impact/effect of a particular activity may change significantly depending on its timing, e.g., tree felling outside of bird nesting season is highly unlikely to directly impact nesting birds, whereas carrying out the same work within nesting season is more likely to have impacts; and
f. **Reversibility** – an irreversible (permanent) effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible (temporary) effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.

Determining Importance

7.16.6 A number of characteristics contribute to the importance of ecological features. These include, for example (but not exclusively):

a. the rarity of a species or habitat;
b. legal protection/conservation status;
c. ability to resist or recover form environmental change;
d. whether the species population size is notable in a wider context;
e. the richness of assemblages of plants and animals; and
f. the presence of species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

7.16.7 The CIEEM guidelines (Ref 236) state that ecological features should be considered within a 'defined geographical context' (i.e. spatial scale), with International importance being the highest level, followed by International and European; National; Regional; Metropolitan, County, vice-county or other local authority-wide areas; River Basin District; Estuarine system/Coastal cell; and Local importance representing the lowest level.

7.16.8 Assigning importance to ecological features is based on professional judgement informed by available guidance and information and expert advice.

Significance of Effect Criteria

7.16.9 In determining the significance of a potential effect, the magnitude of change arising from the Proposed Development is correlated with the value/sensitivity of the particular environmental receptor or process under consideration. The sensitivity of effect criteria will align with CIEEM's Guidelines on Ecological Impact Assessment (Ref 236).

7.16.10 Effects will be defined as either 'Significant' or 'Not Significant'. Effects that are classified as moderate or above are 'Significant'. Effects classified as below moderate are considered 'not significant'.

7.17 Other Assessments

Habitat Regulations Assessment

7.17.1 As the Site is located directly adjacent to the Teesmouth and Cleveland Coast SPA, there is considered to be the potential for likely significant effects on the ecological receptors that constitute the 'qualifying features' of the sites.

7.17.2 As such, a HRA screening exercise will need to be undertaken to determine any likely significant effects resulting from the Proposed Development during either the construction or operational phases.

7.17.3 HRA screening will be completed when sufficient environmental information has been gathered to accurately determined likely significant effects. Alongside the terrestrial ecology assessment, this will include information from the freshwater and marine ecology assessment, air quality assessment, and water environment assessment. It is expected that this information will be available following production of the PEIR.

7.17.4 If likely significant effects are identified, an Appropriate Assessment will then need to be carried out to examine these effects in more detail and determine appropriate mitigation measures in order to avoid any adverse effects on site integrity resulting from the Proposed Development.

7.17.5 In addition, although it does not specifically require assessment under the Habitats Regulations, due to the overlap in qualifying features and geographic coverage, the Teesmouth and Cleveland Coast Ramsar site will also be considered as part of the HRA.

7.17.6 To determine the biodiversity value of the Site pre- and post-development in a quantitative way, a BNG assessment will also be undertaken. BNG is the end result of a process applied to development so that, overall, there is a positive outcome for biodiversity. This process follows the mitigation hierarchy, which sets out that everything possible must be done to firstly avoid, secondly minimise and thirdly restore/rehabilitate losses of biodiversity on a site. Only as a last resort, residual losses are compensated for, contributing towards local and national policies and strategies for conserving and enhancing biodiversity.

7.17.7 The BNG assessment will be based upon achieving compliance with current good practice principles, including measures such as avoiding areas of higher ecological value and achieving a measurable gain for biodiversity. Measurable gains will be calculated using the Statutory Biodiversity Metric.

7.17.8 Therefore, this data will be carried through the assessment and the Statutory Biodiversity Metric will be used to complete the BNG assessment. The BNG assessment will analyse the habitats to be retained, enhanced, created, or lost within the Site. It will identify whether habitat compensation is required and will demonstrate benefits resulting from the Proposed Development.

Further Surveys

7.17.9 As mentioned previously above, the Study Area for the terrestrial ecology assessment and the potential terrestrial ecological features present have been identified as far as reasonably foreseeable at this stage, based on available information, including existing surveys. However, the terrestrial ecological features scoped in will be based on the results of a full PEA, detailed desk study and subsequent species specific surveys. As the assessment progresses and survey work is completed, the findings may reveal the need for further surveys to determine potential likely significant effects to ecological receptors more accurately. Any further survey requirements would be clearly highlighted following the completion of initial survey work.

7.17.10 Proposed terrestrial ecology surveys may include, but are not limited to and are subject to consultation with Natural England and relevant LPAs:

a. PEA, including a UK Habitat classification survey, INNS survey, BNG condition assessment and protected species suitability assessment;
b. Breeding bird survey;
c. Non-breeding bird survey;
d. Bat activity survey;
e. Great-crested newt survey; and
f. Terrestrial invertebrate survey.

Licensing

7.17.11 The findings of the surveys being completed as part of the terrestrial ecology assessment may determine that there are likely significant effects to certain species or

species groups that will result from the Proposed Development. In some instances (such as in relation to badger, otter, water vole or GCN), potential impacts to these species may not be legally permissible without first obtaining a mitigation licence from Natural England. Any requirements for licensing would be clearly set out in the various survey reports to be produced, and licences would be applied for and obtained prior to any works being undertaken that would affect the relevant species. The requirements for any protected species licensing would also be captured within the ES.

7.18 Limitations and Assumptions

7.18.1 This Scoping Report is based on information available at the time of writing. Information on the Site and wider ZoI, as well as the design of the Proposed Development, is therefore subject to change. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

a. Where access restrictions within the Study Area prevent a full ecological baseline assessment, a precautionary principle will be applied to the assessment (and has been to the scoping assessment) of any important ecological features. The precautionary principle will assume a 'reasonable worst-case' scenario informed by professional experience and knowledge, desk-based information and field-based evidence (where available) for any feature/receptor unable to be accessed or fully surveyed. This approach will ensure that appropriate recommendations and/or mitigation are provided even though these may not later be required. Any recommendation/mitigation can thereafter be amended accordingly once access/survey has been possible.
b. A detailed scope for the assessment has been provided as far as feasible at this stage. However, as mentioned above, the scope may be subject to change as a result of the ongoing assessment and/or any forthcoming details relating to the Proposed Development. This may require additional survey effort and/or assessments to be completed in order to accurately determine likely significant effects resulting from the Proposed Development.
c. The scope included within this chapter does not include marine and freshwater ecology. This is detailed separately in **Chapter 8: Freshwater and Marine Ecology**.

8. Freshwater and Marine Ecology

8.1 Introduction

8.1.1 This chapter considers the impacts of the Proposed Development on freshwater and marine ecological receptors during the construction and operational phases of the project, and any potential likely significant effects. It sets out the proposed methodology for the freshwater and marine biodiversity assessment and identifies those impacts that can be scoped out of the assessment. Where necessary, further assessment will be presented in the ES.

8.1.2 Activities from the Proposed Development likely to impact the freshwater and marine environments are:

- Construction phase:
  - Demolition of the two existing jetties;
  - Removal of revetment and excavation works for a closed quay;
  - Piling works for an open quay:
  - Capital dredging for access to the new quay; and
  - Construction of the new quay.
  - Offload of Modules, AIL and Construction Materials.
- Operational phase:
  - Import of feedstock and export products via marine shipping;
  - Maintenance of the dredged channel; and
  - Maintenance of the new quay.
- Decommissioning phase:
  - Cease feedstock import and SAF exports.

8.1.3 This Chapter is intended to be read as part of the whole EIA Scoping Report, with reference to:

a. **Chapter 7: Terrestrial Ecology**; and
b. **Chapter 9: Water Environment and Flood Risk**.

8.1.4 In addition, **Figure 3.1** illustrates statutory ecological designations and ecological habitats.

8.2 Consultation

8.2.1 The Applicant will consult with the following organisations in relation to Marine Ecology during preparation of the PEIR:

a. Environment Agency;
b. Marine Management Organisation;
c. Natural England; and
d. PD Ports.

8.3 Policy, Legislation and Guidance

8.3.1 The policy, legislation, and guidance relevant to the assessment of the Proposed Development is as summarised in Table 8.1:

Table 8.1: Marine and Freshwater Ecology - Summary of Key Policy, Legislation and Guidance

Policy/Legislation/Guidance	Description
Policy	
The Overarching National Policy Statement for Energy (NPS) (EN-1) 2024 (Ref 36)	Sets out national policy for nationally significant infrastructure projects (NSIPs) in the energy sector. It contains the following policy statements that are of key relevance for the purpose of the assessment of environmental impacts on ecological features: “All proposals for projects that are subject to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations)102 must be accompanied by an ES describing the aspects of the environment likely to be significantly affected by the project” (Para 4.3.1). “The construction of an onshore energy project on the coast may involve, for example, dredging, dredge spoil deposition, cooling water, culvert construction, marine landing facility construction and flood and coastal protection measures which could result in direct effects on the coastline, seabed and marine ecology and biodiversity.." (Para 5.6.6). “The ES should include an assessment of the effects on the coast, tidal rivers and estuaries. In particular, applicants should assess: […]the effects of the proposed project on marine ecology, biodiversity, protected sites and heritage assets” (Para 5.6.11). “Environmental net gain is an approach to development that aims to leave the natural environment in a measurably better state than beforehand. Projects should therefore not only avoid, mitigate and compensate harms, following the mitigation hierarchy, but also consider whether there are opportunities for enhancements.” (Para 4.6.1) “Currently biodiversity net gain policy in England only applies to terrestrial and intertidal components of projects. Principles for Marine Net Gain are currently being rolled out by the Government, who will provide guidance in due course. There are provisions in the Environment Act 2021 to allow Marine Net Gain to be made mandatory for NSIPs in the future.” Para 4.6.3
National Planning Policy Framework	The NPPF is the Government’s planning policy for England and provides guidance for local planning authorities and decision-makers,

Policy/Legislation/Guidance	Description
(NPPF) 2024 (Ref 38)	both in drawing up plans and making decisions about planning applications. Section 15 of the framework, titled 'Conserving and enhancing the natural environment', states that "planning policies and decisions should contribute to and enhance the natural and local environment", and incorporates policies for minimising development impacts on biodiversity.
North-east Marine Plan (Ref 198)	North-east Inshore and North-east Offshore Marine Plans provides guidance for sustainable development from the Scottish Border to Flamborough Head in Yorkshire. The Plan will help to enhance and protect the marine environment and achieve sustainable economic growth while respecting local communities both within and adjacent to the marine plan areas. The Plan is applicable to project activities such as construction of the quay and associated dredging.
Stockton-on-Tees Borough Council – Local Plan – Adopted January 2019 (Ref 55)	The Local Plan sets out the Council's policies and proposals to guide planning decisions and establishes the framework for the sustainable economic growth and development of the Borough by 2032. Policy EN5 - Preserve, Protect and Enhance Ecological Networks, Biodiversity and Geodiversity states that: 1. The Council will protect and enhance the biodiversity and geological resources within the Borough. Development proposals will be supported where they enhance nature conservation and management, preserve the character of the natural environment and maximise opportunities for biodiversity and geological conservation particularly in or adjacent to Biodiversity Opportunity Areas in the River Tees Corridor, Teesmouth and Central Farmland Landscape Areas. 2. The Council will preserve, restore and re-create priority habitats alongside the protection and recovery of priority species. 3. Ecological networks and wildlife corridors will be protected, enhanced and extended. A principal aim will be to link sites of biodiversity importance by avoiding or repairing the fragmentation and isolation of natural habitats. 4. Sites designated for nature or geological conservation will be protected and, where appropriate enhanced, taking into account the following hierarchy and considerations: b. Internationally designated sites – Development that is not directly connected with or necessary to the management of the site, but which is likely to have a significant effect on any internationally designated site, irrespective of its location and when considered both alone and in combination with other plans and projects, will be subject to an Appropriate Assessment. Development requiring Appropriate Assessment will only be allowed where: i. It can be determined through Appropriate Assessment, taking into account mitigation, the proposal would not result in adverse effects on the

Policy/Legislation/Guidance	Description
	site's integrity, either alone or in combination with other plans or projects; or ii. as a last resort, where, in light of negative Appropriate Assessment there are no alternatives and the development is of overriding public interest, appropriate compensatory measures must be secured. d. Nationally designated sites - Development that is likely to have an adverse effect on a site, including broader impacts on the national network of Sites of Special Scientific Interest (SSSI) and combined effects with other development, will not normally be allowed. Where an adverse effect on the site's notified interest features is likely, a development will only be allowed where: iv. the benefits of the development, at this site, clearly outweigh both any adverse impact on the sites notified interest features, and any broader impacts on the national network of SSSI's; v. no reasonable alternatives are available; and vi. mitigation, or where necessary compensation, is provided for the impact. e. Locally designated sites: Development that would have an adverse effect on a site(s) will not be permitted unless the benefits of the development clearly outweigh the harm to the conservation interest of the site and no reasonable alternatives are available. All options should be explored for retaining the most valuable parts of the sites interest as part of the development proposal with particular consideration given to conserving irreplaceable features or habitats, and those that cannot readily be recreated within a reasonably short timescale. 5. Development proposals should seek to achieve net gains in biodiversity wherever possible. It will be important for biodiversity and geodiversity to be considered at an early stage in the design process so that harm can be avoided and wherever possible enhancement achieved. Detrimental impacts of development on biodiversity and geodiversity, whether individual or cumulative should be avoided. Where this is not possible, mitigation and lastly compensation, must be provided as appropriate. The Council will consider the potential for a strategic approach to biodiversity offsetting in conjunction with the Tees Valley Local Nature Partnership and in line with the above hierarchy. 6. When proposing habitat creation it will be important to consider existing habitats and species as well as opportunities identified in the relevant Biodiversity Opportunity Areas. This will assist in ensuring proposals accord with the 'landscape scale' approach and support ecological networks. 7. Existing trees, woodlands and hedgerows which are important to the character and appearance of the local area or are of nature conservation value will be protected wherever possible. Where loss

Policy/Legislation/Guidance	Description
	is unavoidable, replacement of appropriate scale and species will be sought on site, where practicable.
Redcar and Cleveland Borough Council - Local Plan - Adopted May 2018 (Ref 33).	The Local Plan sets out the Council's policies and proposals to guide planning decisions and establishes the framework for the sustainable economic growth and development of the Borough up to 2032. Policy N 4 Biodiversity and Geological Conservation states that: Internationally Important Sites - Priority will be given to protecting our internationally important sites, including the Teesmouth and Cleveland Coast Special Protection Area/Ramsar and European Marine Site, and the North York Moors Special Protection Area and Special Area of Conservation. Development that is not directly related to the management of the site, but which is likely to have a significant effect on any internationally designated site, irrespective of its location and when considered both alone and in combination with other plans and projects, will be subject to an Appropriate Assessment. Nationally Important Sites - Development that is likely to have an adverse impact on nationally important SSSI sites, including broader impacts on the national network and combined effects with other development, will not normally be allowed. Where an adverse effect on the site's notified interest features is likely, an exception will only be made where: the benefits of the development, at this site, clearly outweigh both any adverse impact on the features of the site that makes it of special scientific interest, and any broader impacts on the network of SSSIs; no reasonable alternatives are available; and mitigation, or where necessary compensation, is provided for the impact. Locally Important Sites - Development that is likely to have an adverse impact on Local Sites (Local Wildlife Sites and Local Geological Sites) or Local Nature Reserves will only be approved where: the benefits clearly outweigh any adverse impact on the site; no reasonable alternatives are available; and mitigation, or where necessary compensation, is provided for the impact. Wildlife corridors and other habitat networks will be protected and enhanced, particularly hedgerows, watercourses and linking habitat features. Opportunities to deculvert watercourses will be encouraged.
Tees Valley Local Biodiversity Action Plan (LBAP) (updated 2012) (Ref 94)	LBAPs identify local priorities for biodiversity and work to deliver agreed actions and targets for priority habitats and species, as well as locally important wildlife and nature sites. The current Tees Valley Biodiversity Action Plan covers a number of local authority areas, including Stockton-on-Tees . The cornerstone of the plan is habitat and species action plans for locally identified priority habitats and species. As of 2012, the number of priority species has increased significantly to 51.
Legislation	
The Convention on the Conservation of European Wildlife and Natural Habitats 1979 (the 'Bern Convention') (Ref 226)	The principal aims of the Bern Convention are the conservation and protection of the wild plant and animal species (and the natural habitats thereof) listed in Appendices I and II of the Convention. It also seeks to increase co-operation between governments and to regulate the exploitation of species listed in Appendix III, which includes migratory fish species, cetaceans and grey seal.

Policy/Legislation/Guidance	Description
The Oslo and Paris Convention for the Protection of the Marine Environment in the North-east Atlantic 1992 (the OSPAR Convention) (Ref 227)	The OSPAR Convention provides a comprehensive approach to addressing sources of maritime pollution and other matters affecting the marine environment. Annex V of the Convention provides a framework for governments to develop their own conservation measures. Article 2 requires parties to "take all possible steps to prevent and eliminate pollution and shall take the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore marine areas which have been adversely effected". The OSPAR Convention includes a list of threatened and/or declining species and habitats. This list provides an overview of the biodiversity in need of protection in the north east Atlantic and is used by the OSPAR Commission as a guide to the setting of priorities for further work. The area is broken up into five regions, with the Tees Estuary (and therefore Proposed Development) located in Region II: The Greater North Sea.
The Agreement on the Conservation of Small Cetaceans in the Baltic, North-east Atlantic, Irish and North Seas (ASCOBANS) 1991 (Ref 228)	The aim of the agreement is to promote close co-operation amongst Parties with a view to achieving and maintaining a favourable conservation status for small cetaceans. ASCOBANS is applied in all UK waters in accordance with existing statutory protection. A Conservation and Management Plan forming an Annex of the Agreement obliges Parties to engage in habitat conservation and management, surveys and research, pollution mitigation and public information.
The Convention on Migratory Species of Wild Animals (The Bonn Convention) 1979 (Ref 229)	Provides protection for endangered migratory species (listed in Appendix I) and their habitats. Appendix II species are those that have an unfavourable conservation status and that require international agreements for their conservation and management. The legal requirement for the strict protection of Appendix I and Appendix II species is provided by the Wildlife & Countryside Act (1981 as amended) (Ref 95).
The Convention for Wetlands of International Importance (Ramsar Convention) 1976 (Ref 99)	The UK is a signatory to the Ramsar Convention. The Convention has three main 'pillars' of activity: The designation of wetlands of international importance as Ramsar sites; The promotion of the wise use of all wetlands in the territory of each country; and, International co-operation with other countries. The UK has chosen to underpin the designation of its Ramsar sites through prior notification of these areas as Sites of Special Scientific Interest (SSSIs) in England. Accordingly, these receive statutory protection under the WCA 1981 (as amended). The UK Government has also issued policy statements relating to the special status of Ramsar sites. In respect to new developments, Ramsar sites are afforded the same level of protection as SACs and SPAs (at a policy level).
The Wildlife and Countryside Act 1981 (as amended) (WCA) (Ref 95)	The WCA transposes the Bern Convention into UK Law. This is the primary legislation in the United Kingdom for the protection of animals, plants and habitats in the UK. This legislation covers three

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	main areas: q. Wildlife protection, including the protection of plants and animals; r. Nature conservation, countryside and National parks; and s. Public Rights of Way (PRoW) The Act makes it an offence to intentionally kill, injure or take any wild animal listed on Schedule 5. Interference or disturbance with places (or animals occupying these places) used for rest, shelter or protection is also prohibited.
The Countryside and Rights of Way (CRoW) Act 2000 (Ref 96)	The CRoW Act has amended the WCA in England and Wales, strengthening the protection afforded to Sites of Special Scientific Interest (SSSI) and threatened species. It adds the word 'reckless' to the wording of the offences listed under Section 9(4) of the WCA. This alteration makes it an offence to recklessly commit an offence, where previously an offence had to be intentional to result in a breach of legislation.
The Natural Environment and Rural Communities Act 2006 (NERC Act) Ref 97)	Designed to help achieve a rich and diverse natural environment and thriving rural communities through modernised and simplified arrangements for delivering Government policy. The NERC Act established a new independent body (Natural England) responsible for conserving, enhancing, and managing England's natural environment for the benefit of current and future generations, thereby contributing to sustainable development. The NERC Act made amendments to both the WCA and the CRoW Act. Section 40 imposes a duty on public authorities to "in exercising (their) functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity". Section 41 provides a statutory list of species and habitats of principal importance for the purpose of conservation biodiversity. These are referred to as Habitats/Species of Principal Importance (HPI/SPI).
The Conservation of Habitats and Species Regulations 2017 (as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) ('the Habitats Regulations') (Ref 98)	The Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations') consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose the Habitats Directive (Ref 98) into national law. All species listed under Annex IV of the Habitats Directive require strict protection and are known as European Protected Species (EPS). Under Regulation 42 of the Habitats Regulations, it is unlawful to: a. Deliberately kill, capture or disturb; b. Deliberately take or destroy the eggs of; and c. Damage or destroy the breeding site/resting place of any species protected under this legislation. If it is determined that impacts to an EPS during a development are unavoidable then the works may need to be carried out under a site-specific mitigation licence from the Statutory Nature Conservation Organisation, in this case Natural England.

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	Certain EPS are also listed under Annex II of the Habitats Directive and are afforded protection by the establishment of core areas of habitat known as Special Areas of Conservation (SACs). This means that 'Annex II species' under the Habitats Directive are a relevant consideration in a HRA. Following the UK's exit from the EU, the Habitats Regulations were amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The changes were to ensure the Regulations remained operable in the UK, following the UK's departure from the EU.
The Environment Act 2021 (Ref 100)	The Environment Act 2021 has two main functions: To give a legal framework for environmental governance in the UK. To bring in measures for improvement of the environment in relation to waste, resource efficiency, air quality, water, nature and biodiversity, and conservation. The Act includes provisions to strengthen and improve the existing duty on public bodies to conserve and enhance biodiversity, including mandating BNG through the planning system. Schedule 14 of the Act makes provision for BNG to be a condition of planning permission in England. Schedule 14 specifies that biodiversity gains are to be assessed using the metric published by the Secretary of State. The Act requires this for NSIPs, secured under Section 99 and Schedule 15. It is expected that the mandatory requirement for a 10% gain for NSIPs will come into force in May 2026. The vast majority of this Act does not make any immediate changes for organisations other than regulators. Changes to duties for businesses and other organisations are expected in subsequent legislation made under this Act.
Salmon and Freshwater Fisheries Act 1975 (SAFFA) (Ref 231)	SAFFA covers regulation of fisheries in England and Wales and includes legislation that restricts the introduction of polluting effluents, the obstruction of fish passage (screens, dams, weirs, culverts etc.), illegal means of fishing, permitted times of legal fishing and fishing licencing (which covers electric fishing). Under this Act any person who causes or knowingly permits liquid or solid matter to enter any waters (and/or tributaries of waters) to such an extent as to cause the waters to be poisonous or injurious to fish or the spawning grounds, spawn or food of fish, shall be guilty of an offence. The Act also requires that fish passes are installed on new and rebuilt barriers that affect waters frequented by salmon or migratory trout.
The Eels (England and Wales) Regulations 2009 (Ref 232)	These regulations implement Council Regulation (EC) No 1100/20071 of the Council of the European Union, which required Member States to establish measures for the recovery of the stock of European eel (*Anguilla Anguilla*). The regulations apply to England and Wales. The Regulations give powers to the regulators (the Environment Agency and Natural Resources Wales) to implement recovery measures in all freshwater and estuarine waters in England and Wales. The aim of the regulations is to achieve 40% escapement of adult eels relative to escapement levels under pristine conditions. The measures, as set out in the legislation, by which this is to be achieved

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	are to reduce fishing pressures, improve access and habitat quality and reduce the impact of impingement and entrainment. Under the Regulations, the regulators can serve notice to companies detailing their legal obligation to screen intakes and outfalls for eel and/or to remove or modify obstructions to eel migration. However, it is possible for companies to be granted with exemptions if the costs of works greatly exceeds the benefits. In such a situation it is likely the regulator will seek a package of more cost-effective, "alternative measures". The Regulations also have implications for temporary abstraction associated with construction activities, such as drawdown, dewatering and some types of dredging. Any diversion structure capable of abstracting at least 20 cubic metres of water per 24 hours, through any one abstraction point, is covered by the Regulations and will need complaint screening to ensure eels are not entrained into the pumps.
Conservation of Seals Act 1970 (Ref 233)	The Act, under Section 1, protects all seals out to 12 nautical miles and prohibits the killing/taking of seals by certain methods. The Act prohibits the following methods of killing or taking seals without a licence: a. Use of any poisonous substance; and b. Use of any firearm other than a rifle with specified ammunition. There is an annual close season for grey seals extending from 01 September to 31 December, and an annual close season for harbour seals extending from 01 June to 31 August. It is a criminal offence to wilfully kill, injure or take a seal during the close season or to attempt to do so. The Act also gives the Secretary of State the power to make an order prohibiting the killing, injuring or taking of seals in an area where such an order is necessary for the proper conservation of seals. This legislation is pertinent to the Proposed Development due to the presence of grey and harbour seals in the Tees Estuary (within the Proposed Development is adjacent to).
The Water Environment (Water Framework Directive) (England and Wales) Regulations (the 'WFD Regulations') 2017 (Ref 234)	WFD Regulations provide a framework for managing the water environment in England through environmental objectives and a summary of the programmes of measures required to achieve those objectives. WFD Regulations provide a framework for managing the water environment in England through environmental objectives and a summary of the programmes of measures required to achieve those objectives. WFD Regulations cover inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. All water bodies (unless artificial or heavily modified) are required to achieve 'good' ecological status unless alternate objectives are set or there are grounds for deterioration. Ecological status demonstrates the quality of the structure and function of surface water ecosystems indicated through a number of 'quality elements'. These include hydromorphological, chemical and biological indicators (including benthic invertebrates, macroalgae, fish, phytoplankton and angiosperms). When considering the effect of a development or activity on a water

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	body, it is a regulatory requirement under the WFD Regulations to assess if it will cause or contribute to a deterioration in status or jeopardise the water body achieving good status in the future. Water Framework Regulations lists Lower and Higher Sensitivity Habitats that it considers important features that require protection. Where a development is considered to cause deterioration, or where it may contribute to the failure of the water body to meet Good Ecological Status or Good Ecological Potential Status, then an assessment to demonstrate that the development is exempt under Article 4.7 is required. This makes provision for deterioration of status, provided that certain stringent conditions are met.
The Environmental Targets (Biodiversity) (England) Regulations 2023 (Ref 235)	The Environmental Targets (Biodiversity) (England) Regulations 2023 sets out legally binding targets to protect our environment, clean up our air and rivers and boost nature. With reference to freshwater and marine biodiversity, Atlantic salmon *Salmo salar*, brown trout *Salmo trutta*, European eel *Anguilla anguilla* and white- clawed crayfish *Austropotamobius pallipes* are listed as priority species in the framework.
Guidance	
CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland (Ref 236)	The aquatic ecology assessment has been undertaken using the approach detailed in the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (EcIA), hereafter referred to as 'the CIEEM EcIA Guidelines'. These guidelines represent the current best practice for assessing the ecological impacts of development projects.
BS 42020: 2013 Biodiversity — Code of practice for planning and development (Ref 110)	Provides recommendations for ensuring that decisions taken at each step of the planning process are informed by appropriate ecological information.
Guidance for Pollution Prevention 2023 (Ref 237)	Provides environmental good practice guidance for the prevention of pollution, including water environments. This is applicable to the entire UK.
CIRIA 532 Control of Water Pollution form Construction Sites 2001 (Ref 238)	This document provides guidance for the control of water pollution arising from construction activities. It focuses on the potential sources of pollution from within sites and the effective methods of prevention.
Clearing the Waters for All 2017 (Ref 239)	Guidance relating to assessment of impact of activity on coastal and estuarine waters, relating to the WFD. Key stages to be considered are screening and scoping to identify potential at risk receptors.
North Atlantic Conservation Organisation (NASCO) Implementation plan for the period 2019-2024 (Ref 240)	Defra and the Welsh Government have a responsibility for salmon in England and Wales, working closely with the Environment Agency and Natural Resources Wales who are responsible for day-to-day management and regulation. The objectives are to: a. Promote the conservation and maintain the diversity of migratory and freshwater fish, and to conserve their aquatic environment;

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	b. Enhance the contribution that migratory and freshwater fisheries make to the economy, particularly in remote rural areas and in areas with low levels of income; and, c. Enhance the social value of fishing as a widely available and healthy form of recreation; d. For wild salmon, these objectives will be achieved by implementing the WFD and the Habitats Regulations, and management/regulation of fisheries to ensure sustainable exploitation.

8.4 Study Area

8.4.1 The Site covers a total area of 217.9 ha, which includes the Main Site on which the SAF production facility will be developed, as well as access routes, utility corridors, temporary compounds and working areas required to undertake the Proposed Development.

8.4.2 The Study Area for the Proposed Development with regards to marine and freshwater ecology is the area where changes arising from construction and/or operation could lead to significant effects on marine or freshwater ecological receptors. For the purposes of this assessment, it is necessary to apply Study Areas (i.e. ZoIs) of varying sizes depending on the ecological receptor/feature under assessment; all of which extend beyond the Site.

8.4.3 The ZoI for each receptor have been defined based on current best practice guidelines and currently available project information. In some cases, ZoI have been defined on a precautionary basis using professional judgement alongside current guidance and available project information. This is to ensure a sufficient geographical area has been assessed to allow all reasonably foreseeable impacts to be considered. As the marine and freshwater ecology assessment progresses and further information becomes available, both in terms of survey results and project details/design, the ZoI may be subject to refinement later in the project lifecycle. The Proposed Development's freshwater and marine ZoI are presented in Table 8.2.

Table 8.2: Summary of Zone of Influence for Freshwater and Marine Receptors

Receptor	Zone of Influence
Internationally Designated Sites	Within 20km radius from the Site, extended if highly mobile designated feature(s) of a particular site might be present within the vicinity of the Site.
Nationally Designated Site	Within 5km of the Site, extended if there is a designated feature(s) of a particular site that is highly mobile and might be present within the vicinity of the Site.
Non-Statutory Sites	Within 2km of the Site, extended if there is a designated feature(s) of a particular site that is highly mobile and might be present within the vicinity of the Site.
Freshwater	

Receptor	Zone of Influence
Fish	Within the Site and hydrologically connected watercourses within 1000m.
Aquatic Macroinvertebrates	Within the Site and hydrologically connected watercourses within 250m.
Macrophytes	Within the Site and hydrologically connected watercourses within 250m.
Invasive Non-Native Species (INNS)	Within 250m of the Site.
Marine	
Habitats (Subtidal and Intertidal)	Within 250m of the Site.
Benthic Communities	Within 250m of the Site.
Marine Plants and Macroalgae	Within 250m of the Site.
Fish	Within 5km of the Site.
Marine Mammals	Within 100km of the Site
Marine INNS	Within 250m of the Site.

8.5 Baseline Conditions and Future Baseline

8.5.1 The baseline information for freshwater and marine biodiversity (including marine mammals, marine biotopes etc.) has been collated from the following publicly available sources:

a. Defra's Multi-Agency Geographic Information for the Countryside (MAGIC) online map application.
b. Open source 1:25,000 OS datasets;
c. The Rivers Trust River Obstacles map application;
d. Environment Agency Catchment Data Explorer (Ref 241);
e. Environment Agency Ecology and Fish Data Explorer (Ref 242);
f. Environment Agency Water Quality Archives (Ref 243);
g. Tees Estuary Edges – case studies (Ref 244)
h. International Union for Conservation of Nature (IUCN) Red List (Ref 245); and,
i. Available grey literature and technical reports for projects on the River Tees, Tees Estuary and surrounding inshore areas (Ref 246 – Ref 256)

8.5.2 A summary of the baseline conditions is presented below. This assessment does not duplicate information set out in **Chapter 7: Terrestrial Ecology**. Baseline information for the terrestrial ecology assessment can be found in **Chapter 7: Terrestrial Ecology**.

8.6 Designated Sites

8.6.1 Designated sites have been considered if they include features relating to freshwater and/or marine biodiversity, including aquatic habitats and species.

8.6.2 Records of such designated sites have been obtained within 10km of the Site. This distance has been extended accordingly if a direct and functional hydrological connection to the Site is present and for marine mammal SAC/Ramsar features within 100km. Hydrological connectivity was determined using OS maps, aerial photographs, and the River Obstacle map application.

8.6.3 A summary of the designated sites relevant to freshwater and marine biodiversity is provided below.

Internationally Designated Sites

8.6.4 Two internationally designated sites are located within 10km of the Site including the Teesmouth and Cleveland Coast Ramsar and SPA. Designated areas for the seabird species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC.

8.6.5 The SPA is designated for the following features described in Section 7.11:

a. Avocet, *Recurvirostra avosetta* - Reproduction
b. Common tern, *Sterna hirundo* - Reproduction
c. Knot, *Calidris canutus* - Wintering
d. Little tern, *Sterna albifrons* - Reproduction
e. Redshank, *Tringa totanus* - Concentration
f. Ruff, *Calidris pugnax* - Wintering
g. Sandwich tern, *Thalasseus sandvicensis*, syn. *Sterna sandvicensis* - Concentration; and
h. Waterbird assemblage

8.6.6 The Teesmouth and Cleveland Coast Ramsar is designated for the following features:

a. Knot, Calidris *canutus islandica* - Wintering
b. Redshank, *Tringa totanus* - Passage
c. Sandwich tern, *Thalasseus sandvicensis*, syn. *Sterna sandvicensis* – Passage; and
d. Waterbird assemblage – Wintering

8.6.7 Habitats in the Teesmouth and Cleveland Coast Ramsar and SPA includes intertidal sand- and mudflats, saltmarsh, freshwater marsh and saline lagoons which are of great importance to a diverse assemblage of bird species (including designated species).

Nationally Designated Sites

8.6.8 Two nationally designated sites are located within 2km of the Site, as detailed in Table 8.3.

Table 8.3: Nationally Designated Sites Within 2km of the Site

Designation	Distance From Site	Summary of Designation*
The Teesmouth and Cleveland Coast SSSI	Adjacent	Habitat features such as saltmarshes and sand dunes Protected species are harbour seal *Phoca vitulina* (area for breeding) and seabirds

		Invertebrates inhabiting sand dune habitats, which may include the damp depressions ('dune slacks').
Teesmouth National Nature Reserve	1.4km to Seal Sand Section 2km to North Gare Section	Teesmouth NNR has two main sections: North Gare and Seal Sands. Habitats features such as sand dunes, grazing marsh, intertidal sand and mudflats. Protected species are harbour seals and grey seals *Halichoerus grypus* and seabirds. Harbour seal haul out on the sand banks at low tide, and pups are born at the site each summer. This makes Seal Sands the only regular breeding colony of this species on the north east coast.

*Only aquatic features are included. Please refer to the **Chapter 7: Terrestrial Ecology** for remaining features.

Locally Designated Sites.

8.6.9 There is no Local Nature Reserve (LNR) located within 2km of the Site. The closest LNR is Seaton Dunes and Common SSSI 4km to north, south of Seaton Carew.

WFD Designated Waterbodies

8.6.10 The current Water Framework Directive (WFD) status for the Study Area was obtained from the Environment Agency's Catchment Data Explorer website. There is one WFD-designated water body located within the Study Area, the River Tees Water Body (GB510302509900) (Ref 241). The River Tees is designated as a Heavily Modified Water Body (HMWB), meaning it is a body of surface water which as a result of physical alterations by human activity is substantially changed in character.

8.6.11 The River Tees is tidally influenced, flows into the North Sea approximately 5km downstream of the Proposed Development and, borders the Site to the south. The Proposed Development will require construction of a new quay. Quay construction works, including demolition of existing jetties, dredging, piling (or revetment removal and infilling for a closed quay) and quay deck construction, will be assessed for potential impacts on likely receptors e.g. disturbance to breeding terns and seals, cetaceans, migratory fish, etc.

8.6.12 The 2019 WFD ecological status of this water body was classified as Moderate Ecological Status overall. Poor nutrient management, pollution including sewage and heavy metals, and channel modifications are one of many stressors and reasons for the Tees failing to achieve Good overall status. The following biological quality elements are monitored in the Tees: fish (moderate) invertebrates (good), saltmarsh (moderate), phytoplankton (good) and macroalgae (moderate).

8.6.13 Outside of the Site are a series of watercourses/standing waterbodies hydrologically connected to the Teesmouth and Cleveland Coast Ramsar. These are a network of watercourses and ponds to the north, and east of the Site. A number of these waterbodies lie within the Teesmouth and Cleveland Coast, SPA, SSSI and Ramsar site. Their importance will be investigated further during the aquatic habitat survey which will assess these waterbodies' ability to support notable and/or species of conservation importance.

8.6.14 The methodologies and results will be fully detailed in the PEA and discussed further as part of the PEIR.

8.6.15 Water resource receptors including the WFD have been assessed in more detail in **Chapter 9: Water Environment and Flood Risk**.

Freshwater Ecology

8.6.16 At the proposed site, the closest freshwater feature within 250m is Dormans Pond, an artificial lake. A desk study using the Environment Agency's Ecology and Fish Data Explorer was undertaken to determine notable and/or protected freshwater species in a wider area. It comprised macrophytes, aquatic macroinvertebrates and fish (both freshwater and migratory).

Macrophytes

8.6.17 Macrophyte surveys have been undertaken by the Environment Agency between 2013 and 2016 at Greatham Beck (NZ4894427840), Claxton Burn (NZ4720027800), North Burn (NZ4810027200) and Cowbridge Beck (NZ4830025700). All survey locations are located approximately 7km upstream from the Site. No protected or notable species were recorded. The INNS Himalayan balsam (*Impatiens glandulifera)* has been recorded in the River Tees.

Aquatic Macroinvertebrates

8.6.18 Aquatic macroinvertebrate surveys have been undertaken by the Environment Agency between 2015 and 2019 as part of their environmental monitoring programme (Ref 245), approximately 7km upstream, north west of the Site.

8.6.19 The samples were obtained using kick sampling methods and analysed in the laboratory. At Greatham Beck (NZ4894427840) approximately 7km north west of the Site, a survey in 2015 returned no protected or notable species. One INNS mollusc, the New Zealand mud snail *Potamopyrgus antipodarum* was recorded. However, it must be noted that this species is widespread throughout the UK and is considered naturalised.

8.6.20 At Claxton Burn (NZ46885 27771) approximately 8km form the Site, a nationally scarce insect of the family *Capniidae Capnia atra* was recorded in 2019 - this stonefly is usually restricted to high altitudes. Sampling at Dabholm Gut (NZ5657023772) in 2016 returned a poor assemblage of aquatic macroinvertebrates comprising crustaceans including an isopod *Asellus aquaticus* and freshwater shrimps *Gammarus zaddachi* and *Gammarus pulex/fossarum agg*.. True fly larvae Chironomidae, the riffle beetle *Elmis aenea* and worms Oligochaeta. One New Zealand mud snail, an INNS mollusc, was also recorded.

8.6.21 Survey at Cowbridge Beck (NZ4790125744) in 2018 approximately 5.5km to the north west of Site returned no protected or notable species. An INNS mollusc, the New Zealand mud snail was again recorded.

8.6.22 An aquatic macroinvertebrate survey at Billingham Beck (NZ4370723478) in 2019 approximately 9km upstream of the Site, to the west, recorded two INNS species, the signal crayfish *Pacifastacus leniusculus* and an amphipod *Crangonyx pseudogracilis/floridanus*. However, it must be noted that the latter is widespread throughout the UK and considered naturalised.

Freshwater Fish

8.6.23 The desk study of fish survey using the Environment Agency's Ecology and Fish Data Explorer returned fish counts data that has been utilised from the Tees Barrage Elver Pass in 2010 (NZ4622019073), approximately 12km from Site (Ref 242). It is noted that these survey data are more than 2 years old and some at considerable distance upstream from the Site. In 2013 and 2015 another desk study found records of European eel elvers, further downstream at Ormesby Beck (NZ5080119588) approximately 4km south west of the Site. A species of stone loach *Barbatula barbatula* and three-spined stickleback *Gasterosteus aculeatus* were also recorded.

8.6.24 Within years 2016 to 2019, monitoring at Warm up pool (NZ4617719106), approximately 8km upstream from Site to the west, (NZ4617719106), the following species were found: European eel elvers, roach *Rutilus rutilus*, pike *Esox lucius*, gudgeon *Gobio gobio*, chub *Leuciscus cephalus*, dace *Leuciscus leuciscus*, perch *Perca fluviatilis*, flounder *Platichthys flesus*, roach x common bream hybrid *Rutilus rutilus* x *Abramis brama* and brown/sea trout. In the vicinity of the Tees barrage at Canoe slalom (NZ4637719170), fish count surveys in 2016 and 2017 returned the following fish species: dace, roach, Atlantic salmon and brown/sea trout.

Migratory Fish

8.6.25 Migratory fish species, such as Atlantic salmon, brown/sea trout, European eel, and river and sea lampreys, are present in the Tees Estuary (as highlighted in the following marine baseline).

8.6.26 These species, all of which are protected under the NERC Act as Species of Principal Importance (SPI), migrate from marine waters through the Tees Estuary to freshwater nursery sites and from freshwater to the sea. Therefore, these species are assumed to be present in freshwater environments within the Site if suitable habitat is available. The sea lamprey and river lamprey are rare in the region, although the Atlantic salmon and sea trout are most abundant around the northern and western coasts of the UK. This will be confirmed following future PEA and a fish eDNA survey.

Marine Ecology

Abiotic Conditions

8.6.27 The Site borders the Tees Estuary, which is a transitional environment. Water temperature is similar along the surface and bottom, ranging between 5 and 16°C. Salinity ranges from 4.44 to 32.22 parts per thousand (ppt) at the surface and 9.33 to 33.46ppt at the bottom. This data was acquired from Environment Agency WIMS

database approximately 500m in front of the Site, at Teesport monitoring station (within Study Area; Ref 241).

Benthic Habitats and Associated Communities

8.6.28 The marine part of the Site is predominantly comprised of mud and 'Man Made' ground, which is indicative that artificial substrata are present. Multiple anthropogenic features (sea defences, quays) constrain the High-Water Mark (i.e. flood defences) resulting in a restricted intertidal zone (Ref 237).

8.6.29 One priority intertidal habitat is present within 300m both upriver and downriver from the Site ; intertidal mudflats. Intertidal mudflats are a UK Biodiversity Action Plan (UKBAP) priority habitat, legally protected as a Habitat of Principal Importance (HPI) under Section 41 of the NERC Act. This habitat type is also listed in the OSPAR Convention as a threatened and/or declining habitat in Region II (the Great North Sea). These areas of mudflat habitat are also classified as a WFD Lower Sensitivity Habitat (Intertidal Soft Sediment - Sand, Mud & Mixed A2.2, A2.3, A2.4).

8.6.30 Coastal saltmarsh is present within the Tees Estuary. The closest recorded location to the Proposed Development is at the Seal Sands, approximately 2.5km from the Site. Coastal Saltmarsh is a UKBAP Priority Habitat and HPI, WFD Higher Sensitivity Habitat, and listed as a threatened and/or declining habitat under the OSPAR Convention (Region II)(Ref 447). Saltmarsh is also a Reason for Notification for the Teesmouth and Cleveland Coast SSSI as a nationally important feature.

8.6.31 The subtidal biotope present is classified as mud dominated by the polychaete *Capitella capitata* and oligochaetes *Tubificoides* spp. (SS.SMu.SMuVS.CapTubi-MNCR 2022/MB6255-EUNIS 2022). This is not classified as an HPI and has low species richness and low sensitivity.

8.6.32 Contaminant analysis was undertaken on sediment samples collected as part of The Net Zero Teesside project. Subtidal stations 1 and 2 in the estuary and circa 1.5km downriver from the Site found elevated levels of both trace metals and Polycyclic Aromatic Hydrocarbons, with little evidence to suggest the presence of wider sediment contamination within the Study Area. (Ref 244).

8.6.33 The benthic invertebrate composition in the same stations was classified with ecological status of macrobenthic infaunal invertebrate assemblages 'High' and 'Good'. 'High' represented the presence of disturbance sensitive taxa and levels of diversity and abundance associated with undisturbed conditions and 'Good' habitats which are only slightly disturbed. No species designated for conservation or INNS were recorded in any of the samples.

8.6.34 Approximately 8km downstream, one INNS was observed in 2016, a bivalve known as the false angelwing *Petricolaria pholadiformis*. (NZ 48419 22082; Ref 244); this species is classed as an INNS but is now widespread and considered naturalised within the UK.

Phytoplankton

8.6.35 Phytoplankton is regularly monitored in the Tees Estuary by the Environment Agency, with two monitoring sites located within the Study Area (NZ 52800 22100 and NZ 49900 21300). The Environment Agency collects monthly samples from these locations (some months have been excluded, mainly during UK Covid Lockdown periods, such as Jan – April 2019; April – September 2020).

8.6.36 The most abundant taxa were diatoms, with euglenophytes, cyanobacteria and microflagellates also found in high abundance. This composition is typical of phytoplankton communities in UK estuaries. Greatest abundance typically occurs between May and August, peaking in June, with lower abundance observed in winter months (November to January).

8.6.37 No protected or INNS taxa were identified during Environment Agency surveys (2015-2023), however taxa known to cause harmful algal blooms in the UK coastal waters were present. These include: *Alexandrium* spp., *Dinophysis acuminata*, *Dinophysis acuta*, and *Pseudo-nitzschia* spp.. Additionally, several taxa known to cause fish mortality were also recorded including *Gymnodinium* spp., *Dictyocha speculum*, and *Chaetoceros* spp. (Ref 241;Ref 242).

Marine Plants and Macroalgae

8.6.38 Data regarding marine plants and macroalgae in the Study Area is limited. However, following intertidal and subtidal surveys conducted as part of The Net Zero Teesside Project, the surveyed section of the Tees Estuary was determined to have low abundance and diversity of macroalgae (Ref 250). In these surveys, sea lettuce *Ulva sp*., purple laver *Porphyra umbilicalis*, and fucoids (serrated wrack *Fucus serratus*, horned wrack *Fucus ceranoides* and, bladderwrack *Fucus vesiculosus*) were observed. Additionally, one INNS of intertidal kelp, wakame *Undaria pinnatifida*, was also recorded.

8.6.39 Native seagrass meadow is a priority habitat. Predominantly comprised of common eelgrass *Zostera marina*, it is present in the Tees Estuary. Whilst a large amount of this habitat has been lost, restoration projects are being undertaken, including in North Gare, approximately 5km downstream of the Proposed Development (Ref 241).

Fish

8.6.40 The Study Area falls within the MMO North-East inshore Marine Plan area and the International Council for the Exploration of Sea (ICES) rectangle 32E8. The management plan in relation to fish includes long-term strategic plans for the fishing industry in the area; the support for sustainable fishing activities; the protection of fisheries habitats; the encouragement of biodiversity gain for essential fish habitats and the avoidance or management of impacts on essential fish habitats.

8.6.41 The River Tees and estuary is an important water body for diadromous and anadromous fish species that make seasonal migrations between freshwater and marine environments. Fisheries sensitivity maps (Ref 242) indicate that the Tees Estuary provides nursery grounds for herring, plaice, whiting; cod, anglerfish and spurdog. These species are afforded further protection, as detailed in Table 8.6.

8.6.42 The River Tees is designated as one of the 64 ‘principal salmon rivers’ in England and Wales. There is currently a Salmon Action Plan that aims to manage the performance of salmon stocks within the River Tees against Conservation Limits (CL). The CL is a standard defining the minimum desirable spawning stock in a river enabling assessment of performance against management targets. Currently, the River Tees is not achieving its CL and is projected to remain ‘at risk’ of not complying with the salmon management objectives (Ref 240). Within an ‘at risk’ river such as the River Tees it is stipulated that urgent steps must be taken to reduce exploitation by all fisheries to zero.

8.6.43 The estuarine and marine fish assemblage within the Tees Estuary consists of demersal and pelagic species typical of the North Sea. Data from an Environment Agency monitoring site located approximately 2km downstream from the Proposed Development (NZ 53946 26617) is presented in Table 8.4. Only the most recent data (2015-2018) was considered, as this is the most temporally relevant (albeit outdated).

8.6.44 The Environment Agency also undertakes fish surveys at the Tees Barrage (NZ 46789 19328; NZ 46789 19328), which is located approximately 5km upstream of the Site. The assemblage was similar to that at North Gare Sand (Table 8.5). However, the barrage is where the River Tees transitions into a freshwater environment, and therefore the fish assemblage will likely become increasingly dominated by freshwater species at sites upstream of the barrage.

8.6.45 Fisheries sensitivity maps (Ref 242) indicate that the Tees Estuary provides nursery grounds for herring (high intensity), plaice (low intensity), whiting (high intensity); cod (high intensity), anglerfish (low intensity) and spurdog (low intensity). Therefore, juveniles of these species could potentially be present within the vicinity of the Tees Estuary immediately adjacent to the Proposed Development. The protection afforded these species is detailed in Table 8.6.

Table 8.4: Environment Agency fish data, North Gare Sands, Tees Estuary (*priority species)

Common Name	Scientific Name	2015	2016	2017	2018
Herring	*Clupea harengus**	174	29	10	564
Plaice	*Pleuronectes platessa**	20	16	12	9
Lesser Sandeel	*Ammodytes tobianus**	206	1	373	17
Flounder	*Platichthys flesus*	21	2	21	-
Sprat	*Sprattus sprattus*	2	276	7	-
Sand Goby	*Pomatoschistus minutus*	10	3	1	-
Dab	*Limanda limanda*	1	1	1	-
Three-spined Stickleback	*Gasterosteus aculeatus*	1	-	-	-
Five-bearded rockling	*Ciliata mustela*	1	-	-	-

Table 8.5: Environment Agency Fish Data, Tees Barrage, 2015 (*priority species)

Common Name	Scientific Name	Sample A (NZ 46789 19328)	Sample B (NZ 46789 19328)
Plaice	*Pleuronectes platessa*	3	157
Flounder	*Platichthys flesus*	78	23
Sprat	*Sprattus sprattus*	2	3
Sand Goby	*Pomatoschistus minutus*	3	5
Dab	*Limanda limanda*	3	2
Dover Sole	*Solea solea**	1	-
Whiting	*Merlangius merlangus**	-	1
Common Goby	*Pomatoschistus microps*	37	8
Brown/Sea trout	*Salmo trutta*	1	-
Herring	*Clupea harengus**	258	27

Table 8.6: Summary of Fish Species Protected by National or International Legislation/Policy

Common Name	Scientific Name	Habitats Directive (Annex)	OSPAR threatened and/or declining species	Bern Convention (Appendix)	Bonn Convention (Appendix)	NERC 2006 Species of Principal Importance	IUCN Red List*
Herring	*Clupea harengus*					✓	LC (á)
Plaice	*Pleuronectes platessa*					✓	LC (á)
Cod	*Gadus morhua*		✓			✓	LC (á)
Whiting	*Merlangius merlangus*					✓	LC (?)
Anglerfish	*Lophius piscatorius*					✓	LC (?)
Spurdog/Spiny Dogfish	*Squalus acanthias*		✓		II	✓	EN (â)
Atlantic Salmon	*Salmo salar*	II, V	✓			✓	VU (â)
Sea Trout	*Salmo trutta*					✓	LC (?)
European Eel	*Anguilla anguilla*		✓			✓	CR (â)
Sea Lamprey	*Petromyzon marinus*	II	✓	III		✓	LC (?)
River Lamprey	*Lampetra fluviatilis*	II, V		III		✓	LC (?)

*IUCN Red List of Threatened Species. European classification: LC = Least Concern, EN = Endangered, CR = Critically Endangered. Population trend: □ = increasing, □ = decreasing, ? = Unknown.

8.6.46 Common shellfish species are present within the inshore waters. Shellfish surveys conducted on inshore waters as part of the Dogger Bank Teesside Project and Teesside Offshore Wind Project (approximately 8km – 12km from the Site) recorded edible crab *Cancer pagurus*, harbour crab *Liocarcinus depurator*, European lobster *Homarus gammarus* and velvet swimming crab *Necora puber* in high abundance (Ref 252; Ref 253). However, there are no designated shellfish waters within the vicinity of the Site.

Marine mammals

8.6.47 The abundance and density of marine mammals within the Tees Estuary/River Tees (and therefore immediate vicinity of the Proposed Development) is anticipated to be low, however due to the highly mobile and transient nature of marine mammals they could be present within the Study Area. All cetaceans are European Protected Species under Annex IV(a) of the Habitats Directive.

8.6.48 Within the Greater North Sea Ecoregion, four species of cetaceans occur commonly or are resident: harbour porpoise *Phocoena phocoena*, minke whale *Baleanoptera acutorostrata*, bottlenose dolphin *Tursiops truncatus* and white-beaked dolphin *Lagenorhynchus albirostris.* Five more species occur less commonly: Atlantic white-sided dolphin *Lagenorhynchus acutus*, orca *Orcinus orca (*killer whale), long-finned pilot whale *Globicephala melas*, Risso's dolphin *Grampus griseus* and short-beaked common dolphin *Delphinus delphis* (Ref 254).

8.6.49 Apart from harbour porpoise, it is unlikely that any of these species will be present within the estuary proximal to the Site. The protective status of the harbour porpoise is detailed in Table 8.7. There are two pinniped species within the Tees Estuary, the grey seal *Halchoerus grypus* and harbour seal *Phoca vitulina*.

8.6.50 A small population of resident harbour seals are present within the River Tees with haul-outs at Seal Sands and Greatham Creek, approximately 4.5km from the Study Area. Harbour seals also use the Tees Estuary as a breeding site, with breeding harbour seals listed as a Reason for Notification for the Teesmouth and Cleveland Coast SSSI.

8.6.51 Grey seal also use Seal Sands as a haul-out but there are no reported breeding sites for grey seals in the Tees Estuary (Ref 255).

8.6.52 Both species are protected under the Conservation of Seals Act 1970. Further protective status of the two seal species is detailed in Table 8.7.

Table 8.7: Summary of Marine Mammal Species Protected by National or International Legislation/Policy

Common Name	Scientific Name	WCA	EC Habitats Directive (annex)	Bern Convention (Appendix	Bonn Convention (appendix)	OSPAR threatened and/or declining species	ASCOBANS
Harbour Porpoise	*Phocoena phocoena*	✓	II, IV	II	II	✓	✓
Harbour Seal	*Phoca vitulina*	✓	II, V	III			
Grey Seal	*Halichoerus grypus*	✓	II, V	III			

8.7 Future Baseline

8.7.1 Climate change is the most prevalent factor when attempting to predict the future baseline of an ecosystem or species community. Climate change is projected to lead to warmer, wetter winters and hotter, drier summers, with an increase in the intensity and frequency of extreme events such as heatwaves, drought, extreme rainfall leading to flash flooding, storms and wind events. Further information is provided in **Chapter 9: Water Environment and Flood Risk** and **Chapter 13: Climate Change Resilience**.

8.7.2 Impacts of climate change on species are considered to include changes in distribution and abundance, the timing of seasonal events and habitat use and, as a consequence, there are likely to be changes in the composition of plant and animal assemblages. Habitats and ecosystems are also likely to change in character.

8.7.3 The information presented below illustrates how changes within the climate might impact upon freshwater and marine receptors during the operation of the site.

Freshwater Receptors

Aquatic Flora

8.7.4 Climate change resulting in drought, flooding, pollution and subsequent changes in land management has the potential to impact on aquatic plants (including macrophyte communities) and algae occurring in freshwater habitats. Furthermore, rising water temperatures may provide more suitable habitat conditions for invasive algal species and potentially lead to more frequent algal blooms. Changes in species composition, abundance and distribution, as well as loss of aquatic plants and algae would also impact on invertebrates and animals higher up the food chain that depend on them.

Aquatic Macroinvertebrates

8.7.5 Similarly for freshwater invertebrates, climate change effects have the potential to adversely affect invertebrates with changes in community composition, abundance and distribution and especially for those that are sensitive to drying.

Freshwater Fish

8.7.6 Higher temperatures and drought are main stressors on freshwater fish as the amount of dissolved oxygen reduces with temperature increase. Aquatic invertebrates will decline due to lower water quality and reduce the main food source of fish.

Marine Receptors

Marine Habitats

8.7.7 Coastal squeeze (barrier to natural habitats preventing landward transgression in response to sea level rising) might cause the loss of intertidal habitats, such as saltmarsh and intertidal mudflat, which will have an impact on the associated intertidal species due to reduction or loss of habitat.

Benthic Assemblages (Subtidal and Intertidal)

8.7.8 Rising sea levels, acidification, lower dissolved oxygen, increase in storm frequencies and increasing water temperatures may result in a species regime shift due to northward range expansion of ‘southern species’ and a retreat of ‘northern species’. Increased water temperatures might also result in increased habitat viability for INNS, which might cause the degradation or loss of native benthic species. Rising sea levels might also result in an increase in the habitat available for subtidal species and a reduction for intertidally adapted species.

Marine Plants and Macroalgae

8.7.9 Rising sea level and coastal squeeze have the potential to result in reduced habitat viability for saltmarsh species and seagrass due to increased immersion times and increased water depths. Sea level rise could also increase the amount of habitat available for intertidal algal species and might result in increased colonisation of the river wall.

Fish

8.7.10 Rising sea levels and increasing water temperatures might result in a regime shift due to northward range expansion of ‘southern species’ and a retreat of ‘northern species’. Alterations to habitat types, including coastal squeeze may also result in changes in fish assemblage composition.

Marine Mammals

8.7.11 Changes to the benthic assemblages and fish caused by rising sea level and increased water temperatures might have indirect impacts upon marine mammals through changes in prey availability and the subsequent distribution of marine mammals.

Invasive Non-native Species

8.7.12 The effects of climate change, including rising sea levels and increasing water temperatures, might facilitate the spread and establishment of INNS through increased habitat viability and reduced competition/predation.

8.8 Sensitive Receptors

8.8.1 The likely sensitive freshwater and marine receptors within the Proposed Development's ZoI have been identified in Table 8.8.

Table 8.8: Summary of Sensitive Receptors

Receptor Type	Specific Receptor	Location Relative to the Site
Designated Sites		
Internationally designated site	Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar	Adjacent
Nationally designated site	Teesmouth and Cleveland Coast SSSI	Adjacent
Nationally designated site	Teesmouth NNR	1.4km North
Freshwater		
Macrophytes	A range of species	7km from the site
Invertebrates	A range of species	7km from the site
Fish	Protected/notable species, including Atlantic salmon, sea trout, European eel and lamprey species.	Within and adjacent
Freshwater Habitat	River habitat, Standing water (network of ditches and ponds).	7km from the site
WFD Designated River Tees	River Tees and its tributaries	Adjacent
Marine		
Marine Habitat	Intertidal Mudflats	Adjacent
Marine Habitat	Coastal Saltmarsh and Seagrass Meadows	2.5km west
Benthic communities	A range of species	Adjacent

Receptor Type	Specific Receptor	Location Relative to the Site
Phytoplankton	A range of species	Adjacent
Marine plants and Macroalgae	A range of species	Adjacent
Fish	Protected/notable species, including Atlantic salmon, sea trout, European eel and lamprey species.	Adjacent
Marine Mammals	Harbour porpoise, harbour seal, and grey seal	Adjacent

8.9 Design, Embedded Mitigation and Enhancement Measures

Design Measures

8.9.1 At this stage, the design of the Proposed Development is not finalised and design is ongoing.

8.9.2 Impacts on sensitive receptors that may occur during the Proposed Development's construction and operation will be avoided as much as feasibly practicable. The main objective of mitigation measures is to prevent freshwater and marine biodiversity loss.

8.9.3 Given that there are notable and protected species, as well as sensitive habitats capable of supporting these species within the ZoI, additional surveys are proposed. These surveys would target fish, macrophytes, aquatic macroinvertebrate and INNS. The data from further surveys that are undertaken will be presented in relevant survey reports within the PEIR or as part of the ES, depending on time scales.

8.9.4 The following surveys are proposed to inform the PEIR and consenting strategy, including early engagement with key stakeholders:

a. Intertidal Biotope Survey to determine presence of marine priority habitats or species and any INNS;
b. Marine Habitat Survey to confirm saltmarsh, seagrass and other protected habitats;
c. Integration of seabird results from the PEA with habitat survey findings;
d. Potential for eDNA sampling to confirm migratory fish status (presence);
e. Water Quality (standard WFD parameters for Tees Transitional Waterbody), including phytoplankton baseline;
f. Sediment Quality with marine sediment testing to confirm any exceedance of Centre for Environment Fisheries and Aquaculture Science (CEFAS) Action Levels indicating historic contamination.

8.9.5 A marine habitat survey to confirm saltmarsh, seagrass and other protected habitats is not required because seagrass locations are known and there is sufficient data from previous surveys. Similarly a seal survey, focussed on haul-outs and breeding (pupping) areas during summer (June or July) and annual moult (August) to confirm population estimate, periodic vantage point and transect survey to determine seasonal presence.

Design Mitigation and Enhancement Measures

8.9.6 Mitigation will be developed on an iterative basis following broad stakeholder engagement. Mitigation hierarchy will be followed; preference will be given to first avoiding effects, then reducing remaining effects, before targeted mitigation where necessary. Where residual effects remain after application of targeted mitigation and significant adverse effects are likely, off-setting (along with other enhancement measures) will then be considered. These will constitute a range of different interventions, depending on the species or habitat.

Construction Phase

8.9.7 Mitigation during the construction phase is likely to include:

a. A minimised construction footprint would be considered through the selection of options which require less intrusion into the marine and freshwater environments reducing and/or avoiding potential habitat loss. This includes construction works at the quay minimising underwater noise and loss of habitat from excavation, piling and dredging.
b. Adherence to relevant Environmental Permits (for example Natural England SSSI assent), Best Practice Guidance and Regulations, British Standards, MMO licence (for example geophysical surveys) and any relevant species licences (for example marine wildlife licence for activities effecting a protected species);
c. Monitoring to ensure the protection of marine and freshwater biodiversity features;
d. Implementation of industry standard best practice methods and procedures (including Guidance for Pollution Prevention) to ensure water quality impacts are minimised. This includes measures for pollution prevention, such as the creation of a robust surface water drainage system and use of silt fences (where necessary);
g. Restriction period: consideration will be given to undertaking construction activities such as piling outside of sensitive periods of protected and notable fish, seabird and marine mammal species within River Tees and any waterbodies within the Site. This includes migration, nursery and spawning periods;
e. Use of sensitive lighting where any night work is required, with light spill onto aquatic environments minimised;
h. Employment of noise reduction measures on construction and operational plant machinery and equipment affecting protected species of seabirds;
i. Employment of JNCC guidelines to minimise impacts from geophysical surveys and piling must be applied (e.g. presence of a Marine Mammal Observer, use of Passive Acoustic Monitoring). This is to reduce the risk of injury as result of a noise-generating activity;
f. Construction activity that may cause direct disturbance to the marine environment (such as piling) should also not commence unless an Ecological Clerk of Works (ECoW) is present; and
g. Implementation of reduced vessel speeds in proximity to the quay to reduce potential for vessel strike with marine mammals and potential damage to intertidal habitats from wave wash.

8.9.8 Many of these mitigation measures will be secured within a CEMP. The CEMP will detail a series of measures, based on best practice guidelines, to avoid the effects of the Proposed Development on the environment.

8.9.9 The details of selected options for marine deliveries are not specified at the time of EIA Scoping, however a Code of Construction Traffic Management Plan (CTMP) and Code of Construction Practice will be prepared and submitted within the PEIR and ES.

8.9.10 A Biosecurity Management Plan will be prepared to prevent the spread of INNS, including managing plant and vessels that may bring INNS to site, as identified through desk study and future surveys within the Proposed Development.

Operation Phase

8.9.11 Mitigation measures during the operation phase are likely to include:

a. Adherence to relevant consents and licences (e.g. DCO requirements relating to mitigation, compensation and enhancement) Environmental Permits, Best Practice Guidance and Regulations and British Standards;
b. Ongoing monitoring and adaptive management to ensure the protection of marine and freshwater biodiversity features;
c. Implementation of industry standard methods, best available technology and management plans (e.g. marine mammal management plan, emergency spill response plan, etc.) to ensure water quality impacts are minimised;
d. Appropriate design of the Proposed Development to minimise water quality impacts on surrounding habitats, including waterbodies within the River Tees;
e. Sensitive lighting scheme for any permanent lighting to be installed as part of the Proposed Development; and,
f. Implementation of reduced speed of operational vessels to reduce the potential for vessel strike with marine mammals and potential damage to intertidal habitats from wave wash.

8.9.12 Further mitigation measures may be identified as the design of the Proposed Development develops and will be addressed in the PEIR and ES.

Enhancement Measures

8.9.13 With regard to habitat enhancement, the principles of BNG will be developed within the framework of proposed terrestrial BNG for the intertidal area to mean low water level. This is discussed further below.

8.10 Description Of Potential Likely Significant Effects

8.10.1 The Proposed Development has the potential to impact the marine environment during construction phase due to demolition of existing jetties, construction of the new quay (including possible removal of foreshore and revetment, capital dredging and piling) and increased vessel traffic. During the operation there will be increased vessel traffic and a

requirement for maintenance dredging. Material dredged during quay construction and operation will be disposed at sea within licensed disposal sites offshore in the UK Economic Exclusive Zone (EEZ).

8.10.2 Wastewater will be directed to an existing wastewater treatment plant; there will be no discharge of effluents into the River Tees during normal conditions is anticipated. The Proposed Development is to use the existing tunnel crossing under the River Tees, no additional drilling or pipeline installation is anticipated.

8.10.3 The SAF product and renewable naphtha will be exported via pipeline for export by marine transport or rail. The proposed pipelines would connect the Main Site to to local marine or rail loading infrastructure.

Construction Phase

8.10.4 The Proposed Development has the potential for likely significant effects during the construction phase. Likely impacts and receptors are presented in Table 8.9:

Table 8.9 Summary of Construction Phase Likely Impacts and Effects and Marine Ecological Receptors

Likely Impacts	Designated Sites	Intertidal habitats/ communities	Subtidal habitats/ communities	Fish and shellfish	Commercial fisheries	Marine mammals
Disturbance to marine community due to underwater noise	x			x		x
Loss of habitats and species from increase in navigation (increased wave wash)	x	x				
Loss of habitats and species from construction works (demolition of existing jetties, excavation, piling or dredging)	x		x			
Changes to water quality (turbidity) due to existing jetty demolition and quay construction works (piling, excavation, dredging and navigation)	x	x	x	x	x	x
Changes to water quality due to chemical discharges from surface water run-off or discharge of groundwater dewatering	x					
Changes to water quality due to spillage of fuels or other harmful substances	x	x		x	x	x

Likely Impacts	Designated Sites	Intertidal habitats/ communities	Subtidal habitats/ communities	Fish and shellfish	Commercial fisheries	Marine mammals
Change in behaviours in fish and marine mammals due to changes in visual stimuli (artificial light)	x			x	x	
Vessel collisions due to increased vessel traffic	x				x	x
Introduction and spread of marine INNS	x	x	x	x	x	x

Operation Phase

8.10.5 The operation of the Proposed Development has the potential for likely significant effects on aquatic receptors, these could include:

Table 8.10: Summary of Operation Phase Likely Impacts and Effects and Marine Ecological Receptors

Likely Impacts	Designated Sites	Intertidal habitats/ communities	Subtidal habitats/ communities	Fish and shellfish	Commercial fisheries	Marine mammals
Changes to water quality due to spillage risks containing silts, hydrocarbons or other harmful chemicals	x	x		x	x	x
Changes to water quality (turbidity) due to increase in navigation and dredging maintenance.	x	x	x	x	x	x
Disturbance to fish and marine mammals due to changes in the underwater noise from vessel traffic	x			x	x	x
Disturbance to fish and marine mammals due to changes in visual stimuli (artificial light)	x			x	x	x
Vessel collisions due to increased navigation	x				x	x
Introduction and spread of marine INNS	x	x	x	x	x	x

8.10.6 Specific operational impacts for the Proposed Development have not yet been defined and will be subject to further assessment.

Decommissioning Phase

8.10.7 A Development Plan is expected to be prepared prior to any potential decommissioning, typically around 18 months in advance, and will incorporate the environmental requirements relevant at that time. Currently, it is assumed that the operational phase of the Proposed SAF production facility could last a minimum of 30 years. Whilst the SAF production facility would be decommissioned and demolished at the end of its life, it is likely that the quay would be left in-situ for future users of the site. Potential significant impacts associated with decommissioning would likely be similar to those listed for construction above, and include increased navigation, road traffic, and potential water quality issues (as the materials are to be crushed and removed from the Site). Further surveys may be required to assess if there have been changes in ecological assemblages and functioning at that time.

8.11 Elements Scoped In or Out of Further Assessment

8.11.1 Table 8.11 details all elements (receptors and or features) to be scoped in or out of the aquatic ecology assessment. Each element is accompanied by a justification for its inclusion or exclusion from further assessment basing on professional judgement.

Table 8.11: Elements Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Designated Sites				
Internationally designated sites	Construction/ Operation	X		Construction and operation activities could cause the loss/degradation/disturbance of aquatic habitats within the Teesmouth and Cleveland Coast Ramsar/SPA that are of importance to designated species. Potential to impact haul out or breeding locations of the harbour seal (designated feature), e.g. activities may cause visual and acoustic disturbance to those moving/foraging in the Tees Estuary adjacent to the Proposed Development.
Nationally designated sites	Construction/ Operation	X		Construction and operation activities have the potential to negatively impact aquatic features of the Teesmouth and Cleveland Coast SSSI through habitat loss/degradation, visual disturbance and decreased water quality. Operation activities are only anticipated to affect one designated feature – harbour seals. Direct impact on the breeding and haul out site at Seal Sands is not anticipated due to distance from the Proposed Development, however individuals foraging/moving throughout the impacted area of the Proposed Development could be indirectly impacted during operation activities. The other aquatic designated features, saltmarsh and invertebrates inhabiting sand dune habitats, are not anticipated to be impacted due to the distance from the Proposed Development.

Element	Phase	Scoped In	Scoped Out	Justification
Non-statutory sites	Construction/ Operation	X		Construction and operation activities have the potential to indirectly impact grey seals and harbour seals, which are an important mobile feature of the Teesmouth NNR. No other features of this NNR (including intertidal sand and mudflats) are expected to be impacted due to the distance from the Proposed Development and/or lack of hydrological connectivity.
			Freshwater	
Fish	Construction/ Operation	X		Protected fish species are present within the Site, and migratory diadromous species have been recorded in the River Tees. Water quality impacts (pollutants and suspending sediments), alterations to visual stimuli (artificial light spill) and alterations to underwater soundscape (notably piling) during construction could result in direct harm and also incur disturbance/avoidance behaviours. Water quality impacts during operation could also impact freshwater fish communities.
Invertebrates	Construction/ Operation		X	Tees barrage is about 10km upriver that separates most of the non-mobile freshwater species from the Site. The nearby freshwater areas are related to artificial lakes. No impact on invertebrates from changes in water quality or sediment suspension.
Macrophytes	Construction/ Operation		X	Tees barrage is about 10km upriver that separates most of the non-mobile freshwater species from the Site. The nearby freshwater areas are related to artificial lakes. No impact on invertebrates from changes in water quality or sediment suspension.
INNS	Construction/ Operation	X		Site clearance during construction and operation (decommissioning) activities could facilitate the spread of INNS in freshwater environments.
			Marine	
Benthic habitats and associated benthic assemblages	Construction/ Operation	X		Construction and operation activities could result in the loss, degradation or fragmentation of benthic habitats. This includes Priority Habitats, notably mudflats. Given the proximity of the Proposed Development, it is considered that the construction and operation activities could have potential impact to either the habitat itself or significant indirect effects to its setting. Construction activities could also result in the smothering of benthic assemblages. Operation activities could also result in water quality impacts and direct loss/degradation of habitat from vessel wave wash.
Phytoplankton	Construction/ Operation		X	Construction and operation activities could have water quality impacts by introducing pollutants and suspending sediments. Whilst this has the potential to impact phytoplankton assemblages, standard mitigation measures can be incorporated into the

Element	Phase	Scoped In	Scoped Out	Justification
				Proposed Development in relation to water quality to minimise impact to phytoplankton.
Marine Plants and Macroalgae	Construction/ Operation		X	Construction and operation activities could have water quality impacts by pollutants and suspending sediments. Whilst this has the potential to impact marine plants and macroalgae assemblages (which are of low value), standard mitigation measures can be incorporated into the Proposed Development in relation to water quality to minimise impact to macroalgae. Potential impacts on the Saltmarsh and native seagrass habitats during construction or operation due to the wash and increase of turbidity from increased vessel movements and dredging dependant on distance of these habitats from the Proposed Development
Fish	Construction/ Operation	X		Protected fish species, including migratory species, are known to be present in the Tees Estuary. Water quality impacts (pollutants and suspending sediments), and alterations to visual stimuli (artificial light spill) and the underwater soundscape during construction could result in direct harm and also cause disturbance/avoidance behaviours. Water quality impacts during operation could also impact fish species.
Marine Mammals	Construction/ Operation	X		Harbour seals, grey seals and harbour porpoises are present within the Tees estuary. Alterations to visual stimuli (increased lighting), and the underwater noise from construction activities (notably piling) and geophysical surveys could incur physical harm, and/or avoidance/disturbance. Navigation during construction and operation could also result in vessel strikes. The remaining marine mammals recorded as present in the Greater North Sea Ecoregion (minke whale, bottlenose dolphin, white-beaked dolphin, orca, Atlantic white-sided dolphin, long-finned pilot whale, Risso's dolphin and short-beaked common dolphin) have been scoped out due to their unlikely presence in the Tees estuary and consequently vicinity of the Proposed Development.
INNS	Construction/ Operation	X		Vessel movements have the potential to provide a vector for the spread of INNS during construction and operation phase in marine environment.

8.12 Proposed Assessment Methodology

8.12.1 The assessment methodology will be discussed with the Environment Agency and the Local Authority to determine the ecological sensitivities associated with freshwater and marine environments. Consultation will be undertaken with the MMO and Natural England via their Discretionary Advice Services to discuss certain aspects of the marine and freshwater ecology assessment and help refine the scope. Furthermore, a PEA

including a detailed desk study will be completed to inform the assessment of the Study Site and Proposed Development. These tasks will also facilitate the assessment of impacts of construction and operation of the Proposed Development.

8.12.2 The EIA assessment will be undertaken following the principles of EIA as set out by CIEEM's EIA guidelines (Ref 236). Each receptor will be evaluated within the geographic scale of reference and potential effects during the construction and operation phases of the Proposed Development.

8.12.3 The assessment of likely significant environmental effects as a result of the Proposed Development will consider both the construction and operational phases. The impact process involves:

a. identifying and characterising impacts and their effects;
b. incorporating measures to avoid and mitigate adverse effects;
c. assessing the significance of any residual effects after embedded mitigation;
d. identifying appropriate additional mitigation measures and any compensation measures to offset significant residual effects; and
e. identifying opportunities for ecological enhancement.

8.12.4 For adverse impacts, CIEEM's Guidelines for Ecological Impact Assessment have been adapted to classify the magnitude of impacts using a matrix approach to determine significance of effects. This is based on the approach used for road schemes in the UK by the Design Manual for Roads and Bridges. Although the Proposed Development is not a road/bridge, this guidance provides a robust methodology for assessing impacts to marine biodiversity and is considered suitable for this assessment.

8.12.5 Methods of mitigation including prevention, minimising or ex situ compensation of predicted impacts will be identified and addressed using these guidelines.

8.13 Significance of Effect Criteria

8.13.1 The types of designated site and policy objectives reflect the relative ecological importance of sites, habitats, species, and ecosystem services. The proposed criteria for determining ecological importance are proportionate to the level of designation or classification. The assigned levels of importance for marine ecological receptors are presented in Table 8.12.

8.13.2 Magnitude of impact is defined by the level of change from the identified baseline conditions, irrespective of the value/sensitivity of receptors. The categorisation of the magnitude of impact takes into account the following factors where relevant:

a. Positive or negative: whether the change in the environment improves or reduces its quality;
b. Extent: the spatial or geographical area over which the impact/effect might occur;
c. Magnitude: the size, amount, intensity or volume of the impact/effect. This should be quantified where possible;

d. Duration: the length of time an impact/effect is expected to last, relative to the effect caused by the activity. Short-term is considered to be up to one year; medium-term is considered to be between one and 10 years and long-term is considered to be greater than 10 years;
e. Frequency and timing: the frequency refers to how often the activity occurs and results in the effect. Timing is associated to when the impact happens, particularly if coincides with critical periods.; and
f. Reversibility: an irreversible (permanent) effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect (temporary) is associated with possible recovery, either spontaneously or through mitigation measures.

Table 8.12 Environmental Sensitivity of Marine Ecology Receptors

Importance	Proposed Criteria Description
High	Statutory sites designated or classified under international conventions or European legislation, for example: • World Heritage Sites; • Biosphere Reserves; • Wetlands of International Importance (Ramsar sites); • Special Areas of Conservation (SAC); and • Special Protection Areas (SPA). Species classified as 'endangered' or 'critically endangered' according to the International Union for Conservation of Nature (IUCN) Red List (IUCN, 2019).
Medium	Statutory sites designated under national legislation, for example: • Sites of Special Scientific Interest; • Marine Conservation Zones (MCZ); • National Nature Reserves (UK); and • Local Nature Reserves (UK) (LNR). Species classified as 'vulnerable' or 'near threatened' according to the IUCN Red List.
Low	Locally designated wildlife sites Those species considered to be of 'least concern' (according to the IUCN Red List.
Negligible	Habitats and species of low conservation importance in UK, without designated sites or designated wildlife sites.

8.13.3 A typical set of magnitude criteria which can be used in assessment is outlined in Table 8.13 to illustrate the process.

Table 8.13 Indicative Magnitude of Marine Impacts

Magnitude	Proposed Criteria Description
High	Total loss or major alteration to key elements/features of the baseline (i.e., pre-development) conditions.

Medium	Partial loss or alteration to one or more key elements/features of the baseline (i.e., pre-development) conditions
Low	Minor shift away from baseline (i.e., pre-development) conditions.
Very Low	Very slight change from baseline (i.e., pre-development) conditions

8.13.4 The overall significance of the effect is assigned by the combination of both sensitivity of the receptor and magnitude of impact.

Significance Criteria

8.13.5 In determining the significance of a potential effect, the magnitude of change arising from the Proposed Development is correlated with the value/sensitivity of the particular environmental receptor or process under consideration. The sensitivity of effect criteria will align with CIEEM's Guidelines on Ecological Impact Assessment.

Table 8.14 Indicative Significance of Marine Impacts

Sensitivity of Receptor	Magnitude of Impact				
		High	**Medium**	**Low**	**Very Low**
	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Negligible	Negligible
	Very Low	Minor	Negligible	Negligible	Negligible

8.13.6 Effects will be defined as either 'Significant' or 'Not Significant'. Effects that are classified as moderate or above are 'Significant'. Effects classified as below moderate are considered 'Not Significant'.

8.14 Other Assessments

Habitats Regulations Assessment

8.14.1 As the Site is located directly adjacent to the Teesmouth and Cleveland Coast SPA, there is considered to be the potential for likely significant effects on the ecological receptors that constitute the 'qualifying features' of these sites. As such, a HRA screening exercise will need to be undertaken to determine any likely significant effects resulting from the Proposed Development during either the construction or operational phases following the precautionary principle. HRA screening will be completed when sufficient environmental information has been gathered to accurately determine likely significant effects. Alongside the terrestrial ecology assessment, this will include information from the freshwater and marine ecology assessment, air quality assessment, and water environment assessment. It is expected that this information will be available following production of the PEIR.

8.14.2 If likely significant effects are identified an Appropriate Assessment will then need to be carried out to examine these effects in more detail and determine appropriate mitigation measures in order to avoid any adverse effects on the designated site integrity resulting from the Proposed Development.

Biodiversity Net Gain Assessment

8.14.3 To determine the biodiversity value of the Site pre- and post-development in a quantitative way, a BNG assessment will also need be undertaken for intertidal areas only (i.e. between mean low-water springs and mean high-water springs).

8.14.4 BNG is the end result of a process applied to development so that, overall, there is a positive outcome for biodiversity. This process follows the mitigation hierarchy, which sets out that everything possible must be done to firstly avoid, secondly minimise and thirdly restore/rehabilitate losses of biodiversity on a site. Only as a last resort, residual losses are compensated for, contributing towards local and national policies and strategies for conserving and enhancing biodiversity.

8.14.5 There are limited opportunities for marine BNG on-site. The marine BNG assessment will be based upon achieving compliance with current good practice principles, including measures such as avoiding areas of higher ecological value or achieving a measurable gain for biodiversity. Biodiversity value is measured in standardised biodiversity units using the current version of the Statutory Biodiversity Metric Tool.

8.14.6 The BNG assessment will analyse the terrestrial habitats to be retained, enhanced, created, or lost within the Site. It will identify whether habitat compensation is required and will demonstrate benefits resulting from the Proposed Development. In case the Proposed Development needs to achieve a net gain in marine biodiversity post-development including in the intertidal zone are, this is also assessed.

Water Environment Regulations Assessment

8.14.7 Potential impacts of the construction and operation phases on the WFD status of the relevant water bodies will be assessed in a standalone Water Environment Regulations Assessment. A staged approach to undertaking this assessment will be carried out, comprising Screening, Scoping and Impact Assessment. This approach will be adopted for the assessment of the Proposed Development, with the findings of the Screening and Scoping stages discussed with the Environment Agency prior to undertaking the Impact Assessment stage. The assessment will comprise a qualitative assessment supported by site walkover.

8.14.8 Further details on the assessment process are provided in **Chapter 9: Water Environment and Flood Risk.**

Further Surveys

8.14.9 The marine and freshwater receptors present have been identified as far as reasonably foreseeable at this stage, based on available information. However, as the assessment progresses and initial survey work is completed, the findings may reveal the need for further surveys to determine potential likely significant effects to ecological receptors more accurately. Any further survey requirements would be clearly highlighted following the completion of initial survey work.

8.15 Limitations and Assumptions

8.15.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

8.15.2 Access to part of the Site is currently limited, and an aquatic ecology assessment PEA and further desk studies will be undertaken to gain a better understanding of the effects that are likely to occur due to the Proposed Development.

8.15.3 There is limited ecological data available on the freshwater and marine species that are found within the ZoI. Data has been extracted from nearby Environment Agency monitoring locations to try and gain an understanding of what species may be present within the Site. A PEA will be undertaken for all areas within the Site. Subject to this survey, it is anticipated that further specific surveys for invertebrates, fish and macrophytes will be carried out. Benthic ecology sampling and fish surveys may also be required, dependent on the design.

8.15.4 If ecological data is older than 2 years further analysis will be undertaken to confirm its validity. Particularly with mobile species or in circumstances where the habitat, or its management, has changed significantly since the surveys were undertaken. Factors to be considered include (but are not limited to) whether a site supports, or may support, a mobile species which could have moved on to site or changed its distribution within a site. Survey data will provide a snapshot of the ecological baseline at the time of survey. All information received and researched that facilitated this chapter is true at the time of writing.

9. Water Environment and Flood Risk

9.1 Introduction

9.1.1 This section provides the results of the Water Environment and Flood Risk Scoping Assessment for the Proposed Development.

9.1.2 The Water Environment and Flood Risk Scoping Assessment provides the following information in the corresponding subheadings in this chapter:

a. The legislation, policy and guidance context;
b. The EIA scoping assessment methodology;
c. A description of the baseline environment;
d. An initial indication of potential effects that the Proposed Development may cause accounting for tried and tested[1] mitigation;
e. The proposed Water Environment aspects to be scoped in or out of the EIA;
f. The approach to mitigation;
g. Consultation; and
h. Limitations and assumptions.

9.1.3 The following guidance and information has been used to inform this Water Environment and Flood Risk Scoping Assessment:

a. The Design Manual for Roads and Bridges (DMRB) LA 113 Road drainage and the water environment (referred to hereafter as 'LA 113' (Ref 366); and
b. DMRB LA 104 Environmental assessment and monitoring (referred to hereafter as 'LA 104') (Ref 222).

9.2 Legislative, Policy and Guidance Context

9.2.1 The policy, legislation and guidance relevant to the assessment of the Proposed Development is shown in Table 9.1.

[1] Mitigation that is proven to be effective and reliable through repeated use.

Table 9.1: Water Environment and Flood Risk - Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Government 25 Year Environment Plan (2018) (Ref 376Ref 376)	Sets out Government action to deliver cleaner air and water, protect threatened species, and provide richer wildlife habitats. Targets include: a. Reduce the "damaging abstraction" of water from rivers and groundwater, increasing the proportion of water bodies with enough water to support environmental standards. b. Reach or exceed objectives for rivers, lakes, coastal and ground waters that are specially protected, whether for biodiversity or drinking water as per River Basin Management Plans. c. Minimise harmful bacteria in designated bathing waters and continue to improve the cleanliness of our waters.
National Planning Policy Framework (2024) (Ref 38Ref 38)	National Planning Policy Framework (NPPF) Section 14 and Annex 3 in relation to flood risk and climate change. NPPF Section 15 in relation to protection of the water environment. Planning Practice Guidance notes on flood risk and coastal change, water supply, wastewater and water quality.
The Overarching National Policy Statement (NPS) for Energy (EN-1) (2024) (Ref 36Ref 36)	Sets out the Government's policy for delivery of major energy infrastructure and will be the primary basis for decision making. NPS EN-1 (paragraph 5.16.1) recognises that infrastructure "can have adverse effects on the water environment." It states that "these effects could lead to adverse impacts on health or on protected species and habitats and could result in surface waters, groundwaters or protected areas failing to meet environmental objectives established under the Water Framework Directive."
NPS for Renewable Energy Infrastructure (EN-3) (2011) (Ref 318Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed.
NPS for Electricity Infrastructure (EN- 5) (2023) (Ref 320Ref 320)	States that with regard to climate change, applicants should set out to what extent the proposed development is expected to be vulnerable and as appropriate, how it would be resilient to flooding, particularly for substations that are vital for the electricity transmission and distribution network.
9.2.2 Legislation	
The Environmental Permitting (England and Wales) (Amendment) (EU Exit) Regulations 2019(Ref 367Ref 367)	States that it is an offence to knowingly permit a water discharge activity unless complying with an exemption or environmental permit. Also manage works that have the potential to affect a watercourse under the Environment Agency's jurisdiction.
The Environment (Amendment etc.) (EU Exit) Regulations 2019 (Ref 368Ref 368)	The Regulations make technical amendments to the Environmental Protection Act 1990 and the Environment Act 1995 (which among other things, include provisions on the contaminated land, waste and statutory nuisance regimes), the Pollution Prevention and Control Act

Policy / Legislation / Guidance	Description
	1999 (which governs the environmental permitting (EP) regime), the Contaminated Land (England) Regulations 2006 (SI 2006/1380), the Environmental Noise (England) Regulations 2006 (SI 2006/2238) and the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (SI 2015/810) to ensure that they remain operable following Brexit.
Environmental Protection Act 1990 (Ref 171Ref 171)	The Environmental Protection Act 1990 (EPA 1990) sets out the framework for managing and controlling environmental pollution in the UK.
Environment Act 1995 (Ref 64Ref 64)	The Environment Act 1995 aims to protect and improve the environment by addressing various aspects of pollution, waste management, and conservation. The act outlines a comprehensive framework for environmental protection, focusing on a range of issues such as air quality, water resources, waste management, and nature conservation. The act also established the Environment Agency as a regulator.
Environment Act 2021 (Ref 65Ref 65)	Part of a recent legal framework for environmental protection. Specifically targeting water quality and biodiversity enhancement.
The Environmental Permitting Regulations 2016 (Ref 163Ref 163)	States that it is an offence to knowingly permit a water discharge activity unless complying with an exemption or environmental permit. Also manage works that have the potential to affect a watercourse under the Environment Agency's jurisdiction.
Water Resources Act 1991 (Ref 323Ref 323)	Sets out the powers and duties held by Local Authorities associated with flood risk. Consent must be obtained for any works which may affect flow within an ordinary watercourse. Sets out responsibilities for maintenance to reduce flood risk.
The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD) (Ref 374Ref 374)	WFD Regulations provide a framework for managing the water environment in England through environmental objectives and a summary of the programmes of measures required to achieve those objectives.
Land Drainage Act 1991(Ref 322Ref 322)	
Water Act 2014 (Ref 400Ref 400)	The Water Act 2014 (WA 2014) was to reform the water industry by making it more innovative and responsive to customers and to increase its resilience to natural hazards such as drought and floods. The act includes measures to limit the insurance premiums paid by high risk households.
Water Resources (Abstraction and Impounding) Regulations 2006 (Ref 369) **The Water Abstraction and Impounding (Exemptions)**	The Water Resources (Abstraction and Impounding) Regulations 2006 amend the water abstraction and impounding licensing regime in England and Wales, in the light of amendments made by the Water Act 2003 to the Water Resources Act 1991.

Policy / Legislation / Guidance	Description
Regulations 2017 (Ref 370Ref 370)	
Flood Risk Regulations 2009 (Ref 371Ref 371)	The Flood Risk Regulations 2009 set out the duties regarding producing preliminary flood risk assessments, flood hazard maps and flood risk maps and flood risk management plans. In addition, the duty of co-operation between the Environment Agency and Lead Local Flood Authority is described
The Water Supply (Water Quality) Regulations 2018 (Ref 372Ref 372)	These Regulations supplement Chapter III (Water Supply) of the Water Industry Act 1991 and revoke and replace the Water Supply (Water Quality) Regulations 2010. They are primarily concerned with the quality of water supplied by water undertakers whose areas are wholly or mainly in Wales for drinking, washing, cooking and food preparation, and for food production.
Flood and Water Management Act 2010 (Ref 321Ref 321)	Created role of Lead Local Flood Authority (LLFA) to co-ordinate local flood risk management, including review and approval of surface water management systems. Schedule 3 of the Act introduces National Standards for SuDS against which proposed drainage systems should comply.
The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (Ref 373Ref 373)	These Regulations aim to prevent serious environmental effects or ensure that remediation is carried out. The emphasis is on encouraging operators to put in place appropriate pollution prevention measures and where appropriate agreed voluntary remedial action. The Regulations specifically define three types of environmental damage: biodiversity damage to European Union protected species and habitats and Sites of Special Scientific Interest (SSSI); water damage; and land damage.
The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 (Ref 374Ref 374)	The Water Framework Directive (Standards and Classification) Directions 2015 was legislation in England and Wales that set out the specific standards and methods for classifying the quality of water bodies under the WFD. These directions specified how ecological and chemical status were assessed, the criteria for determining "good status," and the procedures for monitoring and reporting.
The Groundwater (Water Framework Directive) (England) Direction 2016 (Ref 324Ref 324)	The Groundwater (Water Framework Directive) (England) Direction 2016 was a document that provided instructions to the Environment Agency in England on how to fulfil its duties under the EU WFD, specifically concerning groundwater protection.
The Conservation of Habitats and Species Regulations 2017 (Ref 375Ref 375) **The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) (Ref 98Ref 98)**	The Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations') consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose the Habitats Directive (Ref 230) into national law.
Guidance	

Policy / Legislation / Guidance	Description
Design Manual for Roads and Bridges (DMRB)	The assessment will be carried out in broad alignment with the LA 113 and LA 104 and will also make use of professional judgement where applicable. LA 113 provides the methodology and criteria for identifying the likely impacts of a proposed road project on the water environment and predicting their magnitude and the significance of the resulting effects. LA 113 is specifically designed for assessing the impacts of road or bridge construction on the water environment and therefore, sections of it are not applicable to the Proposed Development. LA 104 outlines the approach to the assessment of the overall significance of any effects on receptors due to the impacts of the Proposed Development. There is no standard guidance for the methodology for a Water Environment chapter and therefore, in the absence of any sector guidance, DMRB is recognised as a tried, tested and robust approach. Other relevant guidance, which has been used to inform this assessment, includes: The assessment will be carried out in broad alignment with the LA 113 and LA 104 and also makes use of professional judgement, as required. LA 113 provides the methodology and criteria for identifying the likely impacts of a proposed road project on the water environment and predicting their magnitude and the significance of the resulting effects. LA 113 is specifically designed for assessing the impacts of road or bridge construction on the water environment and therefore, sections of it are not applicable. to the Proposed Development. LA 104 outlines the approach to the assessment of the overall significance of any effects on receptors due to the impacts of the Proposed Development. UK government guidance for preventing pollution (Ref 237), working on or near water (Ref 379)and for managing water on land (Ref 380). Construction Industry Research and Information Association (CIRIA) guidance used to inform the assessment including: Control of Water Pollution from Construction Sites – Guide to Good Practice (SP156)(Ref 381). Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (CG532) (Ref 382). Control of Water Pollution from Linear Construction Projects – Technical Guidance (C649) (Ref 383). Environmental good practice on site (C692) (Ref 384). Groundwater control: design and practice (second edition) (C750) (Ref 385). The Sustainable urban Drainage Systems (SuDS) Manual (C753) (Ref 386). Guidance on the construction of SuDS (C768) (Ref 387). Planning Practice Guidance (Ref 420). Guidance for Pollution Prevention (Ref 237). Environment Agency's Approach to Groundwater Protection (2018) (Ref 297). Clearing the Waters for All (DEFRA) (2016) (Ref 326). Non-Statutory Technical Standards for SuDS (2015) (Ref 388).

Policy / Legislation / Guidance	Description
	Natural England Water Quality and Nutrient Neutrality Advice (2022) (NE785) (Ref 389).

Regional and Local Level Policy

9.2.3 Other regional and local level policy have been considered as part of the Water Environment Assessment where these have informed the identification of receptors and resources and their sensitivity; the assessment methodology; the potential for likely significant environmental effects; and required mitigation. These policies at the regional level include:

a. Cycle 3 River Basin Management Plans (RBMPs) 2022-2028 - the RBMP of relevance to the study area is the Northumbria RBMP (Ref 396). This plan provides a framework for protecting and enhancing the benefits provided by the water environment. It also informs decisions on land use planning.
b. Flood Risk Management Plans (FRMPs) - the FRMPs set out how organisations, stakeholders and communities will work together to manage flood risk. The local flood risk strategy relevant to the Study Area is the RCBC Local Flood Risk Management Strategy (2017) (Ref 327).
c. Strategic Flood Risk Assessment (SFRA) – the SFRA provides the central source of all relevant flood risk information and provides the evidence base to make decisions on where to direct new development to ensure development is located in sustainable locations in terms of flood risk. The SFRAs relevant to the Study Area is the STBC SFRA Level 1 (2018) (Ref 442) and RCBC SFRA Level 1(2016) (Ref 328) and Level 2 (2010) (Ref 328).
d. Preliminary Flood Risk Assessment (PFRA) – the PFRA provides a high-level of assessment of flood risk from local sources. The PFRA relevant to the Study Area are the STBC PFRA (2018) (Ref 452) and the RCBC PFRA (2017) (Ref 330).
e. Surface Water Management Plans (SWMPs) – according to the Redcar and Cleveland Council website (Ref 327) the SWMPs are not currently available (at the time of writing – September 2025). It is recommended that these are incorporated and considered into the next phases of the project, once they have been published.

Stockton-on-Tees Borough Council Local Plan (2019) (Ref 55)

9.2.4 Adopted in 2019, and providing a framework until 2032, the STBC Local Plan sets out policies and proposals to guide planning decisions for sustainable growth. More specifically, it identifies housing and employment needs, protection and enhancement of the natural and historic environment, and provision of new infrastructure within the borough.

Redcar and Cleveland Borough Council Local Plan (2018) (Ref 33)

9.2.5 In effect until 2032, the RCBC Local Plan brings in guides to planning with an effective framework for sustainable development setting out policies to ensure that all new development is energy and resource efficient. This is alongside policies for housing

needs, economic, social, and environmental priorities, and providing a framework for decisions on planning applications.

9.3 EIA Scoping Assessment Methodology

Study Area

9.3.1 The water environment and flood risk scoping study area is defined by the Proposed Development footprint and the Site Boundary plus a 1km buffer, as shown on **Figure 9.1** and is based on the 'source-pathway-receptor' pollutant linkage principle. The 1km study area was determined using professional judgement of the potential impacts and pathways related to the Proposed Development.

9.3.2 For direct effects on surface waters, the study area includes the geographical extent of the Proposed Development footprint and all surface water features, including rivers and their tributaries, surface water abstractions and flood zones within 1km, where features have hydrological connectivity to the project.

9.3.3 For groundwater, the study area includes the geographical extent of the Proposed Development footprint and all groundwater features which include underlying aquifers, source protection zones, springs, groundwater abstractions and Groundwater Dependent Terrestrial Ecosystems (GWDTEs)[2] within 1km of the project where features are deemed to have hydrological connectivity to the project, based on available data/professional judgement.

9.3.4 Extension of the study area beyond the 1km buffer may be necessary to capture potential impacts to receptors beyond the immediate study area. This may be important where the project is likely to impact receptors upstream and downstream of the study area. A proportionate, risk-based approach will be taken to the extension of the study area based on assessment of impact pathways; and this will be kept under review as understanding of interactions evolves.

Data Sources

9.3.5 The following information sources have been used to complete this Scoping Report chapter:

a. WFD data (Catchment Data Explorer) (Ref 400);
b. OS Open Data (Ref 401);
c. Designated and Protected Sites (MAGIC) (Ref 326);
d. Flood risk maps (Environment Agency) (Ref 390);
e. British Geological Survey (BGS) 1:50,000 Digital Geology Mapping "GeoIndex" (Ref 391);

[2] GWDTEs are wetlands such as springs, flushes, and fens which are fed by groundwater rather than rainfall or surface runoff. They are particularly sensitive to hydrological and ecological changes caused by development and therefore the Environment Agency have a responsibility to protect GWDTEs and regulate development which may have a negative impact.

f. Drinking water safeguard zones (Environment Agency) (Ref 392) (Ref 393);
g. GWDTEs (Environment Agency) (Ref 394); and
h. RCBC SFRA (Ref 328).

EIA Scoping Assessment Method

9.3.6 A preliminary desk-based review of the relevant information outlined above has been undertaken to establish baseline environmental conditions and identify potential surface water, groundwater and flood risk receptors.

9.3.7 Based on the Proposed Development parameters, alongside the desk-based review of relevant information, the characterisation of baseline and identification of sensitive receptors have been conducted. Potential impacts on surface water and groundwater features have been identified, with professional judgment applied to determine the likelihood of significant effects following best practice mitigation and additional mitigation where applicable.

9.3.8 Should the footprint of the Proposed Development be changed, this assessment would need to be updated. In this event, any newly identified and affected receptors will be included in the buffers of the Study Area specified for surface water, groundwater and flood risk receptors.

Baseline Environment

Designated and Protected Sites

9.3.9 Three statutory designated sites lie within the study area, namely:

a. Teesmouth National Nature Reserve (NNR), located approximately 600m north of the Main Site;
b. Teesmouth and Cleveland Coast Ramsar site, overlapping the southern extent of the site, and immediately adjacent to the west of the Main Site; and
c. Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI) and Special Protected Area (SPA), which includes the wider Seal Sands area, the River Tees (which flows from south west to north east past the Site), along overlapping the southern extent of the site, and immediately adjacent to the east of the Main Site.

Surface Water Features

WFD Classified Surface Water Features

9.3.10 The following WFD surface water, transitional and coastal waterbodies are located within the Study Area:

a. The ‘Tees Water Body’ (GB510302509900), a transitional water body, which is located immediately adjacent to the east of the Site. As of WFD RBMPCycle 3 (2022) the water body has a ‘Moderate’ status;

b. The Tees Estuary (S Bank) water body (ID: GB103025072320) is located at the eastern extent of the Proposed Development. As of Cycle 3 (2022) the water body has a 'Moderate Ecological Potential' status.
c. Marton West Beck Catchment (tributary of Tidal Tees) (ID: GB103025072210) is a tributary of the Tees Water and is located upstream of the Proposed Development. As of Cycle 3 (2022) the water body has a 'Moderate Ecological Potential' status.

Non-WFD Classified Surface Water Features

9.3.11 There are several surface water receptors within the Study Area, including:

a. The River Tees (a Main River) is located along the eastern boundary of the Site;
b. Dorman's Pool and Saltholme West Pool are located north east and west of Navigator North Tees Inland Terminal respectively;
c. Several drainage ditches are present to the south west, north and north west of the main site.
d. There are several unnamed ponds are located north east of the Main Site and south and west of Salthome Brinefields;
e. Saltholme Brine Reservoirs are located approximately 600m west of the Site;
f. Greatham Creek (a Main River) is located approximately 1.3km north west of the Site;
g. Dabholm Gut (an Ordinary Watercourse [3]) is located to the south east of the Site in South Tees adjacent to Brand Sands WWTP;
h. Dabholm Beck (an Ordinary Watercourse) is located to the east of the Site adjacent to Brand Sands WWTP
i. Knitting Wife Beck (an Ordinary Watercourse) located approximately 300m south west of the eastern extent of the Site (Tees Dock roundabout);
j. Mill Race (an Ordinary Watercourse) intersects the Trunk Road at the eastern extent of the Site, and
k. The Fleet (an Ordinary Watercourse) located approximately 200m north of the Site.
l. Holme Fleet (a Main River) located approximately 120m south west of the Site (through the Saltholme Nature Reserve)
m. Ormesby and Normanby Beck both located approximately 1.2km south east of the Site.

Surface Water Drinking Water Safeguard Zones

9.3.12 There are no surface water drinking water safeguard zones (Ref 392) within the Study Area.

Discharge Consents and Abstractions

[3] Ordinary watercourse – these can include watercourses such as some rivers, brook, beck, ditch, dyke, stream, or culvert. The Lead Local Flood Authority (LLFA) and the Internal Drainage Board are responsible for managing flood risk and carrying out flood defence work.

9.3.13 There are numerous discharge consents registered on the Environment Agency Portal within 1km of the Study Area, as of September 2025. Further information and location will be provided at the PEIR/ES.

9.3.14 At time of writing, relevant Environment Agency abstraction data have not been made available to inform this report. Upon receipt of these data, the report will be updated.

Groundwater Features

WFD Classified Groundwater Features

9.3.15 The Site and Study Area are located within two WFD groundwater bodies:

a. 'Tees Sherwood Sandstone Water Body' (GB40301G702000) situated to the north of the River Tees. As of RBMP Cycle 3 (2019), the overall status is 'Good'.
b. 'Tees Mercia Mudstone & Redcar Mudstone Water Body' (GB40302G701300) to the south of the River Tees. As of RBMP Cycle 3 (2019), the overall status is 'Poor'.

Superficial Deposits

9.3.16 BGS 1:50k Digital Mapping (Ref 391) has been reviewed to inform geology and hydrogeology. Most of the Site and surrounding Study Area is underlain by superficial deposits comprising 'Tidal Flat Deposits – Sand, silt and clay'. To the far east of the Study Area, where the Mill Race watercourse is located, superficial deposits comprise a mix of 'Tidal Flat Deposits – Sand, silt and clay', 'Blown Sand – Sand' and 'Glaciolacustrine Deposits, Devensian - Clay and silt'.

Bedrock Geology

9.3.17 According to BGS 1:50k Digital Mapping (Ref 391), almost the entirety of the Site and surrounding Study Area is underlain by bedrock geology comprising 'Mercia Mudstone Group – Mudstone'. To the far east of the Study Area, bedrock geology comprises a mix of 'Penarth Group – Mudstone' and 'Redcar Mudstone Formation'.

Principal Aquifers

9.3.18 According to MAGIC Maps, the Site and surrounding Study Area are underlain by several bedrock aquifers. Specifically, there are Principal Aquifers[4] in the west,

[4] Designated by the Environment Agency, a Principal Aquifer refers to a regionally extensive aquifer or aquifer system that has the potential to be used as a source of potable (drinkable) water. It is a layer of rock or drift deposits that has high permeability and water storage capacity.

Secondary Aquifers[5] in the central regions in which the Main Site is located, and Secondary (undifferentiated) Unproductive Aquifers in the east.

9.3.19 Secondary (undifferentiated) superficial drift Aquifers underly the majority of the Site and Study Area with the exception of the far eastern extents under which Secondary A superficial drift Aquifers are located.

Groundwater Source Protection Zones (SPZs)

9.3.20 There are no groundwater SPZs located beneath the Site or Study Area, according to MAGIC Maps.

Groundwater Abstractions

9.3.21 The groundwater bodies beneath the Site and Study Area may support local abstractions for potable water supply. According to Tees Abstraction Licensing Strategy, the Tees Sherwood Sandstone groundwater body has been assessed as having Water Available for Licensing, although restrictions regarding a 5km buffer along the coast due to saline intrusion apply (Ref 393). At the time of writing this report (September 2025), relevant Environment Agency abstraction data have not been made available to inform this report. Upon receipt of these data, the report will be updated.

Groundwater Drinking Water Safeguard Zones

9.3.22 Based on MAGIC maps, there are no groundwater drinking water safeguard zones within the Site or the Study Area.

Groundwater Dependent Terrestrial Ecosystems

9.3.23 The following GWDTEs are located within the study area:

a. The Tees and Cleveland Coast Ramsar Sites are located to the west of the Site and south east boundary along the River Tees. These areas are designated Ramsar sites based on the presence of nationally and internationally important number of species.
b. The Teesmouth and Cleveland Coast SSSI is designated to the River Tees (south of the Proposed Scheme). The SSSI and Ramsar designations include Dorman's Pool Nature Reserve and Saltholme West Pool Nature Reserve to the west of the Site.

Springs

[5] Designated by the Environment Agency, a Secondary Aquifer refers to an aquifer where groundwater moves through secondary openings and interstices that developed after the rocks were formed. These aquifers typically provide modest amounts of water, and their structure limits their use, although they remain important for rivers, wetlands, and private water supplies in rural areas.

9.3.24 Based on review of OS mapping, there are no springs located within the Site nor Study Area.

Flood Risk

Rivers and Sea Flood Risk

9.3.25 River flooding occurs when the discharge of a river is too great relative to the channel capacity, resulting in water flowing over bank causing flooding. Coastal floods are caused by extreme sea levels, which arise as a combination of four main factors: waves, astronomical tides, storm surges and relative mean sea level.

9.3.26 According to the Environment Agency Flood Map for Planning (Ref 390) the Main Site and most of the connections in South Tees are located in Flood Zone 1, which is defined as having a low probability of flooding – less than 0.1% annual probability of river or sea flooding. The western portion of the Site in North Tees occupied by the pipeline connection to local rail loading infrastructure is located within Flood Zone 3, which is defined as having a high probability of flooding – a 1% greater chance of flooding or a 0.5% or greater chance of sea flooding, in any given year. Environment Agency formal flood defences lie within the 1km study area just south of Greatham Creek and, according to the Flood Map for Planning, they directly benefit the Site. There are also areas of land in Flood Zones 2 and 3 along Dabholm Gut, around Bran Sands and at Steel House Roundabout.

Surface Water Flood Risk

9.3.27 Typically, surface water flooding is caused by a significant amount of rainfall and the high speed at which it hits the ground falling over a short period of time, which overwhelms the drainage networks; this overwhelms the system capacity and causes flooding.

9.3.28 Across the Proposed Development, including the Site and surrounding study area there are localised areas of low (area has a chance of flooding of between 0.1% and 1% each year) to high (area has a chance of flooding of greater than 3.3% each year) surface water flood risk, likely to be associated with the wider Ordinary Watercourse and land drainage network as well as localised depressions owing to the topography of the landscape.

Groundwater Flood Risk

9.3.29 Groundwater flooding is defined as the emergence of groundwater at the ground surface away from perennial river valleys or the rising of groundwater into man-made ground under conditions where the ‘normal’ range of groundwater levels and groundwater flows is exceeded.

9.3.30 The surface geology of the Site, with variably permeable superficial deposits comprising Tidal Flat Deposits (in parts a Secondary A Aquifer) (and locally Blown Sand near Steel

House Roundabout), suggests a potential for groundwater flood risk as water should flow and infiltrate easily. As the bedrock under the Main Site consists of mudstone, which is typically less permeable, this can limit groundwater movement slightly. The STBC PFRA does not identify whether the site is states that the Seal Sands area is not in an area at higher risk of groundwater flooding. However, as detailed in the RCBC PFRA (Ref 390), “the overall level of groundwater flood risk [in South Tees] is low through Redcar and Cleveland”. Additionally, according to the Environment Agency flood risk summary for the Site, based on long-term flood risk maps (Ref 390), “flooding from groundwater is unlikely in this area”.

9.3.31 Based on this, and the underlying geology of the Proposed Development, flood risk from groundwater sources is considered to be low for the Site and surrounding Study Area.

Reservoir Flood Risk

9.3.32 The western extent of the Site and Study Area are at risk of flooding from formal flood storage reservoirs when there is also flooding from rivers (Ref 398), likely via the River Tees.

Other Artificial Water Retaining Structures

9.3.33 Saltholme Brine Reservoir compound, to the west of the Main Site, could present a residual risk of flooding, i.e. if the brine compound failed. However, assuming that the compound has been appropriately designed, this remains a low residual risk. Overall, it can be deemed that the Proposed Development, including the Site and surrounding Study Area are therefore at a low risk of flooding from other artificial water retaining structures.

Sewer Flooding

9.3.34 There is no data or information included in the STBC SFRA (Ref 442) to suggest that the Proposed Development, including the Site and surrounding Study Area is at risk of sewer flooding. A utilities search will be undertaken to help inform assessment of sewer flood risk, as the design of the Proposed Development is progressed; with findings fed back into any accompanying flood risk assessment.

Historical Flooding

9.3.35 The STBC PFRA (Ref 411) describes six significant historical flood events within the borough. None of these are within the Site or Study Area; the closest was caused by heavy rain surcharging a culvert at Port Clarence.

9.3.36 As noted in the RCBC PFRA (Ref 330), “40 historical flood records have been collected which are attributed to flooding along ordinary watercourses. These incidents are due to insufficient culvert and channel capacity. The main ordinary watercourse flooding locations are: […] The Fleet watercourse at Redcar (Dormanstown).”

Future Baseline

9.3.37 Climatic changes including higher temperatures, increase in frequency and length of heat waves, reduced precipitation in summer and increased precipitation in winter are likely to occur as a result of climate change. Surface water flows are likely to become more variable, with more frequent extremes and an increase in flooding.

9.3.38 There is potential for water quality to improve and baseline WFD status to improve as the RBMPs are implemented, as these aim to achieve 'good' status by 2027 for WFD waterbodies. This is considered to be within the future baseline.

9.4 Potential Impacts

9.4.1 This section identifies the potential impacts based on the available information at the time of writing (September 2025) in relation to the construction, operation, maintenance, and decommissioning of the Proposed Development. Assessment of potential effects (and associated reporting) will be updated as the design matures, ultimately reflecting the requirements of the final design.

Construction

9.4.2 Construction is defined as all the works undertaken to build the Proposed Development. Typically, most of the impacts on the Water Environment will occur during this phase as this is when physical changes occur (i.e. earthworks, dewatering etc).

9.4.3 Impacts which have the potential to be significant to the Water Environment during the construction phase include:

a. Increased pollution entering the water bodies from mobilised suspended solids and spillage of fuels or other harmful substances that may migrate to surface water and groundwater receptors;
b. Impacts to the hydromorphological and ecological quality of watercourse(s) (see **Chapter 8: Freshwater and Marine Ecology**) associated with works within or in close proximity to watercourses, including physical change to the watercourses and longer-term changes associated with sediment deposition;
c. Potential damage, degradation or loss of habitats within designated conservation sites, from activities such as wave wash (from increased navigation) and previous contaminant release from seabed associated to piling or capital or maintenance dredging;
d. Changes to water quality within the River Tees associated with jetty demolition and quay construction works, and potential increase in turbidity and release of contaminant materials from excavation, piling, dredging and increased wave wash (from increased navigation);
e. Impacts to local land drainage structures, that may alter existing drainage patterns within catchments and provide potential pathways for pollution;
f. Changes to groundwater levels, flows and quality arising from construction activities, primarily dewatering, earthworks and intrusive investigation works creating new flow paths for groundwater;

g. Impacts on receiving surface water and groundwater quality from the leaching of contaminants from soils into groundwater during construction (see **Chapter 17: Geology and Soils** for further details on impacts on contaminated land and soils); and
h. Changes to surface water flow paths and land drainage systems could modify drainage and increase flood risk.

9.4.4 Whilst it is likely that the effects on water quality and quantity would be mitigated through the implementation of a CEMP which will include best practice measures during construction, it is considered that additional survey and assessment work is required. Such additional survey and assessment work is required to understand the Site's water environment and the likely effects; develop bespoke mitigation plans required and confirm the residual effects and their significance. Therefore, the construction effects on surface water and groundwater quality and quantity, and flood risk are scoped in.

Operation and Maintenance

9.4.5 Impacts which have the potential to be significant to the Water Environment during the operation phase could include:

a. Permanent impact to the hydromorphological and ecological quality of water features associated with works within or in close proximity to water features;
b. Changes to water quality (including suspension of sediment bound contaminants) within the River Tees associated with operational navigation (resulting from wave wash disturbing sediment) and dredging maintenance.
c. Permanent impacts to catchment hydrology and hydrogeology caused by the introduction of a barrier to natural overland flow, surface water and/or groundwater connectivity;
d. Permanent changes in river baseflow due to dewatering effects;
e. Increased flood risk to the Proposed Development and to people and property elsewhere caused by crossing of watercourses, thus affecting flood flow conveyance; and
f. Increased flood risk to the Proposed Development and to people and property elsewhere due to increased rates and volumes of surface water runoff from an increase in impermeable area.

9.4.6 Based on the available information at the time of writing (September 2025), the operation effects for surface water and groundwater quality and quantity, and flood risk are scoped in.

Cumulative and In-combination Impacts

Inter-related

9.4.7 Inter-related effects, which are impacts from several developments, which individually might be insignificant, but when considered together could result in a significant cumulative effect.

9.4.8 Based on the available information at the time of writing it is considered that there would not be any inter-related cumulative impacts on the Water Environment. The Water Environment and Flood Risk receptors will only be potentially impacted by construction works taking place directly within the Site, and it is not foreseeable that these receptors could be further impacted by off-site activities such as nearby committed developments. However, this assessment may need to be revised dependent on the final design of the Proposed Development.

Intra-related

9.4.9 Based on the available information at the time of writing potential intra-related cumulative impacts may be in the form of increased impermeable surfaces, diversions of watercourses or watercourse crossings, issues relating to potential contaminated land, and discharges to watercourses or groundwater features that all combined to have a different impact on a Water Environment and Flood Risk receptor than individual. This will be assessed within the EIA Report, as the design of the Proposed Development is progressed.

9.5 Elements Scoped In or Out of Further Assessment

9.5.1 Table 9.2 below summarises the potential construction and operation impacts relevant to the Water Environment and Flood Risk assessment proposed to be scoped in or out of EIA.

Table 9.2: Proposed Scope for the Water Environment and Flood Risk

Topic Aspect (Potential Impact)	Construction	Operation	Survey Requirements
Surface water quality	Scoped in	Scoped in	Site (visual walkover) survey. Environment Agency request for information on licensed abstractions, discharges and private water supplies.
Surface water quantity	Scoped in	Scoped in	
Groundwater quality	Scoped in	Scoped in	Environment Agency request for information on licensed abstractions, discharges and private water supplies.
Groundwater quantity	Scoped in	Scoped in	
GWDTEs	Scoped in	Scoped in	Not applicable
Flood risk and drainage	Scoped in	Scoped in	Site survey

9.6 Proposed EIA Assessment Methodology

Desk Based Study and Surveys

Desk Based Study

9.6.1 A comprehensive desk-based study will be completed using publicly available data and data received from stakeholders through consultation. The desk study will identify potential water receptors and sensitive areas within the study area, which may include peat, groundwater and surface water dependent features, private water supplies and locations of watercourse crossings that cannot be avoided.

Surveys

9.6.2 Visual walkover surveys will be conducted to ground-truth and expand on the data received during the desk study and to gain a complete understanding of the existing topography, hydrological and hydrogeological conditions of the study area. Where relevant, this information will be used to inform the design of the Proposed Development.

Assessment Methodology

9.6.3 Based on the information obtained from the review of existing data and the site surveys, an assessment of potential effects of the Proposed Development will be undertaken. Where potential significant effects are identified, mitigation measures will be proposed.

9.6.4 A qualitative assessment methodology following the approach outlined in DMRB LA 113 and LA 104 will be used to assess the magnitude of the potential effects will be defined by taking into account the sensitivity of the hydrological and hydrogeological features and the potential effect should that impact occur.

Approach to Mitigation

Design Evolution

9.6.5 The design of the Proposed Development will be approached iteratively, taking account of the environmental information available at specified ‘design snapshots’ (an identified point in time to pause and amend designs based on evolving environmental information gained through further surveys and assessment work). These may include siting of elements (e.g. construction laydown areas) to avoid sensitive surface water and groundwater receptors.

Construction

9.6.6 Beyond the CEMP, additional mitigation is not expected likely to be needed. The application of best practice standard mitigation, as well as bespoke mitigation plans informed by additional survey and assessment work undertaken as part of the EIA will be detailed in a CEMP and adhered to by appointed contractor.

9.6.7 Implementation of a CEMP which will include best practice measures during construction, it is considered that there is additional survey and assessment work required to understand the Site’s Water Environment and the likely effects, develop the bespoke mitigation plans.

Operation

9.6.8 Site specific mitigation may be required to comply with the WFD regulations and mitigate any potential impacts on WFD status; however, it cannot yet be outlined based on the available information at the time of writing (September 2025).

9.6.9 Site specific mitigation will be required to manage any increase in surface water run-off from the development to manage surface water on site and mitigate the impact of the development downstream.

Decommissioning

9.6.10 Beyond the Demolition Environmental Management Plan (DEMP), additional mitigation is not expected likely to be needed. The application of best practice standard mitigation, as well as bespoke mitigation plans informed by additional survey and assessment work undertaken as part of the EIA will be detailed in the DEMP and adhered to by appointed contractor.

9.6.11 Implementation of a DEMP which will include best practice measures during decommissioning, it is considered that there is additional survey and assessment work required to understand the Site's Water Environment and the likely effects, develop the bespoke mitigation plans.

Consultation

9.6.12 Consultation with the Environment Agency will be carried out to discuss potential impacts to surface water and groundwater receptors and to develop appropriate mitigation suitable for the Site.

9.6.13 Information on abstractions and private water supplies will be sought through consultation with the Environment Agency, local councils, and NWL .

9.6.14 Local authorities and the Environment Agency will be consulted on potential flood risk and any required mitigation.

9.7 Limitations and Assumptions

9.7.1 The accuracy of the baseline condition assessment is reliant upon the accuracy of the data available from the sources listed in the References. Flood risk impacts are based on information available from the Environment Agency, and the accuracy of the assessment is dependent upon the quality of data available.

9.7.2 While the potential impacts and mitigation will be based on the criteria presented in LA 113 and LA 104, professional judgement will still be required. The environmental value and sensitivity (referred to in LA 113 as importance) of Water Environment receptors,

the magnitude of potential impacts and the significance level may change during later phases when more information and data becomes available.

9.7.3 Any third-party information, including the readily available data sources and input from external consultations has been assumed to be accurate at the time of writing.

10. Landscape and Visual

10.1 Introduction

10.1.1 This chapter considers the likely impacts of the Proposed Development on landscape and visual receptors during construction, operation and decommissioning with preliminary consideration of potential significant effects (including townscape and seascape as set out in NPS EN-1). It sets out the proposed study area and methodology for the Landscape and Visual Impact Assessment (LVIA) and identifies those impacts that can be scoped out of the assessment. It provides the basis and focus for more detailed assessment as part of the EIA process.

10.1.2 There are clear differences between landscape effects and visual effects and the following distinctions have been made:

a. Landscape effects relate to changes to the landscape as a resource, including physical changes to the fabric or individual elements of the landscape, its aesthetic or perceptual qualities, and landscape character.
b. Visual effects relate to changes to existing views of identified visual receptors ('people'), from the loss or addition of features within their view due to the Proposed Development.

10.1.3 Landscape effects and visual effects will therefore be assessed and reported separately.

10.1.4 The LVIA will be undertaken with reference to other environmental topics, including ecology, heritage, arboriculture assessments. This chapter is supported by the following figures:

a. **Figure 10.1: Site location and study area;**
b. **Figure 10.2: Designations**;
c. **Figure 10.3: Published Landscape Character Areas**; and
d. **Figure 10.4: Zone of Theoretical Visibility and proposed representative viewpoints**.

10.2 Policy, Legislation and Guidance

10.2.1 The policy, legislation, and guidance relevant to the LVIA of the Proposed Development is detailed in Table 10.1.

Table 10.1: Landscape and Visual - Summary of Key Policy, Legislation and Guidance

Policy/Legislation/Guidance	Description
Policy	
National Planning Policy Framework, 2024, Department for Levelling Up, Housing & Communities (Ref 38)	Chapter 12 of the NPPF requires that planning decisions ensure developments *"…are sympathetic to local character"* (paragraph 135c). Chapter 15 requires planning decisions to *"contribute to and enhance the natural and local environment, by: a) [inter alia] protecting and enhancing valued landscapes…"* and *"b) recognising the intrinsic character and beauty of the countryside"* (paragraph 187)
Overarching NPS for Energy (EN-1) 2024 (Ref 36)	Section 4.6 of NPS EN-1 sets out polices with respect to environment and Biodiversity Net Gain. It requires applicants to submit a statement with applications for development consent, demonstrating how opportunities for delivering wider environmental net gains have been considered, and where appropriate, incorporated into proposals as part of good design of the project. Section 4.7 of NPS EN-1 notes the need for careful siting and criteria for good design which takes account of potential impacts on landscape and visual amenity in order to minimise negative effects and recognising opportunities for enhancement. NPS EN-1 section 5.10 recognises that virtually all nationally significant energy infrastructure projects will have adverse effects on the landscape. It sets out the requirements for applicants to carry out a landscape and visual impact assessment, including cumulative effects in accordance with relevant guidance. Content should include effects on landscape character, landscape components and visibility during construction and operation.
NPS for Renewable Energy Infrastructure (EN-3) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed. Paragraph 2.5.2 states that proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-existence/co-location with other marine and terrestrial uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage. Paragraph 2.7.38 states that an assessment of the landscape and visual effects of the proposed infrastructure should be undertaken in accordance with the guidance set out in 5.10 of EN-1.
Stockton-on-Tees Borough Council – Local Plan 2019	Policy SD5 requires that that development proposals are responsive to the landscape, mitigating their visual impact where necessary. Developments will not be permitted where they would lead to unacceptable impacts on the character and distinctiveness of the Borough's landscape unless the benefits of the development clearly outweigh any harm. Wherever possible, developments should include measures to enhance, restore and create special features of the landscape.

Policy/Legislation/Guidance	Description
Stockton-on-Tees Borough Council – Local Plan 2019	Policy SD5 requires that that development proposals are responsive to the landscape, mitigating their visual impact where necessary. Developments will not be permitted where they would lead to unacceptable impacts on the character and distinctiveness of the Borough's landscape unless the benefits of the development clearly outweigh any harm. Wherever possible, developments should include measures to enhance, restore and create special features of the landscape.
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Stockton-on-Tees Borough Council – Local Plan 2019	Policy SD5 requires that that development proposals are responsive to the landscape, mitigating their visual impact where necessary. Developments will not be permitted where they would lead to unacceptable impacts on the character and distinctiveness of the Borough's landscape unless the benefits of the development clearly outweigh any harm. Wherever possible, developments should include measures to enhance, restore and create special features of the landscape.
Redcar and Cleveland Borough Council - Local Plan 2018 (Ref 33)	Policy N 1- Landscape states that: Development proposals will be considered within the context of the Landscape Character Assessment, the Landscape Character Supplementary Planning Document and the Historic Landscape Characterisation. Developments will not be permitted where they would lead to the loss of features important to the character of the landscape, its quality and distinctiveness, unless the benefits of development clearly outweigh landscape considerations. In

Policy/Legislation/Guidance	Description
	such cases appropriate mitigation will be required. Protection will be commensurate to the status of the landscape within the hierarchy.
Tees Valley Green Infrastructure Strategy 2008 (Ref 186)	Sets out a vision for a strategic network of Green Infrastructure for the Tees Valley
Biodiversity Net Gain (Ref 187)	A strategy to develop land and contribute to the recovery of nature, to ensure habitat for wildlife is in a better state than it was before development.
Legislation	
European Landscape Convention (ELC) 2000 (Ref 188)	Paragraph 2.1 of Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3) states that: "The UK has signed and ratified the European Landscape Convention (ELC) since 2002, when the last edition of this guidance was published. The recognition that government has thus given to landscape matters raises the profile of this important area and emphasises the role that landscape can play as an integrating framework for many areas of policy. The ELC is designed to achieve improved approaches to the planning, management and protection of landscapes throughout Europe and to put people at the heart of this process." European Union treaty signed by the UK to include planning, protection and management of landscape within policy. The ELC defines landscape as: "…an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors."
Town and Country Planning Act 1990 (Ref 402)	Sets out the legislative planning framework for the Proposed Development.
Countryside and Rights of Way Act 2000 (Ref 96)	Sets out the legislative framework relating to access to the countryside including recreational routes.
Planning Act 2008 (Ref 2)	Sets out the legislative planning framework relating to development consent orders for nationally significant infrastructure projects.
Guidance	
Guideline for Landscape and Visual Impact Assessment, Third Edition (GLVIA 3) 2013 (Ref 189)	Sets out the guidelines for undertaking a landscape/townscape/seascape and visual impact assessment.
An approach to Landscape Character Assessment 2014 (Ref 190)	Informs the methodology for defining and describing the landscape character baseline.
Visual Representation of Development Proposals: Landscape Institute Technical Guidance Note 06/19 (Ref 191)	Provides advice on how to capture and represent visual amenity through representative viewpoints as well as how the viewpoints should be presented and photomontages should be produced.

Policy/Legislation/Guidance	Description
Design Principles for National Infrastructure (2020), National Infrastructure Commission (Ref 414)	Informs the development of design principles.
Assessing landscape value outside national designations, Technical Guidance Note 02/21 (2021), Landscape Institute (Ref 415)	Informs the methodology for assessing the value attached to the landscape and whether a landscape can be considered "valued landscape" in the context of NPPF paragraph 187(a).
Infrastructure, Technical Guidance Note 04/20 (2020), Landscape Institute (Ref 416)	Background information for the planning and design process for infrastructure projects for landscape.
Planning Practice Guidance (PPG), Natural Environment (Landscape) (Ref 417)	Sets out the benefits of landscape character assessments and the importance of considering Green Infrastructure in the early stages of schemes.
Planning Practice Guidance, Renewable and Low-carbon Energy (Ref 418)	Sets out that planning has an important role in the delivery of new renewable and low-carbon energy infrastructure. The PPG identifies several LVIA considerations, including visual impact, mitigation through screening and glint and glare.

10.3 Consultation

10.3.1 Consultation with relevant stakeholders will be undertaken to inform the location of viewpoints and to invite feedback on the methodology, study area and proposed approach to photomontages. Consultees will include:

a. Stockton-on-Tees Borough Council;
b. Hartlepool Borough Council;
c. Redcar and Cleveland Borough Council; and
d. Middlesbrough Borough Council.

10.3.2 The scoping opinion will be based on advice received from statutory consultees and other relevant organisations. Comments received will be considered and addressed through the PEIR and ES, where relevant to LVIA.

10.4 Study Area

10.4.1 The study area for the LVIA is illustrated on **Figure 10.1**. The geographical extent of the study area proposed is sufficiently wide to enable the assessment of potentially significant landscape and visual effects, in accordance with GLVIA3.

10.4.2 The first stage of defining the study area was informed by detailed desk study, including the preparation of a computer-generated Zone of Theoretical Visibility (ZTV). A ZTV is defined in GLVIA3 as "a map, usually digitally produced, showing areas of land within which, a development is theoretically visible." ZTVs do not indicate how much of the Proposed Development will be visible. The purpose of the ZTV is to:

a. Identify the theoretical extents of visibility of the Proposed Development i.e., areas from which it would not be visible and areas from which it could potentially appear in existing views;
b. Assist in the identification of the study area;
c. Identify areas of landscape and visual receptors likely to be affected by the Proposed Development;
d. Identify locations that are representative of the views experienced by visual receptors at different locations within the study area (representative viewpoints); and
e. Inform the design, including the extent and type of proposed mitigation.

10.4.3 A ZTV has been modelled using the 'Viewshed' tool in ESRI ArcMap GIS Software.

10.4.4 A bare earth ZTV was prepared using digital terrain model (DTM) data with a minimum resolution of 2m. This ZTV represents a worst-case scenario as it does not include features such as existing buildings or vegetation which can screen or filter views. It does not include surface features and is based on the current maximum parameters of the tallest element of the Proposed Development, the emission stacks. The ZTV was based on an initial area of search extending to approximately 10km from the Main Site to establish sensitive receptors. The results are illustrated in **Figure 10.4 Zone of Theoretical Visibility**, which shows areas from which the Proposed Development is theoretically visible or not visible. For the ZTV an assumed viewing height of 1.7m above ground level has been used to simulate the eye level of a person at the top of the range set out in paragraph 6.11 of GLVIA3 to represent the worst-case scenario.

10.4.5 Initial fieldwork was then carried out on the 28th of March 2025 to verify findings from the desk study. This identified further existing features including landform, built development and vegetation which limit potential landscape and visual interactions with the Proposed Development.

10.4.6 The desk study and fieldwork carried out to date show that intervening landform and buildings generally limit the extent of views of the tall structures of the Proposed Development to within 10km of the Main Site. Beyond this distance, significant visual effects are not likely. Therefore, a 10km study area was considered to be appropriate for assessing the visual effects. The Proposed Development sits within the extensive industrial landscape along the Tees estuary. Due to the heavily industrialised nature of this landscape of which the development site is part of, significant effects on the character of the landscape are not expected beyond 2km from the site boundary. It is anticipated that beyond 2km the Proposed Development would be perceived as part of the wider industrial landscape along the Tees estuary. Therefore, a 2km study area was considered to be appropriate for assessing the landscape effects. This judgement is informed by an understanding of the wider landscape character and views and experience of working on projects with similar tall structures.

10.4.7 The LVIA study area may be further refined to focus the assessment or extended areas to include other sensitive receptors as the design of the Proposed Development progresses. Such changes will be made in consultation with Local Authorities and other

relevant stakeholders. The justification for its final extent will be set out in the PEIR and ES.

10.5 Baseline Conditions and Future Baseline

Baseline Conditions

10.5.1 To establish the baseline, a combination of desktop study and an initial walkover of the area surrounding the Site has been undertaken. This process has been further informed by a preliminary Zone of ZTV as shown in **Figure 10.4** based on the principal elements of the development confirmed using Rochdale Envelope principles.

Data Sources

10.5.2 Baseline information has been collated via the following documents and data which will form part of the baseline desk study:

a. MAGIC;
b. OS Mapping and Aerial Imagery;
c. LiDAR Digital Terrain Map – 1m resolution (Environment Agency)
d. Stockton-on-Tees Local Plan 2019 (Ref 55);
e. Stockton-on-Tees Landscape Character Assessment 2011 (Ref 192);
f. Middlesborough Council Landscape and Heritage Assessment 2016 (Ref 193);
g. Redcar & Cleveland Borough Council Landscape Character SPD 2010 (Ref 194);
h. Hartlepool Landscape Assessment 2000 (Ref 195);
i. National Landscape Character Area (NCA) 23 Tees Lowlands (Natural England, 2013) (Ref 196); and
j. Public rights of Way.

Surveys Undertaken and Proposed

10.5.3 The following surveys have been completed at the time of writing:

a. Initial Winter field work, including survey of potential viewpoint locations.

10.5.4 From the initial survey carried out on the 28th of March 2025 it is judged that the visibility of the site and the Proposed Development would not differ from the summer views when vegetation would be in full leaf cover. Therefore, photography from one season (either summer or winter) would be sufficient to understand the likely visibility of the Proposed Development. Photography from a second season has been scoped out of the LVIA.

10.5.5 Further fieldwork will be undertaken to inform the PEIR and ES. This will cover the summer season. Fixed-point photography will be captured for each viewpoint and measured surveys will be carried out for viewpoints where photomontages are proposed.

Existing Baseline

Site Context

10.5.6 The Proposed Development Site and surrounding area are heavily influenced by large industrial structures and complexes as well as the residential settlements outlined in **Section 3: The Proposed Development Site**. The industrial complexes within the Teesside industrial areas are heavily lit, which increases the areas visibility during the hours of darkness. The surrounding landscape contains localised tranquil areas including along the coast, River Tees and inland nature reserves, although the largescale structures are ever present within views. Heavy industry has developed due to the estuary's strategic location close to mineral reserves, a network of main roads, railways and Teesport. The existing industrial installations form a dramatic skyline when viewed from the surrounding hills.

Landscape Designations

10.5.7 There are no statutory landscape designations (i.e. National Parks or National Landscapes) within the site. The edge of the North York Moors National Park is approximately 10km south east of the site, with the popular tourist high point of Roseberry Topping situated approximately 12km from the Proposed Site. The landscape character as well as visual receptors at the North York Moors NP have been scoped out from the LVIA as the distance of the receptors and the intervening topography at Eston Moor reduce the visibility of the Proposed Development. Furthermore, any features of the Proposed Development would be seen within the industrial context of the Tees Valley and would be surrounded by other tall industrial structures including Hartlepool power station, tall chimneys and wind turbines along the coast. Therefore, no significant effect to the character of the North York Moors NP or views experienced from the NP is anticipated and is not scoped in as a receptor.

10.5.8 An area designated by RCBC as sensitive landscape lies to the north and east of the Site across the River Tees. The sensitive landscape area is separated from the Main Site by intervening industrial and urban development, including the Redcar Bulk Terminal which adjoins the sensitive landscape area to the south. No areas have been designated as sensitive landscapes by STBC.

Other Relevant Designations

10.5.9 Other relevant designations within the study area are listed in Table 10.2. Ecological, heritage and policy designations are included because of their contribution to landscape character and visual amenity, in particular their contribution to landscape value. Further detail regarding these designations is provided in **Chapter 7: Terrestrial Ecology and Chapter 11: Heritage**.

Table 10.2: Other Designations

Other Designations and Key Landscape Features within the Study Area
Cowpen Bewley Country Park
Teesmouth National Nature Reserve
Ecological designations (SSSI, SPA, SAC, NNR, LWS), Nature Reserves, Local Nature Reserves, such as Seaton Dunes and Common and Coatham Marsh Local Nature Reserve
Scheduled Monuments
Listed buildings
Conservation Areas such as, Cowpen Bewley Conservation Area
Semi-natural ancient woodland
Teesdale Way Long Distance Path
King Charles III England Coast Path Route
National Cycle Network Routes 1, 14 and 65

Landscape Character

10.5.10 GLVIA3 defines landscape receptors as "*aspects of the landscape resource that have the potential to be affected by a proposal"* (Landscape Institute and IEMA, 2013). Landscape receptors have been identified via a review of published landscape character assessments, maps and aerial photography, relevant planning policy and fieldwork surveys.

10.5.11 Landscape character is defined by GLVIA3 as "a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse."

10.5.12 Published landscape character assessments at the national, marine and local level have been reviewed to identify Landscape Character Types (LCT) and Landscape Character Areas (LCA). These are mapped in **Figure 10.3**.

10.5.13 The geographical extent of LCAs in published assessments at the national level are generally large and extend beyond the study area. As explained in paragraph 5.14 of GLVIA3, "*broad-scale assessments at national or regional level can be helpful in setting the landscape context but are unlikely to be helpful on their own as the basis for LVIA*". LCAs defined at the national scale will therefore be included to provide context but effects on these receptors will not be assessed.

10.5.14 The published LCAs that will be referred to in the LVIA are listed in Table 10.3.

Table 10.3: Published Landscape Character Assessments and Relevant Landscape Character Areas.

Landscape Character Assessment	Relevant Character Areas
National - Natural England National Character Area (NCA) profiles	NCA 15: Durham Magnesian Limestone Plateau
	NCA 23: Tees Lowlands
	NCA 25: North York Moors and Cleveland Hills
Marine - Marine Character Areas	MCA 22: Tyne, Tees and Wear Estuaries and Coastal Waters
Local - Hartlepool Landscape Assessment (2000) Landscape Character Type	Coastal
	Estuarine
	Rural Fringe
	Undulating Farmland
Local -Stockton and Tees Landscape Character Assessment (2011)	East Billingham to Teesmouth
	Thorpe and Billingham Beck Valley
Local -Redcar and Cleveland Landscape Character SPD (2010)	Eston Hills
	Guisborough Lowland
	Redcar Flats

Seascape Character Assessment for the North-east Inshore and Offshore Marine Plan Areas

10.5.15 At a regional level, the Proposed Development Site is located next MCA 22: Tyne, Tees and Wear Estuaries and Coastal Waters which is generally characterised by shelving coastal waters off the extensively developed coast, deepening to approximately 30-50m offshore and encompassing the estuaries and tidal rivers inland.

Local Landscape Character Areas

10.5.16 The review of published landscape character assessments identified gaps in existing information relating to urban areas and former industrial areas within the study area. Therefore, with reference to the published LCA's Local Landscape Character Areas (LLCA) will be defined during the PEIR and ES by the Applicant via desk study and fieldwork surveys to provide full coverage of the study area. The LVIA will assess the impacts on the landscape at the local scale to provide an understanding of the geographical extent of effects. Other LCAs defined at the national scale will be included to provide context but effects on these receptors will not be assessed. The baseline landscape character will be mapped and described in detail in the PEIR and ES.

Landscape Features

10.5.17 Key landscape features which contribute to the character and value attached to the landscape include existing field boundaries and other vegetation within the site, including hedgerows, trees and woodland, which may be directly affected by the Proposed Development. The LVIA will describe the patterns of landcover with reference to the habitat surveys included in the ES.

Views and Visual Amenity

10.5.18 A preliminary ZTV is shown in **Figure 10.4**. This has been prepared to inform this Scoping Report, based on the design information currently available. As certain features of the Proposed Development are unknown at this stage, such as the location of ancillary buildings and structures, these have not been included in the ZTV. Further ZTVs will be produced to support the PEIR and ES.

10.5.19 The preliminary ZTV gives an indication of the potential visibility of the proposed current maximum parameters of the Proposed Development. This indicates that the Proposed Development is likely to be most visible for much of the study area. The ZTV also indicates that views of the Proposed Development reduce in significance beyond 10km from the site, where landform, settlements and woodland increasingly limit views. There are several villages as well as isolated properties within the study area where there are potential views of the Proposed Development. There are also several footpaths traversing the landscape, including parts of two long distance routes.]

Visual Receptor Groups

10.5.20 Visual receptors are defined in GLVIA3 as “individuals and/or defined groups of people who have the potential to be affected by a proposal”. This includes, for example, residents, users of public rights of way and motorists.

10.5.21 Visual receptors likely to experience views of the Proposed Development have been identified through interrogation of the ZTV, desktop analysis of maps and Google Earth, and fieldwork surveys. Where a collection of visual receptors in the same category are likely to experience similar views, they have been grouped. These are set out in Table 10.4 below.

Table 10.4: Visual Receptors

Receptor Type	Receptor or Receptor Group
Residents	Residents of Hartlepool, Billingham, Middlesbrough, Redcar and Greatham
Recreational users	People travelling on the long distance paths within the study area and PRoW at locations across the study area who may be affected by views of the Proposed Development

Viewpoints

10.5.22 Representative viewpoints will be used to assist in describing the baseline view and the effects likely to be experienced by visual receptor groups. These viewpoints have been selected on the basis that they cover a range of viewing distances, elevations and orientations from locations with different viewing experiences of the Proposed Development. In some cases, a viewpoint may therefore be representative of more than one visual receptor group. These viewpoints are set out in Table 10.5 and are shown in **Figure 10.4**. The selection of representative viewpoints has been informed by the following criteria:

a. Accessibility to the public;
b. Number and sensitivity of people whose can be affected;
c. Viewing direction, distance, openness and elevation; and
d. Nature of the viewing experience.

Table 10.5: Proposed Viewpoints

No.	Viewpoint Location	Designations	Visual Receptors
1	**Hartlepool seafront**	King Charles III England Coast Path Route, edge of Conservation Area, Listed Buildings	residents of local communities, recreational
2	**Seaton Carew, Seaton Sands**	King Charles III England Coast Path Route, National Cycle Network Route 14, edge of Conservation Area, Listed Buildings, Open Space	residents of local communities, recreational
3	**North Gare Sands**	King Charles III England Coast Path Margin, Teesmouth National Nature Reserve Local Wildlife Site	recreational
4	**Seal Sands car park, hide**	King Charles III England Coast Path Route	recreational
5	**Cowpen Bewley Woodland Park**	Country Park	recreational
6	**Cowpen Bewley**	Conservation Area, PRoW	residents of local communities, recreational
7	**Saltholme RSBP**	RSPB	recreational
8	**Port Clarence**	Open Space	residents of local communities, recreational
9	**South Gare**	Sensitive Landscape Area, Teesdale Way, King Charles III England Coast Path Margin	recreational
10	**Eston Nab**	Sensitive Landscape Area CRoW open access Historic Landscape Eston Moor Local Nature Reserve Scheduled Ancient Monument Local Wildlife Site	recreational

Visual Representations

10.5.23 Photographs taken during fieldwork surveys will be provided in the ES to help demonstrate the nature of baseline views including the extent of existing screening. These photographs will be presented as Type 1 annotated photographs.

10.5.24 Type 4 photomontages will also be provided from a selection of viewpoints to illustrate the likely extent and nature of changes in baseline views . All photographs and photomontages will be prepared in accordance with Landscape Institute TGN 06/19 (Ref 183).

Future Baseline

10.5.25 The future baseline will include committed developments of a similar type and scale to the Proposed Development that will be delivered prior to commencement of construction. In the absence of the Proposed Development proceeding the existing baseline is likely to change due to development within the Tees valley. It is anticipated that new development will particularly relate to the evolution and repurposing of existing industrial facilities as new technologies are developed and utilised requiring the reconfiguration of buildings, structures and site layouts.

10.5.26 A full explanation of the criteria used to assess sensitivity, magnitude of impact and classification of landscape and visual effects will be outlined within the ES.

10.6 Design, Embedded Mitigation, and Enhancement Measures

10.6.1 The most effective mitigation for adverse landscape and visual effects is to avoid impacts at source as part of the design process, for example through the siting of infrastructure, use of cladding material etc. This will be considered as part of the early design process. However, given the industrial nature of the development, there will be limited opportunity to adapt the design of the main process areas within the Site due to the function of the elements within the plant. There will be no impacts on landscape features within the connection corridors and along the edge of the development. Overall, it is unlikely that potential significant adverse effects can be avoided, minimised, rectified or reduced due to the scale of the Proposed Development. However, the proposed design is expected to be in keeping with the existing industrial landscape in which the Site is located.

10.6.2 The design will be supported by an Outline Landscape and Ecological Management Plan. Beneficial effects will be maximised wherever practicable. Mitigation principles to avoid or minimise potential construction effects will focus on reducing the duration and footprint of construction activity.

10.6.3 As there will be limited opportunity for effective mitigation planting, operational effects will be assessed at year 1. Effects which persist at year 1 of operation will be considered residual effects.

Embedded Measures

10.6.4 Embedded measures are modifications to the design of a scheme, made during the pre-application phase, which are an inherent part of the design and do not require additional action to be taken.

10.6.5 The Proposed Development is currently evolving through design process. Embedded measures for the Proposed Development relevant to LVIA are likely to include:

a. existing buffers to landscape features within the site including vegetation and watercourses;
b. implementation of construction best practice;

Further Mitigation

10.6.6 Further mitigation are actions that require further site and project specific activity in order to achieve a reduction in effect, and/or anticipated outcome. Further mitigation for the LVIA will be defined through the PEIR/ES once the level of significance of effects is known. However, further mitigation is unlikely to be possible.

10.7 Description of Potential Likely Significant Effects

Construction Phase

10.7.1 Elements of the Proposed Development that may give rise to landscape and visual effects during the construction phase include:

a. Enabling works including Site vegetation clearance, ground works including demolition of any remaining existing above ground structures, remediation works (if required) and excavation of any voids or underground services;
b. Excavation and backfilling;
c. Construction activity including vehicular movements, compounds, storing of waste materials; and
d. The presence of tower cranes (of up to a maximum height of 150m) on the skyline during construction of taller elements, and the presence of aviation lighting.

10.7.2 Temporary construction compounds. The introduction of these elements may give rise to the following landscape and visual effects:

a. Temporary changes to local landscape character due to construction activities; and
b. Visual changes experienced by recreational receptors and residents of local communities (receptors).

Operation Phase

10.7.3 Elements of the Proposed Development which may give rise to landscape and visual effects during the operation phase include:

a. 24-hour operational activity introducing noise, movement and lighting within the Site;
b. Tall structures, including stacks up to a maximum height of around 150m;
c. Large scale industrial buildings and silos associated with the SAF production facility;
d. Associated development including administration buildings, kiosks and housing, boundary treatments, security infrastructure, temporary and permanent laydown areas, hard and soft landscaping, drainage, cables, pipelines, plant and equipment; and
e. Off-Site parking facilities.

10.7.4 The introduction of these elements may give rise to the following landscape and visual effects:

a. Changes to local landscape character due to the scale and massing of Proposed Development; and
b. Visual changes experienced by recreational receptors and residents of local communities (receptors) due to the scale and massing of Proposed Development and visible plume from stacks.

Decommissioning Phase

10.7.5 Landscape and visual impacts arising from decommissioning of the Proposed Development are considered to be no greater than those identified during the construction phase and are therefore assessed as construction effects as a reasonable worst-case scenario.

10.8 Elements Scoped In or Out of Further Assessment

10.8.1 The elements scoped in or out of the LVIA are presented in Table 10.6.

Table 10.6: Elements Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
National landscape character (NCA) receptors	Construction, Operation		X	NCAs are defined at national level and are broad in scale. They can be useful for setting the context of finer-scale landscape character assessments. NCAs typically cover such relatively large swathes of land that the scale of the Proposed Development is unlikely to make a discernible difference to the key characteristics. No significant construction, operation or decommissioning impacts on the NCAs are anticipated and are therefore scoped out of further assessment in the EIA.
Seascape Character Assessment for the North-east Inshore and			X	MCA 22: Tyne, Tees and Wear Estuaries and Coastal Waters provides a strategic overview of the character of the coastal waters adjacent to the Proposed Development Site. Given the small scale of the Proposed Development Site within the

Element	Phase	Scoped In	Scoped Out	Justification
Offshore marine plan areas				context of the extensively developed coast within this large seascape character area, no significant construction, operation or decommissioning impacts on MCA 22 are anticipated and are therefore scoped out of further assessment in the EIA.
Local landscape character area (LLCA) receptors	Construction, Operation	X		Review of published LCAs identified gaps within the study area. Therefore, Local Landscape Character Areas (LLCA) will be defined during the PEIR and ES via desk study and fieldwork surveys and with reference to existing published NCAs and LCAs to provide full coverage of the study area. The LVIA will assess the impacts on the landscape at the local scale based on LLCAs to provide an understanding of the extent of effects.
Site specific character	Construction, Operation		X	Due to the existing degraded aspect of the former industrial site sat within a wider existing and operational industrial area no significant construction, operation or decommissioning impacts on the site specific character are anticipated. Therefore the site specific character has been scoped out of further assessment in the EIA.
Visual amenity of residents in local communities such as neighbouring towns and villages (Hartlepool, Seaton Carew, Cowpen Bewley, Port Clarence)	Construction, Operation	X		Potential effects on residents of local communities from these locations are anticipated. Further assessment is needed to understand the scale of the impact.
Visual amenity of recreational receptors, such as receptors along the seafronts, Nature Reserves, along PRoWs, national trail, Country Park, RSBP and Open	Construction, Operation	X		Potential effects on recreational receptors from these locations are anticipated. Further assessment is needed to understand the scale of the impact.

Element	Phase	Scoped In	Scoped Out	Justification
Spaces				
Landscape character and visual receptors	Decommissioning		x	It is assumed that when the Proposed Development is no longer operational, all structures and equipment would be removed in a manner similar to the construction phase, requiring machinery and localised excavation. The proposed green infrastructure would remain. Therefore, the effects on landscape and visual receptors would be the same as and not greater than during the construction phase.
North York Moors National Park (NP)	Construction, Operation, Decommissioning		X	The landscape character as well as visual receptors at the North York Moors NP have been scoped out from the LVIA as the distance of the receptors and the intervening topography at Eston Moor reduce the visibility of the Proposed Development. Furthermore, any features of the Proposed Development would be seen within the industrial context of the Tees Valley and would be surrounded by other tall industrial structures including Hartlepool power station, tall chimneys and wind turbines along the coast. Therefore, no significant effects to the character of the North York Moors NP or views experienced from the NP are expected.
Trees (Arboriculture)	Construction	X		Scoped in on a precautionary basis in the absence of an arboricultural walkover survey, to confirm the presence or absence of significant trees. Scoping survey to be undertaken. Elements of the Proposed Development could result in impacts to trees at construction phase. Potential impacts include tree removal or adverse indirect impacts to retained trees in proximity to the Proposed Development. Subject to arboricultural surveys, standard mitigation measures can be incorporated into the Proposed Development to minimise arboricultural impacts i.e., principles of avoidance and implementation of a CEMP.

10.9 Proposed Assessment Methodology

10.9.1 The methodology for the LVIA involves the following stages:

a. Review published landscape character assessments, studies, relevant supporting evidence base documents, aerial photography and mapping, and undertake fieldwork to define the baseline and to define the extent of the study area within which there is potential for landscape and visual effects;
b. Define the landscape and visual receptors and describe the landscape and visual baseline;

c. Review the design to embed mitigation measures into the Proposed Development to avoid or minimise adverse landscape and visual effects and maximise opportunities for landscape integration and enhancement;
d. Determine the sensitivity of landscape and visual receptors, by considering the value attached to the landscape or views and susceptibility to change of the receptor;
e. Assess the magnitude of impact of the Proposed Development in relation to size or scale, geographical extent, duration and reversibility; and
f. Assess the significance of effect by considering the relationship between the sensitivity of the receptor and the magnitude of impact and determine which effects are significant.

Assessment Scenarios

10.9.2 The assessment of landscape and visual effects of the Proposed Development will be undertaken for the following scenarios:

a. The peak of construction activity resulting in temporary changes to landscape character and visual amenity from sensitive receptors in the vicinity of the Proposed Development Site; and
b. Operational phase resulting in permanent changes to landscape character and visual amenity from sensitive receptors in the vicinity of the Proposed Development Site.

Assessment of Landscape Effects

10.9.3 The assessment of landscape effects will address the effects of the Proposed Development on the landscape as a resource in its own right. Judging landscape effects requires consideration of the sensitivity of the receptor magnitude of impact.

Sensitivity of Landscape Receptors

10.9.4 Paragraph 5.39 of GLVIA3 states that “landscape receptors need to be assessed firstly in terms of their sensitivity, combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape”.

10.9.5 Judging landscape sensitivity will thus be a two-part process of:

a. Value attached to the landscape – relates to the existing landscape and this will be determined at the baseline stage in line with paragraph 5.19 of GLVIA3, which states that “as part of the baseline description the value of the potentially affected landscape should be established”; and
b. Susceptibility to change – which is considered in relation to the Proposed Development.

Value Attached to the Landscape

10.9.6 Landscape Institute Technical Guidance Note (TGN) 02/21: Assessing landscape value outside national designations (Landscape Institute, 2021) defines landscape value as "*the relative value or importance attached to different landscapes by society on account of their landscape qualities*".

10.9.7 For assessing landscape value outside national designations, TGN 02/21 is now the primary source of guidance. The approach to assessing the value attached to the landscape will follow a three-stage process:

a. Stage 1: identify if the landscape is covered by any landscape designations;
b. Stage 2: consider each of the factors listed in Table 10.7, which have been developed with reference to Table 1 of TGN 02/21 and are pertinent and most important to understanding its value; and
c. Stage 3: make an assessment the value attached to the landscape and assign value based on a five-point scale, clearly articulating the reasons for these judgements.

10.9.8 An overall conclusion will be drawn on the value attached to the landscape for each landscape receptor considering the overall weight of evidence.

Table 10.7: Establishing the Value Attached to the Landscape

Stage 1 – Landscape Designations	Stage 2 - Define Landscape Value Factors with Reference to TGN 02/21	Criteria	Typical Description
Landscape with statutory status or national policy protection: National Park, National Landscape, or World Heritage Site. **Local landscape designation, such as Special Landscape Area or Area of Great Landscape Value, supported by policy and a detailed evidence base.**	Natural heritage - Landscape with clear evidence of ecological, geological, geomorphological or physiographic interest which contribute positively to the landscape. Cultural heritage - Landscape with clear evidence of archaeological, historical or cultural interest which contribute positively to the landscape. Landscape condition - Landscape which is in a good physical state both with regard to individual elements and overall landscape structure. Associations - Landscape which is connected with notable people, events and the arts. Distinctiveness - Landscape	Very high	A designated landscape with statutory status (National Park or AONB). Valued landscape in the context of NPPF paragraph 180 (a)
		High	A locally designated landscape supported by a detailed evidence base or with other strong indicators of value, which may include other relevant designations such as ancient woodland or conservation areas, with identified quality in the development plan or evidence base. May be considered valued landscape in the context of NPPF paragraph 180(a) with strong supporting evidence.
		Medium	Unlikely to be a designated for landscape quality but may exhibit some indicators of value which are identified in the development plan or evidence base and are important at the community level.

Stage 1 – Landscape Designations	Stage 2 - Define Landscape Value Factors with Reference to TGN 02/21	Criteria	Typical Description
No relevant designations.	that has a strong sense of identity. Recreational - Landscape offering recreational opportunities where experience of landscape is important. Perceptual (Scenic) - Landscape that appeals to the senses, primarily the visual sense. Perceptual (wildness and tranquillity) - Landscape with a strong perceptual value notably wildness, tranquillity and/or dark skies Functional - Landscape which performs a clearly identifiable and valuable function, particularly in the healthy functioning of the landscape.	Low	Not designated for landscape quality and likely to exhibit few indicators of value which are identified in the development plan or evidence base.
		Very low	A landscape dominated by industry or infrastructure or which is damaged or degraded landscape, not designated for landscape quality and not likely to exhibit indicators of value which are identified in the development plan or evidence base.

Valued Landscape

10.9.9 The principle of “valued landscape” in England is supported by the NPPF 2023 (Chapter 15). Paragraph 180 requires that planning policies and decisions should contribute to and enhance the natural and local environment by, inter alia, (a) “protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan)”.

10.9.10 According to paragraph A4.2.11 of TGN 02/21, a ‘valued landscape’ is an area identified as having sufficient landscape qualities to elevate it above other more everyday landscapes. There is therefore a high bar for an area to be considered valued landscape in the context of the NPPF.

10.9.11 Paragraph A4.2.5 of TGN 02/21 states that, “where a landscape has a statutory status, such as a National Park or AONB, it is self-evident that it is a valued landscape”. Therefore, where such landscapes are present within the study area, these will be attributed very high value and are recognised as valued landscapes in the context of the NPPF.

10.9.12 A different approach will be taken to determine whether landscapes outside of nationally designated landscapes can be considered valued landscape in the context of the NPPF. Paragraph A4.2.6 of TGN 02/21 states that the interpretation of ‘identified quality in the development plan’ is not clear and that there are two fundamentally different

interpretations that have been adopted by inspectors, which are considered below in more detail:

a. It means non-statutory, locally designated landscapes;
b. It means any landscape where there is evidence to justify the identification of a 'valued landscape'. Local designation alone may not be sufficient evidence.

10.9.13 For a landscape without statutory status to be considered valued landscape in the context of the NPPF it must be supported by strong evidence. The assessment will therefore consider each of the criteria set out in Table 10.7, references in Local Plan policy and evidence base, including whether there are existing local landscape designations in forming an overall judgement on value. Landscapes with high value may also be considered valued landscapes in the context of the NPPF.

Susceptibility of Landscape Receptors to Change

10.9.14 GLVIA3 paragraph 5.40 defines the susceptibility to change of landscape receptors as:

10.9.15 "the ability of the landscape receptor (whether it be overall character or condition of a particular landscape type or area, or an individual element and/or features, or a particular aesthetic and perceptual aspect) to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies" (paragraph 5.40).

10.9.16 The features and characteristics which are more or less susceptible to the type of changes proposed will be set out for each LCA. The narrative will provide a clear explanation based upon analysis of the landscape receptor and the extent to which it is able to accommodate the type of change arising from the specific proposal.

10.9.17 Table 10.8 sets out examples of characteristics and features of landscapes which may indicate higher and lower susceptibility in respect of the proposed Development.

Table 10.8 Considerations for Landscape Susceptibility

Landscape Features or Characteristics	Indicators of Higher Landscape Susceptibility	Indicators of Lower Landscape Susceptibility
Field pattern, scale and enclosure	Small scale fields. Complex or irregular field pattern. Ancient field patterns. Field boundaries formed by low fences or walls or hedges with few hedgerow trees.	Large scale fields. Simple, regular or rectilinear field pattern. Uniform field pattern. High field boundaries.
Landform	Steep topography. Exposed hillsides. Irregular or complex landform. Narrow valleys and ridges. Distinctive landform features.	Flat landscapes. Expansive lowland landscapes. Uniform landform. Landscapes with no or minimal distinctive landform features.
Land cover	Pastures, particularly where grazing forms key characteristic of the landscape. Significant woodland cover. Parkland or designed landscapes. Natural or semi-natural land cover, particularly where conservation or restoration is a priority.	Large-scale arable land, particularly monoculture or with evidence of intensive farming practices.
Tranquillity/ human influences	Absence of human influences / natural landscapes. Infrequent built form. Overarching rural character. Remote, tranquil, spiritual or peaceful landscape. Sense of wilderness.	Major infrastructure (transport, utilities, industry). Large concentrations of residential, commercial, industrial development. Character affected by urban development. Noisy, settled landscapes. Modern and developed landscapes with signs of human activity.
Condition / intactness	Intact landscapes with natural or historic features in good condition.	Degraded landscapes (likely to have evidence of human influences / modern intensive farming practices). Degraded / intermittent boundary treatments.
Historic features and cultural heritage	Ancient / historic field patterns. Important, distinctive or remnant features of the landscape. Cultural associations with a particular landscape.	Modern / developed landscape with limited historic features.
Scenic quality and character	High scenic quality. Strong sense of place.	Low scenic quality. Weak sense of place.
Intervisibility	Open landscapes with exposed or far-reaching views. Sparse woodland and vegetative cover. Field systems defined by fences or managed low boundaries. Strong intervisibility with sensitive landscapes.	Confined or enclosed landscape with few inward or outward views. Limited invisibility with sensitive landscapes, key views, or landmarks. Intact, overgrown or tall vegetated boundaries with high proportion of hedgerow trees. High proportion of woodland blocks,

Landscape Features or Characteristics	Indicators of Higher Landscape Susceptibility	Indicators of Lower Landscape Susceptibility
		copses, connected woodlands and belts.

10.9.18 The susceptibility to change for each landscape receptor will be categorised with reference to the criteria in Table 10.9 below.

Table 10.9 Landscape Susceptibility Criteria

Landscape Susceptibility	Typical Description
Very high	The type of change arising from the specific proposal are very likely to lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
SZA	The type of change arising from the specific proposal are likely to lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Medium	The type of change arising from the specific proposal may lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Low	The type of change arising from the specific proposal are unlikely to lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Very low	The type of change arising from the specific proposal are very unlikely to lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.

Combining Judgements to Define Landscape Sensitivity

10.9.19 The sensitivity of each LCA has been defined by combining professional judgements on the value attached to the landscape and its susceptibility to change and is supported by a clear narrative. Reference has been made to the criteria set out in Table 10.10 below.

Table 10.10: Sensitivity of Landscape Receptors Criteria

Sensitivity	Typical Description
Very high	Landscapes with statutory status or national policy protection with very limited ability to accommodate the type of change without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
High	Landscapes which may be locally designated or otherwise supported by a detailed evidence base or landscape with other strong indicators of value with limited ability to accommodate the type of change without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Medium	Landscapes which are unlikely to be a designated for landscape quality but may exhibit some indicators of value and which may have some ability to accommodate the type of change without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Low	Not designated for landscape quality and likely to exhibit few indicators of value and likely to accommodate the type of change no or limited undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Very low	Landscapes of very low value able to accommodate the type of change without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.

Magnitude of Landscape Impacts

10.9.20 Paragraph 3.28 of GLVIA3 notes that the magnitude is informed by combining considerations relating to the "scale, extent and duration" of impacts. This includes the geographical extent of influence, the spatial extent of the impact, the level of integration of new features with existing elements, its duration and degree to which the impact is reversible.

10.9.21 In summarising the magnitude of landscape impacts, reference will be made to the following:

a. size or scale - the degree to which key characteristics or features identified in the baseline would change Judgements on size or scale of change depend on the extent of existing landscape elements that would be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape. It is also influenced by the degree to which aesthetic or perceptual aspects of the landscape are altered through removal or addition of components such as stacks, tall buildings, roads/railway, utility corridors, paths and vegetation; and whether the effect changes the key characteristics of the landscape which are critical to its distinctive character;
b. geographical extent – the area over which the change would occur. Foror example, whether the effects of the Proposed Development are perceived over a large or very localised area.;
c. duration – the time over which the change would occur, set out on the following scale: short term (0-5 years), medium term (5-15 years), or long term (over 15 years); and

d. reversibility - related to whether the change can be reversed and is reported as reversible, partially reversible or permanent, e.g. effects arising from presence of construction traffic will cease at the end of construction and therefore is considered to be reversible, whereas effects arising from presence of new built development could be partially reversible or permanent.

10.9.22 The criteria set out in Table 10.11 will be referred to in determining the magnitude of landscape impacts.

Table 10.11: Magnitude of Landscape Impacts Criteria

Magnitude of Impact	Typical Description
Very high	Substantial changes to key characteristics across most of the area or to unique and distinctive features at a local level. May be longer term impacts and are more likely to be permanent than reversible.
High	Changes to the character of the landscape across large parts of the area or to distinctive features at a local level. May be longer term impacts, permanent or reversible.
Medium	Changes to the character of the landscape across parts of the area or to some existing features at a local level. May be medium term impacts, permanent or reversible.
Low	Slight change to landscape character or landscape features across a small area. May be short to medium term impacts and are more likely to be reversible than permanent.
Very low	Barely perceptible change to the landscape receptor or may impact a limited area or no key characteristics. May be short term impacts, permanent or reversible.

10.9.23 There may be cases where there will be no impacts on a receptor, for example where the design has been changed to avoid such impacts. In such cases this will be recorded as no change.

Assessment of Visual Effects

10.9.24 The assessment of visual effects considers the effects of the Proposed Development on the views available to people and their visual amenity. Judging visual effects requires consideration of the sensitivity of the receptor and the magnitude of the impact. The criteria against which judgements are made are provided below.

Sensitivity of Visual Receptors

10.9.25 Paragraph 6.31 of GLVIA3 states that “each visual receptor, meaning the particular person or group of people likely to be affected at a specific viewpoint, should be assessed in terms of both their susceptibility to change in views and visual amenity and also the value attached to particular views.” The sensitivity of visual receptors results from a combination of parameters, such as:

a. The activity/occupation/ pastime of the receptors at particular locations;
b. The extent to which their attention or interest may be focused on the views; and
c. The visual amenity they experience.

10.9.26 Consideration will also be given to the:

a. Location, focus and orientation;
b. Features or characteristics of value within the view;
c. Principal or secondary interests;
d. Static or kinetic nature of views;
e. Duration of the view.
f. Value attached to views

10.9.27 A three-stage process will be used to determine the value attached to views. This relates to the features and characteristics of the baseline landscape within the view and other indicators of value, for example reference in policy, guidebooks, literature or art:

a. Stage 1: identify if the view or the landscape within the view is covered by any relevant policy or designations and note features and characteristics of value with reference to the landscape baseline;
b. Stage 2: identify if the view is identified on maps, is likely to be from a popular visitor location or has historical or cultural importance or associations; and
c. Stage 3: Determine the value attached to the view with reference to the criteria provided in using the evidence from stages 1 and 2.

Table 10.12: Value Attached to Views Criteria

Value	Typical Description
Very high	Views within or across a nationally or internationally designated landscapes and/or specific views designated in national or regional policy. Views are likely to have few or no detracting features and which may also have strong cultural associations supported by evidence, which could include links to historical events or people, representation in art or literature, for example.
High	Views within or across regionally or locally designated landscapes, other or landscapes with strong indicators of value, or views identified in the development plan or evidence base. Views are likely to have few or no detracting features and may also have some cultural associations supported by strong evidence.
Medium	Views across landscapes which are unlikely to be designated but may exhibit some indicators of value which are identified in the development plan or evidence base and are important at the community level. Views may have some detracting features and cultural associations supported by evidence.
Low	Views across landscapes which are not designated for landscape quality and likely to exhibit few indicators of value which are identified in the development plan or evidence base. Views are likely to have some detracting features and lack cultural associations supported by evidence.
Very low	View across landscapes which are neither designated, nor identified in the development plan or evidence base, and without cultural associations. The landscape in the view is in poor condition or notably detracts from the experience of the view.

Susceptibility of Visual Receptors to Change

10.9.28 The sensitivity of visual receptors is also dependent upon their susceptibility to changes in views and the visual amenity they experience.

10.9.29 Paragraph 6.32 of GLVIA3 explains that "the susceptibility of different visual receptors to changes in views and visual amenity is mainly a function of:

a. The occupation or activity of people experiencing the view at particular locations; and
b. The extent to which their attention or interest may therefore be focussed on the views and the visual amenity they experience at particular locations."

10.9.30 GLVIA3 notes that visual receptors "most susceptible to change", include residents and visitors engaged in outdoor recreation "whose attention or interest is likely to be focused on the landscape and on particular views" (para 6.33).

10.9.31 Table 10.13 sets out the criteria referred to in determining the susceptibility of visual receptors to the Proposed Development.

Table 10.13: Susceptibility of Visual Receptors Criteria

Susceptibility	Typical Description
Very high	Visitors to nationally or internationally designated landscapes, particularly at specific viewpoints or viewing places, where views of the landscape are fundamental to the experience. People engaged in specific activities for enjoyment of dark skies.
High	Residents at home. Visitors to tourist hotspots, heritage assets or other attractions outside of nationally or internationally designated landscapes, particularly at specific viewpoints or viewing places, where views of the landscape are important to the experience. People engaged in outdoor recreation whose attention or interest is likely to be focussed on the landscape and on particular views, for example those using promoted walking and cycling routes. People travelling along promoted scenic routes.
Medium	People engaged in outdoor recreation or travelling along public rights of way or local roads, which are not promoted routes but where an appreciation of the surrounding landscape are relevant to the experience. People working outdoors.
Low	People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape People travelling on major road, rail or other transport routes which are not recognised as scenic routes.
Very low	People working indoors.

Summarising the Sensitivity of Visual Receptors

10.9.32 The sensitivity of visual receptors is based on professional judgement and will be informed by the criteria in Table 10.14, considering the value attached to views and susceptibility of visual receptors to the changes proposed.

Table 10.14: Sensitivity of Visual Receptors Criteria

Criteria	Typical Description
Very high	Activity where views are fundamental to the experience and are related to landscapes with national or international designation and with few or no detracting features and which may also have strong cultural associations supported by evidence.
High	Activity resulting in a particular interest or appreciation of the view and/or views within or across regionally or locally designated landscapes, other or landscapes with strong indicators of value, or views identified in the development plan or evidence base with few or no detracting features and may also have some cultural associations supported by strong evidence.
Medium	Activity resulting in a general interest or appreciation of the and/or a view, likely to exhibit some indicators of value which are identified in the development plan or evidence base and are important at the community level.
Low	Activity where interest or appreciation of the view is secondary to the activity or the period of exposure to the view is limited, and/or views across landscapes which are not designated for landscape quality and likely to exhibit few indicators of value and likely to have some detracting features and lack cultural associations supported by evidence.
Very low	Activity where interest or appreciation of the view is inconsequential to their activity, and/or across landscapes which are neither designated, nor recognised in policy, and without cultural associations or is in poor condition or notably detracts from the experience of the view.

Magnitude of Visual Impacts

10.9.33 The magnitude of visual impacts relates to the extent to which the baseline view would change as a result of the Proposed Development. This assessment has been made with reference to fieldwork observations, photographs and photomontages where relevant from the representative viewpoints identified.

10.9.34 Paragraph 3.28 of GLVIA3 notes that magnitude is informed by combining considerations relating to the “scale, extent and duration” of impacts. This includes the geographical extent of influence, the spatial extent of the impact, the level of integration of new features with existing elements, its duration and degree to which the impact is reversible.

10.9.35 Reference will be made to the following in summarising the magnitude of visual impacts:

a. Size and scale – loss of existing features or addition and integration of new features and the time over which it will be experienced and whether views will be full, partial or glimpsed.
b. Geographical extent – the angle of view in relation to the main activity of the receptor, the distance of the viewpoint from the Proposed Development and the extent of the area over which the changes would be visible.
c. Duration and reversibility – the time over which the change would occur, set out on the following scale: short term (0-5 years), medium term (5-15 years), or long term (over 15 years).

Combining Judgements to Define Magnitude of Visual Impact

10.9.36 The magnitude of visual impact is defined by combining judgements on size or scale, geographical extent, duration and reversibility, with reference to Table 10.15, based on guidance from GLVIA3.

Table 10.15: Magnitude of Visual Impacts Criteria

Magnitude of Impact	Typical Description
Very high	The Proposed Development will result in extensive changes to the character and composition and will become the dominant feature of the landscape within the view. There may be longer term impacts, permanent or reversible.
High	The Proposed Development will change the character and composition of large parts of the landscape within the view. There may be longer term impacts, permanent or reversible.
Medium	The Proposed Development will change the character and composition of discrete parts of the landscape within the view. There may be medium term impacts, permanent or reversible.
Low	The Proposed Development will cause small changes to the character and composition of the landscape within the view. There may be short to medium term impacts, permanent or reversible.
Very low	The development will cause barely perceptible changes in the character and composition of the landscape within view. May be short term impacts, permanent or reversible.

10.9.37 There may be cases where there will be no impacts on a receptor, for example where the design has been changed to avoid such impacts. In such cases this will be recorded as no change.

10.10 Significance of Landscape and Visual Effects

10.10.1 The approach to determining the significance of landscape effects and visual effects and whether these effects are considered significant in EIA terms will be the same.

10.10.2 Judgements on the sensitivity of each receptor and the magnitude of impact will be combined to establish the significance of effect and whether effects are considered significant in EIA terms. There are important distinctions between these two terms:

a. Significance of effect relates to the level recorded for any effect, with reference to the matrix set out in **Table 10.16** below.
b. Significant effects are those which are considered most important in the decision-making process. An effect in this LVIA is considered significant in EIA terms if it is of major or moderate significance. All other effects will be categorised as not significant.

10.10.3 Table 10.16 will be used to guide judgements on the relationship between the sensitivity of a visual receptor, the magnitude of impact and the resulting significance of effect.

Where conclusions differ from this guide, a reasoned explanation will be provided in the assessment text.

10.10.4

Table 10.16: Significance of Landscape and Visual Effects

		Magnitude of impact				
		Very large	**Large**	**Medium**	**Small**	**Very small**
Sensitivity	**Very high**	Major	Major	Major or Moderate	Moderate	Moderate or Minor
	High	Major	Major or Moderate	Moderate	Moderate or Minor	Minor
	Medium	Major or Moderate	Moderate	Moderate or Minor	Minor	Minor or Negligible
	Low	Moderate	Moderate or Minor	Minor	Minor or Negligible	Negligible
	Very low	Moderate or Minor	Minor	Minor or Negligible	Negligible	Negligible

10.10.5 The identification of potentially significant effects on landscape and visual receptors will rely on detailed analysis and the professional judgement of competent experts, and consultation with stakeholders. Table 10.17 defines what the significance of effect terms mean.

10.10.6 Whether effects are adverse, beneficial or neutral will be determined by considering the way in which the changes are likely to affect the baseline.

10.10.7 Adverse effects may occur where the Proposed Development introduces new elements or changes which are discordant or intrusive resulting in a deterioration to existing character or valued features of the landscape or of views and visual amenity.

10.10.8 Beneficial effects may occur where the Proposed Development enhances the character of the landscape or existing views.

10.10.9 Paragraphs 5.37 and 6.29 of GLVIA3 state that is possible for effects to be neutral in their consequences for landscape and for visual receptors. Where a judgement of neutral effects has been reached, reference will be made to the contribution of the Proposed Development to the baseline and acknowledging the positive and negative aspects which have been considered.

10.10.10 Where the assessment has concluded that there will be no impacts on a receptor, this will be reported as no effect. This may, for example, be a consequence of changes to the design which has avoided impacts on receptors identified at the scoping stage.

Table 10.17: Typical Descriptions of Landscape and Visual Effects

Significance of Effect	Landscape Effects	Visual Effects
Major beneficial	Effects that result in a considerable improvement of the existing landscape resource. Valued characteristic features would be restored or reintroduced as part of the development.	Effects that result in a substantial improvement in the existing view.
Moderate beneficial	Effects that result in a partial improvement of the existing landscape resource. Valued characteristic features would be largely restored or reintroduced.	Effects that result in a noticeable improvement in the existing view.
Minor beneficial	Effects that result in a slight improvement of the existing landscape resource. Characteristic features would be partially restored.	Effects that result in a limited improvement in the existing view.
Negligible beneficial	Effects that result in a very slight improvement to the existing landscape resource, not uncharacteristic within the receiving landscape.	Effects that result in a barely perceptible improvement in the existing view.
Neutral	Effects which are a balance between adverse and beneficial effects and are neutral in their consequences for the landscape.	Effects that are a balance between adverse and beneficial effects and are neutral in their consequences for the view of visual receptors.
Negligible adverse	Effects that result in a very slight deterioration to the existing landscape resource, not uncharacteristic within the receiving landscape.	Effects that result in a barely perceptible deterioration in the existing view.
Minor adverse	Effects that result in a slight deterioration of the existing landscape resource. Characteristic features would be partially lost.	Effects that result in a limited deterioration in the existing view.
Moderate adverse	Effects that result in a partial deterioration of the existing landscape resource. Valued characteristic features would be largely lost.	Effects that result in a noticeable deterioration in the existing view.
Major adverse	Effects that result in a considerable deterioration of the existing landscape resource. Valued characteristic features would be wholly lost.	Effects that result in a substantial deterioration in the existing view.

10.10.11 Residual effects are those which remain even with embedded or primary mitigation at construction and operation and which cannot be further mitigated by design or other measures in this time period.

10.11 Assumptions and Limitations

10.11.1 This section sets out the assumptions which have been made and the limitations which inform the scope of the LVIA.

10.11.2 All fieldwork will be undertaken from publicly accessible locations. Professional judgement will be used to assess residents' views, aided by aerial photography and fieldwork observations.

10.11.3 A residential amenity survey is not proposed because it is not anticipated that any individual residential properties will experience overbearing visual consequences as a result of the Proposed Development.

10.11.4 Visual receptors along waterways (River Tees/Tees Mouth) will be assessed via representative viewpoints along South Gare (viewpoint 9) and North Gare (viewpoint 3) as views are expected to be similar.

10.11.5 Agreement will be sought on viewpoints through consultation with relevant local planning authorities and verified views and photomontages will be prepared from a select number of the viewpoints proposed.

10.11.6 For the construction phase assessment, the assumptions are that construction activity will be undertaken across the whole site at the same time and during winter. This assumes that existing deciduous vegetation is not in leaf, thereby representing a worst-case assessment scenario.

10.11.7 It is acknowledged that there will be limited opportunity for effective mitigation planting to reduce the impact due to the scale of the Proposed Development.

10.11.8 For decommissioning, the assumptions are that the Proposed Development is no longer operational, and that all structures and equipment are being removed in a manner similar to the construction phase, requiring machinery and localised excavation. The proposed green infrastructure would remain. Therefore, the effects on landscape and visual receptors would be the same as and not greater than the construction phase.

10.11.9 There are uncertainties at this stage regarding the final layout, siting and heights of the structures associated with the development such as the stacks. The LVIA study area and landscape and visual receptors considered will be reviewed accordingly in relation to the heights of these features, informed by further ZTVs if necessary.

10.11.10 The assessment will be based on the maximum parameters of the Proposed Development, taking account of embedded mitigation and design principles, to represent a reasonable worst-case.

10.11.11 Impacts to visual amenity resulting from the introduction of lighting during construction, operation and decommissioning is unlikely to result in significant effects given the industrial context and existing high levels of lighting within the area. Therefore, night-time assessment has been scoped out.

11. Cultural Heritage

11.1 Introduction

11.1.1 This chapter considers the impacts of the Proposed Development on Cultural Heritage during construction and operation, and any potential significant effects. It sets out the proposed methodology for the Cultural Heritage assessment and identifies those impacts that can be scoped out of the assessment. Where necessary, further assessment would be presented in the ES, if required.

11.1.2 Statutory provision for the safeguarding of heritage assets has been made at a national and local level. Heritage assets comprise below and above ground archaeological remains, buildings, structures, monuments or heritage landscapes.

11.2 Policy, Legislation, and Guidance

11.2.1 The policy, legislation, and guidance relevant to the assessment of the Proposed Development is shown in Table 11.1.

Table 11.1: Cultural Heritage – Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Overarching National Policy Statement for Energy (Adopted) 2024 (EN-1) (Ref 36Ref 36)	Focuses on the potential of adverse impacts to the historic environment through the construction, operation and decommissioning of energy infrastructure.
National Policy Statement for Renewable Energy Infrastructure (EN-3) (Ref 318)	Focuses on the potential of adverse impacts to the historic environment through the construction, operation and decommissioning of renewable energy infrastructure.
National Policy Statement for Electricity Networks Infrastructure (Adopted) 2024 (EN-5) (Ref 320Ref 320)	Focuses on assessment and technology-specific information relating to the development of Electricity Networks Infrastructure
National Planning Policy Framework (NPPF) 2024 (Ref 38Ref 38)	Chapter 16: Conserving and enhancing the historic environment identifies national policy for the preservation and conservation of designated and non-designated heritage assets.
Stockton-on-Tees Borough Council – Local Plan 2019 **(Ref 55)**	Policy SD5 - Natural, Built and Historic Environment, 3 Conserve and enhance the historic environment through a variety of methods including: a. Celebrating, promoting and enabling access, where appropriate, to the historic environment. b. Ensuring monitoring of the historic environment is regularly undertaken. c. Intervening to enhance the historic environment especially where heritage assets are identified as being at risk. d. Supporting proposals which positively respond to and enhance heritage assets. e. Recognising the area's industrial heritage, including early

Policy / Legislation / Guidance	Description
	history, railway and engineering heritage and the area's World War II contribution
Redcar and Cleveland Borough Council - Local Plan 2018 (Ref 33Ref 33)	Policy HE 1 - Conservation Areas states: Character of Conservation Areas - *Development within or otherwise affecting the setting of a conservation area will only be permitted where it preserves or enhances the character or appearance of the conservation area.* Policy HE 2 - Heritage Assets states: Setting of a Designated Heritage Asset - *Any development affecting the setting of a designated heritage asset will only be permitted if the proposal preserves or enhances its significance as a designated heritage asset; protects its immediate setting including the space(s) around the building and the historically significant hard and soft landscaping, including trees, hedges, walls, fences and surfacing; and retains historic plot boundaries and layouts.* Other harm to a Designated Heritage Asset - *Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, it will only be permitted where that harm is outweighed by the public benefits of the proposal, including securing its optimum viable use.* Non-designated Heritage Assets - *Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments will be considered subject to the policies for designated heritage assets.* Policy HE 3 - Archaeological Sites and Monuments states: *Development that would adversely affect archaeological sites or monuments that are designated heritage assets, or their settings, or archaeological sites of equivalent significance will only be approved in the most exceptional circumstances and in accordance with this policy and other heritage policies in this plan.* *Development that may affect a known or possible archaeological site, whether designated or non-designated, will require the results of a desk-based assessment to be submitted as part of the planning application. An archaeological evaluation may also be required to identify the most appropriate course of action.*
Legislation	
Ancient Monuments and Archaeological Areas Act (1979) (Ref 412Ref 412)	Puts in place the measures to create schedules of ancient monuments and areas of archaeological importance and then sets out the legal requirements relating to them.
The Planning (Listed Buildings and Conservation Areas) Act 1990 (Ref 185Ref 185)	Sets out legal requirement for the control of development and alterations which affect listed buildings or conservation areas.

Policy / Legislation / Guidance	Description
Guidance	
Chartered Institute for Archaeologists (CIfA): code of conduct: professional ethics in archaeology (CIfA 2022) (Ref 312Ref 312)	Ensuring professional conduct in archaeology.
CIfA Standard and guidance for historic environment desk-based assessment (CIfA 2020a) (Ref 313Ref 313)	Guidance for producing desk-based assessment.
CIfA Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CIfA 2020b) Ref 314	Guidance for archaeological and built heritage consultancy work.
Good Practice Advice (GPA) 2 – Managing Significance in Decision-taking (2015) (Ref 315Ref 315)	Good Practice Advice which emphasises the requirement for having knowledge and understanding of the significance of heritage assets likely to be affected by development.
GPA 3 – The Setting of Heritage Assets (2017) (Ref 316Ref 316)	Good Practice Advice which provides advice on the setting of heritage assets.
Statements of Significance: Historic England Advice Note 12 (2019) (Ref 317Ref 317)	Guidance and advice in relation to assessing the significance of heritage assets. Sets out a staged approach to describing and analysing heritage significance to help curators to make decisions on the impact of proposals for change to heritage assets.
Planning Practice Guidance (2019) (Ref 203Ref 203)	Advice and guidance on enhancing and conserving the historic environment.

11.3 Study Area

11.3.1 To determine the historic environmental potential within the Site and in line with standard industry practice, the following Study Area has been applied:

a. within the Site, potential for physical impacts to heritage assessed were assessed.
b. a 1km radius Study Area around the Proposed Development site was assessed for effects arising from change within the setting of assets which may affect their heritage significance, and recorded heritage assets which may assist in understanding the archaeological potential of the Site.

11.3.2 This Study Area was considered to be sufficient based on professional judgement, due to the urban nature of the Site and the topographic conditions of the area.

11.3.3 As assessment progresses throughout the EIA process this Study Area will be refined based on increased understanding of the historic environment resource and consultation with RCBC.

11.3.4 A range of desk-based publicly accessible sources were consulted. This allows the assessment of the likely nature, extent, preservation, and significance of any known or previously unrecorded heritage assets that may be present within the Site. This method will also be applied for considering impacts to heritage asset significance through changes to setting. Where appropriate, reference will be made to key heritage assets beyond the Study Area.

11.3.5 Sources used within this assessment include:

a. Heritage Gateway;
b. National Heritage List for England (NHLE) data;
c. Historic OS maps on National Library of Scotland (NLS); and
d. Other Online sources.

11.4 Baseline Conditions and Future Baseline

11.4.1 A high-level appraisal of heritage assets has been undertaken to inform the scoping assessment using publicly available information. This is deemed sufficient to identify constraints and key assets which may need further consideration through design development. Further desk-based assessment historic environment and geoarchaeological assessment will be undertaken to inform the outline CEMP to be submitted as part of the EIA. The level of detail and methodology required for this assessment will be agreed in consultation with the local planning authority and Historic England.

11.4.2 There are no designated heritage assets within the Site.

11.4.3 There are no world heritage sites, scheduled monuments, listed buildings, registered parks and gardens, protected wreck, registered battlefields or conservation areas within 1km of the Proposed Development Site.

11.4.4 The closest designated heritage assets are a group of listed buildings at Cowpen Bewley approximately 1.5km west of the Proposed Development Site, which includes the Grade II* listed Ivy House and five Grade II listed buildings (Village Farmhouse, Little Neuk Farm Cottage, Nightingale's Farmhouse and Barn Adjoining, Hall's Farmhouse and Barn to west of Ivy House). There are also three Grade II listed buildings (Marsh Farmhouse and Farm Cottage, Garden Wall South of Marsh Farmhouse, and Barn and Stable Circa 10m north west of Marsh Farmhouse), located approximately 2.2km east of the Proposed Development Site in Warrenby to the west of Redcar. Cowpen Bewley, Greatham, and Coatham, Redcar are also conservation areas.

11.4.5 An additional designated heritage asset which is considered, although it is located approximately 2.5km south west of the Proposed Development Site, is the Grade II* listed Transporter Bridge (NHLE: 1139267), as it is visible across a large area meaning that its setting should be considered.

11.4.6 The underlying geology of the Proposed Development Site is comprised of mudstone and sandstone bedrock overlain by superficial tidal flat deposits. Seal Sands is reclaimed land and there is extensive made ground present.

11.4.7 There are a number of non-designated heritage assets within 1km of the Proposed Development Site, including prehistoric remains preserved within peat deposits. Historic OS mapping indicates that the Proposed Development Site lies on the Seal Sands area of tidal flats. The land across the site was created through land reclamation in the mid-20th century and then substantially developed for industrial use. All the remaining recorded non-designated heritage assets in the study area date to the post-medieval and 20th century periods, and includes structures relating to land reclamation, clay extraction and industrial development. There are also several defensive structures dating from the First and Second World War recorded in the wider North Tees area.

11.4.8 Due to the extent of previous development and the location of the site on reclaimed land, it is unlikely that there are any archaeological remains of interest in the deposits of made ground found across the site. Where there are undisturbed tidal flat deposits beneath the made ground, these could contain remains of paleoenvironmental or geoarchaeological interest, particularly within any areas of peat.

Future Baseline

11.4.9 The future baseline is not expected to change from the existing baseline described above. This is because buried heritage assets are a typically static resource, which have reached equilibrium with their environment and do not change (i.e. decay or grow) unless their environment changes as a result of human or natural intervention. The exception to this is organic remains which are preserved in anaerobic conditions in peat and waterlogged deposits. These may be affected by changing groundwater conditions as a result of climate change and/or dewatering resulting from construction.

11.4.10 For above ground heritage assets there may be some decay over time in the absence of the Proposed Development.

11.4.11 However, the setting of heritage assets may change if future development takes place. Future development could have an adverse or beneficial effect on setting and could result in the intervening presence of buildings and/or vegetation.

11.5 Sensitive Receptors

11.5.1 Sensitive receptors identified in the baseline discussed above consist of listed buildings and conservation areas, all located beyond 1km from the Proposed Development Site. There is also the potential for remains of geoarchaeological or paleoenvironmental

interest preserved in the tidal flat and peat deposits which survives beneath made ground.

11.6 Design, Embedded Mitigation, and Enhancement Measures

11.6.1 Any requirements for mitigation and/or protection measures of sensitive receptors will be defined in a CEMP. The CEMP will provide appropriate mitigation strategies with the aim to reduce or offset any significant adverse effects identified. Mitigation measures may include:

a. Monitoring of intrusive ground works by heritage specialists to identify any previously unrecorded heritage assets;
b. Excavation and/or recording of assets by appropriately qualified heritage specialists under pre-construction conditions or as construction integrated recording;
c. Physical protection measures and transit plans for vehicles or materials coming to and from Site via road or water to avoid or reduce the risk of strikes to listed structures; and
d. Hoardings or fencing to reduce or remove temporary visual change within the setting of assets during construction.

11.6.2 Therefore, there is no requirement for further design, mitigation and enhancement measures for non-designated assets or below ground archaeology beyond those defined in the CEMP as there will be no significant effects.

11.7 Description of Potential Likely Significant Effects

Construction Phase

11.7.1 Given the industrial nature of the existing landscape and the details of the Proposed Development, it is unlikely that there would be any impact resulting from change to the settings of heritage assets.

11.7.2 There will be no physical impact to known sensitive receptors anticipated and measures will be put in place through the CEMP to ensure that any previously unrecorded archaeological remains within deeply buried tidal flat and peat deposits are mitigated appropriately.

11.7.3 Therefore, there are no significant effects anticipated to Cultural Heritage during the construction phase of the Proposed Development.

Operation Phase

11.7.4 As set out in the construction phase section above, the existing industrial character of the area and the distance to designated heritage assets likely to have settings sensitive to change, means that it is unlikely that there would be any impacts resulting from the operation of the Proposed Development.

11.7.5 As there are no known heritage assets within the Site, there would be no operational impacts within the Site.

Table 11.2: Elements Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Buried heritage assets within the Site	Construction and Operation		X	It is anticipated that buried assets within the Site would be limited to remains of geoarchaeological or paleoenvironmental interest within tidal flat and peat deposits due to the historic development of the Site. The CEMP will include measures to mitigate any impacts. Therefore, these effects can be scoped out of the construction and operation phase as no significant effects are anticipated
Designated and non-designated heritage assets outside of the Site	Construction and Operation		X	No designated heritage assets are present within the 1km study area, with the nearest listed buildings and conservation areas located approximately 1.5km away. Due to the existing industrial character of the Site and surroundings, no significant effects are anticipated for both the construction and operation phases.

11.8 Proposed Assessment Methodology

11.8.1 It is proposed to scope Cultural Heritage out of the EIA. However, a further desk-based historic environment and geoarchaeological assessment will be undertaken to inform the CEMP. The level of detail and methodology required for this assessment will be agreed in consultation with the local planning authority and Historic England.

11.9 Limitations and Assumptions

11.9.1 Due to the works being at scoping stage, only publicly available sources and datasets have been consulted in order to provide an overview of designated and non-designated historic assets within the Site.

12. Greenhouse Gases

12.1 Introduction

12.1.1 This chapter outlines the proposed scope and methodology for assessing the effects of the Proposed Development on GHG emissions during its construction, operation, and decommissioning phases. The assessment has been informed by an overview of baseline environmental conditions and the key issues anticipated in relation to the Proposed Development.

12.1.2 The requirement to consider a project's impact on, and vulnerability to, Climate Change results from Schedule 4 of the EIA Regulations (Ref 9), which require: "A description of the likely significant effects of the development on the environment resulting from […] the impact of the project on climate (for example the nature and magnitude of GHG emissions) and the vulnerability of the project to climate change."

12.1.3 As such, this chapter focuses on assessing the Proposed Development's contribution to climate change via its GHG emissions. The assessment of the project's vulnerability to climate change is addressed separately in **Chapter 13: Climate Change Resilience**.

12.2 Policy, Legislation, and Guidance

12.2.1 The methodology for the GHG assessment has been developed in line with relevant legislation, policy, and industry guidance as well as the intended use of the plant for SAF and renewable naphtha production, as described in Table 12.1.

Table 12.1: Greenhouse Gas - Summary of Key Policy, Legislation (and Case Law) and Guidance

Policy	Description
Infrastructure Carbon Review, 2013 (Ref 300)	In 2013, the UK government published the Infrastructure Carbon Review (HM Government, 2013), aiming to *"release the value of lower carbon solutions and to make carbon reduction part of the DNA of infrastructure in the UK."* Major infrastructure owners, operators and developers across the communication, energy, transport, waste and water sectors were invited to endorse it, become signatories and make commitments under the Review. The Review provided increased emphasis on 'capital carbon' (GHG Emissions associated with raw materials, activities and transport for construction, repairs, replacement, refurbishment and de-construction of infrastructure) while acknowledging that 'operational carbon' (associated with energy consumption for the operation, use and maintenance of infrastructure) will continue to dominate overall emission to 2050 and beyond. The Infrastructure Carbon Review highlighted the importance of assessing GHG Emissions early in the lifecycle of an infrastructure scheme when there is the greatest carbon reduction potential. The assessment presented in this chapter provides an assessment of the Proposed Development early in its lifecycle. The Infrastructure Carbon Review also led to the publication of a Publicly Available Specification on infrastructure carbon management;

Policy	Description
	PAS2080:2016. An updated version of PAS2080 was released in 2023.
The Overarching National Policy Statement for Energy (EN-1) (Ref 36)	Part 3 of EN-1 'The need for new nationally significant energy infrastructure projects' defines and sets out the 'need' for nationally significant energy infrastructure and the ways in which impacts and mitigations will be assessed.
National Policy Statement for Renewable Energy (EN-3) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed. Sets out that the Biomass Strategy informs decisions on how biomass will be supported in the future, reviewing the amount of sustainable biomass available to the UK and how this resource could be best utilised across the economy to help achieve our net zero GHG emissions target, and wider environmental targets
The National Planning Policy Framework (NPPF)(Ref 38)	Explains that achieving sustainable development requires the planning system to pursue three interdependent overarching objectives in mutually supportive ways, so that opportunities can be taken to secure net gains across all objectives.. One of the three objectives is an environmental objective (with the other two being economic and social), which includes the objective of *"mitigating and adapting to climate change, including moving to a low-carbon economy"* (paragraph 8). Section 11, Paragraph 120 of the NPPF notes that planning policies and decisions should "recognise that some undeveloped land can perform many functions, such as…carbon storage or food production". Section 14, Paragraph 152 of the NPPF provides that "The planning system should support the transition to a low-carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in GHG emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low-carbon energy and associated infrastructure." Paragraph 154 provides that "New development should be planned for in ways that: … b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design." Paragraph 158 provides that "When determining planning applications for renewable and low-carbon development, local planning authorities should: a) not require applicants to demonstrate the overall need for renewable or low-carbon energy…; and b) approve the application if its impacts are (or can be made) acceptable." Whilst paragraph 5 of the NPPF confirms the framework does not contain specific policies for nationally significant infrastructure projects, it is identified that the policies contained in the NPPF may include other matters that are relevant. Accordingly, the Secretary of State may determine that the policies of the NPPF in relation to climate change, in addition to those contained in local planning policy, discussed below, are relevant to their determination of the DCO Application for the Proposed Development.
UK Net Zero Strategy, 2021 (Ref 25)	This strategy sets out policies and proposals for decarbonising all sectors of the UK economy to meet a net zero target by 2050. The strategy includes an ambition to deliver four carbon capture, usage and storage (CCUS) clusters, capturing 20-30MtCO_2/year across the economy, including 6MtCO_2/year of industrial emissions, per year by 2030. Teesside and the Humber, Merseyside

Policy	Description
	and North Wales are identified among potential carbon capture cluster locations.
Industrial Decarbonisation Strategy, 2021 (Ref 24)	This is the first strategy published by a major economy, which sets out how industry can be decarbonised in line with net zero, while remaining competitive and without pushing emissions abroad. It builds on the Ten Point Plan and sets out the Government's vision for a prosperous, low-carbon UK industrial sector by 2050, and aims to provide industry with the long-term certainty it needs to invest in decarbonisation. Chapter 4 'Adopting low-regret technologies and building infrastructure' states "To be on track to deliver net zero, we expect that the minimum, in all future scenarios, is 20TWh per year of fossil fuel use replaced with low-carbon alternatives in 2030". It goes onto state that "Current evidence strongly suggests that, given limited sustainable biomass supply, we may need to prioritise the use of biomass where it can be combined with carbon capture and storage (BECCS), resulting in negative emissions".
Jet Zero Strategy, 2022 (Ref 27)	The Strategy sets out the Government's vision for decarbonising aviation, focusing on the development of technologies in a way that maintains the benefits of air travel, especially post COVID 19, whilst maximising the opportunities that decarbonisation can bring for the UK. It includes a 5-year delivery plan, setting out how the Government will achieve net zero aviation by 2050.
Sustainable Aviation Fuel (SAF) Mandate (Ref 29)	The SAF Mandate is a UK Government policy initiative aimed at decarbonising the aviation sector by requiring a minimum proportion of jet fuel supplied in the UK to be derived from sustainable sources. The mandate will come into force in 2025, with a target of 10% SAF by 2030 and 22% by 2040. It sets strict sustainability and lifecycle GHG emissions criteria for eligible fuels, promoting the use of waste-derived and advanced biofuels. The SAF Mandate is a key mechanism for delivering the UK's Jet Zero Strategy and supports investment in domestic SAF production infrastructure, such as the Proposed Development.
Stockton-on-Tees Borough Council Local Plan 2019 (Ref 55)	Policy SD 5 states: 2 (h) Supporting proposals for renewable and low-carbon energy schemes including the generation and supply of decentralised energy.
Redcar and Cleveland Borough Council Local Plan 2018 (Ref 33)	Policy SD 4 - General Development Principle states: All development must be designed to a high standard. Development proposals will be expected to: • be sustainable in design and construction, incorporating best practice in resource management, energy efficiency and climate change adaptation. Policy SD 6 - Renewable and Low-carbon Energy states: • Renewable and low-carbon energy schemes will be supported and encouraged, and will be approved where their impact is, or can be made, acceptable.
Net Zero Strategy for Tees Valley (Ref 301)	Five local authorities (Darlington, Hartlepool, Middlesbrough, Stockton-on-Tees and Redcar & Cleveland) forms the regional Tees Valley Combined Authority. The Local Industrial Strategy sets an overarching ambition - "Tees Valley will

Policy	Description
	be a global leader in clean energy, low-carbon and hydrogen. The area will achieve a Net Zero carbon industrial cluster by 2040, providing good jobs with long-term prospects that local people can access."
Legislation and Case Law	
United Nations Framework Convention on Climate Change (Ref 302)	The UK is a member of the United Nations Framework Convention on Climate Change ('UNFCCC') which drives international action on climate change. The UK has pledged to reduce Emissions under the 'Paris Agreement' in 2015, as a part of a joint pledge by members of the EU. This provides an overarching commitment by the UK.
The Climate Change Act (2008), as amended 2019 (Ref 41)	The Climate Change Act (2008) established a legal requirement for an 80% reduction in the GHG Emissions of the UK economy by 2050 in comparison to the 1990 baseline. In addition, in June 2019 the UK Government updated this commitment to net zero Emissions by 2050.
R (Finch on behalf of the Weald Action Group & Others) v. Surrey County Council (& Others) July 2024 (Ref 448Ref 448)	Supreme Court judgement which requires applicants to assess Scope 3 (downstream) emissions in GHG assessments in addition to Scope 1 and 2 emissions. Although the Supreme Court's decision specifically addresses fossil fuel developments, its interpretation of the EIA Regulations has broader implications. The Court clarified that EIAs must, according to the Regulations, assess the "direct and indirect significant effects" of a project, including downstream (Scope 3) emissions, where a causal connection exists. This principle is not limited to fossil fuel projects and may apply to any development with foreseeable indirect emissions.
Guidance	
Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (Ref 303Ref 303)	EIA Guidance published by IEMA in 2022 will be followed. This provides a framework for the consideration of GHG emissions in the EIA process, in line with the 2014 European Union (EU) Directive. The guidance sets out how to: a. Identify the GHG emissions baseline in terms of GHG current and future emissions; b. Identify key contributing GHG sources and establish the scope and methodology of the assessment; c. Assess the impact of potential GHG emissions and evaluate their significance; and d. Consider mitigation in accordance with the hierarchy for managing project related GHG emissions (avoid, reduce, substitute, and compensate).
UK Government: Assessing effects of downstream scope 3 emissions on climate - June 2025 (Ref 449)	Department of Energy Security and Net Zero – Assessing effects of downstream scope 3 emissions on climate. June 2025 (DESNZ, 2025). Supplementary EIA guidance produced to provide guidance on the assessment of effects of downstream GHG emissions on climate from an offshore oil and gas projects following the Finch Case
The GHG Protocol (Ref 304)	The GHG Protocol provides overarching guidance on developing GHG inventories and reporting standards.
PAS2080: 2023 (Ref 306)	PAS2080 is a specification for carbon management in buildings and

Policy	Description
	infrastructure. It provides a framework for organisations to manage and reduce whole-life carbon emissions across the lifecycle of their projects. The main areas identified in PAS2080 are: • Whole-life carbon management emphasizes managing carbon emissions throughout the entire lifecycle of buildings and infrastructure, from planning to end-of-life; • Supply chain collaboration: encourages collaboration across the value chain involving all stakeholders in carbon reduction efforts; • Integrated decision-making: promotes integrated carbon management into decision-making processes to support sustainability goals; and • Decarbonisation principles: includes principles for setting targets, monitoring, and reporting on carbon emissions.

12.3 Study Area

12.3.1 The GHG assessment scoping study area is defined by the Proposed Development footprint and the Site Boundary, as shown in **Figure 1.2**. In line with best practice EIA Guidance published by IEMA, the study boundaries have been established to cover all lifecycle modules of the Proposed Development.

12.3.2 Unlike other environmental assessments, the GHG assessment is not limited to a defined geographic area. Instead, it considers all increases or decreases in emissions attributable to the Proposed Development, regardless of where those emissions occur. This includes:

a. **Construction emissions**, which originate not only within the Proposed Development footprint but also from off-site sources such as the manufacture and transport of construction materials. For example, GHG emissions associated with the production of concrete – including embodied carbon and energy used in manufacturing – may arise at considerable distances from the site.
b. **Operational emissions**, which include both increases and potential reductions in GHG emissions during the operation of the Proposed Development. These emissions may result from changes in energy demand, water consumption, and material use. Similar to construction emissions, some of these will occur beyond the physical boundary of the Proposed Scheme, such as electricity generation at power stations. The assessment also considers embodied emissions associated with operational materials, waste, and utilities.

12.4 Baseline Conditions and Future Baseline

Baseline

12.4.1 Baseline GHG emissions include those from existing structures and activities within the study area. These include emissions arising from existing land uses, the consumption of energy – such as fossil fuels and electricity purchased from the grid or other sources – and other emissions generated through industrial processes.

12.4.2 Current baseline, at year of submission, is not relevant to the assessment of GHG emissions across the lifecycle of the Proposed Development. Instead, the future baseline is the reference point against which the GHG impact of the Proposed Development can be compared and assessed.

Future Baseline

12.4.3 The future baseline considers the likely evolution of the baseline without the implementation of the Proposed Development. The future baseline, for the GHG Emissions assessment, is defined by the GHG emissions that are expected to arise from the study area in the absence of the Proposed Development, over the period equivalent to the construction, operational and decommissioning phases of the Proposed Development (i.e. the temporal boundary of the assessment).

12.4.4 The future baseline for the GHG Emissions assessment assumes that the study area would continue to operate in its existing configuration for the duration of the temporal boundary of the assessment (i.e. construction, operational and decommissioning phases).

12.5 Sensitive Receptors

12.5.1 For the GHG assessment, emissions are not geographically limited and have a global effect rather than directly affecting local receptors. As per IEMA guidance (Ref 303), the receptor is therefore the global atmosphere. The receptor has a high sensitivity, given the severe consequences of global climate change and the cumulative contributions of all GHG emission sources.

12.6 Design, Embedded Mitigation, and Enhancement Measures

12.6.1 GHG emissions reduction through effective mitigation is a fundamental principle of sustainable development. As outlined in the proposed assessment methodology (Section 12.9), the significance of GHG emissions is based, in part, on the Proposed Development's capacity to deliver meaningful emissions mitigation.

12.6.2 The main purpose of the Proposed Development is to sustainably produce SAF for use as a replacement for fossil-fuel based aviation fuel and to help decarbonise the aviation sector. The Proposed Development will be designed, as far as practicable, to avoid and reduce climate-related impacts through an iterative design process that embeds mitigation measures from the outset. Additionally, how the development is constructed, operated, maintained, and ultimately decommissioned will be managed in accordance with applicable legislative requirements and sectoral best practices to minimise associated environmental effects. Opportunities to mitigate GHG emissions will be developed in line with the PAS 2080 Carbon Reduction Hierarchy of "Avoid", "Switch" and "Improve" (Ref 306), and the IEMA GHG Management Hierarchy of "Eliminate", "Reduce", "Substitute" and "Compensate" (Ref 306).

12.6.3 Mitigation measures may include, but would not be limited to, sourcing of local construction materials, selecting construction materials with lower embodied carbon, increased efficiency of construction plant and machinery, use of renewable/low-carbon fuels for construction vehicles and machinery, and use of shipping rather than road transport for movements of modular plant during construction and import of feedstock during operation.

12.6.4 Measures to reduce GHG emissions will be developed in line with the hierarchy set out in the IEMA guidance as shown in Table 12.2 below.

Table 12.2: IEMA GHG Management Hierarchy

GHG Management Hierarchy	Examples
Eliminate	a. Influence business decisions/use to prevent GHG emissions across the lifecycle. b. Create opportunities for emissions elimination within the organisation by changing, expanding, rationalising or moving business. c. Transition to new business model, alternative operation or new product/service. d. Employ carbon removal technologies, i.e. engineered removals (such as Carbon Capture and Storage) and nature-based solutions (such as afforestation)
Reduce	a. Reduce real and relative (per unit) consumption of carbon and energy. b. Improve efficiency in operations, processes, fleet and energy management. c. Optimise approaches (e.g. technology) and use digital solutions as enablers. d. Optimise design in accordance with the carbon reduction hierarchy (PAS 2080) e. Design for longevity to minimise maintenance and refurbishment f. Employ locally sourced materials and local labour g. Reuse and recycle materials
Substitute	a. Adopt renewables/low-carbon technologies (e.g. on site, transport). b. Reduce carbon (GHG) intensity of energy use and of energy purchased. c. Purchase inputs and services with lower embodied/embedded emissions.
Compensate	a. Compensate 'unavoidable' residual emissions (e.g. removals, offsets). b. Investigate land management, value chain, asset sharing, carbon credits. c. Support climate action and developing markets (beyond carbon neutral).

Construction Phase

12.6.5 At the PEIR and ES stages, relevant design, mitigation, and enhancement measures for the construction phase will be identified. These may include:

a. Design optimisation in accordance with the carbon reduction hierarchy as outlined in Clause 4 of BSI (2023) PAS 2080 *Carbon Management in Infrastructure* (Ref 306);
b. Specifying sustainable materials where possible, including those with reduced embodied carbon and/or recycled content, supported by eco-labels or verified Environmental Product Declarations (EPDs);

c. Designing for longevity, with a focus on minimising maintenance and refurbishment needs, thus reducing emissions over the lifecycle;
d. Selecting efficient mechanical and electrical equipment, such as durable and energy-efficient lighting and telecommunications systems;
e. Using locally sourced materials, where feasible, to reduce emissions from transportation;
f. Employing local labour and encouraging the use of low-carbon or shared transportation, as promoted through the outline Construction Traffic Management Plan (see **Chapter 18: Traffic and Transport**); and
g. Utilising modern, efficient construction plant and delivery vehicles, including those powered by electricity or alternative low-carbon fuels and use of water freight transport for construction and raw material deliveries rather than road freight.

Operation Phase

12.6.6 Further mitigation and enhancement measures for operation will also be identified in the PEIR and ES. These may include:

a. Specifying high-efficiency mechanical and electrical systems, such as lighting and telecoms infrastructure;
b. Maximising operational effectiveness, while minimising parasitic energy loads;
c. Extending the operational lifespan of the development to reduce the frequency of emissions associated with maintenance and repair;
d. Facilitating material reuse and recycling at the end-of-life stage to avoid unnecessary waste and emissions; and
e. Using energy-efficient equipment in maintenance and repair operations.

12.7 Description of Potential Likely Significant Effects

12.7.1 The GHG Scoping process follows the principles set out in PAS 2080 (Ref 306) and BS EN 17472 (Ref 307), breaking down potential emissions sources of each phase into lifecycle stages, as set out in Table 12.3. The scoping of potential GHG emissions has been undertaken in a proportionate manner, ensuring that the GHG assessment in the next stage is focused on likely significant effects and is based on a combination of available evidence and professional judgement. The Proposed Development will lead to the generation of GHG emissions during construction, operation and decommissioning. The potential sources of GHG emissions during all phases of the project are listed in Table 12.3 below. These will need to be considered in the context of the reduction in GHG emissions associated with use of SAF in aviation.

Table 12.3: Key Emission Sources in Construction, Operation and Decommissioning Phases

Project Work Stage	Lifecycle Stage	Description	Potential Sources of Emissions (Not Exhaustive)	Proposed Data Source
Product stage	A1-A3	Manufacture and transport of raw materials to suppliers	Embodied emissions associated with extraction and manufacturing of the required raw materials.	Material quantities
Construction stage	A4	Transport of materials to site	Emissions from fuel and electricity used in vehicles transporting materials to Site.	Assumed transportation distances of material
	A5	Plant and equipment used during construction	Emissions from fuel and electricity used in plant and equipment on Site.	Fuel usage during construction and electricity usage for site compounds
	A5	Transport of waste	Emissions from fuel/energy used in vehicles transporting waste materials from construction, demolition (removal of any unsuitable existing infrastructure on Site) and excavation to destinations away from the Site.	Waste quantities and assumed distance to disposal facilities
	A5	Disposal of waste	Emissions from the demolition, excavation and construction waste.	Likely to be derived from industry and/or academic literature
	A5	Land use, land use change and forestry	Emissions associated with the clearance and disposal of vegetation (grass and shrub) from the Main Site due to the Proposed Development.	Type and area of land subject to change in usage taken from **Chapter 7: Terrestrial Ecology.**
Operation	B2-B35	Maintenance and, repair, replacement, refurbishment	Embodied emissions and emissions from transport and plant associated with maintenance, and repair, replacement, and refurbishment.	Typical maintenance and, repair rates r, replacement, and refurbishment periods for key materials and components, l Likely to be derived from industry and/or academic literature

Project Work Stage	Lifecycle Stage	Description	Potential Sources of Emissions (Not Exhaustive)	Proposed Data Source
	B4-B5	Replacement and refurbishment	Embodied emissions and emissions from materials/products, transport and plant associated with replacement and refurbishment.	Typical replacement and refurbishment periods for key materials and components, likely to be derived from industry and/or academic literature
	B6	Operational Energy Use	Emissions resulting from the energy used in the facilities e.g., heating and cooling, ventilation, lighting, fuel for the backup power generators, and plant and equipment to power the critical loads. Negative emissions from use of SAF displacing hydrocarbons in aviation fuel sector.	Fuel and electricity usage for facilities
	B7	Operational Water Use	Emissions from the use of water for the plant (process water and domestic water consumption).	Water usage for plant
	B8	Operation	During operation, biomass will be converted into SAF. Additional emissions will arise from the processing of biomass to create SAF. Emissions will also arise from the transport of sustainably sourced biomass feedstock, which will be sourced nationally and internationally transferred to site by ship/rail.	Assumed transportation distances of biomass feedstock Likely to be derived from industry and/or academic literature
Decommissioning/ End of Life	C1	Decommissioning process	Emissions from decommissioning work (i.e., fossil fuel and electricity consumed)	Assumed waste rates using construction details using RICS Whole Life Carbon assessment for the built environment

Project Work Stage	Lifecycle Stage	Description	Potential Sources of Emissions (Not Exhaustive)	Proposed Data Source
				assumptions as it is unlikely that detailed decommissioning information will be available at time of assessment.
	C2-C4	Transport and disposal of materials	Emissions sources as fuel/energy consumption from the transport of materials to disposal sites or recovery.	Assumed transportation distances of materials
	D	End-user emissions beyond the boundary	Emissions arising from the end use of SAF, and emissions associated with the transportation of the captured CO_2 off-Site to its end use (storage). Emissions from the end use (combustion) of SAF biofuels are considered zero. This is because the CO_2 released during combustion is offset by the CO_2 absorbed during the growth of the sustainably sourced biomass feedstock. Therefore, for lifecycle assessment reporting, emissions from fuel in use are set to zero for biofuels[6]. The use of SAF therefore contributes to decarbonising the aviation sector and supports the UK's progress toward its net zero target.	Where possible, modelling for the Proposed Development will be used. If modelled data is not available, academic literature will be used instead.

[6] As per RTFO, REDII, and SAF Mandate methodologies.

12.8 Summary of Emission Source Scoping for Further Assessment

12.8.1 The anticipated emission sources scoped in, or out, for GHG are as presented in Table 12.4 below.

Table 12.4: Elements Scoped In or Out of Further Assessment

Emission Sources	Phase	Scoped In	Scoped Out	Justification
Product stage (manufacture and transport of raw materials to suppliers) (A1-3)	Construction	X		Raw materials usage required for the Proposed Development would result in embodied emissions.
Transport of materials to site (A4)	Construction	X		Construction phase emissions from fuel / energy consumption due to the delivery of material to Site have the potential to be large.
Construction/installation process (A5)	Construction	X		Emissions from the plant and equipment used during construction of the Proposed Development have the potential to be large.
Transport and disposal of construction waste (A5)	Construction	X		Emissions from the transport and processing of construction waste associated with the Proposed Development have the potential to be large
Land use, land use change and forestry (A5)	Construction	X		Further assessment of vegetation required to determine the extent of emissions during construction.
Maintenance and repair (B2-B3)	Operation	X		Emissions from maintenance and repair to be informed by industry and/or academic literature
Replacement and refurbishment (B4-B5)	Operation		X	The Proposal Scheme is not designed with the expectation of any significant replacement or refurbishment required within the 30-year design

Emission Sources	Phase	Scoped In	Scoped Out	Justification
				life. This element is scoped out of further assessment.
Operational Energy Use (B6)	Operation	X		Electricity to power the facility will be provided by the on-site CHP plant (potentially supplemented by an electrical connection by the DNO). It is expected that there will be backup power generators, enough to power the critical loads in the event of power failure. This is considered to occur infrequently, however, there will be intermittent testing of the backup systems, emissions arising from this element is not expected to be large.
Operational Water Use (B7)	Operation	X		A potentially notable quantity of process water would be required for operation of the Proposed Development.
Operation (B8)	Operation	X		Emissions from operational processes of the facilities are expected to amount to a notable quantity
End-user emissions (D)	Operation	X		Emissions associated with the use of SAF are proposed to be scoped In.
Decommissioning process (C1)	Decommissioning	X		Emissions from the decommissioning phase are to be informed by industry and/or academic literature.
Transport and disposal of materials (C2-4)	Decommissioning	X		

12.9 Proposed Assessment Methodology

12.9.1 The assessment approach for the Proposed Development will be discussed, and agreement sought, with STBC and the Environment Agency.

12.9.2 The assessment approach considers the likely magnitude of GHG emissions (or avoided emissions) in comparison to the baseline scenario without the Proposed Development. It considers emissions throughout the lifecycle of the Proposed Development including:

a. Construction phase emissions, such as embodied emissions associated with materials, transportation of materials to and from the Site, waste generation, and construction processes;
b. Operational phase emissions, including those from plant operation (including use of SAF in aviation), maintenance, and repair of materials and equipment over time; and
c. Decommissioning phase emissions, arising from dismantling activities, use of plant and equipment, and transportation and disposal of materials.

12.9.3 For all lifecycle stages and sub-stages of the Proposed Development, the assessment will include the following:

a. Data collection – Gathering available information on the scale of GHG-emitting and GHG-capturing activities (e.g., quantities of materials such as concrete, fuel consumption in litres, electricity use in MWh, for both the baseline and the Proposed Development. This will cover the entire appraisal period, which will reflect the minimum design life of 30 years. GHG emissions calculation – Applying appropriate emissions factors (expressed in tCO_2e per unit of activity) to calculate annual emissions and cumulative emissions across the lifecycle of the Proposed Development. All values will be reported in tonnes of carbon dioxide equivalent (tCO_2e).

12.9.4 The temporal boundary for GHG emissions assessment constitutes the construction phase, operational phase and decommissioning phase.

12.9.5 The GHGs emissions for the Proposed Development will be calculated using the formula:

Activity x GHG factor = carbon emissions

Where:

a. Activity data – a measure of the quantity of an activity; and
b. GHG factor – a measure of the GHG emissions per unit of activity.

12.9.6 GHG factors will be obtained from industry recognised sources commonly used in GHG assessments, such as:

c. GHG reporting conversion factors (Ref 453); and
a. The Inventory of Carbon and Energy (ICE) database

12.9.7 The methodology focuses on assessing the impact of the Proposed Development on GHG emissions by quantifying the net GHG emissions arising from each

lifecycle stage. Emissions associated with the Proposed Development will be compared to the baseline scenario (as described in Section 1.4 above) to quantify the net impact of the Proposed Development.

12.9.8 The assessment of construction and operation impacts will be undertaken in line with the following recognised industry standards and guidance:

a. ISO 14064-1:2018 (Ref 308);
b. GHG Protocol (Ref 304);
c. IFC Environmental, Health, and Safety Guidelines for Thermal Power Plants (Ref 309)
d. IPCC Guidelines for National Greenhouse Gas Inventories (Ref 310) and;
e. PAS 2080 (Ref 306).

12.10 Significance of Effect Criteria

12.10.1 Any magnitude of emitted or avoided GHG emissions makes a cumulative contribution to climate change (positive or negative).

12.10.2 The significance of GHG impacts is assessed in line with IEMA guidance (Ref 303) which emphasises the importance of considering a project's net impact on emissions over its entire lifecycle. This impact may be positive, negative, or negligible, depending on the extent to which the Proposed Development contributes to or mitigates climate change.

12.10.3 The following terms have been used to define the significance of the effects identified as set out in IEMA guidance:

a. **Major adverse (significant):** the GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy and does not make a meaningful contribution to the UK's trajectory towards net zero;
b. **Moderate adverse (significant):** the GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals, falling short of fully contributing to the UK's trajectory towards net zero;
c. **Minor adverse (not significant):** the GHG impacts are fully consistent with applicable existing and emerging policy requirements and good practice design standards, fully in line with measures necessary to achieve the UK's trajectory towards net zero;
d. **Negligible (not significant):** the GHG impacts are reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050; and
e. **Beneficial (significant):** the net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline, substantially exceeding net zero requirements with a positive climate impact.

12.10.4 To provide appropriate context for the estimated GHG emissions associated with the Proposed Development, and in accordance with IEMA guidance, these emissions will be compared against the respective UK carbon budget (Table 12.5) (Ref 311) established by the UK Government and covering the period from 2023 to 2042, albeit the latest seventh Carbon Budget has yet to be legislated by government.

Table 12.5: Key Emissions Sources in Construction Stage

Carbon Budget Period	UK Carbon Budget ($MtCO_2e$)
Fourth: 2023-2027	1,950
Fifth: 2028-2032	1,725
Sixth: 2033-2037	965
Seventh: 2038-2042	535

12.11 Limitations and Assumptions

12.11.1 The GHG assessment will be undertaken using the best available information at the time of assessment. A reasonable worst-case scenario will be developed using appropriate industry benchmarks, and conservative assumptions using industry best practice and academic literature, on materials, design, assembly, earthworks, and the use of components to provide a robust assessment of likely carbon emissions.

12.11.2 The methodology used to calculate the UK carbon budgets is different to that used for the calculation of lifecycle emissions for the Proposed Development, and therefore caution must be taken when making a direct comparison. However, for the purposes of identifying the extent to which the Proposed Development may impact the ability of the UK Government to meet its carbon budgets, it is necessary to make this comparison.

12.11.3 At the time of writing, information on the decommissioning of the Proposed Development is unavailable. In the absence of decommissioning information at further assessment stages of PEIR and ES, assumptions used for the construction phase of the Proposed Development will be used to estimate decommissioning emissions.

12.11.4 A full list of assumptions and limitations will be provided within the ES.

13. Climate Change Resilience

13.1 Introduction

13.1.1 This section outlines the scope and methodology for the assessment of the likely significant effects arising from the Proposed Development in respect of Climate Change Resilience (CCR).

13.2 Policy, Legislation, and Guidance

13.2.1 The methodology for the CCR assessment has been developed in accordance with relevant legislation, policy, and industry guidance, as shown in Table 13.1.

Table 13.1 Climate Resilience – Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Overarching National Policy Statement for Energy (EN-1) 2024 (Ref 36)	Section 4.10 of the Policy Statement highlights that "the Secretary of State should be satisfied that applicants for new energy infrastructure have taken into account the potential impacts of climate change using the latest UK Climate Projections and associated research and expert guidance (such as the Environment Agency's Climate Change Allowances for Flood Risk Assessments) available at the time the ES was prepared to ensure they have identified appropriate mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure, including any decommissioning period."
Climate Change Adaptation: Policy Information (Ref 37)	The policy paper states that: "Preparing for a changing climate, or climate adaptation, will help the UK to reduce negative consequences of climate change and take advantage of new opportunities" and provides an overview of how the UK is preparing for climate change. This includes commitments to understanding the risks through the UK Climate Change risk assessment, preparing for climate change through the National Adaptation Programmed, adapting services and infrastructure under the Adaptation Reporting Power (ARP).
National Planning Policy Framework (NPPF) 2024 (Ref 38)	Presents the Government's planning policies for England and how these are to be applied. Guidance relating to ways to minimise vulnerability and improve resilience to climate change impacts is mainly set out in Section 14: Meeting the Challenge of Climate Change, Flooding and Coastal Change.

Policy / Legislation / Guidance	Description
The Third National Adaptation Programme (NAP3) and the Fourth Strategy for Climate Adaptation Reporting (2023 – 2028) (Ref 39)	The National Adaptation Programme (NAP) sets the actions that government and others will take to adapt to the challenges of climate change in the UK. It sets out key actions for the next five years, including protecting and adapting local businesses, infrastructure and natural environment in the face of changing climate.
Stockton-on-Tees Borough Council Environmental Sustainability and Carbon Reduction Strategy 2022-2032 (Ref 40)	This Strategy 2022-2032 sets out the Local Authority's strategy for achieving net zero emissions by 2032 and adapting to climate change. The Strategy outlines 4 strategic aims, of which Aim 4 is 'Adapt to the impacts of climate change'.
Legislation	
The Climate Change Act 2008, as amended by the Climate Change Act (2050 Target Amendment) Order 2019 (Ref 41)	The UK legislative basis to address climate change. It sets the requirement for a national adaptation programme and associated publication of a national climate change risk assessment every five years. The Climate Change Act provides the policy framework to promote climate change adaptation action in the UK.
The Infrastructure Planning (Environmental Impact Assessment) Regulations2017 (Ref 257)	These regulations apply the amended EU EIA directive to the infrastructure planning system in England.
Guidance	
National Planning Practice Guidance (NPPG): Climate Change 2019 (Ref 43)	Explains the processes and tools that can be used through the planning system in England. The Guidance on Climate Change advises how to identify suitable mitigation and adaptation measures in the planning process.
IEMA EIA Guide to: Climate Change Resilience and Adaptation 2020 (Ref 44)	Hereafter referred to as 'the IEMA Guidance'. This guide provides a framework for the effective consideration of climate change resilience and adaptation in the EIA process. This guide has been used within the assessment approach.
ISO 14091:2021 Adaptation to climate change – Guidelines on vulnerability, impacts and risk assessment. (Ref 45)	This international standard provides guidelines on approaches to assess climate change-related risks. It highlights the role of risk assessments in improving climate change adaptation planning and informing climate change adaptation activities from their implementation through to monitoring.

13.3 Study Area

Physical Boundary

13.3.1 The CCR assessment is defined by the Proposed Development's Site Boundary, as shown in **Figure 1.2**.

Temporal Boundary

13.3.2 The construction period is likely to be up to four years in duration, (commencing no earlier than 2028). Climate change is not expected to be so significant within the construction programme timescales as to require additional mitigation beyond current good practice. The construction phase has, therefore, been scoped out of the CCR assessment, however if the four-year construction period extends beyond 2035, construction should be scoped in as climate changes may be significant compared to the present baseline.

13.3.3 The area within which the Proposed Development is located is anticipated to experience changes in climate conditions during the operational and decommissioning phases, and, therefore, the Proposed Development's vulnerability to climate change may be increased. As a result, the operation and decommissioning phases have been scoped into the CCR assessment.

13.3.4 For the purpose of the CCR assessment, it has been assumed that the Proposed Development will have an anticipated lifespan of a minimum of 30 years, and that decommissioning will take place at or after 30 years, and is assumed to take 15-18 months.

13.4 Baseline Conditions and Future Baseline

13.4.1 IEMA's Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation (Ref 44) highlights the need for the baseline to consider:

a. The current climate baseline (defined by historic climate conditions) to provide an indication of past vulnerability; and
b. The future climate baseline (short-term extremes and long-term variation) to assess a project's vulnerability to climate change.

13.4.2 Information regarding historical climate conditions for the study area has been obtained from HadUK observation data (Ref 46), and is shown in the 'Baseline Observation 1980-2010' column of Table 13.2.

13.4.3 UKCP18 Probabilistic Climate Projections data (Ref 47) has been used to identify the anticipated changes in climate conditions for the 2030s (2020-2049), the

2050s (2040-2069) and 2080s (2070-2099)[78]. Table 13.2 shows the anticipated changes for each of these time periods.

Table 13.2 Baseline and Projection Data for Climate Metrics. All Projections Data was Taken for RCP 8.5 for Pre-defined 30-year Periods.

Metric	Unit	Baseline Observation (1980-2010)	Future climate (RCP8.5)		
			2030s	2050s	2080s
Summer mean temperature	˚C	14.7	+1.0	+1.9	+3.9
Winter mean temperature	˚C	3.9	+0.9	+1.6	+3
Average summer precipitation	mm	166	-5.9%	-13.7%	-23.1%
Average winter precipitation	mm	122	+6.9%	+11.6%	+20.9%
Average daily maximum temperature in summer	˚C	19.4	+1.0	+2.0	+4.0
Average daily minimum temperature in winter	˚C	0.8	+0.9	+1.6	+3.0
Average number of heatwaves per year (3 days above 25˚C)	occurrences/ year	0.7	1.5	2.5	4.5

13.4.4 The Site is located along the tidal River Tees, which flows into the nearby North Sea. Sea level projections at the closest marine projections data point (Ref 48), show that the area is likely to be exposed to future sea level rise.

13.4.5 Table 13.3 presents the projected sea level rise for the 2030s, 2050s and 2080s using RCP8.5 marine projections data.

Table 13.31 Sea Level Rise Projections in Metres Presented as 50th Percentile (10th Percentile to 90th Percentile) for RCP8.5

Metric	2030s	2050s	2080s
Sea level anomaly (m) from 1981-2000 baseline	+0.16 (0.12 to 0.21)	+0.29 (0.22 to 0.38)	+0.55 (0.40 to 0.74)

13.4.6 The projections indicate a potentially large increase in extreme heat. Average summer temperatures are projected to increase from 14.7˚C to 18.6˚C, whilst the

[7] The probabilistic projections in the UKCP18 dataset (Ref 43) provide local low, central and high changes across the UK, corresponding to various probability levels (e.g. 10%, 50% and 90%). There are a number of Representative Concentration Pathways (RCPs) available for UKCP18 with each pathway representing a different climate scenario resulting in a different range of global mean temperature increases over the 21st century.

[8] RCP 8.5 has been used for the future baseline, as it represents a high emissions and high impact future scenario. This approach is in line with IEMA (2020) guidance which recommends that a conservative approach is taken when establishing realistic changes to future climatic conditions.

number of heatwaves per year is projected to increase from 0.7 heatwaves per year to 4.5 heatwaves per year in the 2080s. Both the winter average and average daily minimum temperatures are also anticipated to increase.

13.4.7 The projections also show that mean summer precipitation are projected to decrease by up to 23% by the 2080s while mean winter precipitation is projected to increase by up to 20% by the 2080s.

13.4.8 Met Office data about future changes to other climate hazards (Ref 49,Ref 50) indicate the following trends:

a. **Storms** – There are no compelling trends in changes to storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. However, from 2050 onwards, increases in the frequency of winter storms are expected over the UK with deeper and more intense storms [1];
b. **Wind** – From 2050 onwards, there is an increase in near surface wind speeds over the UK the winter season. Surface wind speeds increase more over western parts of the UK and over the ocean in winter and decrease across the UK in summer [2]; and
c. **Lightning** – There is likely to be an increase in lightning frequency over the UK in summer and spring, with a decrease in autumn. In winter, future decreases in lightning are seen over the sea to the north and west of the UK, where high flash rates are currently seen [1].

13.5 Sensitive Receptors

13.5.1 In line with IEMA guidance (Ref 44), the CCR assessment qualitatively assesses the impacts and risks of climate change on the Proposed Development based on professional expertise and judgement. The assessment differs from many other EIA topics in that it considers how receptors may be affected by an external factor (climate change), not how environmental receptors may be affected by a development's impacts.

13.5.2 Receptors considered in this assessment include built assets, infrastructure, the SAF production process, decommissioning activities and equipment, and staff (operational, maintenance and decommissioning) of the Proposed Development.

13.6 Description of Potential Likely Significant Effects:

13.6.1 From the anticipated changes to the UK climate presented in Section 13.4, a number of climate hazards have been identified as potentially relevant to the Proposed Development. These hazards along with their possible impacts are presented in Table 13.4[9].

[9] A full identification and assessment of potential hazards, receptors, and associated impacts will be undertaken as part of the PEIR. At this stage, the intention of **Table 13.3** is not to provide an exhaustive list, but rather to outline a generalised overview of impact types.

Table 13.4 Hazards and Potential Impacts

Climate Hazard	Potential Impact
Increased likelihood of extreme hot weather	Extreme high temperature causing asset failure and or decrease in lifespan. Sustained periods of hotter temperatures impacting upon operation of critical equipment. Reduced efficiency of cooling systems. Health impacts on workforce.
Increased likelihood of intense rainfall, and resultant surface or river flooding	Surface flooding on site or at key access point resulting in damage to the Main Site and critical equipment. Fluvial flooding causing access disruption. Health impacts on workforce.
Sea level rise, storm surge effects	
Increased drought events	Possible water restrictions could halt or slow down operational processes. Water-intensive processes such as cooling may be reduced, and wastewater processing may be disrupted. Soil shrinkage and associated subsidence
Storms events (including high winds, lightning strikes)	High winds may cause direct damage to assets, including the Main Site and utility corridors. Access corridors may become damaged or blocked, causing operational disruption.

13.7 Cumulative and in-combination Impacts

13.7.1 Guidance on EIA also discusses how future climate change will be integrated with assessments undertaken by other environmental topics. To address the 'in-combination' impacts of climate change, future climate projections will be considered as part of individual topic impact assessments.

13.7.2 It is not expected that there will be any cumulative impacts on the Proposed Development with regards to CCR (which considers risks to the Proposed Development itself). Therefore, a cumulative assessment is scoped out of further assessment.

13.8 Summary of Climate Change Resilience Scoping for Further Assessment

13.8.1 As set out in Section 0, the construction period is likely to be up to four years in duration, (commencing no earlier than 2028). Climate change is not expected to be so significant within the construction programme timescales as to require additional mitigation beyond current good practice. The construction phase has, therefore, been scoped out of the CCR assessment, however if the four-year construction period extends beyond 2035, construction should be scoped in as climate changes may be significant compared to the present baseline. As shown in Section 13.4, the area within which the Proposed Development is located is anticipated to experience changes in climate conditions during the operational and decommissioning phases, and, therefore, the Proposed Development's vulnerability to climate change may be increased. As a result, the operation and

decommissioning phases have been scoped into the CCR assessment (see Table 13.5).

Table 13.5 Summary of scope for CCR Assessment

Potential Impact	Construction	Operation	Decommissioning	Survey Requirements
Increased likelihood of extreme hot weather	Scoped out	Scoped in	Scoped in	N/A
Increased likelihood of intense rainfall, and resultant surface or river flooding	Scoped out	Scoped in	Scoped in	N/A
Sea level rise, storm surge effects	Scoped out	Scoped in	Scoped in	N/A
Increased drought events	Scoped out	Scoped in	Scoped in	N/A
Storms events (including high winds, lightning strikes)	Scoped out	Scoped in	Scoped in	N/A

13.9 Proposed EIA Assessment Methodology

13.9.1 The approach to determining the potential impacts and risks of climate change on the Proposed Development has been developed to align with the recommendations set out in the IEMA Guidance (Ref 44).

13.9.2 This approach, shown in **Figure 13.1**, uses climate projections to identify potential impacts, and then assesses the likely 'Likelihood' and 'Consequence' of these impacts on the Proposed Development.

13.9.3 Significance will be determined using the matrix shown in Table 13.6.

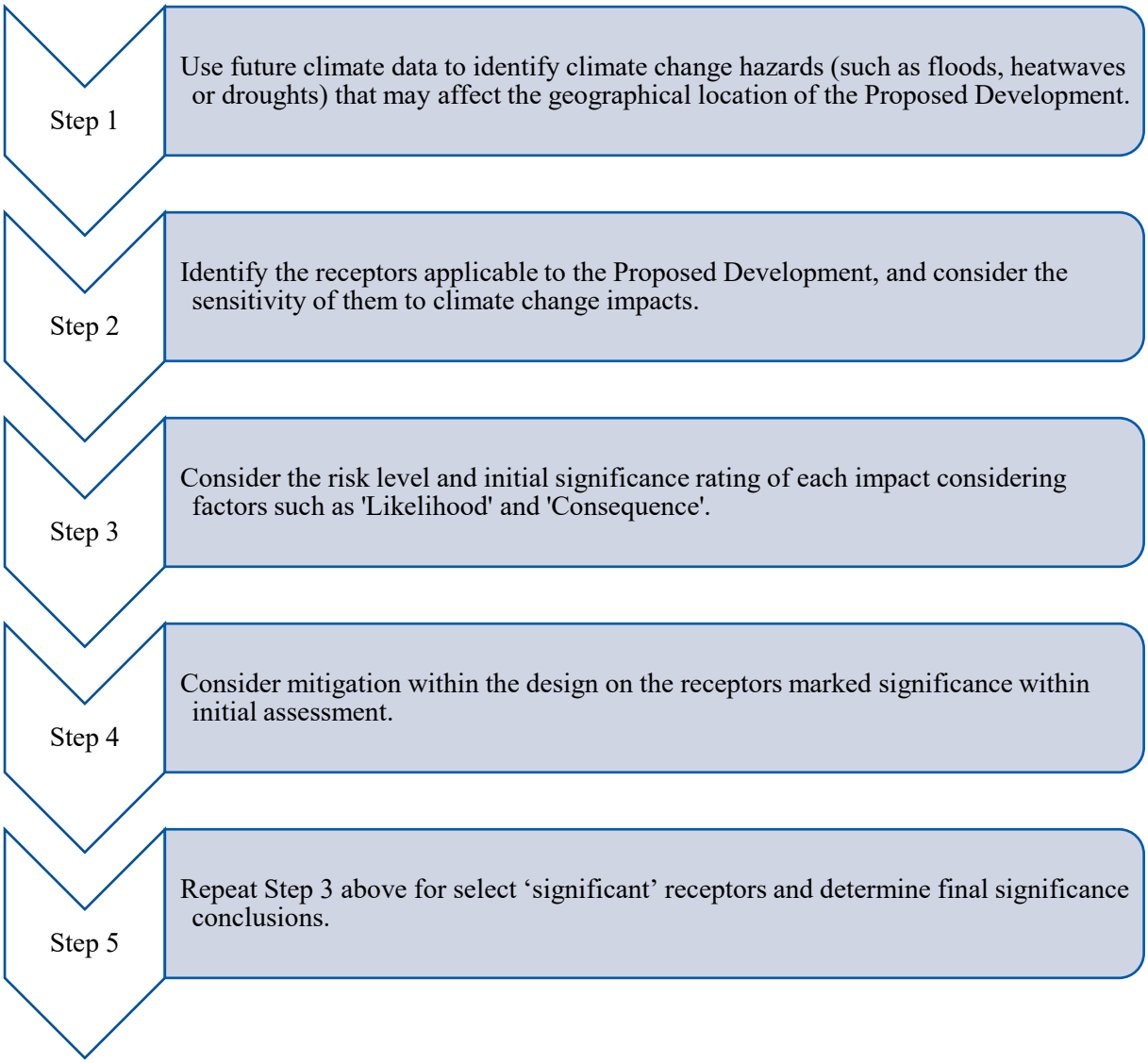


Figure 13.1 CCR Assessment Approach

Table 13.6 CCR Assessment - Significance Matrix (S Denotes Significant, NS Denotes Not Significant)

		Consequence			
		High	**Medium**	**Low**	**Negligible**
Likelihood	**High**	Major (S)	Major/ Moderate (S)	Moderate/Minor (NS)	Minor/Negligible (NS)
	Medium	Major/ Moderate (S)	Moderate (NS)	Minor (NS)	Negligible (NS)
	Low	Moderate/ Minor (NS)	Minor (NS)	Minor (NS)	Negligible (NS)
	Negligible	Minor/ Negligible (NS)	Negligible (NS)	Negligible (NS)	Negligible (NS)

13.10 Approach to Mitigation

13.10.1 Mitigation and enhancement measures have not been explored in detail during the development of this scoping report; however, they will be more fully addressed during the PEIR stage. At that point, detailed engagement will take place with the design teams and the client to ensure that these measures are appropriately integrated into the assessment process.

13.11 Limitations and Assumptions

13.11.1 The limitations and assumptions for using the proposed methodology are:

a. the assessment method is largely qualitative, particularly the process of scoring risks;
b. there is limited methodological guidance on the assessment of individual risks;
c. there is inherent uncertainty in climate change projections. The quantitative data used in the assessment will be obtained from UKCP18, the latest set of probabilistic projections for the UK; and
d. there is often uncertainty in the relationship between changes in climate hazards and the respective response in terms of asset performance.

13.11.2 A full list of assumptions and limitations associated with the CCR assessment will be provided as part of the assessment undertaken at the PEIR stage.

14. Materials and Waste

14.1 Introduction

14.1.1 This Chapter outlines the scope of the assessment to be undertaken for Material Assets and Waste. It also discusses the potential environmental effects associated with the Proposed Development during construction, operation and decommissioning. The assessment will follow the IEMA Guidance for Materials and Waste in Environmental Impact Assessment (Ref 174). The effects will also be assessed in the context of relevant national, regional, and local materials and waste management policies.

14.1.2 It sets out the proposed methodology for the material assets and waste assessment and identifies those impacts that can be scoped out of the assessment. Where impacts are scoped in, further assessment will be presented in the ES.

14.1.3 There may be interrelationships related to the potential effects on waste and resources and other disciplines. Therefore, please also refer to the following chapters:

a. **Geology and Soils;**
b. **Greenhouse Gases;** and
c. **Climate Resilience**

14.2 Policy, Legislation, and Guidance

14.2.1 The policy, legislation, and guidance relevant to the Material Assets and Waste assessment of the Proposed Development is shown in Table 14.1.

Table 14.1: Materials and Waste – Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Overarching NPS for Energy EN-1 2024 (Ref 36)	Sets out the Government's policy for delivery of major energy infrastructure and will be the primary basis for decision making. Section 5.14: Waste Management outlines government policy on hazardous and non- hazardous waste and sustainable waste management implemented through the waste hierarchy. The overall aim is to produce less waste by reusing it as a resource wherever possible, or to dispose of it in a way that is least damaging to the environment and human health. Paragraph 5.14.6 of NPS EN-1 refers to the specific requirement to prepare a SWMP, which should include information on the proposed recovery and disposal of waste, along with an assessment of the impact of waste arising from the development on the capacity of waste management facilities in the area. The Waste Management Plan for England provides a detailed analysis of the present state of waste management at the national level and assesses how the objectives of the Waste Framework

Policy / Legislation / Guidance	Description
	Directive will be effectively supported. It outlines the Waste Hierarchy, which gives top priority to waste prevention, followed by preparing for reuse, recycling, other types of recovery and finally disposal (e.g. landfill).
NPS for Renewable Energy Infrastructure (EN-3) (2023) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed.
National Planning Policy Framework (2024) (NPPF) (Ref 38)	The NPPF highlights that the purpose of the planning system is to contribute to the achievement of sustainable development through three overarching objectives: economic, social and environmental. The environmental objective requires the planning system to contribute and enhance the natural and local environment by "using natural resources prudently" and "minimising waste and pollution."
National Planning Policy for Waste (2014) (Ref 157)	The National Planning Policy for Waste outlines the Government's ambition to promote a sustainable approach to resource use and management. It sets out waste planning policies and should be read alongside: the National Planning Policy Framework; the National Waste Management Plan for England and any relevant successor policies, guidance or documents.
National Policy Statement for Hazardous Waste (2013) (Ref 158)	The National Policy Statement for Hazardous Waste outlines the Government's main objectives for hazardous waste and the key principles for management of hazardous waste.
Our Waste, Our Resources: A Strategy for England (2018) (Ref 160)	Our Waste, Our Resources: A Strategy for England sets out how the Government will preserve stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. The strategy also outlines the Government's aims to minimise the damage caused to the natural environment by reducing and managing waste safely and carefully, and by tackling waste crime. It combines actions to take now with firm commitments for the coming years and gives a clear longer-term policy direction in line with the 25 Year Environment Plan.
Tees Valley Joint Minerals and waste Development Plan (2011) (Ref 161)	The Tees Valley Minerals and Waste Development Plan Documents have been prepared jointly by the boroughs of Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton-on-Tees. The Core Strategy Development Plan Document (DPD) and Policies and Sites DPD set out the vision and strategic polices required to achieve the key objectives for minerals and waste in the Tees Valley. The development plan aims are for the Tees Valley, by 2026, to give priority to the production of secondary and recycled aggregates for construction; limit and carefully manage primary aggregate extraction and safeguard mineral resources; and promote the reuse, recycling and recovery of value from waste.
Legislation	
The Environment Act 2021 (Ref 65)	The Act sets out clear statutory targets for the recovery of the natural world in four priority areas, one of which is waste: Part 3 specifically refers to waste and resource efficiency, incorporating producer responsibility obligations; resource efficiency; managing waste; and waste enforcement and regulation.

Policy / Legislation / Guidance	Description
Waste (Circular Economy) (Amendment) Regulations 2020 (Ref 162)	These regulations amend The Waste (England and Wales) Regulations 2011 and The Environmental Permitting (England and Wales) Regulations 2016 to include prevention of waste generation and establishing waste prevention programmes, greater segregation of waste and more detailed records.
The Environmental Permitting (England and Wales) Regulations 2016 (as amended) (Ref 163)	Aims to streamline the legislative system for industrial and waste installations into a single permitting structure for those activities which have the potential to cause harm to human health or the environment.
The Controlled Waste (England and Wales) Regulations 2012 (Ref 164)	The Controlled Waste (England and Wales) Regulations 2012 provide a definition of controlled waste and classifies waste as household, industrial or commercial waste. It allows Local Authorities to implement charges for the collection of waste from non-domestic properties.
The Waste (England and Wales) Regulations 2011 (Ref 165)	These regulations allow for the transfer of controlled waste to be recorded on alternative documentation, such as invoices, instead of waste transfer notes.
The Revised EU Waste Framework Directive 2008/98/EC (2008) (Ref 166)	The Directive provides a comprehensive foundation for the management of waste across the European Community and provides a common definition of waste. A definition of waste is provided in the predecessor to this Directive (European Directive 2006/12/EC) which defines waste as: “any substance or object that the holder discards or intends or is required to discard.”
The Clean Neighbourhoods and Environment Act 2005 (Ref 167)	The Act provides that it is the responsibility of construction workers on site to guarantee that waste is disposed in the appropriate manner.
The Hazardous Waste (England and Wales) Regulations 2005 Ref 168)	These regulations introduced measures to control storage, transport and disposal of hazardous waste. The Regulations provide a means to ensure that hazardous waste and any associated risks are appropriately managed.
Council Directive 1999/31/EC of 26 April 1999 on the Landfill of Waste (1999) (Ref 169) ‘The Landfill Directive’	The Landfill Directive aims to protect both human health and the environment. In particular, it provides measures, procedures and guidance to reduce as much as possible negative impact from landfill. In particular to surface water, groundwater, soil, air; on the global environment including greenhouse effect; and risks to human health. The Directive introduces rigorous operational and technical requirements. The provisions of these Directives continue to have effect as transposed into domestic law by virtue of The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc) (EU Exit) Regulations 2020. These regulations make provisions and amendments to the Environmental Protection Act 1990 and waste regulations to ensure that environmental permitting and waste regimes continued to operate effectively following the EU exit transition period.
The Waste Minimisation Act 1998 (Ref 170)	The Act enabled local planning authorities to take the appropriate steps to reduce and minimise the generation of household, commercial or industrial waste within their area.
The Environmental Protection Act 1990 (Ref 171)	The Act defines, within England and Wales and Scotland, the fundamental structure and authority for waste management and control of emissions into the environment. The Act outlines the

Policy / Legislation / Guidance	Description
	requirement of the manager of a development to ensure that any excess materials or waste as a result of construction activities are recovered or disposed of without any subsequent adverse effects upon the surrounding environment.
The Control of Pollution (Amendment) Act 1989 (Ref 172)	The Control of Pollution (Amendment) Act 1989 makes it a criminal offence for a person who is not a registered carrier to transport controlled waste to or from any place in Great Britain. The Act also provides for the seizure and disposal of vehicles used for illegal waste disposal.
The Control of Pollution Act 1974 (Ref 173)	The Act makes provisions with respect to the generation and revision of 'waste disposal plans' and prohibits the unlicensed disposal of waste.
Guidance	
IEMA Guide to Materials and Waste in Environmental Impact Assessment (2020) (Ref 174) ('the IEMA Guidance')	Guidance used to assess the potential impacts and effects from the Proposed Development, using the process and significance criteria it sets out.

14.3 Study Area

14.3.1 The study areas that are applicable to the Proposed Development (as defined in the IEMA Guidance (Ref 174), are:

a. The Development Study Area - the extent of works within The Site, including areas required for temporary access, site compounds and other enabling activities.
b. The 'expansive study area' will consist of the geographical area of the north east of England. It will include the availability of materials as well as the capacity of waste management infrastructure (landfill). The expansive study area can be expanded to include national materials stocks where necessary. In addition, the expansive study area for hazardous waste landfill capacity is within England.

14.3.2 As indicated within the IEMA Guidance, professional judgement will be used to provide consideration on a balance of the proximity principle and value for money principle for establishing the second study area.

14.4 Baseline Conditions and Future Baseline

14.4.1 This section describes baseline material consumption and waste disposal for the current land use and provides regional and national information and data in the context of which environmental assessment can be undertaken.

14.4.2 The most up to date sources of information have been used to collate data for material resource availability, mineral safeguarding, landfill capacity and waste recovery. Indication of the most recent year from which data has been acquired is provided throughout. The baseline data collected and presented in this section were obtained by desk study, from publicly available data sources.

Baseline

14.4.3 The key sources of information on material resource availability, landfill capacity and waste recovery will be:

a. Department for Business and Trade (2023) Monthly Statistics of Building Materials and Components (Ref 176).
b. North East England Aggregates Working Party Annual Report 2022 (2023) (Ref 175).
c. Mineral Products Association (2022) 'Aggregates demand and supply in Great Britain: Scenarios for 2035' (Ref 177).
d. Mineral Products Association, Profile of the UK Mineral Products Industry, 2020 Edition (Ref 178).
e. StatsWales. (2023). Iron and Steel Production by Year, Measure and Area (Ref 179).
f. Defra (2022) UK Statistics on Waste (Ref 180).
g. Environment Agency, Waste Data Interrogator (2023) Waste Management Information 2021 (Ref 181).
h. Environment Agency (2024). 2023 Remaining landfill capacity, England (Ref 182) Materials Currently Required

14.4.4 The Main Site is currently vacant land which has been cleared and which is located in Flood Zone 1. There will need to be groundworks to clear the site, remove concrete including foundations and piles. The exiting jetties will require demolition and removal along with dredge material for the marine works. There is a potential scenario in which the hotspots of contaminated material within the historic landfill within the Main Site are excavated and waste replaced with clean fill if identified by ground investigation.

Materials Availability

14.4.5 Table 14.2 provides a summary of the availability of the main construction materials in North-east of England region and the UK. The items listed are considered to be appropriate to the bulk construction materials required for the Proposed Development for construction not involving modular plant. The overview provided excludes technological products but provides a proportionate context in which the assessment of impacts and significant effects from material consumption from the Proposed Development can be undertaken.

14.4.6 Across the UK, the availability of materials typically required for construction schemes, indicates that stocks / production / sales remain buoyant, although information on steel stocks, production or sales are not available for the region.

14.4.7 The North East England Aggregates Working Party Annual Monitoring Report 2020 (Ref 175) indicates that the landbank of permitted reserves for sand and gravel is 12.6 years and for crushed rock is 35.1 years (as of 31 December 2020).

Table 14.2: Construction Materials Availability in the North-east of England and the UK

Material Type	North East England	UK
Sand and gravel * (Ref 176)	2.2 million tonnes (Mt) (2022)	53.3 million tonnes (Mt) (GB) (2022)
Permitted crushed rock *	4.9Mt (2020) (Ref. 14.25)	125.9Mt (GB) (2021) (Ref. 14.26)
Primary aggregate (comprises sand and gravel and crushed rock) *	6.5Mt (2022) (Ref. 14.25)	183.3Mt (GB) (2021) (Ref. 14.26)
Concrete blocks + (Ref 176)	29.4 million square meters (Mm^2) (North) (2022)	72.8Mm^2 (2022)
Recycled and secondary aggregate*	* 0.8Mt (2022) (Ref. 14.25)	71.0Mt (2018) (GB) (Ref. 14.27)
Ready-mix concrete * (Ref 177)	0.6 million cubic meters (Mm^3) (2019)	24.7Mm^3 (2019)
Steel + (Ref 179)	(no data)	7.2Mt (2021)
Asphalt * (Ref 177)	0.8Mt (2019)	27.4Mt (2019)
# stocks + production * sales		
GB: Great Britain (England, Wales and Scotland) figures used where UK figures (including Northern Ireland) are unavailable		

14.4.8 The Tees Valley Core Strategy (Ref 161) includes plans for Mineral Safeguarding Areas. Whilst the Strategy indicates there are no shallow reserves of coal, sand and gravel, limestone, there are deep reserves of gypsum and salt located within and adjacent the Development Study Area. It is also noted that these reserves are already prevented from exploitation onsite by previous industrial use of the Site. However, the nature of gypsum and salt deposits means that they can also be worked (including potentially beneath the site) from other locations using standard techniques (solution or room and pillar mining).

Site Arisings Currently Generated

14.4.9 The Development Study Area formerly contained a chemical production plant which has been decommissioned and demolished; the assets on this part of the site do not, therefore, currently generate any site arisings. The existing operational infrastructure within the wider Development Study Area may currently generate site arisings, waste which can be diverted from landfill, or hazardous waste which can be treated.

14.4.10 The charts and data presented in this section confirm the availability of waste management facilities in the region; these facilities are expected to enable suitable recovery of site arisings generated by the Proposed Development

14.4.11 Defra data (shown in Table 14.3) (Ref 180) show that within England, the recovery rate for non-hazardous construction and demolition wastes has remained above 90% since 2015.

Table 14.3: Non-Hazardous Construction and Demolition Waste Recovery in England

Year	Generation (Mt)	Recovery (Mt)	Recovery rate (%)
2015	57.7	53.3	92.3%
2016	59.6	55.0	92.1%
2017	62.2	57.9	93.1%
2018	61.4	57.5	93.8%
2019	62.3	58.3	93.6%
2020	53.6	50.0	93.2%
Note: Defra's 2022 update of the data in this table did not extend the data range for England beyond 2020			

14.4.12 Regional data for construction and demolition waste (Table 14.4) show that the North East Region's recovery percentage is lower than the average across England, as demonstrated in Table 14.3. Data include the total waste received from both within north east England and from other regions in the UK (Ref 181).

Table 14.4: Construction Waste Management Routes for Waste Received in North East England (2023)

Waste Management Route	Inert and Non-hazardous Waste (Tonnes)	Hazardous Waste (Tonnes)	Total Waste (Tonnes)
Treatment and Recovery	2,335,646	18,370	2,354,016
Landfill	1,706,369	10,518	1,716,887
Total	4,042,015	28,888	4,070,903

14.4.13 Data in **Figure 14.1** has been collated to show that trends for waste recovery in the region have risen steadily over the past 21 years (Ref 181). Data is provided for all waste types in North East England and hence will include, but are not specific to, construction, demolition and excavation wastes.

14.4.14 Trends for transfer, recovery and metal recycling in North East England indicate that there is likely to be regional infrastructure and capacity for managing construction, demolition and excavation wastes from the Proposed Development. Construction and demolition recovery trends across North East England (**Figure 14.1**) and the data in Table 14.5 confirm this assertion (Ref 181).

14.4.15 The Tees Valley Joint Minerals and Waste Development Plan Policies and Sites (Ref 35) considers construction and demolition waste recycling and encourages the promotion of facilities able to manage site arisings close to their source. Policy MWC7 (Ref 147) allows for land to be provided to increase construction and demolition waste recycling from 700,000 tonnes per annum in 2016 to 791,000 tonnes per annum in 2021.

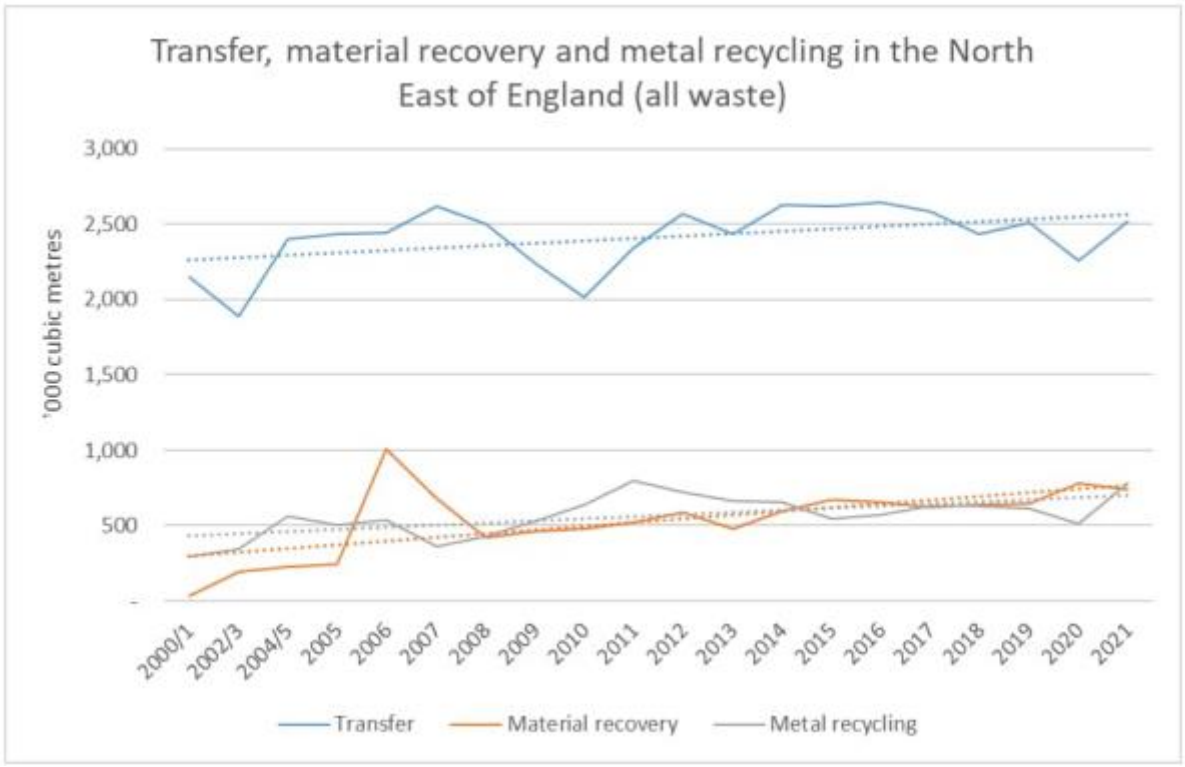


Figure 14.1: Transfer, Materials Recovery and Metal Recycling in North East England (2000/1 – 2021)

Table 14.5: Permitted Waste Recovery Sites in North East England (2021)

Waste Recovery Facility Type	Number of Sites
Incineration	15
Transfer	161
Treatment	151
Metal Recovery	121
Use of Waste	1
Total	449

Current Waste Generation and Disposal

14.4.16 The Development Study Area does not currently generate any significant waste for disposal to landfill. The magnitude of impact associated with disposing of this waste is expected – using professional judgement – to be negligible in the context of available regional capacity.

Remaining Landfill Capacity

14.4.17 The most recent Environment Agency data (Ref 182) confirm that at the end of 2023, 15 landfill sites in North East England were recorded as having 19.2 million cubic meters (m^3) of remaining capacity; this data is presented in Table 14.6, which also shows the change in capacity from 2020 to 2021.

Table 14.6: Remaining Landfill Capacity in North East England (2023)

Landfill Type	Capacity in 2023 (m^3)
Hazardous (merchant)	3,792,000
Inert	6,588,000
Non-hazardous (including stable hazardous waste cells)	8,891,000
Total	19,271,000
Notes	Restricted hazardous landfill sites are excluded as they only accept waste from restricted sources and producers, e.g. site operator / managing site.

14.4.18 Baseline regional landfill capacity is detailed in **Figure 14.2**. Simple statistical forecasting (using the Microsoft Excel forecasting function) has been used to demonstrate long term void capacity in the confirmed absence of future provision. For the purposes of forecasting remaining landfill capacity, the year 2028 has been used.

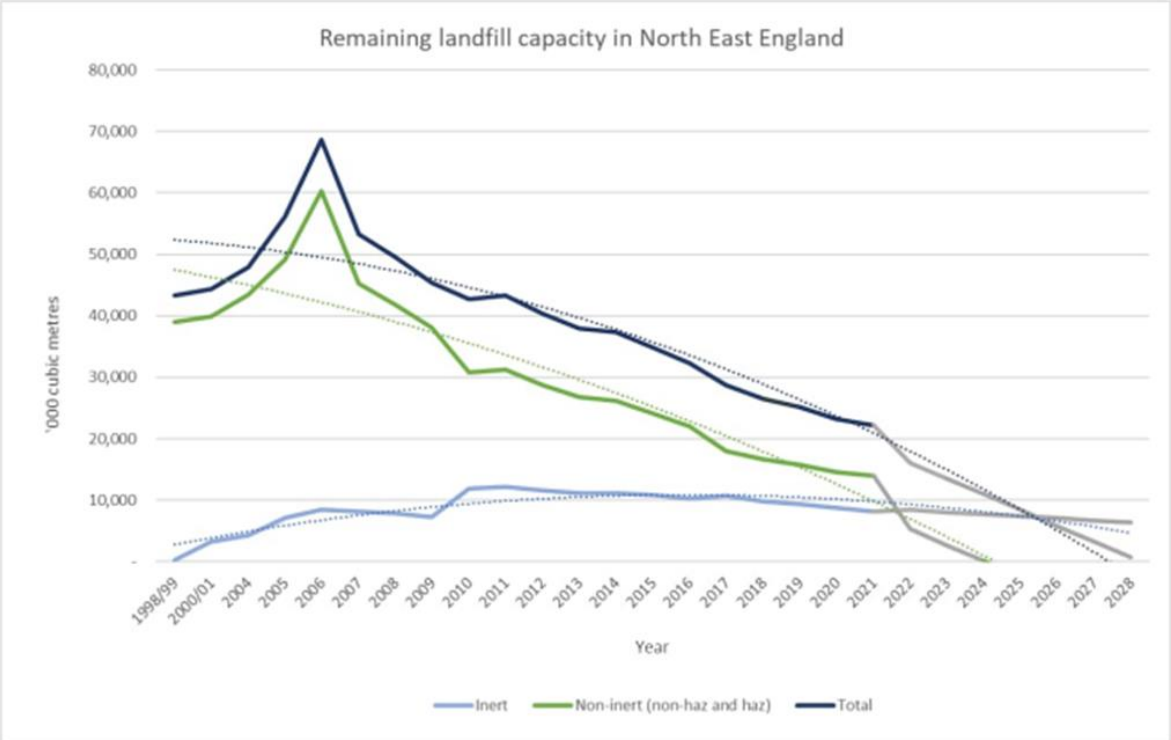


Figure 14.2: Remaining Landfill Capacity in North East England

14.4.19 Baseline data indicates that in the absence of future provision, inert, non-inert and total landfill capacity is likely to become an increasingly sensitive receptor throughout the duration of the construction phase and in operation. **Figure 14.2** shows that in the absence of future provision, waste capacity in North East England is forecast to reduce from 2021 to 2028 by as much as:

a. Inert waste: 22% to 6.4 million m^3;

b. Non-inert waste: 100% to 0 m^3; and
c. Total waste: 97% to 0.7 million m^3.

14.4.20 To align with IEMA Guidance (Ref 174) assessment classifications, remaining hazardous landfill capacity is assessed at a national level (rather than regionally). The following data in Table 14.7 confirms that at the end of 2021, England had 12.1Mm^3 of remaining capacity for hazardous (merchant) waste.

Table 14.7: Remaining Hazardous Waste Landfill Capacity in England (2021)

Landfill Type	Remaining Capacity in 2023 (m^3)
Hazardous merchant	9,680,000
Hazardous restricted*	695,000
Total hazardous	10,375,000
*Restricted landfill sites only accept waste from restricted sources and producers, e.g. site operator / managing site.	

Future Baseline

14.4.21 In a future baseline, and in the absence of the Proposed Development, it is considered that the land use within the Development Study Area will remain in its current state. It is anticipated that any material consumption or waste generation for disposal to landfill would be minimal.

14.4.22 The latest available information on waste infrastructure capacity has been used to inform the future baseline. Where information on likely trends is available, this is utilised to define the potential future baseline.

14.4.23 It is anticipated that different types of waste infrastructure capacity will continue to be available during the construction, operation and decommissioning of the Proposed Scheme.

14.4.24 Landfill will experience some use of available capacity as void space is taken. Government policy measures are also likely to continue to divert waste from landfill.

14.4.25 Permitted capacity data published by the Environment Agency for 2018 to 2023 has been used to estimate the projected landfill capacity for the North-east for the future baseline to 2028 (Table 14.8).

14.4.26 The average percentage change has then been applied to the permitted landfill capacity and projected forward to 2028. This method assumes that the average percentage change in permitted capacity for each class of landfill remains constant. The use of an average value taken from historical data provides an allowance for potential future increases or decreases in permitted capacity for each class of landfill. This approach is widely accepted industry standard for assessing landfill capacity.

14.4.27 The data identifies the future inert and non-hazardous landfill capacity in the North-east for the disposal of construction, operation and decommissioning waste arising from the Proposed Scheme.

Table 14.8: Future Landfill Capacity in the North-east

Facility Type	Estimated Capacity (m^3)				
	2024	**2025**	**2026**	**2027**	**2028**
Inert waste landfill	6,649,000	6,159,000	5,704,000	5,283,000	4,893,000
Non-hazardous landfill	9,032,000	8,899,000	8,767,000	8,637,000	8,510,000

14.4.28 Table 14.9 identifies the future hazardous landfill capacity in England for the disposal of construction, operation and decommissioning waste arising from the Proposed Scheme.

Table 14.9: Future Hazardous Landfill Capacity in England

Facility Type	Estimated Capacity (m^3)				
	2024	**2025**	**2026**	**2027**	**2028**
Hazardous waste landfill	10,375,000	8,545,000	7,037,000	5,796,000	4,774,000

14.5 Sensitive Receptors

14.5.1 In the context of this assessment, the following sensitive receptors have been identified:

a. Material resources – consumption impacts on materials' immediate and long-term availability, and results in depletion of natural resources.
b. Landfill void capacity – reductions in regional and national infrastructure result in unsustainable use and loss of resources, and temporary or permanent degradation of the natural environment.

14.6 Design, Embedded Mitigation, and Enhancement Measures

14.6.1 It is anticipated that the principle of sustainable resource management (including designing out waste) - in the context of the Waste Hierarchy and the Proximity Principle - will be applied and adopted through – as a minimum – the outline CEMP submitted as part of the DCO application. No other primary mitigations for materials and / or waste, for the construction and operation phases of the Proposed Development, have yet been committed to, but it is expected that measures will be identified and adopted as the design develops.

14.6.2 Where any construction waste is generated from the site clearance and preparation works, the Proposed Development will strive to re-use or recycle materials, such as concrete and hardstanding, onsite.

14.6.3 Examples of potential design (secondary) mitigation and enhancement measures are noted in Table 14.10, and will be considered as to their technical feasibility and overall viability'.

Table 14.10: Potential Design, Mitigation and Enhancement Measures

Element	Description	Stage
Materials	Identification and specification of material resources that can be acquired responsibly, in accordance with BES 6001 Framework Standard for Responsible Sourcing (Ref 183)	Design and construction
	Design for resource optimisation: simplifying layout and form, using standard sizes, balancing cut and fill, maximising the use of renewable materials, and materials with recycled or secondary content, and setting net importation as a scheme goal.	Design
	Design for off-site construction: Maximising the use of pre-fabricated structures and components, encouraging a process of assembly rather than construction.	Design
	Design for the future: Considering how materials can be designed to be more easily adapted over an asset lifetime, and how repurposing, reuse, and remanufacturing, as well as deconstructability and demountability of installed elements, can be maximised at end-of-first-life.	Design
	Design to incorporate products that can be leased or hired (Products as a Service) or digitalise elements of the works (in place of physical structures and assets).	Design
	Identify opportunities to minimise the export and import of material resources.	Design and construction
	Manage engineering plan configurations and layouts to ensure the most effective use of materials and arisings can be achieved.	Design and construction
	Implement a Materials Management Plan in accordance with the CL:AIRE Definition of Waste: Code of Practice (Ref 184).	Construction
Waste	Engage early with contractors to identify possible enhancement and mitigation measures (for example, waste exemptions), and to identify opportunities to reduce waste through collaboration and regional synergies.	Design and Procurement
	Design for recovery and reuse: identifying, securing and using material resources at their highest value, whether they already exist on site, or are sourced from other schemes.	Design
	Ensure arisings are properly characterised before or during design, to maximise the potential for highest value reuse.	Design
	Working to a proximity principle, ensuring arisings generated are handled, stored, managed and reused or recycled as close as possible to the point of origin.	Design and construction
	Identify areas for stockpiling and storing wastes that will minimise quality degradation and leachate and will minimise damage and loss.	Design and construction
	As part of a CEMP, specify management requirements for waste and arisings and capture information and data on site arisings recovered and diverted from landfill, by developing a Site Waste Management Plan once a preferred option has been selected.	Design

14.7 Description of Potential Likely Significant Effects

Construction Phase

14.7.1 During the construction phase, natural materials will be required, which could have a potentially significant adverse effect on the environment through the depletion of natural resources. The types and quantities of construction materials will be assessed as part of the ES.

14.7.2 Waste will be generated during construction phase, which has the potential for significance adverse effects on remaining landfill capacity. Landfill capacity is considered a sensitive receptor in the UK. The potential for waste to be diverted from landfill through reuse of site arisings and recovery, recycling or treatment will reduce the adverse effects on landfill capacity. The types and quantities of waste generated and the anticipated disposal method will be assessed as part of the Environmental Statement.

Operation Phase

14.7.3 The feedstock for the Proposed Development (biomass) will be sustainably sourced biomass (which may include agricultural residues) and therefore will not impact on the depletion of material resources and is therefore not within the scope of this assessment.

14.7.4 Waste generated by the operation of the Proposed Development is anticipated to be managed accordance with the Waste Hierarchy to maximise diversion from landfill where possible. Some operational waste may be disposed of to landfill, such as ash and slag, if alternative waste recovery routes cannot be found. In lieu of an assessment of operational waste, the development of an Outline Waste Management Plan will be prepared to accompany the ES.

Elements Scoped In or Out of Further Assessment

14.7.5 The elements scoped in and out for further assessment are summarised in Table 14.11.

Table 14.11: Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Consumption of material resources associated with the construction of the Proposed Development	Construction (site preparation)	X		Further information is required to assess the potential impacts of the Proposed Development construction on material resource availability, These materials are a finite resource and, in the absence of comprehensive data for the entire site and based on the scale and nature of the Proposed Development, this element should be scoped into the ES for further assessment but could be subject to scoping out following liaison with stakeholders.

Element	Phase	Scoped In	Scoped Out	Justification
Consumption of material resources associated with the Proposed Development during operation	Operation	X		Operation phase activities of the Proposed Development will consume non-sustainable material resources such as natural gas and chemicals. As such, the impacts associated with material resource consumption are scoped in.
Disposal and recovery of waste associated with the construction and of the Proposed Development	Construction (including site preparation)	X		Further information is required to assess the potential impacts of the Proposed Development on existing waste infrastructure and landfill capacity. Assessment will reconfirm remaining landfill capacity and identify on-site storage, potential disposal / treatment / reuse of all waste types (e.g. inert, non-hazardous and hazardous) and required mitigation measures. The site is cleared and no demolition activities (for example existing buildings) are anticipated as part of the construction phase for the Proposed Development. Concrete slabs and foundations may be broken up, crushed and re-used on site under a deposit for recovery permit
Disposal and recovery of waste associated with the Proposed Development during operation	Operation		X	The operation of the Proposed Development is anticipated to generate waste arisings (e.g. ash and slag). An Outline Waste management Plans will be prepared as part of the ES submission in lieu of scoping in operational waste. The Outline Waste Managment Plan will (where applicable) review relevant policies and procedures and solid waste generation information, with a view to formalising the management arrangements for operational solid waste arising from the Proposed Development.
Consumption of material resources associated with the Proposed Development decommissioning	Decommissioning		X	The design life of the Proposed Development is anticipated to be 30 years. Material resources are not anticipated to be required for decommissioning the works. As such, the effects associated with material resource consumption are considered to be minimal and not significant
Disposal and recovery of waste associated with the Proposed	Decommissioning		X	The design life of the Proposed Development is anticipated to be at least 30 years. As it is not practicable to reliably predict the scale and nature of waste infrastructure and management

Element	Phase	Scoped In	Scoped Out	Justification
Development decommissioning				processes that will be available so far into the future, effects associated with waste generation and disposal at the time of decommissioning are scoped out from this chapter but should be assessed and managed in the decommissioning plan in accordance with best practice at the time.
Impacts and effects associated with the extraction of raw resources and the manufacture of products	Construction and operations		X	The impacts of extraction and manufacture of materials cannot be assured with any accuracy and are subject to separate environmental consent and permitting processes. Therefore, they are scoped out of the assessment.
Impacts and effects resulting from the transportation of material resources and waste to and from the site	Construction and operations		X	The impacts associated with transportation are considered as part of **Chapter 5: Air Quality, Chapter 6: Noise and Vibration**, **Chapter 12: Greenhouse Gases**, and **Chapter 18: Traffic and Movement** – as appropriate to these specialist topics

14.7.6 The IEMA Guidance (Ref 174) will be used to assess the potential impacts and effects from the Proposed Development, using the process and significance criteria it sets out. It is anticipated that Method W1 (Void Capacity, as detailed in the IEMA Guidance) will be used to best reflect the scale and nature of the Proposed Development.

14.7.7 In accordance with the IEMA Guidance, the assessment will be a quantitative exercise that aims to identify the following:

a. The type and volume of materials to be consumed by the Proposed Development, including details of any recycled materials content;
b. Any sterilisation of Mineral Safeguarding Areas;
c. The type and volume of waste to be generated by the Proposed Development, with details of planned recovery and / or disposal method (for example on-site reuse, off-site recycling, disposal to landfill);
d. The cut and fill balance; and
e. Details of any materials to be specified, where sustainability credentials (particularly those that improve resource efficiency) afford performance beyond expected industry standards.

14.7.8 As described previously in this chapter, the sensitive receptors that will be incorporated into the assessment are:

a. Material resources – consumption impacts on their immediate and long-term availability, resulting in depletion of natural resources; and

b. Landfill void capacity – reductions in regional and national infrastructure, resulting in unsustainable use or loss of resources and temporary or permanent degradation of the natural environment.

14.7.9 The impacts from the Proposed Development during the construction phase that would be considered in the assessment include:

a. Anticipated reductions in availability (stocks, production and/or sales) of materials regionally and nationally; and
b. Anticipated reductions in the landfill void capacity of regional and national infrastructure.

14.7.10 The likely types and estimated quantities of construction material resources required (including site arisings generated) for the Proposed Development will be assessed. Impacts and effects will be evaluated against data for the regional and national materials markets, where information is available.

14.7.11 The likely types and estimated quantities of construction waste to be generated by the Proposed Development will be assessed. Impacts will be evaluated against the capacity of regional (or where justified, national) waste management infrastructure.

14.8 Significance of Effect Criteria

Sensitivity

14.8.1 The criteria for assessing sensitivity of materials and waste is set out in Table 14.12.

Table 14.12: Materials and Waste Sensitivity Criteria

Sensitivity	Materials Criteria On balance, the key materials required for the construction of the Project…	Inert and Non-hazardous Waste Criteria Landfill void capacity is expected to…	Hazardous Waste Criteria Landfill void capacity is expected to…
Negligible	Are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; and/or are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*	...remain unchanged or is expected to increase through a committed change in capacity.	...remain unchanged or is expected to increase through a committed change in capacity.
Low	Are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and/or are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.	...reduce minimally: by <1% as a result of wastes forecast	...reduce minimally: by <0.1% as a result of wastes forecast

Sensitivity	Materials Criteria On balance, the key materials required for the construction of the Project…	Inert and Non-hazardous Waste Criteria Landfill void capacity is expected to…	Hazardous Waste Criteria Landfill void capacity is expected to…
Medium	Are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; and/or are available comprising some sustainable features and benefits compared to industry standard materials.	...reduce noticeably: by 1-5% as a result of wastes forecast.	...reduce noticeably: by 0.1-0.5% as a result of wastes forecast.
High	Are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; and/or comprise little or no sustainable features and benefits compared to industry-standard materials.	...reduce considerably: by 6-10% as a result of wastes forecast	...reduce considerably: by 0.5-1% as a result of wastes forecast.
Very High	Are known to be insufficient in terms of production, supply and/or stock; and/or comprise no sustainable features and benefits compared to industry-standard materials.	... reduce very considerably (by>10%); end during construction or operation; is already known to be unavailable; or would require new capacity or infrastructure to be put in place to meet forecast demand.	... reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or would require new capacity or infrastructure to be put in place to meet forecast demand.
Notes	* Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: **a.** comprise reused, secondary or recycled content (including excavated and other arisings); **b.** support the drive to a circular economy; and/or c. in some other way reduce lifetime environmental impacts.		

Magnitude

14.8.2 Table 14.13 sets out the criteria for assessing magnitude of materials and waste. For the purposes of the assessment, Method W1 (void capacity) as set out in the IEMA Guidance relating to materials and waste (Ref 174), will be used.

Table 14.13: Materials and Waste Magnitude Criteria

Magnitude	Materials Criteria The assessment of the Project is made by determining whether the consumption of…	Inert and Non-hazardous Waste Criteria The percentage depletion of remaining landfill void capacity	Hazardous Waste Criteria The percentage depletion of remaining landfill void capacity
No Change	...no materials are required	Zero waste generation and disposal from the development.	Zero waste generation and disposal from the development.
Negligible	...no individual material type is equal to or greater than 1% by volume of the regional* baseline availability.	Waste generated by the development will reduce regional* landfill void capacity baseline** by <1%	Waste generated by the development will reduce national landfill void capacity baseline** by <0.1%
Minor	...one or more materials is between 1-5% by volume of the regional* baseline availability; and/or the development has the potential to adversely and substantially*** impact access to one or more allocated mineral site (in their entirety), placing their future use at risk.	Waste generated by the development will reduce regional* landfill void capacity baseline** by 1-5%.	Waste generated by the development will reduce national landfill void capacity baseline** by 0.1-0.5%.
Moderate	...one or more materials is between 6-10% by volume of the regional* baseline availability; and/or one allocated mineral site is substantially*** sterilised by the development rendering it inaccessible for future use.	Waste generated by the development will reduce regional* landfill void capacity baseline** by 6-10%.	Waste generated by the development will reduce national landfill void capacity baseline** by <0.5 - 1%.
Major		Waste generated by the development will reduce regional* landfill void capacity baseline** by >10%.	Waste generated by the development will reduce national landfill void capacity baseline** by >1%.
Notes	* or where justified, national. ** forecast as the worst-case scenario, during a defined construction phase. *** justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed.		

Significance of Effects

14.8.3 In accordance with the IEMA Guidance (Ref 174), the significance of effects from materials and waste will be determined by comparing sensitivity and magnitude within the significance of effects matrix provided in Table 14.14.

Table 14.14: Matrix to Assign Significance of Effects Category

		Magnitude				
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
Sensitivity of Receptor	***Very high***	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or Moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

Effect Threshold

14.8.4 At this stage of the assessment a number of potential significant effects have been identified below for materials and waste following the IEMA Guidance.

Construction

14.8.5 Material assets

a. Safeguarded mineral resources (salt and gypsum/anhydrite) could theoretically be sterilised for extraction from the Proposed Development site rendering it inaccessible for future use. However, Mineral resources have been discounted from further assessment as it is considered that they are already sterilised both within the Main Site by the existing development and also within the wider surrounding area by the existing surrounding industries. It is also noted that the deep reserves of gypsum and salt are shown across a significant area of Tees Valley and that development of the site would not prevent extraction of these minerals at depth if accessed from a different location;
b. One or more materials between 6-10% by volume of the regional (or where justified national) baseline availability; and
c. 30-59% diversion from landfill rate.

14.8.6 Waste

a. Reduction in the capacity of inert landfill in the expansive study area;
b. Reduction in the capacity of non-hazardous landfill in the expansive study area; and

c. Reduction in the capacity of hazardous landfill in England.

Operation

14.8.7 Waste

a. 30-59% diversion from landfill rate.
b. Reduction in the capacity of inert landfill in the expansive study area;
c. Reduction in the capacity of non-hazardous landfill in the expansive study area; and
d. Reduction in the capacity of hazardous landfill in England.

14.9 Limitations and Assumptions

14.9.1 To ensure transparency within all stages of the EIA process, the following limitations and assumptions have been identified:

Materials

14.9.2 The assessment of materials is based upon the validity of the collated information, regarding the resources that are expected to be consumed during the 'in scope' lifecycle phases of the Proposed Development;

14.9.3 A lifecycle assessment (including embodied carbon and water) of materials has not been included, as the effort and resources required to complete such an exercise are deemed disproportionate to the benefit they would offer the assessment of significance of effects. Furthermore, many of the elements assessed within a lifecycle assessment are not directly relevant to the goals of this chapter. Embodied Carbon (as part of a whole life carbon assessment) is assessed in **Chapter 12: Greenhouse Gases** of this report.

Waste

14.9.4 The assessment of impacts and effects on landfill void capacity will be based upon the validity of the collated information, regarding the waste generated and disposed of by the Proposed Development during 'in scope' phases of the development;

14.9.5 Landfill operators can claim commercial confidentiality for their data at the time of submission to the Environment Agency; data for sites with a commercial confidentiality agreement in place are therefore unavailable for the analyses presented in this chapter.

15. Socioeconomics

15.1 Introduction

15.1.1 This chapter considers the impacts of the Proposed Development on socioeconomics during construction and operation, and any potential significant effects. The socioeconomic assessment will include employment generation and demand for accommodation and community facilities. The chapter sets out the proposed methodology for the socioeconomic assessment and identifies those impacts that can be scoped out of the assessment. Where relevant, further assessment will be presented in the ES.

15.2 Policy, Legislation, and Guidance

15.2.1 There are no legislative requirements which exist in relation to socioeconomics, therefore the assessment is guided by the Government's planning policy and guidance. The policy and guidance relevant to the assessment of socioeconomics and the Proposed Development is as set out in Table 15.1 below:

Table 15.1: Socioeconomics - Summary of Key Policy and Guidance

Policy / Guidance	Description
Policy	
National Planning Policy Framework (NPPF) 2024 (Ref 38)	Published by the UK Government, the NPPF sets out planning policies and how these are expected to be applied. Paragraph 86a outlines that planning policies should "set out a clear economic vision and strategy which positively and proactively encourages sustainable economic growth".
National Policy Statement for Energy EN-1 2024 (Ref 36)	The National Policy Statement (NPS) sets out national policy for the delivery of major energy infrastructure. It has effect for the decisions by the Secretary of State on applications for energy developments that are nationally significant. Under Section 4.3 'Environmental Effects/Considerations', paragraph 4.3.4 states "To consider the potential effects, including benefits, of a proposal for a project, the applicant must set out information on the likely significant environmental, social and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated or compensated for, following the mitigation hierarchy. This information could include matters such as employment, equality, biodiversity net gain, community cohesion, health and well-being." Under Section 5.13, 'Socio-economic Impacts', paragraph 5.13.2 states that "Where the project is likely to have socio-economic impacts at local or regional levels, the applicant should undertake and include in their application an assessment of these impacts as part of the [Environmental Statement]".

Policy / Guidance	Description
NPS for Renewable Energy Infrastructure (EN-3) (2023) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed.
North-east Strategic Economic Plan 2022 (Ref 348)	The North-east Strategic Economic Plan aims to create "100,000 more and better jobs for the North-east economy", stating "Our aim is to deliver on national energy policy, while driving growth in the North-east. We will deliver on national and regional decarbonisation goals through unique North-east energy projects and make the North-east the go-to place to develop and showcase new energy solutions that change the world".
Stockton-on-Tees Borough Council Local Plan (Ref 343 (Ref 55)	Adopted in 2019, the STBC Local Plan sets out how the Council will develop the borough until 2032. Policy SD4 – Economic Growth Strategy states that economic development needs will be directed to appropriate locations within the borough to ensure the delivery of sustainable economic growth. As part of the Seal Sands, North Tees and Billingham Chemical Complex areas, the Site falls within the main growth locations and therefore will be safeguarded from general employment development which is unrelated to the main cluster.
Guidance	
Homes and Communities Agency Employment Density Guide 3rd Edition 2015(2) (Ref 349)	The Homes and Communities Agency (HCA) (now Homes England) provides an employment density matrix for the different use classes, as a guide for future employment assessment.
Homes and Communities Agency Additionality Guide 4th Edition 2014 (Ref 350)	The HCA outlines guidance for composite multipliers (the combined effect of indirect and induced multiplier effects) for displacement and leakage rates that should be applied as part of the assessment of employment generation.
The North-east of England Plan Regional Spatial Strategy to 2021 2008(1) (Ref 347)	The North-east of England Plan was the Regional Spatial Strategy (RSS) for the North-east of England. The Plan outlined a broad development strategy for the region for the period to 2021. It has now been withdrawn. Theme 3A: 'Delivering Economic Prosperity and Growth' provides a framework for economic development, skills and training, and regeneration to deliver an "Urban and Rural Renaissance". The theme outlines the aim to strengthen the regional economy by encouraging economic activity in both urban and rural areas. It seeks to ensure economic diversity, by recognising the region's strong position in industries such as the renewable energy sector.

15.3 Study Area

15.3.1 In the absence of statutory guidance on socioeconomic assessments, reference has been made to planning policy, best practice guidance and professional judgement / experience.

15.3.2 For the purposes of this socioeconomic assessment, study areas include: a Local Impact Area (Stockton-on-Tees and Redcar and Cleveland local authority areas); a Wider Impact Area (Middlesbrough and Hartlepool local authority areas); a Regional Study Area (North East England); and a National Study Area (England and Wales).

15.4 Employment Generation

15.4.1 The economic impact of the Proposed Development is considered relative to North East England, as this represents the principal labour market catchment area. Stockton-on-Tees (where the Proposed Development is located) is accessible from all areas of the North East and is likely to be served by labour from the wider region rather than just restricted to the local labour market; particularly given the scale and nature of the Proposed Development. The North-east labour market incorporates the population that may reasonably be expected to travel to and benefit from the Proposed Development. The study area for economic impacts follows guidance set out within the Employment Density Guide 3rd Edition (Ref 349) and Additionality Guide 4th Edition (Ref 350).

15.5 Increased Demand for Accommodation from Temporary Workers

15.5.1 Any workers employed at the Site during the construction phase are likely to require access to local accommodation, should they be drawn from a wider geographical area outside of the region. This may be due to the requirement for a specialist construction skill or activity. Given that any workers who are temporarily relocating to the local area during construction will likely reside within the locality, the surrounding settlements within an approximately 3km radius from the Site will be considered. In addition to this, the settlements of Billingham, Stockton-on-Tees, Middlesbrough and Hartlepool are also relevant for consideration, given that these are larger settlements which offer a range of local amenities including temporary accommodation, hotels, and other services. The extent of the study area has been determined based on professional judgement and is deemed appropriate to capture the receptors most likely to be affected by the Proposed Development.

15.6 Baseline Conditions and Future Baseline

15.6.1 A summary of baseline conditions is presented below. Crime and Safety have been omitted from this baseline study under the assumption that as the Proposed Development is located within a private industrial estate, adequate security and safety measures will be implemented, and crime is expected to be a low concern and will not be considered further in this chapter. The key sources of information on socioeconomic baseline conditions will be Nomis (official census and labour market statistics) and the Office for National Statistics (ONS).

Baseline

Population

15.6.2 In 2023, the population of the Local Impact Area was around 202,000, the population of the Wider Impact Area was 588,000, the population of the North-

east of England was around 2.7 million, and the population of England and Wales was almost 61 million (ONS, 2023). The Local Impact Area's level of elderly dependency was the same as that of the National Study Area at this time, with people aged 65 and over making up almost a fifth of the population. The Local Impact Area and Wider Impact Area had the smallest working age populations (as a proportion of their total population), with people aged 16 to 64 making up just 61% of the total population in the study area. Meanwhile the working age population as a percentage of the total population in the Regional Study Area and National Study Area was 62% and 63%, respectively.

15.6.3 The percentage of people aged 15 or younger was relatively consistent across the study areas, with the largest discrepancy being just 2 percentage points between the Local and Wider Impact Areas (19%) and the North-east (17%).

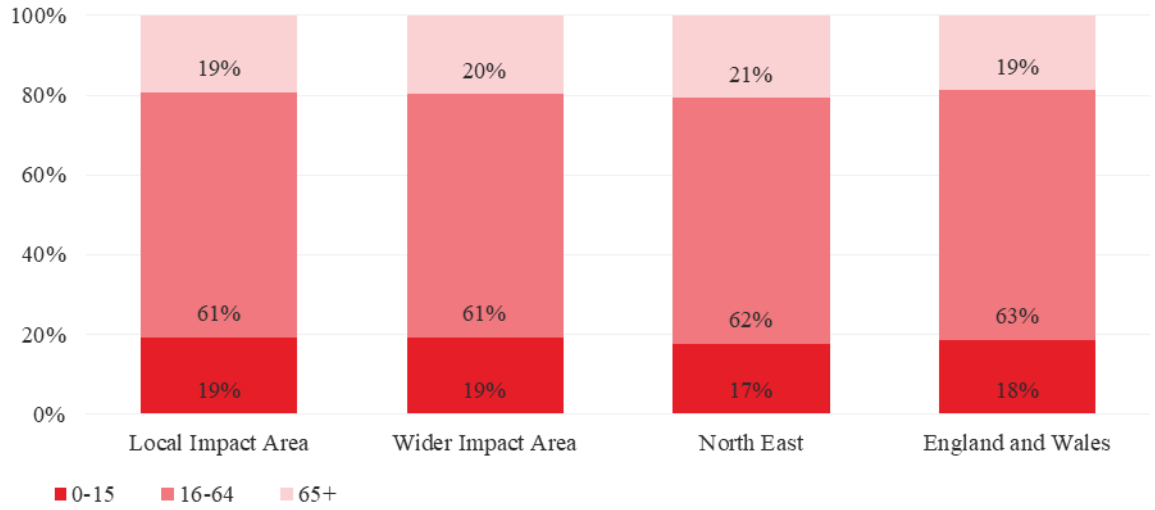


Figure 15.1: Age Structure (ONS, 2023)

Employment

15.6.4 Employment data reveals that, in 2023, Health was the dominant sector for employment across all study areas, accounting for 13.4% of jobs in the Local Impact Area, 19.2% of jobs in the Wider Impact Area, 16.2% of jobs in the North-east of England and 13.4% of jobs across England and Wales (BRES, 2023).

15.6.5 In the Local Impact Area, Retail, Education and Professional, scientific & technical services each accounted for 8.5% of jobs, while Manufacturing accounted for 12.2% of jobs. In the Wider Impact Area, Manufacturing was the second largest employer (9.6% of the workforce), followed by Education (9.4%) and Retail (9.1%).

Occupations

15.6.6 Data obtained from the Annual Population Survey reveals that around a fifth (21%) of the workforce in the Local Impact Area was employed in 'professional' occupations in 2023. The second most common type of occupation in the Local Impact Area was caring, leisure and other service' (14%) and Elementary (12%) was the third. Professional occupations were the most common occupation type

in the Wider Impact Area, while 12% of the workforce was employed in associate professional occupations, and 12% were employed in caring, leisure and other service occupations. The Local Impact Area had a notably high proportion employed in process, plant and machine operations, while the Wider Impact Area had the highest proportion employed in elementary occupations.

Table 15.2: Employment by Sector, % (2023)

Industry	Local Impact Area	Wider Impact Area	North-east	England and Wales
Agriculture, forestry & fishing	0.4	0.4	1.1	1.2
Mining, quarrying & utilities	1.8	2.5	1.4	1.1
Manufacturing	12.2	9.6	9.9	7.4
Construction	7.3	6.6	5.1	4.9
Motor trades	1.8	1.2	1.1	1.7
Wholesale	2.7	2.3	1.9	3.7
Retail	8.5	9.1	8.8	8.2
Transport & storage	6.1	5.6	5.6	5.0
Accommodation & food services	7.3	6.8	7.7	7.8
Information & communication	3.0	2.3	3.3	4.6
Financial & insurance	1.2	1.0	1.9	3.3
Property	1.8	2.4	2.3	2.0
Professional, scientific & technical	8.5	6.5	5.8	9.5
Business administration & support services	7.3	6.3	6.9	8.7
Public administration & defence	4.3	4.8	7.0	4.4
Education	8.5	9.4	9.3	8.3
Health	13.4	19.2	16.2	13.4
Arts, entertainment, recreation & other services	3.7	4.1	4.7	4.6

Economic Activity

15.6.7 Data obtained from the Annual Population Survey (2023) reveals that the economic activity rate and employment rate in the Local Impact Area was more closely aligned with that of the National Study Area than were the Regional Study Area and Wider Impact Area, with the Wider Impact Area experiencing a 4% lower economic activity rate, and 5% lower employment rate, than England and Wales.

15.6.8 Across the Local Impact Area, Wider Impact Area and Regional Study Area, the proportion of people who are self-employed is relatively low, at 7% compared to 10% across England and Wales. The unemployment rate - that is, the proportion of economically active people who are not employed - is higher in the Local and

Wider Impact Areas (both 5%) than the Regional and National Study Areas (both 4%).

15.6.9 In the Local and Wider Impact Areas, the proportion of the economically inactive population who want a job is notably higher than the average for the National Study Area, at 33% and 25% respectively. The proportion of economically inactive individuals who want a job in the Local Impact Area is almost double the average for England and Wales.

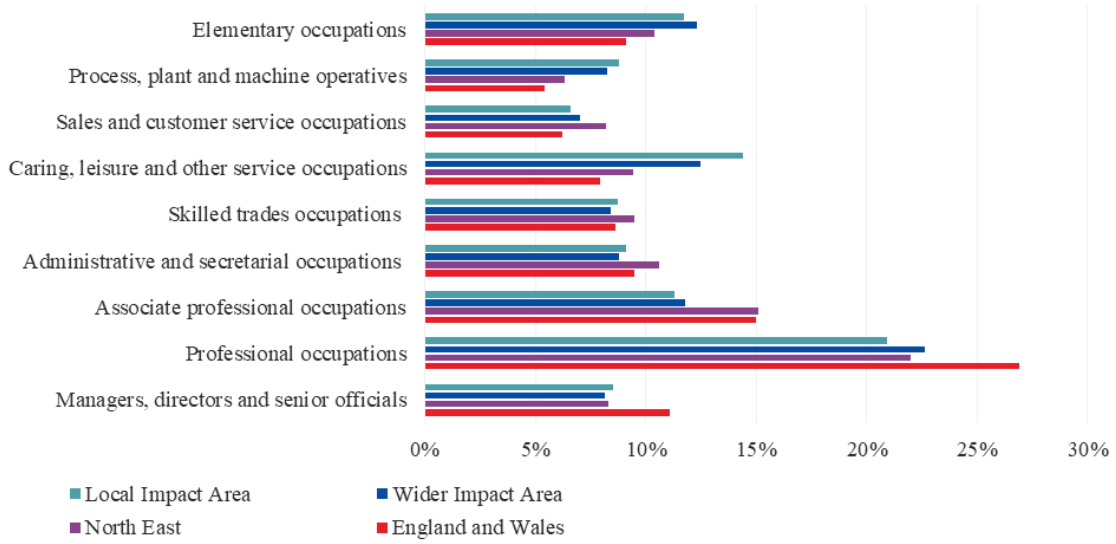


Figure 15.2: Occupations (APS 2023)

Table 15.3: Economic Activity of the Working Age Population (APS, 2023)

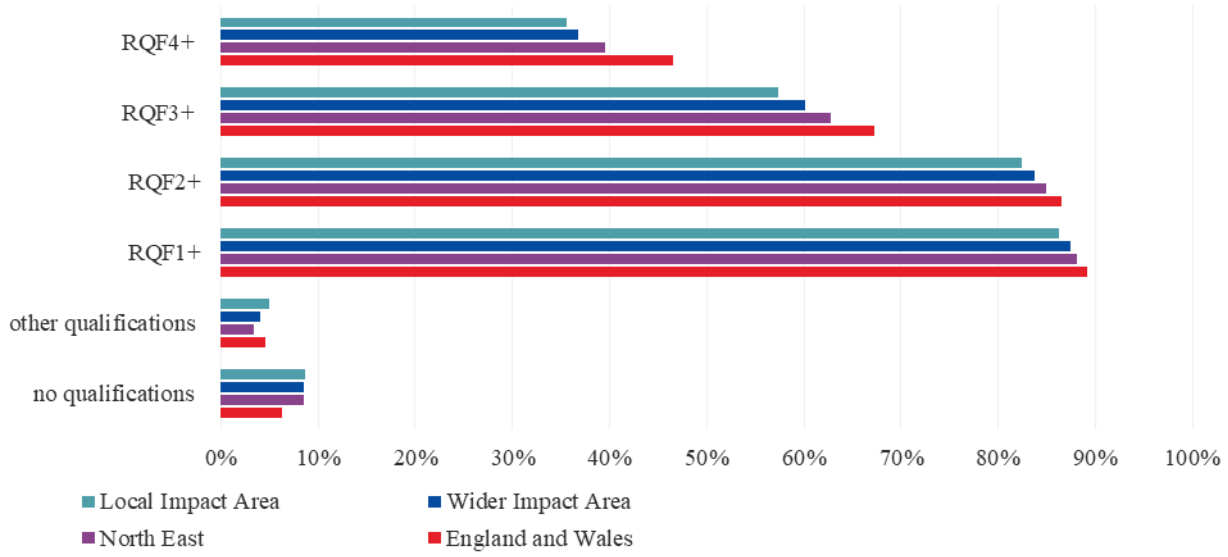
	Local Impact Area	Wider Impact Area	North East	England and Wales
Economic activity rate	78%	75%	76%	79%
Employment rate	74%	71%	73%	76%
% who are employees	67%	64%	65%	66%
% who are self employed	7%	7%	7%	10%
Unemployment rate	5%	5%	4%	4%
% who are economically inactive	22%	25%	24%	21%
% of economically inactive who want a job	33%	25%	20%	18%
% of economically inactive who do not want a job	67%	75%	80%	82%

Qualifications

15.6.10 In 2023, the proportion of the working age population with an RQF Level 1 qualification was smallest in the Local Impact Area, slightly larger in the Wider

Impact Area, larger again in the Regional Study Area, and greatest across England and Wales. The same is true for RQF Level 2, 3 and 4 qualifications, with the study areas experiencing more similar levels of educational attainment at lower RQF levels. Overall, areas located closer to the Proposed Development Site appear to experience lower levels of educational attainment.

15.6.11 In 2023, around half the working age population (47%) in England and Wales had an RQF level 4 qualification (equivalent to a Level 4 NVQ), while only 40% of the population in the North-east held one. The Local Impact Area had the lowest proportion of people aged 16 to 64 with an RQF level 4 qualification at this time, with just 36% holding one. The Local Impact Area and Regional Study Area had the highest proportions of people aged 16 to 64 without any qualifications (both 9%).



15.6.12

Figure 15.3: Qualifications (APS, 2023)

Deprivation

15.6.13 The English Indices of Deprivation (MHCLG, 2019) (Ref 352) uses a combination of information relating to seven ‘domains’: income; employment; health deprivation and disability; education, skills and training; barriers to housing and services; crime; and living environment to create an overall score of deprivation. Deprivation is scored between 1 and 317 (representing the 317 local authority districts within England), with a score of 1 being most deprived and 317 being least deprived.

15.6.14 The English Indices of Deprivation ranks Stockton-on-Tees 113th of 317 local authorities in England. The site falls within Stockton-on-Tees 003B LSOA, which is amongst the 10% most deprived neighbourhoods in England (IMD decile 1). Stockton-on-Tees is ranked 39th for proportion of LSOAs which place within the 10% most deprived LSOAs nationally, while Redcar and Cleveland ranks 29th, Hartlepool ranks 10th and Middlesbrough ranks 1st. This indicates that the Wider Impact Area experiences a relatively high level of deprivation.

15.6.15 Within the Wider Impact Area, Stockton-on-Tees has the lowest ranks for income (99th), employment (67th) and education, skills and training (139th), meaning that it is the least deprived in those three areas, while Middlesbrough has the highest rank across all three domains.

Table 15.4: Indices of Deprivation, Wider Impact Area (MHCLG, 2019)

	Redcar and Cleveland	Middlesbrough	Hartlepool	Stockton-on-Tees (Local Impact Area)
Local authority rank	62	16	25	113
% of LSOAs in first decile rank	29	1	10	39
Income rank	50	9	16	99
Employment rank	17	4	5	67
Education, skills & training rank	102	36	77	139

Gross Annual Earnings

15.6.16 Data obtained from the Annual Survey of Hours and Earnings (ASHE) shows that residents of the Wider Impact Area have the lowest average and median gross annual earnings of any of the study areas. Across all geographies the mean income is higher than the median income, suggesting that a few highly paid residents of the respective study areas skew the data. Notably, residents of the Local Impact Area experience higher gross annual earnings than residents of the Wider Impact Area.

15.6.17 The discrepancy between median and mean gross annual earnings for residents is smallest in the Local Impact Area and largest for residents of the National Study Area. This discrepancy is also relatively small in the Wider Impact Area and Regional Study Area, suggesting that the North-east experiences lower levels of income inequality within the region, while income inequality is greater across England and Wales.

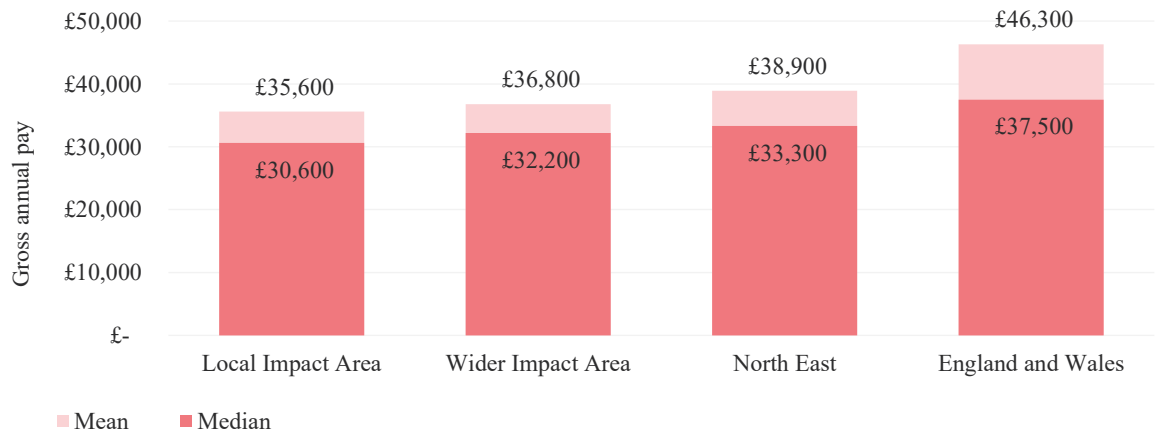


Figure 15.4: Residence-based Gross Annual Earnings (ASHE, 2024)

15.6.18 Similarly, workplace-based gross annual earnings data suggests that mean gross annual earnings are lowest in the Wider Impact Area and greatest in the National Study Area, and the discrepancy between median and mean earnings is relatively small in the North-east when compared to the average for England and Wales.

15.6.19 The median and mean gross annual earnings of residents of the Wider Impact Area are marginally higher than the area's workplace-based earnings, potentially suggesting that residents seek work outside the Wider Impact Area and, as a result, obtain higher salaries and wages. The same is true of the Local Impact Area and Regional Study Area.

15.6.20 The mean salary of workers in the Local Impact Area is higher than the mean salary of workers in the Wider Impact Area. However, the median salary of workers in the Local Impact Area is lower than that of the Wider Impact Area. This indicates that while the average salary in the Local Impact Area is skewed upwards by a few highly paid workers, workers in the Local Impact Area generally earn slightly less than workers in the Wider Impact Area.

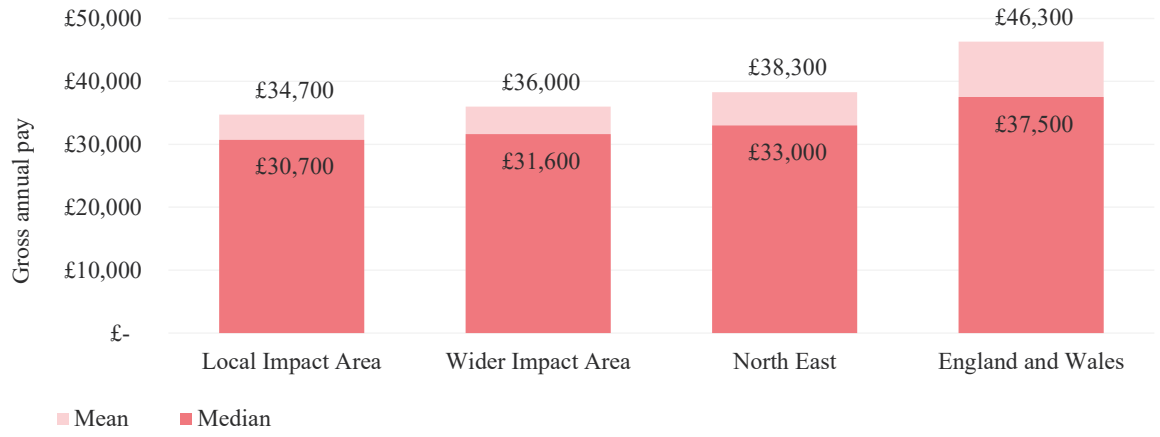


Figure 15.5: Workplace-based Gross Annual Earnings (ASHE, 2024)

Gross Value Added (GVA)

15.6.21 GVA is a productivity metric that measures the value generated by any unit engaged in the production of goods and services. It provides a currency value for outputs less the cost of inputs directly attributable to that production, such as raw materials and labour contracts. Therefore, GVA per worker represents the average economic contribution made by an individual worker to a region, sector or economy.

15.6.22 In 2022, the total GVA in the Local Impact Area was around £6 billion, and the GVA per worker for this area was around £73,200 (ONS, BRES). In the Wider Impact Area, GVA totalled £13 billion, and GVA per worker stood at £60,200. Notably, the GVA per worker for the Local Impact Area was just over £4,000 more than that of the National Study Area, £13,000 higher than that of the Wider Impact Area, and almost £16,000 higher than the figure for the Regional Study Area. In 2022, the total GVA in the North-east was £63 billion, and across England and Wales it was more than £2 trillion.



Figure 15.6: GVA Per Worker (2022)

Housing

15.6.23 Data obtained from the Census (2021) reveals that 66% of homes within the Local Impact Area are owned. This figure is higher than that of the Wider Impact Area, Regional Study Area and National Study Area. Across all study areas, around half of those who own their home have a mortgage or loan or shared ownership. The North-east has the highest proportion of social rented properties of the identified study areas (22%), while the Local Impact Area has the lowest, at 16% (just 1 percent less than the proportion across England and Wales).

15.6.24 Around a fifth of the residential properties located in the Wider Impact Area and Regional Study Area are social rented. The proportion of residential properties that are privately rented is lowest in the Local Impact Area and North-east (17%) and highest across England and Wales (20%).

Table 15.5: Housing Tenure (Census 2021)

	Local Impact Area	Wider Impact Area	North-east	England and Wales
Total households	83,800	246,600	1,175,700	24,783,200
Owned	66%	62%	60%	62%
Owns with a mortgage or loan or shared ownership	34%	30%	28%	30%
Social rented	16%	20%	22%	17%
Private rented	17%	18%	17%	20%

Local Employment Context

15.6.25 There are a range of accommodation options and providers within the Wider Impact Area, including larger hotel chains, B&Bs, serviced apartments and Apart-hotels.

Future Baseline

15.6.26 As the Proposed Development is located in a heavily industrial area, the surroundings are likely to remain the same in the medium to long term. The STBC Local Plan (Ref 55) outlines targets for economic growth in the period to 2032, which encourage industrial activities. It is likely that in the absence of the Proposed Development, similar heavy industrial activities would be developed on the Site.

15.7 Sensitive Receptors

15.7.1 The identified Sensitive Receptors are as follows:

a. Local economic receptors, including working age individuals within the local and regional level study areas, who would access jobs during the construction and operational phases of the Proposed Development.
b. Local business/community receptors, including accommodation providers, services, and facilities who will serve construction workers either through supply chain linkages, or directly during the construction phase of the Proposed Development.

15.8 Design, Embedded Mitigation, and Enhancement Measures

Construction and Operation Phase

15.8.1 Relevant design, mitigation and enhancement measures will be identified in the ES. These are likely to include the adoption of best practicable means, such as:

a. The Applicant will look to work with the promoters of other schemes to mitigate and reduce the effect of the cumulative construction workforce as far as possible.
b. The Applicant would work proactively to provide local employment opportunities and to enable access to training where possible; and
c. The processes used to recruit and manage staff working at the Proposed Development would be demonstrably fair and offer equal opportunities to all.

15.9 Description of Potential Likely Significant Effects

Construction Phase

15.9.1 The potential effects associated with the construction phase include:

a. Generation of direct, indirect and induced employment opportunities for construction workers on site, as well as manufacturing services and suppliers.
b. Increased demand for accommodation and community facilities due to an influx of construction workers.
c. Generation of direct, indirect and induced Gross Value Added from construction activity on site, as well as manufacturing services and suppliers.
d. Increased maritime employment during construction and operation.

Operation Phase

15.9.2 The potential effects associated with the operation phase include:

a. Generation of permanent direct, indirect and induced employment opportunities associated with the Proposed Development.
b. Growth opportunities for manufacturing services and suppliers for maintenance activities.
c. Generation of direct, indirect and induced Gross Value Added from operational phase activities.

Decommissioning Phase

15.9.3 The potential effects associated with the decommissioning phase include:

a. Generating jobs due to decommissioning works;
b. Gross Value Added from direct, indirect and induced impacts of decommissioning phase works.
c. Loss of operational jobs due to closure of Proposed Development.

15.10 Elements Scoped In or Out of Further Assessment

15.10.1 The elements scoped in or out for further socioeconomic assessment are as follows:

Table 15.6: Elements Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Employment generation (direct, indirect, and induced)	Construction	X		The construction of the Proposed Development is anticipated to generate direct, indirect and induced employment opportunities, which are likely to give rise to a significant beneficial effect. Temporary construction employment generation is likely to be significant in the context of local and regional employment markets, benefiting residents in the local and regional study areas. Given the potential for significant numbers of direct, indirect and induced construction jobs which are anticipated to be created during construction of the Proposed Development, this has been scoped in for further assessment.
Gross Value Added generation (direct, indirect and induced)	Construction	X		The construction of the Proposed Development is anticipated to generate direct, indirect and induced GVA opportunities, which

Element	Phase	Scoped In	Scoped Out	Justification
				are likely to give rise to a significant beneficial effect. Temporary construction activity is likely to be significant in the context of local and regional markets, benefiting businesses in the local and regional study areas. Given the potential for significant GVA impacts which are anticipated to be created during construction of the Proposed Development, this has been scoped in for further assessment.
Employment generation (direct, indirect, and induced)	Operation		X	The Proposed Development is anticipated to generate permanent direct, indirect and induced employment. Whilst this would be beneficial in generating new operational employee jobs in the local and regional areas, given the nature of the Proposed Development, it is not considered likely that these will have a significant effect in the context of the overall employment markets. Therefore, operational employment generation as a result of the Proposed Development has been scoped out and will not be considered further for assessment.
GVA generation (direct, indirect, and induced)	Operation		X	As above
Increased demand for accommodation due to an influx of temporary workers.	Construction	X		Whilst it is assumed that the majority of direct, indirect and induced employment opportunities will be made available to employees in the study area and the wider region, some elements or phases of construction will require the employment of specialist contractors. This could require contractors to temporarily reside in locations close to the Site and give rise to a significant increase in demand for accommodation local to the Proposed Development. This is likely to deliver a beneficial effect on the local economy therefore, this

Element	Phase	Scoped In	Scoped Out	Justification
				has been scoped in for further assessment.
Increased demand for community infrastructure and services due to an influx of temporary workers	Construction		X	Whilst it is assumed that specialist contractors will be required for some of the construction activities, and they are likely to reside within the local area, it is not anticipated that this would give rise to a significant increase in demand for community infrastructure and services local to the Proposed Development. It is not anticipated that specialist contractors would choose to relocate their families based on previous experience of similar projects, hence there would be little to no additional requirement for education and wider community services. Medical and welfare facilities would be accessible to construction workers in association with employment on-site. As a negligible effect is anticipated for an increase in demand for community infrastructure and services, it has been scoped out and will not be considered for further assessment.
Employment generation (direct, indirect, and induced)	Decommissioning		X	It is the assumption for the EIA that most elements of the Proposed Development will be decommissioned at the end of the operational lifespan, either prior to or at 30 years, taking approximately 15 -18 months. The decommissioning works would therefore be completed in less time than the construction of the Proposed Development (four-year construction period). Given the nature of the decommissioning works and the length of the decommissioning period, the effects would be less than the construction of the Proposed Development. However, due to the limited information available and unknown decommissioning processes that will be available at the time the

Element	Phase	Scoped In	Scoped Out	Justification
				works are expected to take place, it is difficult to accurately predict the employment generation. Therefore, this has been scoped out of this chapter.
GVA generation (direct, indirect, and induced)	Decommissioning		X	As above
Loss of employment opportunities	Decommissioning		X	As part of decommissioning, the jobs generated during the operational phase (as set out in paragraph 15.7.2) could be lost. However, it may be that the Applicant is able to redeploy these members of staff through retainment or re-skilling. Due to limited information available at the time of writing, it is difficult to know the extent of employment opportunities that would be lost. Therefore, this has been scoped out of this chapter. However, it should be assessed and managed in the decommissioning plan.

15.11 Proposed Assessment Methodology

15.11.1 There are likely to be significant effects on socioeconomics during construction of the Proposed Development. Further assessment that is proposed to be undertaken for the ES is outlined below.

Employment Generation

15.11.2 The assessment of likely significant effects relating to employment generation during the construction phase will be undertaken using Excel-based modelling and statistical analysis, employing additionality assumptions per guidance as is best practice. Employment will be based on the construction duration and cost and will be estimated by applying an average gross output per construction industry employee to the estimated total construction cost. Leakage, displacement, and multiplier effects are then taken into account to determine the total net employment.

Assessing Economic Activity and Employment Impacts

15.11.3 To quantitatively assess economic impact (such as employment and GVA impacts), the socioeconomic assessment will use an economic impact model, along with the estimation of full-time equivalent (FTE) jobs, to quantify the direct, indirect, and induced employment and GVA impacts during the construction,

operation, and decommissioning phases. The model makes assumptions about the level of additionality and displacement (that is, retention of jobs and expenditure in the region) and will assess economic impacts using an approach which is consistent with the methods set out in HM Treasury Green Book (2022)(Ref 404). It should be noted that this modelling will be done as part of the full socioeconomic assessment within the ES.

Assessing Demand for Accommodation from Temporary Workers

15.11.4 An evaluation of the likely number of additional individuals coming to live in the study area will be undertaken, based on assumptions made by the applicant associated with travel planning, construction methodologies, and the construction programme. A percentage of the overall construction employment workforce will be determined based on these factors. Consideration will be given to any additional pressure which may arise on local accommodation facilities, in the context of existing availability and demand within the local area.

Tourism and Recreation

15.11.5 A proportionate approach will be taken to assessing tourism and recreation impact; the Proposed Development is not expected to impact significantly on tourism given the current industrial use of the Study Area. However, a high-level assessment of current recreational assets in the Study Area has been undertaken using the Outdoor Recreation Valuation Tool (ORVal)(Ref 405).

15.12 Significance of Effect Criteria

15.12.1 The methodology for assessing socioeconomic impacts will follow standard EIA guidance and will involve:

a. Consideration of local policy, plans and development constraints;
b. Assessment of the likely scale, permanence and classification of impacts; and
c. An assessment of the residual and cumulative impacts of the Proposed Development.

15.12.2 The assessment will consider the likely direct, indirect and cumulative impacts associated with socioeconomics during demolition and construction. Cumulative impacts associated with the Proposed Development will be addressed in **Chapter 21: Cumulative Effects** of the ES. For socioeconomics there is no accepted definition of what constitutes a significant (or not significant) socioeconomic effect. It is however recognised that classification of an effect reflects the relationship between the scale of an impact (magnitude) and the sensitivity (or value) of the affected resource or receptor.

15.12.3 As such socioeconomic effects will be assessed on the basis of:

a. Consideration of sensitivity to effects: Specific values in terms of sensitivity are not attributed to socioeconomic resources/receptors due to their diverse nature and scale. However, the assessment takes account of the qualitative (rather than quantitative) ‘sensitivity’ of each receptor and, in particular, their

ability to respond to change based on recent rates of change and turnover (if appropriate); and

b. Magnitude of the impact: This entails consideration of the size of the effect on people or business in the context of the area in which effects will be experienced.
c. Scope for adjustment or mitigation: The socioeconomic study is concerned in part with economies. These adjust themselves continually to changes in supply and demand, and the scope for the changes brought about by the project to be accommodated by market adjustment.

15.13 Limitations and Assumptions

15.13.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

15.13.2 The socioeconomic assessment for the Proposed Development will consider employment and GVA generation during the construction stage. The baseline conditions and assessment will be undertaken as a desk-based study, using recognised data sources including those set out in Table 15.7 below:

Table 15.7: Data Sources

Source	Date	Summary	Coverage of Study Area
Annual Survey of Hours and Earnings (Ref 407)	2022	Resident-based and workplace-based median gross annual earnings	Local Authorities North East England England
Office for National Statistics (ONS, 2022) (Ref 406), Business Register and Employment Survey (BRES, 2024) **Office for National Statistics (ONS, 2024) (Ref 407)**	2022	Gross Value Added (GVA) and GVA per worker.	Proposed Development LSOA Proposed Development Study Area Local Authorities North East England England
Indices of Multiple Deprivation (MHCLG)(Ref 209)	2019	Deprivation	Proposed Development Study Area Local Authorities
Natural England Agricultural Land Classification Maps (Ref 88)	2010	Land Use	Proposed Development Study Area
Census 2021 (Ref 210)	2021	Housing: number of dwellings and dwelling tenure.	Proposed Development LSOA Proposed Development Study Area

Source	Date	Summary	Coverage of Study Area
			Local Authorities North East England England
Outdoor Recreation Valuation Tool (ORVal) (Ref 405)	2023	Recreational assets: visitor estimates and welfare value	Proposed Development Site Boundary and 250m buffer

15.13.3 The impacts of the socioeconomic assessment will be appraised against relevant national standards and/or professional experience and expert judgement where appropriate.

16. Population and Human Health

16.1 Introduction

16.1.1 This chapter considers the effects of the construction and operation of the Proposed Development on Population and Human Health, including any potential significant effects on:

a. Population resources: private property and housing; community land and assets; development land and business (marine and terrestrial); walkers, cyclists and horse riders; and recreation (marine and terrestrial).
b. Determinants of health: health related behaviours; social environment; economic environment; bio-physical environment; institutional and built environment.

16.1.2 Where necessary, further assessment will be presented in the PEIR and ES. This scoping chapter identifies those impacts that can be scoped out of the assessment and sets out, where applicable, the proposed methodology for the Population and Human Health assessment.

16.2 Policy, Legislation, and Guidance

16.2.1 The policy, legislation, and guidance relevant to the assessment of the Proposed Development is shown in Table 16.1.

Table 16.1: Population and Human Health- Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description	
Policy		
Overarching National Policy Statement (NPS) for Energy EN-1 2024 (Ref 36)	Paragraph 4.2.4 states that the ES should "consider the potential effects, including benefits, of a proposal for a project, the applicant must set out information on the likely significant environmental, social and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated or compensated for, following the mitigation hierarchy. This information could include matters such as employment, equality, […], community cohesion, health and well-being." Paragraph 4.3.4 states "[…] where the proposed project has an effect on humans, the ES should assess these effects for each element of the project, identifying any	Paragraph 4.2.4 states that the ES should "consider the potential effects, including benefits, of a proposal for a project, the applicant must set out information on the likely significant environmental, social and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated or compensated for, following the mitigation hierarchy. This information could include matters such as employment, equality, […], community cohesion, health and well-being." Paragraph 4.3.4 states "[…] where the proposed project has an effect on humans, the ES should assess these effects for each element of the project, identifying any

Policy / Legislation / Guidance	Description	
	potential adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate." Paragraph 4.3.6 states "Opportunities should be taken to mitigate indirect impacts, by promoting local improvements to encourage health and wellbeing, this includes potential impacts on vulnerable groups within society, i.e. those groups which may be differentially impacted by a development compared to wider society as a whole."	potential adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate." Paragraph 4.3.6 states "Opportunities should be taken to mitigate indirect impacts, by promoting local improvements to encourage health and wellbeing, this includes potential impacts on vulnerable groups within society, i.e. those groups which may be differentially impacted by a development compared to wider society as a whole."
NPS for Renewable Energy Infrastructure (EN-3) (2023) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed.	
National Planning Policy Framework (NPPF) 2024 (Ref 38)	The NPPF sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced. Paragraph 96 states that "Planning policies and decisions should aim to achieve healthy, inclusive and safe places."	
North-east Inshore and North-east Offshore Marine Plan 2021 (Ref 198)	The North-east Marine Plan aims to enhance and protect the marine environment and achieve sustainable economic growth while respecting local communities both within and adjacent to the marine plan areas which stretches from the Scottish border and Flamborough Head, in Yorkshire. It includes the River Tees. Relevant policies include: NE-CO-1: Co-existence; NE-PS-1: Ports, Harbours and Shipping; NE-ACC-1: Access; NE-TR-1: Tourism and Recreation; and NE-SOC-1: Social Benefits.	
Redcar and Cleveland Borough Council Local Plan 2018 (Ref 33)	Policy N 2 - Green Infrastructure states: Opportunities to incorporate green infrastructure into developments should be sought, in accordance with the Tees Valley Green Infrastructure Strategy. Green infrastructure should be fundamental to the planning of major new development and re-development schemes and should help to integrate development with surrounding townscape and landscape, and with adjoining communities. Green infrastructure should be designed to high standards of quality and sustainability and aim to be multi-functional, link to the wider green infrastructure network, improve visual amenity, enhance community	

Policy / Legislation / Guidance	Description
	activity, support the provision of priority natural habitats and species, and seek opportunities to improve the water environment. We will protect and support the enhancement, creation and management of our green infrastructure network, to improve its quality, value, multi-functionality and accessibility Policy N 3 - Open Space and Recreation states: Redevelopment of primary or secondary open space, and any other amenity open space or sport and recreational land and buildings, including playing fields, will only be allowed where'll. the community would gain greater or equivalent benefit from the provision of alternative open space, sport or recreational facilities within the local area
Stockton-on-Tees Borough Council Local Plan 2019 (Ref 55)	Policy SD5 Natural, Built and Historic Environment: 1c Conserve and enhance the natural, built and historic environment through a variety of methods including: Protecting and enhancing green infrastructure networks and assets, alongside the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species. Policy SD8 – Sustainable Design Principles: 1c.The Council will seek new development to be designed to the highest possible standard, taking into consideration the context of the surrounding area and the need to respond positively to the need to protect and enhance ecological and green infrastructure networks and assets. Policy ENV6 - Green Infrastructure, Open Space, Green Wedges and Agricultural Land includes: Protection, enhancement: and management of green infrastructure to improve its quality, value, multi-functionality, and accessibility. The loss of open space will not be supported unless it is surplus to requirements, replaced by equivalent or better provision, or the proposal is for other sports or recreational provision. The protection and enhancement of open space to meet community needs and enable healthy lifestyles. Loss of open space will not be supported unless surplus to requirements, replaced by equivalent or better provision, or the proposal is for other sports or recreational provision. Policy TI1 – Transport Infrastructure includes: Improvement of the public transport network and routes for pedestrians, cyclists, and other users. Improvement, extension, and links between the Borough's network of footpaths, bridleways, and cycleways. Safeguard of routes for future infrastructure to widen transport choice, including cycleways and footbridges. Policy TI2 – Community Infrastructure includes:

Policy / Legislation / Guidance	Description
	Protection, maintenance, and improvement of existing community infrastructure and require new community infrastructure alongside new development.
Legislation	
Countryside and Rights of Way (CROW) Act 2000 (Ref 96)	The CROW Act makes provision for and aims to protect public access to the countryside. It extends the right of public access to the countryside, including to woodlands, the Green Belt, waters and grasslands; and for connected purposes.
Localism Act 2011 (Ref 202)	The Localism Act gives rights and powers to both communities and individuals. It is relevant in the context of the Proposed Development due to its proximity to recreational facilities.
Guidance	
National Planning Practice Guidance (various dates) (Ref 204)	Explains the processes and tools that can be used through the planning system in England.
Planning Practice Guidance - Open Space, Sports and Recreation Facilities, Public Rights of Way and Local Green Space 2014 (Ref 450)	Guidance on how planning proposals should consider potential impacts on open space, sports and recreation facilities and public rights of way.
Planning Practice Guidance - Healthy and Safe Communities 2014 (Ref 205)	This sets out guidance on how new planning proposals should promote health, wellbeing and safety.
Design Manual for Roads and Bridges LA 112 Population and human health 2020 (Ref 206)	This sets out guidance for assessing and reporting the environmental effects on land use and accessibility, and human health resulting from the construction, operation and maintenance of highways projects.
Determining Significance for Human Health in Environmental Impact Assessment. IEMA, (2022 (Ref 207)	This guidance provides a framework for the proportionate assessment of health effects in EIA, including guidance on how to assign significance to human health effects.
Effective Scoping of Human Health in Environmental Impact Assessment. IEMA, 2022 (Ref 207)	This guidance provides a framework for the proportionate scoping of health assessment in EIA. It provides guidance on determining when an EIA health chapter is required and provides an indicative list of health determinants to be considered.

16.3 Study Area

16.3.1 The Study Area for the population assessment is defined using the DMRB LA 112 - Population and human health (Ref 206). This standard advises a study area of 500m surrounding the Proposed Development to be used to report on the likely effects on private property and housing, community land and assets, development land and business and walkers, cyclists and horse-riders.

16.3.2 The Study Area for human health has been informed by the geographic area within which effects on health determinants are likely to occur. This has been defined by the consideration of the likely extent of direct and indirect impacts on health determinants and existing barriers within the environment. This has been determined using professional judgement, the IEMA guidance (Ref 207) and the study areas of related environmental topics.

16.3.3 Given the scale and context of the Proposed Development, a study area of a 250m radius around the Site has been selected.

16.3.4 A profile of the study area population has been compiled using publicly accessible baseline data as referenced in 16.4.1, focusing on demographic and health indicators for lower super output areas (LSOAs) that fall within the study area. Demographics and health indicators are included at the local, regional and national level for comparison. The study area is encompassed by Stockton-on-Tees 003B and Redcar and Cleveland 0003. The local areas are STBC and RCBC, and the region is the North-east.

16.4 Baseline Conditions and Future Baseline

16.4.1 The sources of information used in the Population and Human Health baseline conditions are:

a. Fingertips Public Health Data (Ref 208);
b. Google Maps
c. English Indices of Multiple Deprivation (Ref 209);
d. Official Census and Labour Market Statistics (NOMIS) (Ref 210);
e. Stockton JNSA (Ref 200)
f. Stockton-on-Tees Local Plan (Ref 55)
g. Redcar and Cleveland JSNA (Ref 211)
h. Redcar and Cleveland Local Plan (Ref 33);
i. The Stockton-on -Tees Active Travel Hub (inclusive of Redcar and Cleveland) (Ref 212); and
j. Sustrans National Cycle Network map (Ref 225).

Population Baseline

Private Property and Housing

16.4.2 Private property is residential land and residential development land that does not accommodate public space or any other community facility or assets. Commercial property is considered under the ‘Development land and businesses’ section below.

16.4.3 The principal land associated with the Study Area is industrial. There is no housing located within the Study Area. The nearest residential areas are the Port Clarence and Haverton Hill, areas of Stockton both located approximately 2.8km south west of the Main Site.

Community Land and Assets

16.4.4 The principal land associated with the Study Area is industrial. There are no community lands or assets located within the Study Area. The nearest community land and assets to the Proposed Site are:

a. RSPB Saltholme (3km west)
b. Teesmouth National Nature Reserve (600m north)
c. Seaton Common National Nature Reserve (4.2km north west)
d. North Gare Beach (3.5km north)
e. North Gare Peir (4.7km north).

Development Land and Businesses

16.4.5 The Site is located within Tees Valley, an area that works as a connected economic area covering Darlington, Hartlepool, Middlesborough, Redcar and Cleveland and Stockton-on-Tees. The Study Area is dominated by industrial uses. The north bank of the River Tees is occupied by a variety of operations including building materials manufacturers, steel works and power plants, among other heavy industry, including:

a. KD Pharma UK Ltd and Lianhetech Seal Sands to the north;
b. Navigator Terminals Seal Sands to the north east
c. Navigator North Tees Inland Terminal to the south west;
d. BOC, SABIC and N+P Subcoal Production Teesside to the south; and
e. Whitetower Energy Ltd and Central Area Transmission System (CATS) Terminal to the west.

Walkers, Cyclists, and Horse-Riders (WCH)

16.4.6 There are no WCH routes situated within the boundaries of the Proposed Development Site, or any WCH routes within the study area that are anticipated by the construction and operation of the Proposed Development. There are a number formal and informal footpaths within North Gare Sands and Seaton Dunes and Common Local Nature Reserve.

Recreation

16.4.7 The River Tees is used by a variety of users including (Ref 214):

a. Commercial passenger boats;
b. Leisure craft - powered and unpowered;
c. Smaller craft involved in various river events and activities;
d. Water Skiing;
e. Jet Skiing;
f. Anglers (including a number of angling associations: Stockton Angling Ltd, Thornaby Angling Association, and Yarm Angling Ltd) (Ref 215
g. Walkers; and
h. Canal & River Trust maintenance vessels also operate at various locations on the River Tees.

16.4.8 However, due to the heavy industry use of the River Tees at its mouth, adjacent to the Site, these types of uses are understood to be limited within the Study

Area, with the majority of these users operating within the Canal and River Trust managed section of the River Tees further up-river, outside of the Study Area. This is located up-river from the tidal barrage at Stockton-on-Tees, situated 4.5km south west of the site, to Low Worsall, a total distance of approximately 22km from the Site.

16.4.9 North Gare Sands and Seaton Dunes and Common Local Nature Reserve are located to the north of the Site. This area is used for enjoyment of public open space. It hosts a variety of informal outdoor activities, including:

a. Walking;
b. Swimming;
c. Watersports including windsurfing, kitesurfing and surfing;
d. Fishing;
e. Wildlife photography; and
f. Birdwatching.

16.4.10 Seaton Carew Golf Club is adjacent to the Seaton Dunes and is located approximately 3.6km north of the Site. This historical golf club is in use throughout the year and hosts its own members as well as visiting clubs and guests.

Human Health

Age Breakdown

16.4.11 The number and proportion of the population per age group for the study area, Stockton-on-Tees, North-east and England is presented below. Overall, the age demographic of the study area is similar to the regional and national averages, with a slightly higher percentage of under 14-year-olds and a slightly higher percentage of 25-64-year-olds. The study area has a lower proportion of residents over the age of 85 when compared to Stockton-on-Tees, the region and the nation.

Table 16.2: Age Breakdown for the Study area, Stockton-on-Tees, North-east and England 2021 (Ref 217)

Age Group (years)	Study area	Stockton-on-Tees	North-east	England
	Proportion	Total Proportion	Proportion	Proportion
0-14	20%	18%	17%	17%
15-24	11%	10%	12%	12%
25-64	54%	52%	51%	52%
65-84	13%	17%	18%	16%
85+	1%	2%	2%	2%

Population Health

16.4.12 Overall, the health of the local area is worse than the region and nation. Within the study area, fewer people report good or very good health when compared to the local area, region and nation. Life expectancy and percentage of active adults is lower in the local area whilst under 75 mortality and prevalence of obesity is higher.

Table 16.3: Indicators of Population Health for Stockton-on-Tees, the North-east, and England

Indicator	Stockton-on-Tees	North-east	England
Life expectancy at birth for males (3 year range)	78.2	77.4	79.1
Life expectancy at birth for females (3 year range)	81.7	81.4	83.1
Year 6 prevalence of obesity	24.6%	24.5%	22.1%
Under 75 mortality rate from all causes	385.6	415.9	341.6
Under 75 mortality rate from cardiovascular disease	80.5	88.2	77.4
Percentage of physically active adults	62.1%	63.2%	67.1%

Table 16.4: Self-rated Health (Ref 218)

Indicator	Study area	Stockton-on-Tees	North-east	England
Good or very good health	68%	80%	78%	82%
Fair health	20%	14%	15%	13%
Bad or very bad health	12%	6%	7%	5%

Indices of Deprivation

16.4.13 The English Indices of Multiple Deprivation 2019 (IMD) (Ref 209) comprises seven different ‘domains’ which relate to income, employment, education, health, skills and training, barriers to housing and services and living environment to create an overall deprivation score.

16.4.14 LSOA Stockton-on-Tees 003B has high deprivation across multiple domains. It is in the most deprived decile for overall deprivation, income, employment, education skills and training and health and disability. It is least deprived for the domain of barriers to housing and services and is has below average deprivation for the domain of living environment.

Table 16.5: Indices of Multiple Deprivation

Domains of deprivation	Overall deprivation	Income	Employ-ment	Education, skills and training	Health deprivation and disability	Barriers to housing and services	Living environ-ment
Stockton-on-Tees 003B	**1**	**1**	**1**	**1**	**1**	**8**	**6**

Air Quality, Landscape, Noise, and Water Environment

16.4.15 Relevant health determinants and receptors will be considered in the baselines of the following chapters: Chapter 5: Air Quality, Chapter 10: Landscape and Visual, Chapter 6: Noise and Vibration, and Chapter 9: Water Environment and Flood Risk.

Future Baseline

16.4.16 Between mid- 2018 and mid- 2028, the population of Stockton-on-Tees is anticipated to increase by 1.6% (Ref 16.30), whereas the population for England is anticipated to increase by 5% between the same years (Ref 220).

16.4.17 Aging of the population is set to continue, with the population aged between 60 and 84 projected to increase from 21.8% in 2018 to 26.5% in 2043 (Ref 220).

16.4.18 An ageing population and increasing population are likely to put stress on existing services, housing and infrastructure. However, with regards to barriers to housing and services, the study area has low levels of deprivation, as referenced in Table 16.5.

16.5 Sensitive Receptors

16.5.1 Land use and accessibility focuses on the potential effects on private property, community land, businesses, and WCH, associated with the Proposed Development.

16.5.2 The baseline has not identified any sensitive receptors within the Study Area.

16.6 Design, Embedded Mitigation, and Enhancement Measures

Construction Phase

16.6.1 Relevant design, mitigation and enhancement measures will be identified in the ES where appropriate, and these may include:

a. A Construction Traffic Management Plan (CTMP) (and an outline CTMP (oCTMP) will be prepared and submitted as part of the ES) will be implemented to minimise effects on vehicular travellers and their access between community facilities (**Chapter 18: Traffic and Transport**); and
b. Access routes to residential and commercial properties and community assets remaining open throughout the construction period;
c. Noise management plans will be applied during construction to minimise noise and vibration impacts of the Proposed Development (**Chapter 7: Noise and Vibration**).

16.6.2 Good practice measures will be outlined within CEMP submitted with the ES Stage in order to avoid conflict with WCHs, local residents and recreation facilities and ensure impacts from construction dust, noise and traffic are managed appropriately.

Operation Phase

16.6.3 Relevant design, mitigation and enhancement measures will be identified in the ES, and these may include:

a. Careful selecting of low noise plant and equipment, and location of this equipment to minimise noise impacts;
b. The use of noise-attenuating barrier in the form of either acoustic screens and/or earth bunds;
c. Prioritisation of water for freight (bulk materials and product export);
d. The Applicant would work proactively to provide local employment opportunities and to enable access to training where possible;
e. The processes used to recruit and manage staff working at the Proposed Development would be demonstrably fair and offer equal opportunities to all;
f. Appropriate design of the Proposed Development to minimise water quality impacts on surrounding habitats, including waterbodies within RSPB Saltholme and the River Tees; and
g. The provision of tree planting to provide visual assimilation and screen low level clutter in selected locations if practicable.

16.6.4 For more detail see mitigation measures outlines within Chapter 5: Air Quality, Chapter 6: Noise and Vibration, Chapter 10: Landscape and Visual Impact, as well as Chapter 15: Socioeconomics.

16.7 Description of Potential Likely Significant Effects

Construction Phase – Population Effects

16.7.1 The potential likely significant effects associated with the construction phase includes:

a. **Private Property and Housing**: No potential effects associated with the construction phase have been identified.
b. **Community Land and Assets**: No potential effects associated with the construction phase have been identified.
c. **Development Land and Business:** No potential effects associated with the construction phase have been identified.
d. **Walkers, Cyclists, and Horse-riders:** No potential effects associated with the construction phase have been identified.
e. **Terrestrial Recreation:** No potential effects associated with the construction phase have been identified.
f. **Marine Development Land and Business:** Whilst there may an effect on businesses that rely on the River Tees due to the introduction of a new source of vessel traffic, access within the navigation channel will be covered within **Chapter 20: Marine Navigation.**
g. **Marine Recreation:** No potential effects associated with the construction phase have been identified.

Construction Phase – Human Health Effects

Health Related Behaviours

16.7.2 The construction of the Proposed Development will not have the potential to influence risk-taking behaviours or diet. There may be impacts on the amenity of beaches, dunes and informal walking routes close to the site. However, given the existing industrial character of the area, this is not likely to deter people from using these areas or reduce levels of physical activity.

Social Environment

16.7.3 The Site is remote from residential areas and there are no community resources in the study area that provide space for social gatherings or community activities. The construction of the Proposed Development will therefore not affect opportunities for social interaction or influence community cohesion or community safety.

16.7.4 The Site has direct access to the A1185 road and A178 Seaton Carew Road, and construction traffic is not expected to cause congestion or impede cyclist or pedestrian movements. Therefore, there is no potential for the scheme to cause community severance. Use of water freight for importation of modules which reduces construction traffic movements on roads.

16.7.5 The temporary construction workforce will include workers from outside the study area who will require accommodation. This has the potential to affect the housing market within the Stockton-on-Tees area. This will be assessed in **Chapter 15: Socioeconomics.**

Economic Environment

16.7.6 The Proposed Development will require an estimated 2000 temporary construction staff during the construction phase. Whilst much of the construction workforce is likely to come from outside the local area, employment and training

opportunities will also be created for local people. This has the potential to improve levels of employment and income in the Stockton-on-Tees area. This will be assessed in **Chapter 15: Socioeconomics**.

Bio-physical Environment

16.7.7 The construction of the Proposed Development may have environmental effects, such as noise or air quality effects, that would have the potential to impact on the health and wellbeing of the affected receptors. However, given the location of the site in an existing industrial area, there will be very little exposure of the population to such effects. Any human health effects on individual receptors detailed in **Chapter 5: Air Quality, Chapter 6: Noise and Vibration**, will be assessed within those topic's respective ES chapters, and mitigation considered where relevant and appropriate. No population-level health effects are expected.

16.7.8 The construction of the Proposed Development will comply with legal requirements and standards to prevent harm to human health from contamination of soils and drinking water, as described in **Chapter 9: Water Environment** and **Chapter 17: Geology and Soils**.

Institutional and Built Environment

16.7.9 The site is located in an industrial area remote from residential neighbourhoods and as such will not affect public realm or the built environment in which people live. It also makes use of a largely brownfield former employment site that is currently vacant.

16.7.10 The construction of the Proposed Development will not result in the loss of, or impact on transport access to, any health and social care services, schools or other community infrastructure. Temporary construction workers are not likely to register with local general practitioner (GP) surgeries and, while there may be some use of health services by the workforce, this is likely to be a very small impact with no potential to affect service capacity.

Operation Phase – Population Effects

16.7.11 The potential likely significant effects associated with the construction phase includes:

a) **Development Land and Business:** No potential effects associated with the construction phase have been identified.

b) **Private Property and Housing:** No potential effects associated with the operation phase have been identified.

c) **Community Land and Assets:** No potential effects associated with the operation phase have been identified.

d) **Development Land and Business:** No potential effects associated with the operation phase have been identified.

e) **Walkers, Cyclists, and Horse-riders (WCH):** No potential effects associated with the operation phase have been identified.

f) **Terrestrial Recreation:** No potential effects associated with the operation phase have been identified.

g) **Marine Development Land and Business:** Whilst there may an effect on businesses that rely on the River Tees due to the introduction of a new source of vessel traffic, there may be population/health benefits from increased river traffic. Access within the navigation channel will be covered **within Chapter 20: Marine Navigation**.

h) **Marine Recreation:** No potential effects associated with the operation phase have been identified.

Operation Phase- Human Health Effects

Health Related Behaviours

16.7.12 The operation of the Proposed Development will not have the potential to influence risk-taking behaviours or diet. There may be impacts on the amenity of beaches, dunes and informal walking routes close to the site. However, given the existing industrial character of the area, this is not likely to deter people from using these areas or reduce levels of physical activity.

Social Environment

16.7.13 The site is remote from residential areas and there are no community resources in the study area that provide space for social gatherings or community activities. The operation of the Proposed Development will therefore not affect opportunities for social interaction or influence community cohesion or community safety.

16.7.14 The site has direct access to the A178 Seaton Carew Road, and operational traffic is not expected to cause congestion or impede cyclist or pedestrian movements. Therefore, there is no potential for the scheme to cause community severance.

Economic Environment

16.7.15 The Proposed Development will require an estimated 2000 temporary construction staff during the construction phase. Whilst much of the construction workforce is likely to come from outside the local area, employment and training opportunities will also be created for local people. This has the potential to improve levels of employment and income in the Stockton-on-Tees area. This will be assessed in **Chapter 15, Socioeconomics**.

Bio-physical Environment

16.7.16 The Proposed Development may have environmental effects, such as noise or air quality effects, that would have the potential to impact on the health and wellbeing of the affected receptors. However, given the location of the site in an existing industrial area, there will be very little exposure of the population to such effects. Any human health effects on individual receptors detailed in **Chapter 5: Air Quality, Chapter 6: Noise and Vibration**, will be assessed within those

topic's respective ES chapters, and mitigation considered where relevant and appropriate. No population-level health effects are expected.

16.7.17 The design and operation of the Proposed Development will comply with legal requirements and standards to prevent harm to human health from contamination of soils and drinking water, as described in **Chapter 9: Water Environment** and **Chapter 17 Geology and Soils**.

Institutional and Built Environment.

16.7.18 The site is located in an industrial area remote from residential neighbourhoods and as such will not affect public realm or the built environment in which people live. The operation of the Proposed Development will not impact on health and social care services, schools or other community infrastructure.

16.8 Elements Scoped In/Out of Further Assessment

16.8.1 The impacts scoped in or out for the population, human health and land use assessment are as set out in Table 16.6.

16.9 Proposed Assessment Methodology

16.9.1 The assessment of Population and Human Health effects has been scoped out. Therefore no assessment methodology is provided in this Scoping Chapter.

Table 16.6: Elements Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification	
Population Assessment					
Private Property and Housing	Construction and Operation		X	Due to the limited number of private properties and housing located within the Study Area, the contained nature of the construction works and the surrounding road network with good road linkages, it is anticipated that effects on access will not be significant. Once operational, the	Due to the limited number of private properties and housing located within the Study Area, the contained nature of the construction works and the surrounding road network with good road linkages, it is anticipated that effects on access will not be significant. Once operational, the Proposed Development is not likely to have a significant effect on private property and housing, particularly in the context of the baseline levels of heavy industrial activities at and surrounding the Proposed Development Site.

Element	Phase	Scoped In	Scoped Out	Justification
				Proposed Development is not likely to have a significant effect on private property and housing, particularly in the context of the baseline levels of heavy industrial activities at and surrounding the Proposed Development Site.
Community Land and Assets	Construction and Operation		X	There are limited community land uses and assets located within the Study Area. Access to these facilities are likely to be maintained throughout construction and operation therefore, effects are expected to not be significant.
Walkers, Cyclists, and Horse-riders (WCH)	Construction and Operation		X	There are no Public Rights of Way (PRoW) within the boundaries of the Main Site. The King Charles III England Coast Path crosses the Proposed Development 300m to the west of the Main Site.
Terrestrial Businesses	Construction and Operation		X	Access to businesses is likely to be maintained during construction, therefore no significant effects are likely to occur. Access to businesses is likely to be maintained during construction, therefore no significant effects are likely to occur.
Businesses that rely upon access to the River Tees	Construction and Operation		X	Whilst there may be an effect on businesses that rely on the River Tees due to the introduction of a new source of vessel traffic, access within the navigation channel will be covered within **Chapter 20: Marine Navigation**. The Proposed Development will develop new marine infrastructure for import of feedstock. Therefore, there is likely to be an increase in marine vessels associated with the operation of the Proposed Development, however, this is not predicted to impede on businesses that also rely on the river for transportation of materials and goods

Element	Phase	Scoped In	Scoped Out	Justification
Terrestrial Recreation	Construction and Operation		X	Due to the Proposed Development being located within a heavily industrialised area, the construction works and operation would not significantly decrease the enjoyment of recreational activities in the area.
Recreational users of the River Tees	Construction and Operation		X	Due to the Proposed Development being located within a heavily industrialised area with high volume shipping lanes, the construction works and operation would not significantly decrease the enjoyment of recreational activities in the area.
Human Health Assessment				
Health behaviours	Construction and Operation		X	The Proposed Development will not have any impact on diet or opportunities for risk taking behaviours. There will be some potential disturbance of beaches and informal walking routes on North Gare Sands, but this does not have the potential to impact on levels of physical activity.
Social environment	Construction and Operation		X	Neither the existing site nor the Proposed Development are publicly accessible. The development will not impact any leisure, cultural or social resources. It will not affect transport (either vehicle, cyclist or pedestrian) and will not cause community severance. There will be no housing relocations or impacts on residential areas.
Economic environment	Construction and Operation		X	The construction and operation of the Proposed Development will create employment and training opportunities for local people. These effects, including the potential wellbeing effects associated with increased levels of employment and income, will be assessed in **Chapter 15 – Socioeconomics.**
Biophysical environment	Construction and Operation		X	There is potential for adverse environmental effects as a result of the Proposed Development, which can influence health. However, given the location of the site in an existing industrial area, there will be very little exposure of the population to noise, air emissions and other environmental effects. Any human health effects detailed in **Chapter 5: Air Quality, Chapter 6: Noise and Vibration, Chapter 15: Socioeconomics and Chapter 18: Traffic and Movement** will be assessed within those topic's respective ES chapters, and mitigation considered where relevant and appropriate.

Element	Phase	Scoped In	Scoped Out	Justification
Institutional and built environment	Construction and Operation		X	The site is located in an industrial area remote from residential neighbourhoods and as such will not affect public realm or the built environment in which people live. The construction and operation of the Proposed Development will not impact on health and social care services, schools or other community infrastructure.

17. Geology and Soils

17.1 Introduction

17.1.1.1 This chapter considers the impacts of the Proposed Development on Geology and Soils during construction and operation, and any potential significant effects. It sets out the proposed methodology for the Geology and Soils assessment and identifies those impacts that can be scoped out of the assessment. Where necessary, further assessment would be presented in the ES.

17.2 Policy, Legislation, and Guidance

17.2.1.1 The policy, legislation, and guidance relevant to the assessment of the Proposed Development is shown in Table 17.1.

Table 17.1: Geology and Soils- Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Overarching National Policy Statement for Energy 2024 (EN-1) (Ref 36	Section 5.4 outlines the requirement for biodiversity and geological conservation. It is stated that where the development site is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance.
NPS for Renewable Energy Infrastructure (EN-3) (2023) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed.
The National Planning Policy Framework (2024) (NPPF) (Ref 38)	The NPPF is a document that sets out the Government's planning policies for England and how they are expected to be applied. The NPPF states that the purpose of the planning system is to contribute to the achievement of sustainable development. The NPPF includes specific chapters which relate to the assessment of Geology and Soils as follows: Chapter 11: Making effective use of land The NPPF states that the planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions (Section 124). Chapter 15: Conserving and enhancing the natural environment In accordance with Section 187 of the NPPF, the planning system is required to contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils. It should recognise the intrinsic character and beauty of the countryside, including the economic and other benefits of the best and most versatile (BMV) agricultural land. It should also seek to prevent new and existing development from contributing

Policy / Legislation / Guidance	Description
	to or being put at unacceptable risk from soil or water pollution or land instability. Planning decisions should lead to the remediation and mitigation of despoiled, degraded, derelict contaminated and unstable land, where appropriate. Guidance relating to ground conditions and pollution is provided in Sections 196 & 197 which are quoted below. 196 - Planning policies and decisions should ensure that: a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation); b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and c) adequate site investigation information, prepared by a competent person, is available to inform these assessments. 197 - Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner." Chapter 17: Facilitating the sustainable use of minerals Section 222 recognises that "It is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs". Within Section 223 it is stated that appropriate policies should be adopted "so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resources defined will be worked)".
Stockton-on-Tees Borough Council – Local Plan (Ref 55)	The Local Plan sets out the Council's policies and proposals to guide planning decisions and establishes the framework for the sustainable economic growth and development of the Borough. Policy ENV5 - Preserve, Protect and Enhance Ecological Networks, Biodiversity and Geodiversity states that: The Council will protect and enhance the biodiversity and geological resources within the Borough. Sites designated for nature or geological conservation will be protected and, where appropriate enhanced. Policy ENV7 – Ground, Air, Water, Noise and Light Pollution states that: All development proposals that may cause groundwater, surface water, air (including odour), noise or light pollution either individually or cumulatively will be required to incorporate measures as appropriate to prevent or reduce their pollution so as not to cause unacceptable impacts on the living conditions of all existing and potential future occupants of land and buildings, the character and appearance of the surrounding area and the environment.
Legislation	

Policy / Legislation / Guidance	Description
Environmental Protection Act 1990 (Ref 171)	This is the key regulatory regime relating to historical land contamination. Part 2A of the Environmental Protection Act 1990 describes a regulatory role for local authorities and provides local authorities with the power to inspect land to identify land which is contaminated within the meaning of the Part 2A definition, to establish liability and to ensure its remediation. In England and Wales the Part 2A regime consists of three main legislative / statutory elements, these are Part 2A itself, the Statutory Guidance and the Regulations.
Contaminated Land Regulations (England), 2006 (amended 2012) (Ref 286)	Regulation 3 provides a definition of what constitutes 'contaminated land' and sets out the responsibilities of the local authority and the Environment Agency in the identification and management of contaminated land. Contaminated land assessment works associated with Part A are to be conducted in accordance with these regulations.
The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 374)	Legislation that seeks to establish an integrated approach to the protection and sustainable use of the water environment.
Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (Ref 287)	These Regulations aim to prevent serious environmental effects or ensure that remediation is carried out. The emphasis is on encouraging operators to put in place appropriate pollution prevention measures and where appropriate agreed voluntary remedial action. The Regulations specifically define three types of environmental damage: biodiversity damage to European Union protected species and habitats and Sites of Special Scientific Interest (SSSI); water damage; and land damage.
The Environmental Permitting (England and Wales) Regulations 2016 (Ref 367)	These regulations streamline the legislative system for industrial and waste installations into a single permitting structure for those activities which have the potential to cause harm to human health or the environment. The regulations require every regulated facility (as defined) to be operated under the authority of an environmental permit. They provide, among other things, for: the discharge of functions by the regulator in relation to permits, procedure for environmental permitting, enforcement notices and other enforcement measures and powers of the regulator.
Control of Substance Hazardous to Health Regulations (COSHH) 2002 (Ref 288)	Under COSHH employers are required to control substances that are hazardous to health. It outlines a precautionary approach to risk management with control strategies aiming to reduce exposure as much as possible.
Control of Asbestos Regulations (CAR) 2012 (Ref 289)	Legislation to set out the duties to manage risks from asbestos/asbestos containing materials (ACM) in existing non-domestic premises and during any work activity involving asbestos. Duty holders must make sure anyone who carries out any work in non-domestic premises and any occupants of the premises are not exposed to asbestos from ACM that may be present.
Construction (Design & Management) Regulations (CDM), 2015 (Ref 262)	Legislation to ensure health and safety issues are properly considered during a project's development so that the risk of harm to those who have to build, use and maintain the development is reduced. CDM regulations apply to all building

Policy / Legislation / Guidance	Description
	and construction work, including new build, demolition, refurbishment, extensions, conversions, repair and maintenance.
Guidance	
Natural Environment Published January 2016, updated July 2019 (Ref 290)	Guidance that explains key issues in implementing policy to protect and enhance the natural environment, including local requirements.
Health and Safety Executive (HSE) (1991) Guidance Note HS(G)66, Protection of Workers, and the General Public during the Development of Contaminated Land (Ref 291)	Addresses the considerable hazards associated with contaminated land working and aspects which developers and contractors need to consider.
Environment Agency (2020 Updated July 2023) Land Contamination Risk Management (LCRM) (Ref 292)	Provides guidance on how to assess and manage the risks from land contamination.
Environment Agency and National House Building Council (NHBC) (2008) Guidance for the safe development of housing on land affected by contamination, Environment Agency R&D Publication 66 (Ref 285)	Guidance to assess how best to construct housing on land affected by contamination. Although published by the NHBC, the guidance provided is relevant to many types of development.
CIRIA C552 (2001), Contaminated Land Risk Assessment: A guide to good practice (Ref 293)	Provides guidance on the examination and risk assessment of contaminated land and provides an explanation of the key elements of risk assessment practices and procedures.
CIRIA C532 (2001) Control of Water Pollution from Construction Sites (Ref 294)	Provides guidance on environmental good practice for the control of water pollution arising from construction activities. The document focuses on the potential sources of water pollution from within construction sites and the effective methods of preventing its occurrence.
BS 10175 (2011 +A2:2017) Investigation of Potentially Contaminated Sites – Code of Practice (Ref 295)	Provides recommendations for investigation of potentially contaminated land or land with naturally elevated concentrations of potentially harmful materials.
Department for Environment, Food and Rural Affairs (DEFRA), Contaminated Land Statutory Guidance April 2012 (Ref 296)	Provides statutory guidance on the processes involved in assessing contaminated.
Environment Agency (2023) Groundwater Protection (Ref 297)	Contains position statements which provide information about the Environment Agency's approach to managing and protecting groundwater.
British Standards Institute (BSI) BS 5930 (2015 +A1:2020) The Code of Practice for Site Investigations. (Ref 298)	Provides guidelines for conducting ground investigation.

Policy / Legislation / Guidance	Description
Design Manuals for Roads and Bridges (DMRB) 109 (Geology and Soils) (Ref 299)	A manual that covers the requirements that shall be applied to the assessment, reporting and management of environmental effects on geology and soils from the delivery of highways projects. Although the Proposed Development is not a highways project, this guidance is used in the absence of any other guidance specific to the topic of Geology and Soils.

17.3 Study Area

17.3.1 The Main Site of the Proposed Development is an irregular shaped parcel of land lying approximately 5 metres above ordnance datum (mAOD).

17.3.2 This chapter covers land defined as the Site as shown in **Figure 1.2**. The Study Area for the Geology and Soils assessment includes the Site, plus the following buffers:

a. A 50m buffer from the Proposed Development has been used in identifying sources of contamination posing a risk to human health receptors. Given there is no direct citing of a recommended buffer in industry guidance for the assessment of human health in relation to contaminated land, the 50m buffer used is determined on the basis of professional judgement and its acceptance on other schemes. A 50m buffer is the area that could be impacted in terms of Geology and Soils as a result of the Proposed Development and surrounding sensitive environmental receptors and contamination migration potential; and
b. A 250m buffer from the Proposed Development has been used to identify sources of contamination posing a risk to sensitive controlled waters receptors (groundwater and surface water). This is consistent with safe development on contaminated land guidance document R&D66 when considering the impacts of contamination on sensitive environmental receptors.

17.3.3 It is noted that the above buffers are based on human health and controlled waters receptors, additional sensitive receptors such as mineral resources are identified within Section 17.5, however these additional receptors are specifically within the Site and do not require consideration within a buffer beyond the Site boundary.

17.3.4 This chapter has been prepared in accordance with the constructability information provided for the Proposed Development, as well as consideration of typical industry operational measures to be adopted during the construction phase (i.e. around worker Health and Safety and protection from contamination etc.). It is assumed that the information provided and reviewed in the baseline is representative of existing ground conditions. A degree of professional judgement has been used in the interpretation of information and in determining the sensitivity and magnitude.

17.4 Baseline Conditions and Future Baseline

Method of Baseline Data Collection

17.4.1 To inform the assessment of baseline conditions, a Phase 1 Preliminary Risk Assessment (Phase 1 PRA) will be produced and a site walkover will be undertaken.

17.4.2 For the purposes of this Scoping Report the following publicly available data sources have been reviewed:

a. Historical mapping available online
b. UXO online risk maps produced by ZeticaUXO
c. British Geological Survey (BGS) Onshore GeoIndex online viewer (including borehole records)
d. Mining Remediation Authority Interactive Map viewer
e. BGS geological mapping 1:50,000 map and 1:10,000 map
f. Environment Agency Catchment Data Explorer
g. MAGIC
h. Cranfield Soil and Agrifood Institute Soilscapes

Baseline Conditions

17.4.3 The following sections present a summary of the baseline conditions.

Site History

17.4.4 The Main Site was occupied by the natural estuarine environment comprising Seal Sands in the north and mud and sand in the South until 1950 when reclamation of the Main Site began with a track and jetty in the south of the site enabled dredged material to be used to backfill the reclaimed area and this was topped off by a layer of steelworks slag.

17.4.5 A chemical plant complex was developed in the east and centre of the Main Site in the late 1960s which was originally owned by Monsanto. BASF Plc acquired the site in 1985, and INEOS took ownership in 2008. Operations at the chemical plant ceased in 2020/2021 and the plant was demolished by 2023. The site was cleared to ground slab level and therefore it is assumed that former building foundations and other sub-structures remain beneath the site.

17.4.6 The western end of the Main Site is a closed landfill site which is also vegetated. The Environment Agency public register indicates is this Seal Sands Waste Disposal Site operated by Cleveland County Council with waste input from December 1973 to December 1978. In March 1977 a ‘resolution permit’ was issued and re-issued in November 1977 (licence reference CLE/R4/1, 700/R4, CLE/170/1 and CLE72) for up to 600m^3/d. It was permitted to take both inert, industrial and commercial wastes. The end date of waste disposal operations is not clear, although anecdotal evidence suggests that the filling operations had ceased by 1985.

17.4.7 North of Seal Sands Road is vegetated with grass and scrub part of which is included in the proposed DCO as a construction laydown area. Available historical maps suggest that this part of Seal Sands was reclaimed but does not appear to have been previously developed. The Seal Sands landfill lies adjacent to the north of the northern site boundary.

Soil Quality

17.4.8 The majority of the Proposed Development both north and south of the Tees is located on land reclaimed from the Tees Estuary using natural and man-made materials. The Main Site has been used as a chemical works, landfill and undeveloped vegetated grassland and scrub, with transport by pipeline and road internal to the site. The connection corridors to the south of the Tees are on land reclaimed by use of slag and other fill materials. There is therefore potential for contamination as a result of historical uses (such as operational spills) as well as the made ground composition (such as slag).

Agricultural Land

17.4.9 The Main Site is classified as urban.

Geological Designated and Non-designated Features

17.4.10 There are no potential Local Geological Sites (formerly referred to as Regionally Important Geological Sites (RIGS)) within the Main Site or site buffer.

17.4.11 The geological sequence that underlies the Main Site is summarised in Table 17.2:

Table 17.2: Anticipated Ground Conditions

Strata	Site Coverage	Description
Made Ground	Whole of Main Site	Likely to be both reworked natural and man-made artificial deposits
Superficial Deposits		
Tidal Flat Deposits	Whole of Main Site	Predominantly sand, silt and clay
Glacial till	Whole of Main Site	Predominantly clay, with silt, sand and gravel
Bedrock		
Mercia Mudstone Group	Whole of Main Site	Brown, red-brown calcareous clays and mudstones with occasional beds of siltstone and fine-grained sandstone
Sherwood Sandstone Group	Whole of Main Site	Sandstone, red, yellow and brown, part pebbly and conglomeratic
Linear Features		
Saltholme Fault	Southeast of the Main Site	Normal fault downthrown to the north

Hydrogeology

17.4.12 A summary of aquifer classifications (from Environment Agency data) is provided in Table 17.3.

Table 17.3: Aquifer Classifications

Strata	Site Area	Aquifer Classification	Groundwater Vulnerability
Superficial Deposits			
Tidal Flat Deposits	Whole of Main Site	Secondary Undifferentiated Aquifer (clay) Secondary A Aquifer (sand and silt)	High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits
Bedrock			
Mercia Mudstone Group	Whole of Main Site	Secondary B Aquifer	High
Sherwood Sandstone Group	Whole of Main Site	Principal Aquifer	High

17.4.13 The Main Site does not lie in a groundwater source protection zone (SPZ). There are multiple groundwater abstraction licences within 1km of the Main Site:

a. Active groundwater abstraction at North Tees Ltd located approximately 132m to the south west of the Main Site, comprising 8 boreholes in the Mercia Mudstone Group bedrock for general use relating to secondary category (very low loss) applications. Licence number: 1/25/04/164, with an annual abstraction volume 450,000m^3 and max daily volume of 1,500m^3.
b. Multiple groundwater abstraction licences are active between 568m and 787m to the west of the Main Site associated with Sabic UK Petrochemicals. Groundwater is being abstracted from the Sherwood Sandstone for general use relating to secondary category applications with medium loss. Licence number: 1/25/04/134, with an annual abstraction volume 1,800,000m^3 and max daily volume of 6,478m^3.

17.4.14 The WFD (Ref 374) classifies the Sherwood Sandstone Group as having a good chemical and overall rating and the MMG as having a poor chemical and overall rating.

Hydrology

17.4.15 The River Tees is classified under the WFD as chemical rating (fail), an ecological rating (moderate) with an overall rating of moderate. Further details are provided **in Chapter 9: Water Environment and Flood Risk**.

Mining, Ground Workings and Natural Cavities

17.4.16 The Main Site does not lie within a Coal Mining Reporting Area. Both salt and anhydrite have been worked at depth in Teesside in the past by solution mining of salt immediately to the west of the Main Site and underground extraction of anhydrite in Billingham. No salt or anhydrite extraction is understood to have been undertaken beneath the Main Site.

Mineral Resources

17.4.17 The Tees Valley Core Strategy (Ref 161) includes plans for Mineral Safeguarding Areas. Whilst the Strategy indicates there are no shallow reserves of coal, sand and gravel, and limestone, there are deep reserves of gypsum and salt located within and surrounding the Proposed Development's study area. It is noted that these reserves are shown to be present across the majority of the area covered in the Tees Valley Core Strategy.

Geological Designated Site

17.4.18 There are no geological important designated SSSIs on or within 250m of the Main Site.

Landfills and Waste Management

17.4.19 The western part of the Main Site comprises a former landfill licence by Cleveland County Council, site reference CLE/R4/1, 0700/R4, CLE/170/1 and CL72, that accepted inert, industrial and commercial waste from 1973. The end date of waste disposal operations is not clear, although anecdotal evidence suggests that the filling operations ceased by 1985.

17.4.20 The former Imperial Chemical Industries landfill site (now closed) at Seal Sands, site reference 0700/CLE/019, is located adjacent to the north of the Main Site.

Unexploded Ordnance

17.4.21 Teesside was subject to bombing raids during the Second World War and the Main Site is at risk from UXO. The made ground at the Main Site was placed after the Second World War, and therefore UXO risk is principally associated with the underlying tidal flat deposits. A detailed UXO risk assessment will be undertaken for the Main Site.

Potential Sources of Contamination

17.4.22 The following relevant potential contamination sources have been identified in consideration of the Main Site's previous industrial use:

a. Contaminants within Made Ground material associated with previous on-Site and off-site uses; and
b. Hazardous Ground Gas associated with potential Made Ground and on and off-site landfill sites; and

c. Hazardous vapours associated with volatile contamination within soil and/or groundwater arising from contaminant migration from on-site landfill sites and adjacent sites.

Potential Contaminant Pathways

17.4.23 Relevant potential pathways are considered to include the following:

a. Direct contact, ingestion and inhalation of soil bound contaminants/dust;
b. Migration of hazardous ground gas (relating to Made Ground or landfills) / vapours (relating to soil or groundwater contaminant sources) into any deeper excavations during construction causing asphyxiation or explosion and migration into the future buildings if left untreated; and
c. Migration of mobile contaminants into superficial and bedrock aquifers and/or the River Tees.

17.4.24 Confirmation of the nature and extent of impact to receptors via these pathways would require ground investigation, plus testing and assessment of contaminant concentrations in soil, water, gas and vapour phases. These pathways are potentially more plausible during the construction phase but could also be relevant during the operational phase dependent on the nature of the developed site (i.e. foundation types, presence of areas of soft landscaping etc.). It is anticipated that the potential for impacts in both the construction and operational phases could be readily mitigated through typical health and safety and site remediation activities (if needed).

Future Baseline

17.4.25 In a future baseline, and in the absence of the Proposed Development, it is considered that the land use within the development study area will either remain in its current state or undergo redevelopment of different industrial nature.

17.4.26 With respect to Geology and Soils, the future baseline is anticipated to remain largely unchanged unless there are significant earthworks completed as part of any future redevelopment. It is anticipated that should the Main Site remain in its current condition there will be a continued presence on the Main Site to ensure the operational aspects continue without altering the future baseline.

17.5 Sensitive Receptors

17.5.1 Based on the initial Conceptual Site Model presented here, relevant potential receptors are considered to include the following:

a. Construction workers during the development and / or future maintenance workers;
b. Future Site users;
c. Neighbouring users of existing operational facilities during the development:
    1. KD Pharma UK Ltd and Lianhetech Seal Sands to the north;
    2. Navigator Terminals Seal Sands to the north east;
    3. Navigator North Tees Inland Terminal to the south;
    4. BOC, SABIC and N+P Subcoal Production Teesside to the south; and

5. Whitetower Energy Ltd and Central Area Transmission System (CATS) Terminal to the west.

d. Third parties during and after the development;
e. Mineral resources (underlying reserves of gypsum and salt);
f. Groundwater in superficial deposits (Secondary Undifferentiated and Secondary A Aquifers) and bedrock (Secondary B and Principal Aquifers); and
g. Surface waters (River Tees).

17.6 Design, Embedded Mitigation, and Enhancement Measures

17.6.1 At this early stage of the Proposed Development's design (for more information on the current design and alternatives which have been considered, see **Chapters 2 and 3: Site and Proposed Development Description),** details on embedded mitigation measures in place at Construction Phase are not available. However, the following industry standard embedded mitigation measures are recommended:

a. Completion of a detailed desk study to ascertain the UXO risk at the Main Site, and to potentially zone the Main Site prior to investigation delivered by way of site-specific UXO report;
b. An intrusive investigation to refine the contamination conceptual site model and geotechnical soil parameters, and to further understand the hydrogeological regime (described within an interpretative ground investigation report);
c. Installation/use of gas / vapour and groundwater monitoring wells (described within an interpretative ground investigation report);
d. Classification of waste soils for disposal or excavated material reuse assessment, to satisfy the Environment Agency permitting requirements, land contamination officers and planners (described within an interpretative ground investigation report);
e. Identification of remediation requirements, and likely timescales for remediation to aid development of the construction programme (described within a Remediation Strategy); and
f. Identification of monitoring requirements that may be required as part of the environmental permit for the Proposed Development (likely described within a Remediation Strategy and / or Verification Report).

Construction Phase

17.6.2 It is anticipated that the appropriate secondary mitigation measures, including but not limited to the following, will be included in the CEMP which will be secured as part of the DCO requirements:

a. Earthworks would be completed in accordance with a Contaminated Land: Applications in Real Environments (CL:AIRE) compliant Materials Management Plan or environmental permit to ensure re-used material does not present a risk to human health or the environment and complies with UK waste legislation regulations;
b. Incorporation of a temporary surface water drainage strategy to limit any contaminated run-off entering surrounding surface watercourses;
c. Subject to the findings of future intrusive ground investigation (likely to be included as a requirement of the DCO), a suitable remediation strategy will

be formulated and agreed with the Local Planning Authority prior to being implemented to mitigate unacceptable contaminated land related risks in the context of the Proposed Development;

d. Any activities completed as part of the construction phase which have the potential to promote potential contaminant migration pathways to the underlying aquifers, for example piling, will be completed following an appropriate risk assessment and completed in accordance with appropriate Risk Assessments and Method Statements (RAMS).

17.6.3 Appropriate measures to limit release of contaminants to the ground from construction related activities (e.g. use of plant/machinery and storage of materials) to be incorporated within a CEMP.

Operation Phase

17.6.4 It is anticipated that mitigation measures will be inherent in the design of the future facility and the future operations will be undertaken in line with the appropriate environmental permitting requirements with particular reference to The Environmental Permitting (England and Wales) Regulations 2016 (Ref 163).

17.6.5 To mitigate any potential operational effects, the drainage design for the Proposed Development will require consideration of measures to prevent contamination from migrating toward sensitive surface watercourses and underlying aquifers. All storage and loading / unloading areas will be adequately bunded.

17.7 Description of Potential Likely Significant Effects

Construction Phase

17.7.1 Based on our understanding of the Proposed Development, the characteristics of the Main Site and experience from other similar schemes, potentially likely significant effects as outlined below. The likely significant effects associated with the Construction Phase will relate to:

a. Exposing construction staff to contaminated dust and soil particulates during construction related earthworks activities (specific receptors include construction workers during development);
b. Mobilising existing contamination in soils and groundwater as a result of ground disturbance and dewatering and creating preferential migration pathways for contaminants to reach sensitive receptors (e.g. as a result of piling or along new service trenches). Specific receptors include construction workers, neighbouring users of existing operational facilities, mineral resources, groundwater and surface watercourses;
c. Introduction of new sources of contamination to the ground, such as fuels and oils used in construction plant, associated with any spillages and leaks. Specific receptors include construction staff, neighbouring users of existing operational facilities, mineral resources, groundwater and surface watercourses; and
d. Release of hazardous gas and subsequent accumulation within confined spaces associated with disturbing organic soils or infilled areas of land. Specific receptors include construction workers during development.

Operation Phase

17.7.2 The likely significant effects associated with the Operation Phase will relate to:

a. Damage to structures and infrastructure from ground contaminants. Specific receptors include foundations and other buried structural components, belowground pipework, etc); and
b. Introduction of new sources of contamination to the ground as a result of potential spills, leaks and uncontrolled discharge of potential pollutants during the operation phase. Specific receptors include workers during operation, and controlled waters (groundwater and surface water courses).

17.8 Elements Scoped In or Out of Further Assessment

17.8.1 A summary of elements to be scoped in or out of further assessment are presented in Table 17.4 below.

Table 17.4: Elements Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Contaminated soil and detriment to human health	Construction and Operation	X		Potential for construction staff (and possibly the general public) to be exposed to contaminants and UXO in the ground. This risk to human health will be mitigated through robust risk assessments and method statements (RAMS) which are standard practice during any construction stage. A desk-based Phase 1 preliminary risk assessment will be part of the Environmental Statement, and will inform future pre-commencement intrusive investigation, generic quantitative risk assessment (GQRA) and if required detailed quantitative risk assessment (DQRA) and remediation strategy. This will determine the areas of contamination that can then be used to inform the RAMS. Contaminated land pathways to human health will be addressed via the remediation strategy and incorporated as part of the construction phase, thereby leaving the Site 'suitable for use' from a contaminated land perspective as part of the operational phase. Contaminated land pathways to human health to be addressed via the remediation strategy and incorporated as part of the construction phase, thereby leaving the Site 'suitable for use' from a contaminated land perspective as part of the operational phase. The above refers to the Main Site. The Connection Corridors will be scoped out of the assessment due to works being within a narrow zone and standard

Element	Phase	Scoped In	Scoped Out	Justification
				environmental management and engineering methods would be employed during construction to manage any potential risks.
Controlled waters contamination (Including Ramsar and SSSI sites)	Construction and Operation	X		Potential for contaminants to be mobilised and impact sensitive controlled water receptors. Potential sources of contamination and understanding of the hydrogeological regime will be acquired through a desk-based Phase 1 preliminary risk assessment (PRA) that will be part of the Environmental Statement. The Phase 1 PRA will inform future pre-commencement intrusive investigation, generic quantitative risk assessment (GQRA) and if required detailed quantitative risk assessment (DQRA) and remediation strategy. The requirement for the implementation of standard practices during construction to minimise the potential for release of contaminants to the environment will be included within the CEMP. The potential for piling to create contaminant pathways will also be considered. Potential for releases from site infrastructure (tanks and pipelines) during operation will be mitigated through appropriate design and the facility will be operated in accordance with the environmental permitting requirements. The above refers to the Main Site. The Connection Corridors will be scoped out of the assessment due to works being within a narrow zone and standard environmental management and engineering methods would be employed during construction to manage any potential risks.
Hazardous Ground Gas to accumulate within confined spaces	Construction and Operation	X		Potential for works to create additional pathways to allow hazardous gas (e.g., methane and carbon dioxide) to accumulate within underground chambers / pipeline runs or pipeline support infrastructure, or to migrate towards buildings will be assessed through a desk-based Phase 1 preliminary risk assessment (PRA) that will be part of the Environmental Statement. The Phase 1 PRA will inform future pre-commencement intrusive investigation, and hazardous ground gas risk assessment and remediation strategy.

Element	Phase	Scoped In	Scoped Out	Justification
				During construction it is anticipated that ground gas risks will be and mitigated through standard construction practices and implementation of good design. Construction works will be completed in accordance with the CEMP which will include the requirement for construction activities to be completed in accordance with relevant RAMS and consideration of working in confined spaces. If confined spaces or other areas where gas could accumulate are included in the Proposed Development, the construction of these could include gas protection measures where necessary, and / or appropriate entry and use controls. The above refers to the Main Site. The Connection Corridors will be scoped out of the assessment due to works being within a narrow zone and standard environmental management and engineering methods would be employed during construction to manage any potential risks.
Built Environment – detriment of pipes and cables from aggressive ground contaminants over time.	Construction and Operation		X	Discounted from the construction phase as insufficient time for contaminants to impact structures, pipe/ducting materials during the construction phase of the Proposed Development. Potential for aggressive ground conditions to affect in ground structures in operation phase. Contaminants in the ground to impact (damage) pipe and cable material over time will be assessed during future intrusive works and mitigated through implementation of good design.
Agricultural Soils	Construction and Operation		X	Agricultural soils have been discounted from further assessment as they have not been identified to be a sensitive receptor. The Main Site has an agricultural classification of 'urban'
Mineral Resources	Construction and Operation		X	Mineral resources have been discounted from further assessment as it is considered that they are already sterilised both within the Main Site by the existing development and also within the wider surrounding area by the existing surrounding industries. It is also noted that the deep reserves of gypsum and salt are shown across a significant area of Tees Valley and that development of the site would not prevent extraction of these

Element	Phase	Scoped In	Scoped Out	Justification
				minerals at depth if accessed from a different location.

17.9 Proposed Assessment Methodology

17.9.1 Geology and Soils will be scoped into the EIA for potential contamination impacts to human health and controlled waters and hazardous ground gas risks related to the Main Site.

17.9.2 A desk-based Phase 1 preliminary risk assessment (PRA) including an initial conceptual site model (CSM) will be prepared and submitted with the Environmental Statement. The PRA and CSM will assess data gaps and uncertainties and inform the scoping of future intrusive ground investigation.

17.9.3 Based on the findings of the PRA the ES will assess:

a. the potential for construction staff, site neighbours and the general public to be exposed to contaminants and UXO in the ground.
b. the potential for future site users to be exposed to contaminants in the ground.
c. the potential for contaminants to be mobilised and impact sensitive controlled water receptors.
d. the potential for creation of additional pathways to allow hazardous gas to accumulate within infrastructure or buildings.

17.9.4 The potential for releases during operation from site infrastructure such as tanks and pipelines.

17.9.5 The Geology and Soils chapter of the ES will cover:

a. Identification and evaluation of impacts with respect to land contamination;
b. Qualitative assessment of significance and magnitude of land contamination on human health and controlled waters in accordance with current guidance;
c. Assessment of impacts on land contamination during both the construction and operational phases of the Proposed Developments; and
d. Recommendations for mitigation measures that would reduce the potential effects of the developments to acceptable levels.

17.9.6 The EIA will inform the design as to where mitigation measures may be required during the Proposed Development's construction, operation and decommissioning. These mitigation measures are anticipated to include the recommendation for further intrusive ground investigation to address residual data gaps or better delineate identified contamination hotspots or plumes. It is anticipated that the requirements for intrusive investigation would be discussed and agreed in advance with the Environment Agency and STBC land

contamination officer, as appropriate. The data generated by the intrusive ground investigation will be used to inform generic quantitative risk assessment (GQRA) and if required detailed quantitative risk assessment (DQRA) and remediation strategy and verification plan to address identified risks to receptors.

17.9.7 The ES will also make recommendations for possible mitigation measures to be employed by contractors and incorporated into a CEMP, on a precautionary basis, to allow for encountering previously unidentified contamination during the construction phase.

17.10 Limitations and Assumptions

17.10.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

a. In preparing the Geology and Soils scoping chapter, a key assumption has been that ground investigation will be a requirement for, and undertaken to inform, design of the proposed facility;
b. It has been assumed that all construction works, and the operation of the proposed facility will be completed in accordance with standard environmental practices and under the planning regime;
c. It has been assumed that the construction phase will be completed in accordance with the requirements of a CEMP which will include as a minimum the requirement for the construction phase to be completed in line with appropriate RAMS which will be prepared in line with the requirements of standard environmental practices and guidance; and
d. At the time of writing, there has been no substantive consultation with either the local authorities or Environment Agency. Any commentary associated with the scoping report will be addressed as required.

18. Traffic and Movement

18.1 Introduction

18.1.1 This chapter considers the impacts of the Proposed Development on Traffic and Movement during construction and operation, and any potential significant effects. It sets out the proposed methodology for the Traffic and Movement assessment and identifies those impacts that can be scoped in or out of the Environmental Impact Assessment (EIA).

18.1.2 The impacts of the Proposed Development on Marine Navigation are considered in **Chapter 20: Marine Navigation**.

18.2 Policy, Legislation, and Guidance

18.2.1 The policy, legislation, and guidance relevant to the Traffic and Movement assessment of the Proposed Development is as follows in Table 18.1:

Table 18.1: Traffic and Movement - Summary of Key Policy, Legislation and Guidance

Policy/ Legislation/ Guidance	Description
Policy	
Overarching National Policy Statement for Energy (EN- 1) 2024 (Ref 36Ref 36)	The Overarching National Policy Statement (NPS) for Energy (EN-1) explains the assessment principles to which the Secretary of State will have regard in the examination of energy NSIPs (such as the Proposed Development), and explains the considerations for the assessment of traffic and movement impacts associated with the transport of materials, goods and personnel to and from a development during all project phases.
NPS for Renewable Energy Infrastructure (EN-3) (2023) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed.
National Planning Policy Framework (NPPF) 2024 (Ref 38Ref 38)	The National Planning Policy Framework (NPPF) replaced the previous Planning Policy Statements and Planning Policy Guidance used to determine planning applications under the Town and Country Planning Act 1990. The document states the need for a Transport Statement (TS) or Transport Assessment (TA) to support developments likely to generate significant numbers of trips. It suggests that development should take advantage of opportunities for sustainable travel, facilitated by a Travel Plan (TP).
Department for Transport Circular 01/2022 Strategic road network and the delivery of sustainable development (2022) (Ref 419Ref 419)	Department for Transport (DfT) Circular 01/2022 explains how National Highways will engage with the planning system and fulfil its remit to be a delivery partner for sustainable economic growth whilst maintaining, managing and operating a safe and efficient Strategic Road Network (SRN).

Policy/ Legislation/ Guidance	Description	
Highways England Water Preferred Policy (2019) (Ref 420Ref 420)	This policy provides guidance on when to move an AIL by water and when it is allowed to be moved by road.	
Tees Valley Joint Minerals and Waste Development Plan Document (2011) (Ref 35Ref 35)	The Minerals and Waste Core Strategy contains the long-term spatial vision and strategic policies needed to achieve the key objectives for minerals and waste developments in the Tees Valley.	
Tees Valley Strategic Transport Plan (2020) (Ref 421Ref 421)	The Tees Valley Strategic Transport Plan is a comprehensive plan outlining the long-term transportation strategies and infrastructure improvements for the Tees Valley region. It aims to improve connectivity, support economic growth, and promote sustainable travel across the area.	
STBC Local Plan (2019) (Ref 55Ref 55)	The STBC Local Plan, adopted 30 January 2019, sets out a framework for the delivery of sustainable transport opportunities and associated infrastructure (Policy TI1), including the development of public transport, rail, and NMU networks. Multi-modal access to and from areas of industrial activity must also form part of the overall approach to the planning and development of the future transport networks, including the identification of preferred HGV routes to/from areas of industrial activity. This is particularly relevant to the location, construction, operation and decommissioning of the Proposed Development	
Redcar and Cleveland Borough Council Local Plan (2018) (Ref 33Ref 33)	The Local Plan sets out the Council's policies and proposals to guide planning decisions and establishes the framework for the sustainable economic growth and development of the Borough up to 2032. The Local Plan covers a range of matters including the number of new homes that are needed and where they should be located; the amount and proposed location of new employment land; protection and enhancement of the natural and historic environment; provision of new infrastructure and improvement of town centres and community facilities in the Borough.	The Local Plan sets out the Council's policies and proposals to guide planning decisions and establishes the framework for the sustainable economic growth and development of the Borough up to 2032. The Local Plan covers a range of matters including the number of new homes that are needed and where they should be located; the amount and proposed location of new employment land; protection and enhancement of the natural and historic environment; provision of new infrastructure and improvement of town centres and community facilities in the Borough.
Legislation		
The Highways Act 1980 (Ref 422Ref 422)	The Highways Act 1980 sets out the requirements pertaining to delivering highways infrastructure, managing existing highways and managing highway activity including off site highway works, for example, the creation of temporary site access.	
New Roads and Street Works Act 1991 (Ref 423Ref 423)	The New Roads and Street Works Act 1991 provides a legislative framework for street works by undertakers and works for road purposes to the extent that these must be co-ordinated by street authorities.	

Policy/ Legislation/ Guidance	Description
Traffic Management Act 2004 (Ref 424Ref 424)	The Traffic Management Act 2004 provides powers to tackle congestion and disruption on the road network and requires local authorities, where possible, to ensure that traffic can move quickly and freely on their roads.
The Planning Act 2008 (Ref 2Ref 2)	The Planning Act 2008 created a new development consent regime for major infrastructure projects in the fields of energy, transport, water, wastewater, and waste. It was intended to speed up the process for approving major new infrastructure projects.
Local Transport Act 2008 (Ref 425Ref 425)	The Local Transport Act 2008 intended to address increasing road congestion and to improve the quality of local bus services and placed a requirement on authorities to prepare a Local Transport Plan.
Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 257Ref 257)	The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 is UK legislation that sets out the requirements for assessing and mitigating the environmental impacts of major infrastructure projects. The regulations require developers to prepare an EIA and consult with stakeholders and the public. The aim of the regulations is to ensure that the environmental impacts of major projects are fully assessed and addressed, and that sustainable development principles are followed.
Guidance	
Environmental Assessment of Traffic and Movement (2023) (Ref 284Ref 284)	Known as 'the IEMA Guidelines'. This guidance provides a basis for a comprehensive and consistent approach to the appraisal of traffic and movement impacts.
Planning Practice Guidance Travel Plans, Transport Assessments and Statements (2014) (Ref 426Ref 426)	This PPG was published in March 2014. Together, PPGs and the NPPF set out what the Government expects of local authorities. The overall aim is to ensure the planning system allows land to be used for new homes and jobs, while protecting valuable natural and historic environments. The guidance includes specific details in relation to the preparation of a TA, TS and Travel Plan (TP).
LA 101 - Introduction to environmental assessment (2019) (Ref 427Ref 427)	This document sets out the over-arching requirements and principles that form an introduction to the environmental assessment of motorway and all- purpose trunk roads.
LA 103 - Scoping projects for environmental assessment (2020) (Ref 428Ref 428)	This document sets out the requirements for scoping motorway and all-purpose trunk road projects for environmental assessment.
LA 104 - Environmental assessment and monitoring (Highways England, 2020) (Ref 222Ref 222)	This document sets out the requirements for environmental assessment of projects, including reporting and monitoring of significant adverse environmental effects.
LA 112 - Population and Human Health, Design Manual for Roads and Bridges (2020) (Ref 206Ref 206)	This document sets out the requirements for assessing and reporting the environmental effects on population and health from construction, operation and maintenance of highways projects.

18.3 Study Area

18.3.1 The Study Area will be based upon the anticipated 'worst case' scenario whereby the greatest level of construction activities are expected to be occurring at the same time, and therefore the highest number of construction vehicles will be generated. Further details on the anticipated number of workers and HGV movements during the operational phase are provided in Section 18.7.

18.3.2 The Study Area will be refined as further information is made available and the Proposed Development's traffic and movement characteristics are fully developed, including cumulative impacts and AILs.

18.3.3 As part of the PEIR, a desk-study will be undertaken to identify PRoW within the Study Area which may need to be closed or diverted (temporarily or permanently) to manage any potential conflict between non-motorised users (NMU) and development generated the traffic. At this Scoping stage it is anticipated that there will be no requirement to temporarily or permanently close or divert PRoW as part of the Proposed Development, including the King Charles III England Coast Path and Teesdale Way.

18.4 Baseline and Future Baseline

Data Sources

18.4.1 A comprehensive review of all available baseline information will be undertaken as part of the Traffic and Movement assessment, including but not limited to, motorised traffic movements, pedestrian and cycle infrastructure, accident data, and public transport provision.

18.4.2 The accident data will be derived from the '*Crashmap*' data platform, with other data sources including (but not limited to) public transport scheduling information, 'Strava' heat maps, Department for Transport (DfT) traffic data, and OS mapping.

Baseline

Local Highway Network

18.4.3 While the surrounding road network will be considered in greater detail as part of the Traffic and Movement assessment process, it is expected that the following five links or routes will be included:

a. **A1185**: This operates as the primary route connecting the strategic road network (i.e. the A19 and A669) to the Site. Currently operating as an identified HGV priority route (confirmed by STBC), it consists of a two lane, 50mph carriageway in both directions, with a physical right turn island providing the northern access into the residential area of Billingham;
b. **A178 / Seaton Carew Road:** This north-south running 'A' road provides a direct link between Seaton to the north and Port Clarence to the south. It connects into a 4-arm roundabout with the A1185, providing direct access to / from the Site;

c. **A1046 / Port Clarence Road**: Located to the south west of the Site, this link passes through a small area comprising residential and industrial activities. Importantly, it passes High Clarence Primary School and, as a high sensitivity receptor, it is expected to be included as part of the wider Traffic and Movement assessment;
d. **A1085 "Trunk Road":** Located on the south side of the River Tees, this 'A' road runs from Middlesbrough to Redcar, passing through a largely industrialised area, including the main entrance to the British Steel Lackenby site. It operates as a dual-carriageway at its southern end, narrowing to a single lane, two-way carriageway north of the British Steel site entrance; and
e. **A1053**: Providing a connecting link between the A174 and the A1085, this 'A' road dual-carriageway is subject to the 60mph national speed limit. While not located adjacent to any sensitive receptors, it is anticipated that it will operate as a key route for construction vehicles travelling to / from the construction works south of the River Tees.

18.4.4 There are also a series of B roads and/or unclassified roads within the study area, some of which may be included as part of the Traffic and Movement assessment depending upon the outcome of the initial link screening process (refer to section 18.9).

18.4.5 A key element of the baseline review will be the collection and analysis of contemporary traffic data. This will include DfT data which is already publicly available, some of which is summarised in Table 18.2.

18.4.6 In conjunction with the existing DfT data (above), it is proposed that a series of traffic surveys will be undertaken to support the Traffic and Movement assessment. While the specific locations of each of the count sites have still to be defined, it is expected that the following locations will be included:

a. Seaton Carew Road / A1185 Seal Sand Roundabout. It is proposed that all four approach arms are surveyed;
a. Port Clarence Road (adjacent to High Clarence Primary School);
b. Port Clarence Road (on the approach to the 'Transportation Bridge');
c. A1185 (between the A689 / Wynyard Park roundabout and March House Avenue); and
d. A689 (between the access roundabout to Billingham Services and the A689 / Wynyard Park roundabout).

Public Right of Way, Walking and Cycling

18.4.7 There are no known PRoW crossing the Main Site. The King Charles III England Coast Path crosses both:

a. the proposed site vehicle access route at the roundabout junction of the A178 Seaton Carew Road and Seal Sands Road; and
b. the junction of the existing pipeline corridor access off the A178 Seaton Carew Road located to the south of the above roundabout.

18.4.8 The main strategic long-distance NMU route within the immediate study area is the National Cycle Network Route 14. This connects Billingham to the west and Hartlepool to the north east. The section of this route which runs parallel to the

A1185 currently operates as a segregated off-road path, located on the northern fringes of Billingham.

18.4.9 The remaining 'A' roads to/from the Site (i.e. the A1185 and Seaton Carew Road links) do not currently feature any dedicated pedestrian or cycle facilities.

Table 18.2: DfT Traffic Count (Annual Average Daily Flow), 2-way Daily Vehicle Flows

Count Point	Easting	Northing	Road	Location	Year				
					2020	2021	2022	2023	2024
73620	450650	524590	A178	Seaton Carew Rd (north)	5,652	6,222	6,702	6,831	6,911
56750	450520	521970	A178	Seaton Carew Rd (south)	6,636	7,310	7,886	8,048	8,146
27578	450544	523660	A1185	-	4,415	4,556	4,874	4,912	4,950
48059	445000	526000	A686	-	24,284	26,602	28,633	33,201	33,563
38341	450246	521445	A178	'Transporter Bridge'	627	687	735	744	753
73625	445870	525960	A1185	East of roundabout with A689 (Stockton Rd)	9,115	10,015	10,765	13,156	13,290

Source: https://roadtraffic.dft.gov.uk/#12/54.5844/-1.3989/basemap-countpoints

Public Transport - Bus

18.4.10 Being an industrial site with relatively low levels of passenger demand, existing public transport provision to/from the Site is limited to the Stagecoach no. 1 service which operates along the north-south running Seaton Carew Road (A178) – refer to Table 18.3.

18.4.11 The nearest bus stop to the Site is located adjacent to the junction between the A1185 (Seal Sands Link Road) and the Seal Sands Roundabout. This may provide opportunities for site operatives and staff to access the Site via public transport, although it is accepted the opportunities for this may be limited.

Table 18.3: Bus Timetable

Stagecoach Service No.	Route	Daytime Frequency	
		Monday – Saturday	Sunday
1	Middlesborough – Haverton Hill – Port Clarence – Hartlepool (north)	30 mins	60 mins

18.4.12 There are no rail stations or sections of the public passenger railway within the immediate vicinity of the Proposed Development. The nearest railway stations to the Main Site are at Billingham, approximately 5 km to the west, and at Middlesborough and South Bank approximately 3 km and 2.5 km to the south respectively.

Accident Data

18.4.13 The Traffic and Movement assessment will include a full review of traffic accident data for the most recent, full 5 year period, as sourced from the *'Crashmap'* web platform.

18.4.14 A preliminary data gathering exercise for 20181 – 2022 has already been undertaken along the A1185 corridor / Seal Sand Roundabout and Seaton Carew Road, with the results summarised in Table 18.4.

Table 18.4: Local Accident Data (2018 – 2022)

Location	2018	2019	2020	2021	2022
Seal Sand Roundabout / A1185	-	4 slight 0 serious 0 fatal	-	-	0 slight 1 serious 0 fatal
Seaton Carew Road	-	1 slight 0 serious 0 fatal	0 slight 1 serious 0 fatal	1 slight 0 serious 0 fatal	-
Port Clarence Road / Transporter Bridge	-	-	0 slight 1 serious 0 fatal	-	-

Future Baseline

18.4.15 The following sources of information will be used to define the Future Baseline conditions upon which the Traffic and Movement assessment will be based:

a. **Committed Developments**: There may be the potential for cumulative impacts resulting from the interaction between the Proposed Development and the operation of committed developments within the surrounding area. An assessment of the significance of the Cumulative Effects will therefore be undertaken; and
b. **TEMPro**: The Trip End Model Program (TEMPro) v8 software, as developed by the DfT, will be used to predict the level of background traffic growth within the local area between the surveyed traffic flow year (2025) and the peak year of the construction phase. The latter will be based upon a preliminary construction programme which is currently under development,

18.4.16 Sensitivity testing may be undertaken where appropriate. This will be determined through scoping discussions with STBC and National Highways, this may include assessing different rates of build out associated with the committed developments, or other factors.

18.5 Sensitive Receptors

18.5.1 It is proposed that the sensitive receptors identified as part of this Traffic and Movement assessment will fall into one of two categories, namely:

a. **Motorised Users:** Motorised users of the surrounding highway network, including vehicle drivers and public transport users; and
b. **Non-Motorised Users**: NMUs, including pedestrians, cyclists, horse riders (and other vulnerable user groups).

18.5.2 These receptors will also be considered within the context of local development types, for example, sensitive areas such as schools, hospitals, and/or large residential areas.

18.6 Design, Embedded Mitigation, and Enhancement Measures

Construction Phase

18.6.1 At this stage in the EIA, a detailed assessment of the Traffic and Movement impacts has not yet been undertaken to determine whether mitigation is required. However, potential mitigation measures that could be considered are outlined below. These are subject to change following the main assessment. Mitigation measures will be confirmed at the ES stage following the detailed assessments.

a. A road sweeper could be stationed at the site to promptly address any debris that may end up on the public road;
b. Construction traffic should follow designated routes to minimise disruption in sensitive areas such as village/town centres, schools, and commercial zones;
c. Signs indicating construction traffic routes could be installed, with warning signs placed near site entrances to alert other road users in advance; and
d. The effects of construction traffic on existing link capacity will be minimised by avoiding routes through built up areas as far as practicality allows.

18.6.2 If a footway is to be temporarily closed, a safe alternative route will be required. The needs for children, older people and disabled people will be considered when offering an alternative route, where possible this alternative route should ideally be a minimum of 1.5 metres wide (as per DfT's Safety at Streetworks, 2013). However, the details of such temporary infrastructure changes will be considered in more detail as part of the Traffic and Movement assessment.

18.6.3 Risks of accidents between construction vehicles and other road users will be reduced by routes which avoid higher accident frequency links (where possible). Proper signage and communication will also inform staff/residents to be more cautious around sites and along transport links. Safety audits and proper driver training will be seen as standard procedures for also reducing risk of accidents.

18.6.4 The chosen routes, specifically the minor links, must have an inspection to show any narrow local roads, junction turning constraints and low bridges or bridges with a low limited load bearing capacity. Efforts will be made to avoid utilising unsuitable local roads by establishing temporary access points and haul roads wherever feasible.

18.6.5 Throughout the construction duration, physical enhancements to the local road network will be undertaken as practicable, ensuring compliance with relevant standards, and preventing unintended secondary impacts such as inadequate drainage.

18.6.6 Relevant design, mitigation and enhancement measures will also include the following management documents:

a. An Outline Construction Traffic Management Plan (oCTMP). This will provide details of procedures for construction related traffic, including: number of vehicles; routes; frequency and timing of movements; worker hours and shift patterns; laydown areas and parking; and AILs; and
b. An Outline Construction Worker Travel Plan (oCWTP). This will focus on minimising the traffic impacts associated with construction workers travelling to and from Site.

18.6.7 Contractors will be responsible for maintaining detailed delivery schedules. They will also be required to report and compile details of any accidents or near misses on public roads. Monitoring of personnel movements will involve periodic surveys to assess on-site temporary car park occupancy and gather feedback and complaints from staff and stakeholders. These sorts of measures will be set out in more detail in the outline oCTMP.

Abnormal Indivisible Loads

18.6.8 AILs will be transported to site by sea and unloaded at the new quay for transport to the site. The use of modular plant transported by boat directly to site will minimise the number of HGV movements required associated with construction.

18.6.9 Where smaller AILs must be transported by road, traffic management measures will be agreed with the highways owners and the Police in advance of the construction commencement. This will most likely involve engagement with the Local Authority and/or Highways England. As part of this process agreements will be made in regard to timings of AIL movements (i.e. late night movements to minimise impacts on the road network) and any temporary removal of road furniture which may be required for the transportation of the AILs (i.e. temporary removal of street lights, signs or signalling equipment). Any such requirements will be agreed directly with the landowner. Impacts of the import of modular plant to the site via the Tees Estuary will be assessed in **Chapter 20: Marine Navigation.**

Operation Phase

18.6.10 It is considered that no design, mitigation, or enhancement measures will be required as the operational phase will likely not give rise to any significant environmental Traffic and Movement effects. Operational vehicle movements (e.g. ash disposal or consumables) will be significantly lower than during construction. The delivery of the feedstock will predominantly be by marine transport offloaded at the quay within the Site boundary and export of SAF and renewable naphtha product will also be by ship or rail from local third party facilities. There may be minor movements of HGVs by road during operation

associated with import of feedstocks. Impacts of operational marine traffic will be assessed in **Chapter 20: Marine Navigation**.

18.7 Description of Potential Likely Significant Effects

Construction Phase

18.7.1 When assessing the effect of the construction vehicles on the surrounding transport networks, this will be disaggregated into non-HGV movements (i.e. cars, Light Goods Vehicles (LGV), etc) and HGV movements (i.e. tipper lorries, etc).

18.7.2 The specific types of construction vehicles likely to be used will be further refined once the detailed construction programme is developed. Details on the origin(s) of the various construction vehicles and load types is not available at this stage of the Proposed Development. The routing of the construction vehicles will depend upon the location of the construction compounds, with the intention that all routing will be along 'A roads' / main roads and avoiding residential areas wherever possible. This routing will then be refined as part of the assessment process and the development of mitigation measures.

18.7.3 It is anticipated that the construction phase is likely to be up to four year's duration. During this time, it is expected that a maximum of 2000 construction workers will be required during the peak of the construction phase, with the average number of workers on Site reducing during the off-peak periods.

18.7.4 During the construction phase, some materials will be delivered by road (raw materials) and water (plant and prefabricated equipment) as set out in further detail in **Chapters 2 and 3: Site and Proposed Development Description**. The number of HGV movements associated with the construction phase will be developed as the Proposed Development progresses and will be assessed in both the PEIR and ES.

18.7.5 The likely significant effects for Traffic and Movement associated with the construction phase are set out in Table 18.5.

Table 18.5: Traffic and Movement - Likely Significant Effects

Environmental Impacts	Description	Receptor Type
Driver Delay	Increases in traffic flows on existing roads can lead to traffic delays to non-development traffic which can occur at: Key roads within the Study Area where there may be additional concentrations of traffic flow; and Key junctions on the highway network near the Site	Motorised users NMU
Road Safety	The impact of the Proposed Development will be assessed in terms of its likely effect on the existing accident record and any potential increase in the number of accidents.	Motorised users NMU
Fear and Intimidation	Fear and intimidation criteria are considered to be dependent on the volume of traffic, the proportion of HGVs, proximity to people and any deficiencies	NMU

Environmental Impacts	Description	Receptor Type
	in protection offered which can be caused by issues such as narrow pavement widths	
Severance	Severance can occur when there is a perceived division within a community which becomes separated by a major traffic route. The assessment of severance considers specific local conditions and, in particular, the local pedestrian routes to key local facilities including crossings.	NMU
Pedestrian amenity	Some developments can bring about increases in the number of vehicle and pedestrian movements which can lead to greater increases in delay to pedestrians seeking to cross the road.	NMU

Operational Phase

18.7.6 Due to the most significant impacts being likely to occur during the construction phase, it is considered that the environmental impacts relating to potential movements of materials, plant and workers during the operational phase can be scoped out. Details of this are set out below.

18.7.7 The SAF production facility will utilise biomass as the primary feedstock. It is intended that this feedstock will be delivered to Site by ship and offloaded at the proposed quay within the Site boundary. Having direct access to a quay to enable deliveries of the feedstock is highly beneficial since it avoids double handling of that feedstock prior to use. Ship or rail will be the primary means of exporting SAF and renewable naphtha from the site with limited use of HGVs (approximately 10 per day). Operational wastes (e.g. combustion ash) will also require export by road.

18.7.8 It is anticipated that the changes to road traffic flows as a result of the Proposed Development during its operational phase are not expected to change by more than 10% when compared to the site's permitted use. In accordance with the IEMA Guidelines (Ref 284), it is proposed that operational traffic movements resulting from the Proposed Development are therefore scoped out. For transparency, this decision will be fully justified and explained as part of the PEIR and ES, whereby the predicted operational vehicle flows will be confirmed. Export of SAF and renewable naphtha from local rail loading infrastructure will be under existing consents and as such can be scoped out.

Decommissioning Phase

18.7.9 While the traffic volumes associated with the decommissioning phase are not yet known at this stage, it is expected that they will be less than that of construction traffic volumes and, on that basis, it is considered that undertaking an assessment of the construction phase will provide a clear understanding of any potential impacts without the need to undertake a separate decommissioning assessment.

18.7.10 The decommissioning phase is therefore scoped out of the Traffic and Movement assessment.

18.8 Elements Scoped In or Out of Further Assessment

18.8.1 A summary of the impacts that are proposed to be scoped in or out for the Traffic and Movement assessment are outlined in Table 18.6.

Table 18.6: Elements Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Development generated construction traffic	Construction	X		The construction traffic impacts of Site construction works, including the requirements of AIL, will be assessed as part of the ES. At this stage, construction traffic volume and movements are not known. Further information to establish the construction traffic generation and profile will be sought from the Applicant.
AILs delivery strategy	Construction	X		At this stage, the size and number of AIL movements are not known, nor is the type of vehicle required to be used (including import of modular plant by sea). The ES will confirm the worst-case number of abnormal and modular loads required and the types of vehicles/vessels required. Any mitigation measures required to facilitate the delivery of abnormal/modular loads will be detailed in the ES and any resultant likely significant effects assessed.
Proposed Development generated operation traffic	Operation		X	The operational traffic impacts of Site operation works are not expected to change by more than 10% when compared to the sites existing use and therefore, in line with IEMA Guidelines (Ref 284) can be scoped out. This will be evidenced in the TA as part of the application.
Development generated decommissioning traffic	Decommissioning		X	The traffic impacts of Site decommissioning works are uncertain at this stage, and it is considered that the likely

Element	Phase	Scoped In	Scoped Out	Justification
				significant effects would be no worse than the Construction Phase. A DEMP would be prepared at the time of decommissioning

18.9 Proposed Assessment Methodology

Overview

18.9.1 It is proposed that the assessment methodology to be used to determine the potential effects of the Proposed Development on the Traffic and Movement networks within the study area will follow the IEMA guidelines, as set out in '*Environmental Assessment of Traffic and Movement*' (2023). This document supersedes the '*Guidelines for the Environmental Assessment of Road Traffic*' (IEMA, 1993) which, until early-2023, provided the basis of the transport assessment process.

18.9.2 The assessment methodology and assumptions underpinning the assessment will be agreed with (STBC and National Highways to ensure that it meets the necessary standards and guidelines. RCBC and Middlesbrough Council (MC) will also be consulted as neighbouring highway authorities. Given the small number of HGV and construction worker vehicle movements required for connection works south of the Tees it is considered that these can be scoped out of the assessment.

18.9.3 It should be noted that the traffic data used within the assessment will also feed into two separate, but parallel assessments, firstly Air Quality and secondly, Noise and Vibration. The former requires 24-hour Annual Average Daily Traffic (AADT) data while the latter requires 18-hour Annual Average Weekday Traffic (AAWT).

Sensitivity and Magnitude Assessment Screening Criteria

18.9.4 The IEMA guidance (2023) requires that to determine the significance and magnitude of any potential effects the following rules or assessment criteria should be applied:

a. Rule 1: highway links where flows are predicted to increase by more than 30% and where the number of HGV is predicted to increase by more than 30% should be included as part of the full assessment; and
b. Rule 2: any other particularly sensitive area(s) where traffic flows are predicted to increase by 10% or more should also be included.

18.9.5 As part of a screening exercise, these rules will then help identify those links for further assessment based upon the following seven elements:

a. Severance of communities;
b. Driver and passenger delay;
c. NMU delay;

d. NMU amenity (including potential impacts on Stockton-on-Tees PRoW, footways and cycle routes;
e. Fear and intimidation;
f. Road user and pedestrian safety; and
g. Hazardous / abnormal load review.

18.9.6 For each of these elements, the magnitude and sensitivity of the potential effects will be based upon the predicted changes in traffic flows, as set out in Table 18.7.

Table 18.7: Sensitivity and Magnitude Criteria

Sensitivity Receptor	Sensitivity Definitions and Traffic Magnitude
High	• Total change or major alteration to key elements / features of the baseline conditions; • Impact occurs over a large scale or spatial geographical extent and/or is long-term or permanent in nature; and • Generally, **an absolute change of >90% change in traffic** is considered **high magnitude**.
Medium	• Partial change or alteration to one or more key elements / features of the baseline conditions; • Impact occurs over a medium scale / spatial extent and/or has a medium-term duration; and • Generally, **a 60% - 90% change in traffic** is considered **medium magnitude**.
Low	• Minor shift away from the baseline conditions; • Impact occurs over a local to medium scale / spatial extent and/or has a short to medium-term duration; and • Generally, **a 30% - 60% change in traffic** is considered **low magnitude**.
Negligible	• Very slight change from baseline conditions; • Impact is highly localised and short term with full rapid recovery expected to result in very slight or imperceptible changes to baseline conditions or receptor population; and • Generally, **a rule of <30% change in traffic** is considered **negligible magnitude**.

18.9.7 The Traffic and Movement assessment will also include the following:

a. Incorporating embedded mitigation, specific measures implemented as part of the design process of the Proposed Development to minimise potential environmental impacts. The need for additional mitigation measures (secondary mitigation) hinges on the significance of effects on access, traffic, and transport.
b. In the worst-case scenario analysis, the assessment will examine the Proposed Development parameters under conditions predicted to yield the greatest environmental impact, referred to as the 'worst-case scenario.' This scenario represents the conditions that would result in the maximum potential change for a given receptor and its potential impact.

18.9.8 In terms of the assessment year and the 'worst case' scenario, it is proposed that any background traffic growth will be accommodated through the application of factors derived from the DfT's Trip End Model Presentation Programme (TEMPro).

18.9.9 Note, the purpose of the Traffic and Movement assessment, unlike a formal TA, is not to assess the operational capacity of the local road network (including junction capacities and associated modelling). Rather, it follows the IEMA link-based approach to understanding traffic volumes and the potential impacts this has on the seven elements listed under paragraph 19.9.5.

Evaluation of Significance and Assessment Criteria

18.9.10 The evaluation of significance is determined through the combination of receptor sensitivity and magnitude of change (as highlighted in Table 18.7 above). Table 18.8 sets out how these categorisations will be combined.

Table 18.8: Evaluation of Significance

		Magnitude of Change			
		Negligible	**Small**	**Medium**	**Large**
Receptor Sensitivity	**Low**	Negligible	Minor	Minor	Moderate
	Medium	Negligible	Minor	Moderate	Moderate
	High	Negligible	Moderate	Moderate	Major

18.9.11 The sensitivity of receptors for transport effects will be defined using the following preliminary descriptions (currently under development):

a. Negligible: receptors which are very lightly used (by all users or particularly by vulnerable road users) relative to other receptors within the study area or those which have a very high capacity to accommodate change without significant effects arising;
b. Low: receptors which are lightly used (by all users or particularly by vulnerable road users) relative to other receptors within the study area or those which have a high capacity to accommodate change without significant effects arising;
c. Medium: receptors which are used (by all users or particularly by vulnerable road users) to an average level relative to other receptors within the study area or those which have a moderate capacity to accommodate change without significant effects arising; and
d. High: receptors which are heavily used (by all users or particularly by vulnerable road users) relative to other receptors within the study area or those which have a low capacity to accommodate change without significant effects arising.

18.9.12 For some receptors, the thresholds of significance may benefit from further interpretation and the application of professional judgement on the part of the

assessor, backed up by data or quantified information wherever possible. For example, if a link is adjacent to a school or care home, it would likely have a higher sensitivity due to the presence of vulnerable users. Similarly, if the route runs through the middle of a town or village, it would also have a higher sensitivity than if there was limited direct access to frontage development.

18.9.13 This more subjective approach to the assessment of specific receptor locations will therefore form a key part of the overall Traffic and Movement assessment.

Committed Developments

18.9.14 There may be the potential for cumulative impacts resulting from the interaction between the Proposed Development and an agreed list of 'reasonably foreseeable' committed developments. An assessment of the significance of the Cumulative Effects will therefore be undertaken as part of the Traffic and Movement assessment. The methodology for establishing a Long List and Short List of committed developments is set out in **Chapter 21: Cumulative Effects**.

Assessment Scenarios

18.9.15 The following assessment scenarios are proposed and will be discussed further with STBC as part of ongoing scoping discussions:

a. Baseline: this scenario relates to the current 2025 surveyed traffic flows;
b. Future Baseline: this scenario takes the 2025 Baseline traffic data and applies background traffic growth factors as derived from TEMPro;
c. Do Minimum: this is the future Baseline scenario plus the traffic associated with the list of 'reasonably foreseeable' committed developments (refer to paragraph 19.9.14); and
d. Do Something Scenario: this is the future Do Minimum scenario plus the construction traffic associated with the Proposed Development.

18.10 Transport Assessment Methodology and Significance of Effects

18.10.1 In accordance with the IEMA-based assessment methodology, the sensitivity of a road link or receptor will be based upon a combination of traffic volumes and, importantly, a quantifiable review of the type of motorised users and/or NMU's who may use it. In addition to this, the Traffic and Movement assessment will also include a separate TA, as appended to the Traffic and Movement chapter of the ES.

18.10.2 The assessment and significance of effects referred to within a TA is typically based upon the operational capacity of a junction and changes in traffic flows. This is measured by the 'Ratio of Flow to Capacity' (RFC) of the approach arms to a particular junction. It is typically recognised that an RFC value <0.85 is desirable. If the RFC is greater than this, but below 1.0, this suggests that the junction is approaching capacity and at risk of unacceptable levels of queuing but still within acceptable limits. Where the RFC >1.0, the junction is exceeding its theoretical capacity.

18.10.3 Importantly, although the approach arm of a junction may be >1.0, this does not necessarily mean it is unacceptable in terms of network operation. For example, the RFC may only be >1.0 for a very short period of time (i.e. a weekday peak hour), with all other times suggesting an RFC of <0.85. Alternatively, although a junction may be operating above its theoretical capacity, this may still be acceptable to the local highways authority on the assumption that other users (i.e. NMUs) may benefit from any potential changes to the junction configuration (i.e. provision of a cycle lane).

18.10.4 Ultimately, while the RFC metric is an important means by which the operational capacity of (yet to be defined) junctions within the Study Area will be assessed. The junction modelling results **within the TA** should also allow for professional judgement and review.

18.10.5 While the TA will be based upon an alternative assessment methodology to that used for the EIA Traffic and Movement assessment, it is proposed that the RFC values will still be assigned a 'sensitivity' value, thereby allowing a means by which the results from the two assessments can be compared.

18.10.6 These sensitivity values will be assigned in accordance with the following categories: ,

a. Any junction approach arm with an RFC <0.5 will be categorised as having a negligible sensitivity;
b. Any junction approach arm with an RFC between 0.5 and 0.7 will be categorised as having a low sensitivity;
c. Any junction approach arm with an RFC between 0.7 and 0.85 will be categorised as having a medium sensitivity;
d. An RFC of between 0.85 and 1.0 will be categorised as having a high sensitivity;
e. Any junction approach arm with an RFC of >1.0 will be classified as having a very high sensitivity.

18.11 Limitations and Assumptions

18.11.1 The scope of the Traffic and Movement assessment has not yet been discussed with STBC or National Highways. This will be carried out during the preparation of the PEIR and prior to the ES being completed.

18.11.2 There is limited design information availability at the time of writing this Scoping Report. The assessment within the ES will therefore be in-line with the latest design information available at the time of submission. Where design information is unknown or unavailable, conservative or 'worst case' assumptions will be made.

18.11.3 Table 18.9 provides a summary of the T&T elements that are proposed to be included or excluded from the T&T assessment, along with a justification for that decision.

Table 18.9: Traffic and Movement Elements Scoped In or Out of Environmental Impact Assessment

Element	Phase	Scoped In	Scoped Out
Construction traffic assessment	Construction	X	
Operational traffic assessment	Operation		X
Decommissioning traffic assessment	Decommissioning		X

19. Major Accidents and Disasters

19.1 Introduction

19.1.1 This chapter considers the vulnerability of the Proposed Development to Major Accidents and/or Disasters (MA&D) during construction, operation and decommissioning, caused by natural hazards or manmade hazards (including operational failure), and any potential significant effects as well as impacts to receptors arising from MA&D affecting the Proposed Development. For the purpose of the EIA, the vulnerability of the Proposed Development to a MA&D event during decommissioning is anticipated to be no worse than that for the construction phase following the implementation of risk management plans for decommissioning. Construction and decommissioning are therefore considered together.

19.1.2 This chapter also sets out the proposed methodology for the MA&D assessment and identifies those MA&D categories and types that can be scoped out of the assessment. Where necessary, further assessment will be presented in the ES.

19.1.3 Based on professional judgement, MA&D are events or situations that have the potential to affect the Proposed Development and to go on to cause immediate or delayed serious damage to one or more of the following: human health; welfare; cultural heritage; and the environment. The list of MA&D categories and types to which the Proposed Development may be vulnerable during construction and operation phases are listed in Table 19.1.

Table 19.1: MA&D Categories and Types

Category	Type
Natural	Geophysical
	Hydrological
	Climatological and Meteorological
	Biological
Technological or Manmade Hazards	Societal
	Industrial and Urban Accidents
	Transport Accidents
	Pollution Accidents
	Utility Failures
	Malicious Attacks
	Engineering Accidents and Failures

19.1.4 This chapter should be read in conjunction with technical topic chapters **(Chapter 5: Air Quality** to **Chapter 20: Marine Navigation**) to provide a broader environmental context of the risks associated with these MA&D events/situations. These chapters also include examples of the measures that may be used to prevent or mitigate significant effects and details of the preparedness for, and proposed response to, emergencies. Measures will be identified further in the ES.

19.1.5 The definitions of key terms used in this chapter are given in Table 19.2. These definitions have been developed by reference to the definitions used in EU and UK legislation and guidance relevant to MA&D (as set out below in Section 19.2) as well as professional judgement in the context of the Proposed Development.

Table 19.2: MA&D Key Terms and Definitions

Term	Definition
(Major) Accident	In the context of the Proposed Development, an event that threatens immediate or delayed serious damage to human health, welfare and/or the environment and requires the use of resources beyond those of the Applicant or their contractor(s) to respond. Serious damage includes the loss of life or permanent injury, and/or permanent or long-lasting damage to a receptor that cannot be restored through minor clean-up and restoration efforts. The significance of this effect will take into account the extent, severity and duration of harm and the sensitivity of the receptor.
ALARP	"ALARP" stands for "as low as reasonably practicable". Reasonably practicable involves weighing a risk against the trouble, time and money needed to control it. Thus, ALARP describes the level to which the Health & Safety Executive (HSE) expect to see workplace risks controlled.
Adaptive Capacity	The capacity of receptors to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.
Consultation Zone	The Office for Nuclear Regulation (ONR) and the HSE set consultation distances around nuclear installations, major hazard sites and major accident hazard pipelines after assessing the risks and likely effects of major accidents at the nuclear installation/major hazard site/pipeline. The area enclosed within the consultation distance is referred to as the consultation zone (CZ). The local planning authority is notified of this consultation distance and has a statutory duty to consult the ONR/HSE on certain Proposed Developments within that consultation zone.
Disaster	In the context of the Proposed Development, a naturally occurring phenomenon such as an extreme weather event (for example storm, flood, temperature) or ground-related hazard events (for example subsidence, landslide, earthquake) with the potential to cause an event or situation that meets the definition of a (Major) Accident, as defined above.
External Influencing Factor	A factor that occurs beyond the Site that may present a risk to the Proposed Development, e.g. if an external major event occurred (e.g. earthquake or a Control of Major Accident Hazards (COMAH) site major accident) it would increase the risk of serious damage to a receptor associated with the Proposed Development.
Hazard	Anything with the potential to cause harm, including ill-health and injury, damage to property or the environment; or a combination of these.
Internal Influencing Factor	A factor which occurs within the Site that may present a risk to the Proposed Development.

Term	Definition
Magnitude of Impact	The magnitude of an impact is typically defined by the following factors: extent – the area over which an effect occurs; duration – the time for which the effect occurs; frequency – how often the effect occurs; and severity – the degree of change relative to existing conditions.
MA&D Group	A MA&D which can be grouped as either a Natural Hazard (Disaster) or Technological or Manmade Hazard (Major Accident).
MA&D Category	A set of values used to categorise events within a related parent MA&D Group.
MA&D Type	A set of values used to sub-categorise events within a MA&D Category.
Risk	The likelihood of an impact occurring, combined with effect or consequence(s) of the impact on a receptor if it does occur.
Risk Event	An identified, unplanned event, which is considered relevant to the Proposed Development and has the potential to be a MA&D subject to assessment of its potential to result in a significant adverse effect on a receptor.
Sensitivity	The sensitivity of a receptor is a function of its value, and capacity to accommodate change reflecting its ability to recover if it is affected. It is typically defined by the following factors: Adaptability – the degree to which a receptor can avoid, adapt to or recover from an effect. Tolerance – the ability of a receptor to accommodate temporary or permanent change. Recoverability – the temporal scale over and extent to which a receptor will recover following an effect.
Vulnerability	In the context of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (on the assessment of the effects of certain public and private projects on the environment) the term refers to the 'exposure and resilience' of the Proposed Development to the risk of a MA&D. Vulnerability is influenced by sensitivity, adaptive capacity and magnitude of impact.

19.2 Policy, Legislation, and Guidance

19.2.1 The policy, legislation, and guidance relevant to the assessment of the Proposed Development is shown in Table 19.3:

Table 19.3: MA&D- Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Overarching National Policy Statement for Energy (2024) (EN-1) (Ref 36) and 'National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines 2023' (EN-4) (Ref 91)	Together they provide the primary basis for decision by the Infrastructure Planning Commission (IPC) on applications it receives for gas supply infrastructure and gas/oil pipelines.
NPS for Renewable Energy Infrastructure (EN-3) (2023) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed.
National Planning Policy Framework (NPPF) 2024 (Ref 38)	The NPPF highlights that the purpose of the planning system is to contribute to the achievement of sustainable development through three overarching objectives: economic, social and environmental. The Framework states that "local planning authorities should consult the appropriate bodies when considering applications for the siting of, or changes to, major hazard sites, installations or pipelines, or for development around them." It goes on to state that "Planning policies and decisions should promote public safety and take into account wider security and defence requirements by anticipating and addressing possible malicious threats and other hazards (whether natural or man-made)." It also states that "Planning policies and decisions should ensure that: a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining."
Other Policy	
Stockton-on-Tees Borough Council – Local Plan (2019) (Ref 55)	Policy SD 5 – Natural, Built and Historic Environment: Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of ground, air, water, light or noise pollution or land instability. Wherever possible proposals should seek to improve ground, air and water quality
Redcar and Cleveland Borough Council - Local Plan (2018)	Policy SD 4 - General Development Principles states that: In assessing the suitability of a site or location, development will be permitted where it: e. avoids locations that would put the environment, or human health or safety, at unacceptable risk
Legislation	
Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 257)	The Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 (the 'EIA Regulations') cover the process of EIA in the context of Nationally Significant Infrastructure Projects. They apply the amended EU Directive 2014/52/EU. Schedule 4 Paragraph 5(d) of the EIA Regulations requires: A description of the likely significant effects of the Proposed Development on the environment resulting from the risks to human health, cultural heritage or the environment (for example due to accidents or disasters).

Policy / Legislation / Guidance	Description
	Schedule 4, Paragraph 8 of the EIA Regulations requires: A description of the expected significant adverse effects of the Proposed Development on the environment deriving from the vulnerability of the Proposed Development to risks of MA&D that are relevant to the project concerned. If appropriate, a description of the measures envisaged to prevent or mitigate the significant adverse effects of major accidents and / or disasters on the environment and details of the preparedness for and proposed response to such emergencies.
Health and Safety at Work etc. Act 1974 (c. 37) (Ref 261)	The Act provides the framework for the regulation of workplace health and safety in the UK. It provides a legal framework for the provision of safe plant and equipment and prevention of harm to people from occupational hazards present in a workplace, including emergencies, which may affect those offsite or visiting the Proposed Development.
Construction (Design and Management) (CDM) Regulations 2015 (Ref 262)	These Regulations place legal duties on almost all parties involved in construction work, with specific duties on clients, designers and contractors, so that health and safety is considered throughout the life of a construction project from inception to demolition and removal. The client, designer(s) and contractor(s) must avoid foreseeable risks, so far as is reasonably practicable, by eliminating hazards associated with the design, construction, operation and maintenance of the Proposed Development. The Regulations ensure that mechanisms are in place to continually identify, evaluate and manage safety risks throughout the design, construction and operation phases of the Proposed Development. Many of the risks identified and managed at the design phase also serve to eliminate or reduce the risk of a major accident (and therefore environmental consequence) occurring during the construction and operation phases.
Control of Major Accident Hazards (COMAH) Regulations 2015 (Ref 263)	The purpose of the COMAH Regulations is to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any accidents which do occur. There are at least 22 COMAH sites within a 5km radius of the Proposed Development
The Planning (Hazardous Substances) Regulations 2015 (Ref 264)	These Regulations transpose the land-use planning requirements of the European Seveso III Directive and relate to the way hazardous substances consents operate, and the way in which the planning system reduces the likelihood and impact of major accidents. Hazardous substance consents focus on ensuring the safety of the public around the consented site from potential major accident hazards. Many of the risks identified and managed at the design phase also serve to eliminate or reduce the risk of a major accident (and therefore environmental consequence) occurring during the construction, operation and decommissioning phases.
The Supply of Machinery (Safety)	The Regulations aim to remove technical barriers to trade, in particular

Policy / Legislation / Guidance	Description
Regulations 2008 (Ref 265	products, by harmonising national health and safety provisions applicable to such products when they are first placed on the market or put into service in the European Economic Area. Many of the risks identified and managed in the design of machinery used in and associated with the Proposed Development will serve to eliminate or reduce the risk of a major accident (and therefore environmental consequence) occurring during the construction and operation phases of the Proposed Development.
The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) (Ref 266)	DSEAR implements the Chemical Agents Directive 98/24/EC and the Explosive Atmospheres Directive 99/92/EC. DSEAR sets minimum requirements for the protection of staff from fire and explosion risks arising from dangerous substances and potentially explosive atmospheres. Under the regulations, the Proposed Development will require that mechanisms are in place to identify, evaluate and manage the risk of a major accident due to loss of containment to ALARP. Many of the risks identified and managed will serve to eliminate or reduce the risk of a major accident (and therefore environmental consequence) occurring during the construction and operation phases of the Proposed Development.
The Equipment and Protective Systems for Use in Potentially Explosive Atmospheres Regulations 1996 and 2016 (Ref 267)	The Regulations implement measures for safety and consumer protection with respect to electrical equipment and any provisions concerning the composition, labelling, marketing, classification or description of electrical equipment intended to be used in potentially explosive atmospheres. The use of the correct level of intrinsically safe equipment and protective systems will likely minimise the likelihood of a large-scale release of Sustainable Aviation Fuel (SAF) or renewable naphtha from the Proposed Development and therefore reduce the risk of a major accident.
Occupier's Liability Act 1984 (c.3) (Ref 268)	This Act amends the law of England and Wales as to the liability of persons as occupiers of premises for injury suffered by persons other than their visitors. The Act provides a legal framework for the prevention of harm to people from occupational safety and health hazards present on premises under the control of the occupier, including to those visiting the premises. The Proposed Development will include premises controlled by the Applicant that will attract visitors who could be impacted by MA&D whilst on/crossing those controlled premises.
The Pipelines Safety Regulations 1996 (Ref 269)	The purpose of these Regulations is to ensure that pipelines are designed, constructed and operated properly to ensure their integrity and reduce risks.
Guidance	
IEMA: Major Accidents and Disasters	The purpose of the primer is to increase awareness of the MA&D topic

Policy / Legislation / Guidance	Description
in EIA: A Primer 2020 Ref 270)	and its application within all stages of EIA. The primer outlines an assessment methodology based on known current practice within the UK and provides definitions of key terminology. The Primer is structured around a typical assessment approach and provides a proportionate method for considering major accidents and disasters through the stages of EIA.
'Green Leaves III' Guidelines for Environmental Risk Assessment and Management 2011 (Ref 271)	Providing generic guidance for the assessment and management of environmental risks. A cyclical framework for risk management is presented that identifies four main components of risk assessment: formulating the problem; carrying out an assessment of the risk; identifying and appraising the management options available; and addressing the risk with a risk management strategy. A source-pathway-receptor model is suggested as a tool to assist in risk screening and an example is provided of applying the following filters to prioritise significant hazards for further investigation: the plausibility of linkages between the source of a hazard and a receptor; the relative potency of a hazard, availability of a pathway, or vulnerability of a receptor; the likelihood of an event, based on historic occurrence or of changed circumstances; or a view on the performance of current risk management measures that, if they were to fail, may increase the potential for future harm.
Guideline – Environmental Risk Tolerability for COMAH Establishments 2013 (Ref 272)	Providing generic guidance on how to undertake environmental risk assessments required by the COMAH Regulations. It provides: A definition of the types of harm that should be considered in an environmental risk assessment, and how the harm should be characterised for the assessment. In this context, the level of environmental harm that would be considered serious has been defined for various different receptor types in terms of the combination of the: extent (the area / distance); severity (the degree of harm within the area of impact); and duration (the recovery period). For environmental harm to be considered serious then all parameters must exceed the receptor thresholds as defined in this guideline. The thresholds reflect expert opinion on levels of harm that would be considered serious, with consideration to various receptor specific areas of legislation (such as the Water Framework, Habitats and Environmental Liability Directives). The guideline also provides: a definition of the risk criteria to be used in assessing the tolerability of the environmental risk from an establishment and, where appropriate, individual scenarios; and guidance on how the risks may be evaluated
ISO 31000:2018 Risk Management – Guidelines 2018 (Ref 273)	This guidance identifies a number of principles that need to be satisfied to make risk management effective. If the standards are adopted and applied the management of any risk should help minimise losses, improve resilience, improve controls and improve the

Policy / Legislation / Guidance	Description
	identification of opportunities and threats. The ISO standard states that when defining risk criteria, the following factors should be considered: the nature and types of causes and consequences that can occur and how they will be measured; how likelihood will be defined; the timeframe(s) of the likelihood or consequence(s); how the level of risk is to be determined; the views of stakeholders; the level at which risk becomes acceptable or tolerable; and whether combinations of multiple risks should be considered and, if so how, and which combinations should be considered.

19.3 Study Area

19.3.1 Based on professional judgement, the following factors, and associated distances from the Site, were adopted for setting the Study Area to capture internal and external influencing factors that may have high adverse consequences on the Proposed Development:

a. Manmade features:
    1. Airports and airfields within 13km (the general safeguarding zone 1);
    2. Control of Major Accident Hazard facilities within 5km;
    3. Major accident hazard pipelines within 1km;
    4. Nuclear installations within 3km (distance to The Land Use Planning Outer Consultation Zone 2);
    5. Fuel retail sites (including Liquified Natural Gas, Liquified Petroleum Gas) within 1km;
    6. Rail infrastructure within 500m; and
    7. Transmission (gas, electrical, oil/fuels) crossing the Site.
b. Natural features with the potential to create risks within:
    1. 3km (chiefly hydrological and geological, for example dam failure and seismic activity respectively); and
    2. 1km (chiefly hydrological and geological, for example flood risk and unstable ground conditions respectively).

19.3.2 The Study Area has been based primarily on information held by the Applicant and information gathered to inform this chapter from the data sources discussed below.

19.4 Baseline Conditions and Future Baseline

Baseline

19.4.1 The baseline relevant to MA&D comprises:

a. Features external to the Proposed Development that contribute a potential source of hazard to the Proposed Development;
b. Sensitive environmental receptors at risk of significant effect; and

c. Current (without the Proposed Development) MA&D risks for the existing locality.

19.4.2 The baseline conditions described for MA&D are derived from the following desk study sources:

a. National Risk Register of Civil Emergencies (Ref 274);
b. British Geological Survey (BGS) GeoIndex Onshore (Ref 275
c. Tsunamis Hazard Map
d. The International Disaster Database (Ref 277);
e. Health and Safety Executive's (HSE) Planning Advice Web App (Ref 278
f. HSE's COMAH 2015 Public Information Search (Ref 279
g. OS mapping;
h. Google aerial and street view maps; and
i. Technical topic chapters (**Chapter 5: Air Quality** to **Chapter 20: Marine Navigation**).

19.5 Sensitive Receptors

19.5.1 Schedule 4 of the EIA Regulations (Ref 9) sets out the information that should be included in an ES where that information is relevant to the specific characteristics of the development. As such, this chapter has considered the following receptors:

a. Members of the public and local communities;
b. Infrastructure and the built environment;
c. The natural environment, including ecosystems, land and soil quality, air quality, surface and groundwater resources and landscape;
d. The historic environment, including archaeology and built heritage; and
e. The interaction between the factors above.

19.6 Design, Embedded Mitigation and Enhancement Measures

19.6.1 Relevant design, mitigation and enhancement measures will be identified in the ES, and these may include:

a. good engineering practice (during the construction, operation and decommissioning phases);
b. Environmental, Health & Safety Management systems (during the construction, operation and decommissioning phases);
c. supplier management environmental, health and safety standards (e.g. Construction Skills Certification Scheme) (during the construction, operation and decommissioning phases);
d. risk management systems (during the construction, operation and decommissioning phases); and
e. a CEMP (during the construction phase).

19.6.2 This assessment assumes that embedded mitigation measures identified in each of the technical topic chapters (**Chapter 5: Air Quality** to **Chapter 20: Marine Navigation**) will be implemented for the Proposed Development, in order to assess the magnitude of impact.

19.7 Description of Potential Likely Significant Effects

19.7.1 There is no published guidance for the application of the legal requirements to the assessment of MA&D. However, selected relevant guidance for risk assessment methodologies is summarised in Table 19.3.

19.7.2 In addition to the information sources used to collate baseline information (detailed in Section 19.4), the following have been consulted to support the identification of potential MA&D:

19.7.3 The Cabinet Office National Risk Register of Civil Emergencies (2020 Edition) (Ref 279). This document is the unclassified version of the National Risk Register, and it identifies the main types of civil emergencies that could affect the UK in the next five years. It is recognised, however, that this document does not provide an all-encompassing list of all potential accidents and disasters and its timescales are short term.

19.7.4 The International Federation of Red Cross & Red Crescent Societies Early Warning, Early Action (Ref 280This guidance looks to other countries including those in warmer climates, thereby identifying risks that the UK may encounter in the future in light of climate change and global warming.

19.7.5 The International Disaster Database (Ref 277) contains data covering over 22,000 mass disasters in the world since 1900 to the present day and aims to *"rationalise decision making for disaster preparedness, as well as provide an objective base for vulnerability assessment and priority setting".*

19.8 Scoping Process for Major Accident and Disaster Risks

Likelihood and Consequence Events

19.8.1 Low likelihood and low consequence events are scoped out as these are unlikely to result in significant adverse effects because they do not fall into the definition of a MA&D (see Table 19.2).

19.8.2 Highly likelihood and low consequence events are also scoped out, as they will not lead to significant adverse effects.

19.8.3 High likelihood and high consequence events are also scoped out, as it is assumed that existing legislation and regulatory controls would not permit the Proposed Development to be progressed under these circumstances.

19.8.4 The remaining events, low likelihood and high consequence events, are the subject of the MA&D assessment. Using professional judgement, the assessment identifies relevant events and determines whether a significant environmental effect is possible.

Occupational Health and Safety

19.8.5 In accordance with emerging EIA practice, occupational health and safety (H&S) is scoped out of this topic. Other health issues are covered in relevant topic sections of **Chapter 5: Air Quality**, **Chapter 6: Noise and Vibration** and **Chapter 9: Water Environment and Flood Risk**. As 'in combination' impacts, human health is also considered within **Chapter 21: Cumulative Effects**, not least as it is covered by detailed H&S legislation: The Management of Health and Safety at Work Regulations 1999 (Ref 281), The Workplace (Health, Safety and Welfare) Regulations 1992 (Ref 282) and The Dangerous Substances and Explosive Atmospheres Regulations 2002 (Ref 266).

19.8.6 A long list of all possible MA&D groups, categories and types has been prepared below, Table 19.4. This is reviewed to rule out any potential MA&D that are considered highly unlikely to occur due to the location of the Proposed Development, based on baseline information and information provided by for the technical topics relevant to MA&D.

19.8.7 Those MA&D types that cannot be screened out from the three-component process will require further detailed assessment in the ES.

19.8.8 The review of the MA&D groups, categories and types identified in the Study Area, has been undertaken to inform the scoping process, summarised in Table 19.4. This table shows the potential vulnerability of the Proposed Development to the risk of a MA&D at the type level. A determination on if the MA&D type is to be scoped in or out of the MA&D assessment is provided, in accordance with either phase of the Proposed Development. The phases are indicated in the table as "C" for construction, "O" for operation and “D” for decommissioning. The ES will provide greater assessment and justification for the topic areas scoped in and for those that are scoped out no further assessment is considered necessary in the EIA.

19.9 Impacts Scoped In or Out of Further Assessment

19.9.1 The MA&D types that have been scoped in for further assessment in the ES are summarised in Table 19.4.

Table 19.4: Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
UXO	Construction	X		Construction hazards can include events which have the potential for harm, including fatal injuries to workers
Major Accident Hazard Chemical Sites	Construction	X		Construction hazards can include events which have the potential for harm, including fatal injuries to workers
Major accident hazard pipelines	Construction	X		Construction hazards can include events which have the potential for harm, including fatal injuries to workers
Fuel Storage	Construction	X		Construction hazards can include events which have the potential for harm, including fatal injuries to workers
Pollution accidents to land	Operation	X		The accidental release of pollutants could result in hazards with harm to people onsite or offsite.
Pollution accidents to water	Operation	X		The accidental release of pollutants could result in hazards with harm to watercourses or groundwater.
Major Accident Hazard Chemical Sites	**Operation**	**X**		**The accidental release of flammable substances could result in a fire if immediately ignited. This could result in harm to people onsite and potentially offsite. The accidental release of toxic substances could result in a hazard with the potential to harm people on-site or potentially offsite.**
Major accident hazard pipelines	Operation	X		The accidental release of flammable substances could result in a fire if immediately ignited. This could result in harm to people onsite and potentially offsite. The accidental release of toxic substances could result in a hazard with the potential to harm people on-site or potentially offsite .
Fuel Storage	Operation	X		The accidental release of flammable substances could

Element	Phase	Scoped In	Scoped Out	Justification
				result in a fire if immediately ignited. This could result in harm to people onsite and potentially offsite. The accidental release of toxic substances could result in a hazard with the potential to harm people on-site or potentially offsite.
Major Accident Hazard Chemical Sites	Decommissioning	X		The accidental release of flammable substances could result in a fire if immediately ignited. This could result in harm to people onsite and potentially offsite. The accidental release of toxic substances could result in a hazard with the potential to harm people on-site or potentially offsite.
Major accident hazard pipelines	Decommissioning	X		The accidental release of flammable substances could result in a fire if immediately ignited. This could result in harm to people onsite and potentially offsite. The accidental release of toxic substances could result in a hazard with the potential to harm people on-site or potentially offsite.
Fuel Storage	Decommissioning	X		The accidental release of flammable substances could result in a fire if immediately ignited. This could result in harm to people onsite and potentially offsite. The accidental release of toxic substances could result in a hazard with the potential to harm people on-site or potentially offsite .

19.10 Proposed Assessment Methodology

19.10.1 In line with the IEMA Primer (Ref 270), for those MA&D types which have been scoped in for detailed assessment in the ES, the proposed assessment process to be used in the ES will include:

a. Identifying potential risk events related to the scoped in MA&D types;

b. Screening these risk events, e.g. to remove unrealistic worst-case scenarios;
c. Defining the likely worst-case consequences (impact);
d. Assessing the likelihood; and
e. Determining whether the risk event could be a MA&D and, if relevant, whether the risk is ALARP with the proposed mitigation measures.

19.11 Significance of Effect Criteria

19.11.1 By definition, a major accident and / or disaster would have a major Significant effect on the environment (including human health, welfare and/or the environment). Accordingly, any risks that could result in a major event without suitable mitigation, management or regulatory controls in place will be assessed as Significant in the context of EIA.

19.12 Limitations and Assumptions

19.12.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

a. The assessment of Major Accidents and Disasters will take into consideration the relevant embedded mitigation in the design and additional mitigation measures that are developed throughout the EIA process.
b. The design of the Proposed Development is the subject of relevant Hazard Identification (HAZID) studies and actions identified will be integrated into the final design, to reduce risks to ALARP.
c. The construction phase of the Proposed Development will be managed through the implementation of the construction phase plan required under the CDM Regulations 2015 (Ref 262) and a CEMP.
d. The Proposed Development is being designed and its implementation guided by other industry standards and codes, many of which are mandatory. These require infrastructure and systems to be designed so that risks to people and the environment are either eliminated or reduced to levels that are ALARP.
e. Environmental effects associated with unplanned events that do not meet the definition of a MA&D (e.g. minor leaks and spills that may be contained within the construction sites) are addressed in other topic chapters as appropriate and not in this chapter.

19.12.2 It is recognised that the management framework for the Proposed Development is not fully defined at this stage; however, a presumption of standard practice and regulatory compliance within the adopted management framework has been assumed and will be developed following the appointment of the principal contractor.

20. Marine Navigation

20.1 Introduction

20.1.1 This chapter sets out the proposed scope and methodology for the marine navigation assessment of the Proposed Development. It sets out the data sets and study area used to scope the navigation risks, gives an overview of baseline conditions, and identifies likely significant effects to be considered.

20.2 Policy, Legislation and Guidance

20.2.1 Table 20.1 summarises the policy legislation and guidance identified as relevant to this scoping exercise.

Table 20.1 Relevant Policy Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Department for Transport (DfT) Port Marine Safety Code (PMSC) (DfT, 2025a) (Ref 429)	A UK national standard developed by the DfT and the Maritime and Coastguard Agency (MCA). It provides a framework to ensure safe marine operations in ports, harbours, terminals, marinas, and other marine facilities across the UK.
Legislation	
The Tees and Hartlepool Harbour Byelaws 1977 & 1985 (PD Ports, 1985) (Ref 430)	An Act to grant the Tees and Hartlepool Port Authority certain powers and duties as the harbour authority for the River Tees.
General Directions for Safety of Navigation, Persons and Property in the Harbour (PD Teesport) (PD Teesport, 2021). (Ref 431)	To establish mandatory rules and procedures for the safe navigation, berthing, operation, and conduct of vessels and individuals within the Tees and Hartlepool Harbour area, ensuring the protection of life, property, and the marine environment.
Harbours, Docks & Piers Clauses Act 1847 (UK Parliament, 1847) (Ref 432)	The Harbours, Docks, and Piers Clauses Act 1847 is a foundational piece of UK legislation designed to standardise and consolidate provisions commonly included in individual Acts that authorise the construction and improvement of harbours, docks, and piers.
Tees and Hartlepool Port Authority Act 1966 (UK Parliament, 1966) (Ref 433)	A local Act of Parliament that established the statutory framework for the governance and operation of the Tees and Hartlepool Port Authority.
Tees and Hartlepool Port Authority Act 1982 (UK Parliament, 1982) (Ref 434)	An Act to authorise the Tees and Hartlepool Port Authority to stop up and extinguish certain public rights of way; and for connected purposes.
Guidance	
International Port and Ship	The ISPS Code is a SOLAS Convention amendment (1974/1988) on maritime security which includes minimum security arrangements for

Security Code 2004 (IMO, 2004) (Ref 435)	ships, ports, and government agencies. It outlines responsibilities for detecting security threats and taking protective measures against incidents affecting ships and port facilities used in international trade.
Port Marine Safety Code – "Guide to Good Practice on Port Marine Operations" (DfT, 2025b) (Ref 436)	A guide to supplement the Port and Marine Facilities Safety Code, containing useful information and detailed guidance on issues relevant to the management of ports and other marine facilities.
Marine Safety Plan 2024-2026 – PD Ports (PD Teesport 2024a) (Ref 437)	The Marine Safety Plan illustrates how PD Teesport policies and procedures satisfy the requirements of the PMSC code. It commits PD Teesport to undertake the management and marine operations, in particular, safe navigation, within the scope of its duties and powers, in a way that safeguards the port infrastructure, users of the port, including members of the public and the marine environment.
River Tess Passage Plan (PD Teesport, 2024b) (Ref 438)	This guide is prepared by PD Teesport to assist mariners in creating a passage plan for navigation in the River Tees.
Notice to Mariners – PD Ports (PD Teesport, n.d.) (Ref 439)	The Notices to Mariners contain important navigational information including chart updates, changes in channels and aids to navigation.
International Maritime Organisation (IMO), Revised Guidelines for Formal Safety Assessment 2018 (IMO 2018) (Ref 440)	Offers a method for identifying and evaluating hazards and risks related to marine operations, along with suitable mitigation measures, in a clear and consistent manner.
Marine Guidance Note (MGN) 654 Offshore Renewable Energy Installations (OREI) – Guidance on UK Navigational Practice, Safety and Emergency Response (2021) (Ref 441)	This MGN outlines considerations for assessing the potential impact of the Proposed Scheme on navigational safety and emergency response. Applicable in UK waters, Territorial Sea, and Exclusive Economic Zone, it offers guidance on the Navigation Risk Assessment (NRA) for any UK marine project.

20.3 Baseline Environment

Study Area and Navigational Features

20.3.1 The Study Area is considered to extend upstream of the Main Site to one nautical mile beyond the turning circle and downstream to a line between the South Gare Lighthouse North Gare Pier at the mouth of the Tees. The Study Area has been selected to include the existing jetties at the former INEOS Nitriles site as well as other navigation operations on the Tees that might be affected by the Proposed Development. Further work to refine the study area would be undertaken for the purposes of the marine navigation ES chapter.

20.3.2 Significant navigational features within the study area are summarised in Table 20.2 below.

Table 20.2 Key Navigational Features

ID	Key Navigational Feature	Description
1	**Hartlepool power station intake**	Intake for nuclear power station within Seaton Channel
2	**Able Seaton Port**	6 quays in Seaton Channel
3	**Conoco Phillips Terminal**	8 jetties
4	**Inter Terminals (Exolum)**	2 jetties
5	**Navigator Terminals Seal Sands**	3 jetties
6	**Navigator North Tees**	1 jetty
7	**SABIC North Tees Jetties**	3 jetties
8	**South Bank Wharf**	1,000m quay
9	**Tees Dock**	3 general cargo berths, 2 RoRo berths, 500m quay
10	**Teesport Container Terminals (1 &2)**	4 berths, 5 ship-to-shore cranes.
11	**Redcar bulk terminal**	320m quay
13	**Riverside RoRo**	1 RoRo berth
14	**Tees Dock No 10**	1 jetty
15	**Turning circle at Tees Dock**	Approximately 350m diameter turning circle adjacent to the proposed scheme.
16	**Navigation aid No. 21**	Physical navigation aid located ~200m east of the proposed scheme.

Statutory Authorities

20.3.3 PD Ports is the Statutory Harbour Authority (SHA) for Teesport and the Port of Hartlepool. Their jurisdictional area covers a 12 mile stretch of the River Tees and an area extended three miles into the North Sea, encompassing the Study Area. As SHA, PD Ports is responsible for all vessel traffic management, ensuring safe navigation, and maintaining channel depths. The Study Area is entirely contained within PD Port's jurisdictional area as SHA.

Vessel Traffic Management

20.3.4 PD Ports operates a Vessel Traffic Management Service that manages vessel movements within the Teesport and Port of Hartlepool, as well as the Tees and Hartlepool Bays and their seaward approaches. The primary objectives of the VTS are to enhance maritime safety, improve the efficiency of navigation, and support environmental protection within the VTS area. This is achieved by mitigating the development of unsafe navigational situations through:

a. Providing timely information on factors that may influence ship movement and assist on-board decision making
b. Monitoring and managing ship traffic for shape and efficient ship movements
c. Responding to unsafe situations as they develop

20.3.5 PD Ports have issued a set of byelaws and general directions for vessels navigating the SHA area, which apply to any VTS controlled vessels (any vessel

over 20m in length). These vessels are required to seek permissions from VTS before entry into the VTS area.

Pilotage

20.3.6 PD Teesport is the Competent Harbour Authority for the Study Area with respect to pilotage. The requirements for pilotage are contained within the PD Ports Pilotage Directions 2023 (PD Ports 2023). The areas where pilotage is mandatory in the Tees are:

a. the Approach Channel from Tees North Buoy to the inner limit of the Seaton Turning Area;
b. the navigable area of the Seaton Channel and Holding Basin;
c. the navigable area of the Tees between the inner limit of the Seaton Turning Area and No.23 Buoy;
d. the navigable area of the Tees between No.23 Buoy and the upper limit of PD Teesport's jurisdiction.

20.3.7 The Pilotage Directions specify that pilotage is mandatory for vessels navigating in the specified areas when:

a. The Length Overall(LOA) exceeds 95m; or
b. The summer deadweight exceeds 4,000 tonnes; or
c. The gross tonnage exceeds 4,000 tonnes; or
d. The LOA exceeds 20m and the cargo on board are dangerous goods or marine pollutants; or
e. The vessel is in excess of 50m LOA and requires the services of a tug; or
f. The vessel is less than 50m LOA and requires the services of a tug, where a risk assessment carried out by the Harbour Master and Tees Bay Pilots so dictates.

20.3.8 The proposed vessels during operation will vary in size from Coaster to Panamax. As many of them will meet at least one of the above criteria, they will require pilotage for berthing operations. These vessels may encounter delays while waiting for an available pilot.

Vessel Traffic

20.3.9 The River Tees is one of the busiest waterways in the UK. It is home to the major port of Teesport and Hartlepool which together handled more than 28 million tonnes of cargo annually in 2023 and received over 2,758 vessel arrivals in the same year (Ref 451). This includes a diverse mix of vessel traffic including bulk carriers, petrochemical tankers, container ships, RoRo vessels and offshore support vessels. In addition, a range of port support vessels such as pilot boats, tugs, workboats, dredgers, and other types of vessel operate within the port.

20.3.10 Mapping of Automatic Identification System (AIS) data by the MMO for the year 2019 shows a vessel density of over 10,000 vessel movements per year in the main Tees navigation channel adjacent to the Proposed Development site (MMO, 2019).

20.3.11 Although Teesport is primarily a commercial port, leisure and non-commercial vessel traffic must also be considered. PD Ports, as SHA, permit such recreational navigation so long as it does not cause a “danger, annoyance, nuisance or inconvenience to other users”.

Maritime Incidents

20.3.12 Incident data was obtained from the following sources and periods within the study area:

a. Marine Accident Investigation Branch (MAIB) data portal (2022-2024) (Royal National Lifeboat Institute (RNLI) callouts (2020-2024) RNLI.

20.3.13 Eight MAIB incidents and 12 RNLI callouts were recorded within the study area. The RNLI callouts cover predominantly commercial and a small number of leisure incidents. Reasons for launch include machinery/equipment failure, man overboard, person in water and false alarms. The relevant recorded MAIB incidents are in Table 20.33 below.

20.3.14

Table 20.3 MAIB Recorded Incidents in the Study Area

Date	Vessel Type	Description	Occurrence Severity
01/08/2024	**Bulk carrier**	A bulk carrier struck the quay side whilst the vessel was swinging.	Serious
01/11/2024	**Tanker**	Tanker ship's pilot ladder did not conform to SOLAS regulations.	Marine incident
01/01/2023	**Vehicle carrier**	Vehicle carrier crewman suffered a fractured leg due to a parted mooring line.	Less serious
01/03/2023	**Tug vessel**	A tug crewmember sustained multiple fractures to the arm when the vessel was pushing a barge	Less serious
01/07/2023	**Oil tanker**	Oil tanker crew used a weighted heaving line when taking a tug on arrival.	Marine incident
01/08/2023	**Oil tanker**	A crude oil tanker used an unsafely weighted heaving line.	Marine incident
01/11/2023	**Tanker**	A tanker used an unsafely weighted heaving line.	Marine incident
01/07/2023	**Not listed**	Cable layer was making fast when a mooring bollard sheered.	Marine incident

20.4 Consultation

20.4.1 A hazard identification workshop will be arranged to bring together relevant navigational stakeholders for the area to discuss the potential impacts on marine navigation associated with the Proposed Development.

20.5 Planned Surveys

20.5.1 There are no planned surveys to inform the marine transport and navigation assessments for the Project as sufficient baseline data is already available.

20.6 Identification of Potential Effects

20.6.1 The Proposed Development has the potential to affect marine navigation during the construction and operational phases. Potential effects during the decommissioning stage will be assessed at the appropriate time.

20.6.2 Cumulative effects may arise where other developments and activities are ongoing in the area. An assessment of the likely effects will be set out in the marine navigation ES chapter.

Construction

20.6.3 Marine operations during the construction phase will be associated with:

a. Decommissioning and removal of the existing jetties, new quay construction (including excavation or piling) and dredging for the berthing pocket and access channel.
b. Delivery of Modules, AIL and other construction materials via ship to the new quay.

20.6.4 There would be a requirement for multiple vessels to support decommissioning and removal of the existing jetties, new quay construction and associated dredging. The number, type, and size of these vessels will be determined at PEIR stage when the design has been further progressed and an outline construction plan has been developed. The vessels might be expected to include a combination of: jack-up barges used for piling operations; crane barges used for lifting operations; tugs to support repositioning of unpropelled barges to, from and around the worksite; multi-cat workboats to supply the barges with construction materials and components; dredging vessels to undertake capital dredging works; and other support vessels for miscellaneous tasks.

20.6.5 Delivery of AILs will involve the arrival and unloading of up as significant number of modules during an 18-month construction period. These modules are expected to be transported to Teesport via ocean-going vessels and offloaded directly to the quay. The specification of these vessels and their unloading operations will be further assessed for the PEIR and ES. following further development of the quayside design and construction requirements for the Proposed Development.

20.6.6 The following potential navigational impacts have been identified during the decommissioning and removal of the existing jetties, new quay construction

(including piling or revetment removal and excavation) and dredging for the berthing pocket and access channel:

a. Vessel grounding: There is potential for construction works vessels to ground as they manoeuvre to, from, and around the work areas.
b. Vessel contact: There is potential for construction works vessels to make contact with fixed objects and infrastructure as they manoeuvre to, from, and around the work areas.
c. Vessel collision: There is potential for construction works vessels to collide with other vessels as they manoeuvre to, from, and around the works area.
d. Incidents during construction activities: There is the potential for incidents to occur during construction activities, such as lifting operations, that impact marine navigation.
e. Impacts on wider port operations: There is potential for increased construction works traffic and activity to place an increased demand for port services which may affect operations and navigation risk elsewhere.

20.6.7 The following potential navigational impacts have been identified during delivery of AILs via ship to the new quay:

a. Vessel grounding: There is potential for project vessels to ground as they transit through the Tees navigation channel and manoeuvre to and from the quay.
b. Vessel contact: There is potential for project vessels to make contact with fixed objects and infrastructure as they transit through the Tees navigation channel and manoeuvre to and from the quay.
c. Vessel collision: There is potential for project vessels to collide with other vessels as they transit through the Tees navigation channel and manoeuvre to and from the quay.
d. Mooring breakout: There is potential for project vessels to breakout from their moored position at the quay.
e. Incidents during cargo operations: There is the potential for incidents to arise during the transfer of project cargo from vessel to shore that might impact marine navigation.
f. Impacts on wider port operations: There is potential for increased vessel traffic associated with AIL deliveries to place an increased demand for port services which may affect operations and navigation risk elsewhere.

Operation

20.6.8 Marine operations during the construction phase will be associated with:

a. Import of feedstocks to the quay at the Main Site.
b. Export of finished products using nearby existing facilities.

20.6.9 Deliveries of feedstock to the quay are anticipated to be completed by ocean-going bulk carriers. The largest of these vessels are anticipated to be Panamax bulk carriers with LOA of up to 239m and beam of up to 32m. The requirement for volume of feedstock import vessel movements during the operational phase is currently being investigated and will be further assessed for the PEIR and ES.

20.6.10 Export of finished products is anticipated to be completed via marine, rail or HGV loading facilities at the nearby existing liquid bulk facilities and using any existing navigational agreements already in place.

20.6.11 As the export operations are anticipated to use existing infrastructure and agreements, it is not expected that there will be any material change to the vessel traffic and marine navigation in the area as a result. As investigations are ongoing into the use of these facilities and the number of vessel movements expected the scope of assessment in relation to export vessel navigation during the operational phase will be confirmed in the PEIR.

20.6.12 The following potential navigational impacts have been identified during delivery of feedstocks to the quay during operation phase:

a. Vessel grounding: There is potential for vessels to ground as they transit through the Tees navigation channel and manoeuvre to and from the quay.
b. Vessel contact: There is potential for project vessels to make contact with fixed objects and infrastructure as they transit through the Tees navigation channel and manoeuvre to and from the quay.
c. Vessel collision: There is potential for project vessels to collide with other vessels as they transit through the Tees navigation channel and manoeuvre to and from the quay.
d. Mooring breakout: There is potential for project vessels to breakout from their moored position at the quay.
e. Impacts on wider port operations: There is potential for increased vessel traffic associated with feedstock deliveries to place an increased demand for port services which may affect operations and navigation risk elsewhere.

Decommissioning

20.6.13 Decommissioning of the Proposed Development is not anticipated until at least 30 years after commissioning. It is not considered appropriate to outline decommissioning operations at this time due to the extent of unknown factors related to the future marine baseline and technical requirements for decommissioning. For these reasons, it is deemed more appropriate to create a decommissioning plan at the point of decommissioning, following best practices of the time. Therefore, decommissioning has been scoped out from review. A Decommissioning Plan would be prepared at an appropriate time.

20.7 Sensitive Receptors

20.7.1 Relevant Sensitive Receptors in the study area includes:

a. Vessel traffic associated with the Proposed Development.
b. Existing vessel traffic within the study area which includes cargo ships, port support vessels, recreational vessels, and other vessel types. These are described at Section 20.3.
c. Existing infrastructure within the Study Area. Key navigational features are described in Table 20.2.

20.8 Design, Mitigation and Enhancement Measures

20.8.1 In the context of the PMSC, the principle of 'as low as reasonably practicable' (ALARP) is a well-established standard across the industry, applicable to both health and safety and port marine operations. At its core, ALARP embodies the idea of 'reasonable practicability'—balancing the level of risk against the resources (effort, time, and cost) required to mitigate it. The PMSC makes specific reference to ALARP in relation to the MSMS and NRAs.

20.8.2 Through the NRA process, a range of mitigation measures or controls are identified for inclusion in the ES. These measures are then integrated either directly into the Project's design or applied through management practices. The primary aim is to ensure that risk levels remain within thresholds considered to be ALARP. Such controls would be embedded within the background navigational environment, and include:

a. Harbour Authority Safety Management System, which includes plans and processes to manage marine emergencies;
b. Vessel traffic management;
c. Reactive response to marine emergencies; and,
d. Application of:
   - International Convention for the Safety of Life at Sea (SOLAS)
   - Convention on the International Regulations of Preventing Collisions at Sea (COLREGS).
   - International Convention of Standards of Training, Certification, and Watchkeeping for Seafarers (STCW).
   - International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) guidance on Aids to Navigation (AtoN).

20.9 Proposed Assessment Methodology

20.9.1 Further assessment will be required to evaluate the impact of the Proposed Development on marine navigation. The approach to this will be discussed and agreement sought with the Statutory Harbour Authority. The scope of the assessment will include qualitative assessment informed by a Navigation Risk Assessment (NRA). The NRA outputs would inform the marine transport and navigation ES chapter and the NRA would be provided as an appendix to the ES. This will include a judgement on significance of effects arising from the Proposed Development.

20.9.2 The following key data sources will be used to identify the baseline characterisation for the NRA:

a. Data on accidents and incidents within the study area gathered from PD Ports (as Statutory Harbour Authority), the Marine Accident Investigation Branch (MAIB) and the Royal National Lifeboat Institution (RNLI);
b. Vessel Simulation Study, if appropriate;
c. Historical weather data;
d. Historical Automatic Identification System (AIS) data;
e. Historical vessel movement data from PD Ports (as Statutory Harbour Authority); and
f. Navigational features and charted information from Admiralty Charts.

20.9.3 A hazard identification workshop would be arranged to gather inputs from relevant navigational stakeholders. The workshop would include discussions around the potential impacts on navigational safety associated with the Proposed Development.

20.9.4 The need to have further controls would be determined following completion of the risk assessment and any further considerations made. The determination of any further controls will be agreed in consultation with the SHA to determine whether an ALARP state has been met for each risk.

20.9.5 The significance of potential effects will be evaluated systematically based on identification of the frequency and consequence of each impact. The potential effects will be assessed in conjunction with the results of the above assessment, professional judgement, and take into the outcomes of consultation held with navigational stakeholders.

20.10 Summary

20.10.1 The potential impacts scoped in or out of the marine navigation assessment are set out in Table 20.4:

Table 20.4 Elements Scoped in or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Risk of vessel grounding	Construction and Operation	X		There is potential for vessels associated with the Proposed Development to ground as they transit, manoeuvre, and undertake construction activities or cargo operations.
Risk of vessel contact	Construction and Operation	X		There is potential for vessels associated with the Proposed Development to make contact with fixed objects and infrastructure as they as they transit, manoeuvre, and undertake construction activities.
Risk of vessel collision	Construction and Operation	X		The Proposed Development will introduce a new source of vessel traffic to the port, with the potential to increase the risk of collision between vessels (both vessels associated with the Proposed Development and third-party vessels).
Risk of mooring breakout	Construction and Operation	X		There is potential for vessels associated with the Proposed Development breaking out of their moorings, potentially causing an obstruction in the navigation channel or making contact with other objects.
Risk of incidents	Construction	X		There is potential for incidents occurring during construction activities, such as lifting operations,

Element	Phase	Scoped In	Scoped Out	Justification
during construction activities				that impact marine navigation.
Risk of incidents during cargo operations at the quay	Construction	X		There is potential for incidents occurring during the transfer of AILs at the quay that that impact marine navigation.
Impacts on wider port operations	Construction and Operation	X		Increased vessel traffic associated with the Proposed Development has the potential to place an increased demand for port services which may affect operations and navigation risk elsewhere.
Risks associated with export of finished product	Operation		X	As the export operations are anticipated to use existing infrastructure and agreements, it is not expected that there will be any material change to the vessel traffic and marine navigation in the area as a result.

20.11 Limitations and Assumptions

20.11.1 In the interest of transparency throughout the EIA process, the following assumptions and limitations have been outlined:

a. Consultation with the SHA is required to inform the PEIR and ES development. The proposed assessment methodology is subject to agreement with the Statutory Harbour Agreement and is therefore subject to change.
b. Publicly available AIS data published by the MMO for the year 2019 has been used to inform this scoping report. This is limited in detail and from an earlier year yet still provides an indication of the level of vessel traffic in the area. More detailed AIS analysis will be undertaken to inform the further assessment.
c. The required specification, type, and number of vessels required during the construction and operation phases of the Proposed Development is still being investigated. This information will be assessed in the PEIR and ES.

21. Cumulative Effects

21.1 Introduction

21.1.1 The EIA Regulations (Ref 9) require that, in assessing the effects of a particular development, consideration should also be given to the Cumulative Effects that may arise from the Proposed Development in conjunction with other existing and/or approved developments.

21.1.2 The ES will assess the potential for significant Cumulative Effects as a result of the Proposed Development in the form of a Cumulative Effects Assessment (CEA). The CEA will be presented as a standalone chapter of the ES.

21.1.3 In line with Schedule 4, paragraph 5(e) of the EIA Regulations the ES will consider "the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources". Furthermore, it will address Schedule 4, paragraph 5 of the EIA Regulations which states "the description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union level (as they had effect immediately before exit day) or United Kingdom level which are relevant to the project, including in particular those established under the law of any part of the United Kingdom that implemented Council Directive 92/43/EEC and Directive 2009/147/EC".

21.1.4 Cumulative Effects may arise because of several different factors and combined changes. According to IEMA (Ref 9) cumulative impacts can be defined as "the additional changes caused by a Proposed Development in conjunction with other similar developments as the combined effect of a set of developments, taken together, in practice 'effects' and 'impacts' are used interchangeably".

21.1.5 The following types of Cumulative Effects will be considered in the ES:

a. **Intra-project effects** – the interaction and combination of different residual environmental effects of the Proposed Development affecting the same receptor. For example, visual and noise effects during construction affecting nearby PRoWs.
b. **Inter-project effects** – the residual environmental effects of the Proposed Development combining and interacting with the residual environmental effects of other, committed development(s), affecting the same receptor. For example, traffic effects upon users of the local road network because of the Proposed Development and a nearby industrial development.

21.2 Policy, Legislation and Guidance

21.2.1 The policy, legislation, and guidance relevant to the assessment of the Proposed Development is detailed in Table 21.1. The National Planning Practice Guidance 2016 has been excluded from Table 21.1 due to a lack specific policies regarding CEA.

21.3 Proposed Assessment Methodology

Intra-Project Effects

21.3.1 The assessment of Intra-project Effects will be based on the information and Study Areas within the technical chapters. This assessment considers any residual effects that are reported as Minor or above within the technical chapters. Minor effects, while not significant, are considered in the assessment on the basis that multiple minor effects may interact to result in a significant effect. Negligible residual effects reported in the technical chapters are considered unlikely to accumulate to the extent that a significant Intra-project effect would occur.

21.3.2 The assessment methodology for Intra-project Effects will involve the following key stages.

Stage 1 - Screening of Sensitive Receptors

21.3.3 A screening of Sensitive Receptors (as identified in each topic chapter) will be undertaken to determine whether any has the potential to be exposed to more than one type of residual effect (within an individual technical topic assessment and/or across multiple technical topic assessments) during either the construction or operation phases of the Proposed Development. These Sensitive Receptors are termed ‘Common Receptors’ and will be taken forward to Stage 2 of the assessment.

Stage 2 - Determine Common Receptor’s Residual Effects

21.3.4 Of the common Receptors identified in Stage 1, those that have two or more nonnegligible residual effects will be identified and taken forward to Stage 3 of the assessment.

Stage 3 – Assessment of Intra-Project Effects

21.3.5 An assessment of the overall significance of the Intra-project Effects on Common Receptors identified at Stage 2 will be undertaken. The assessment will be based on information provided within the technical topic assessments, as well as professional judgement. Significance Criteria

21.3.6 The significance classifications for Intra-project Effects will adhere to those described in the ES. The criteria for these classifications will also be detailed in the ES.

21.3.7 If significant residual Intra-project Effects are identified, additional mitigation measures will be proposed in the ES.

Inter-Project Effects

21.3.8 The assessment methodology for Inter-project Effects will involve the identification of incremental changes to baseline conditions likely to be caused by other relevant projects together with the Proposed Development. These will involve the following key stages. Stage 1 – Identification and Evaluation of Developments for Consideration

21.3.9 Stage 1 of the approach outlined in Advice Note 17 (Ref 260) requires the identification of a ZoI for each technical topic (derived from the Study Areas in considered within the ES for the Proposed Development, with other, reasonably foreseeable developments identified within those ZoI. These projects are termed 'Other Developments'.

21.3.10 'Other Developments' will be identified through an initial search, within the identified ZoI, of the: planning registers of the local planning authorities; Planning Inspectorate's planning register; and relevant development plans. Based on professional judgement, the initial search will be based on the largest practicable ZoI search area identified in technical topic chapters. This will create a 'long-list' of 'Other Developments' for consideration (corresponding with Stage 1 in Advice Note 17 (Ref 260).

21.3.11 Table 20-2 of Advice Note 17 also provides criteria to indicate the level of certainty that can be applied to each of the 'Other Developments' being implemented. Table 21.1 has been based on Table 20-2 of Advice Note 17. The criteria are presented, descending from Tier 1 (most certain) to Tier 3 (least certain) and reflect a diminishing degree of certainty that can be assigned to each 'Other Development'.

21.3.12 For the selection of 'Other Developments' the criteria set out in Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment (Ref 260) will be used.

21.3.13 The resulting long list will be sent to the relevant local planning authorities (such as STBC) for comment and agreement will be sought prior to progressing to Stage 2. A draft long list will be produced at the PEIR stage, and this list will be reviewed and updated at the ES stage ahead of progressing to Stage 2, to ensure that the search of 'Other Developments' is as up to date as practicable. The long list will be updated during the ES stage, being finalised at a date ahead of submission of the ES. This date will be determined and outlined in the ES.

Table 21.1: Cumulative Effects – Summary of Key Policy, Legislation and Guidance

Policy / Legislation / Guidance	Description
Policy	
Overarching National NPS for Energy (EN-1) 2024 (Ref 36)	Sets out the government's policy for delivery of major energy infrastructure and is the primary basis for decision making. Paragraph 4.1.5 states: In considering any Proposed Development, in particular when weighing its adverse impacts against its benefits, the Secretary of State should take into account: […] *its potential adverse impacts, including on the environment, and including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce, mitigate or compensate for any adverse impacts, following the mitigation hierarchy* Paragraph 4.4.5 states: *"The impacts of more than one development may affect people simultaneously, so the applicant should consider the cumulative impact on health in the ES where appropriate".*
NPS for Renewable Energy Infrastructure (EN-3) (2023) (Ref 318)	Sets out the needs case for renewable energy and secondly to establish the specific criteria by which applications for development consent for such schemes are to be assessed.
National Planning Policy Framework (NPPF) 2024 (Ref 38)	Presents the Government's planning policies for England and how these are to be applied. Paragraph 185 from the NPPF specifically relates to Cumulative Effects and states: "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development"
UK Sustainable Aviation Fuel (SAF) Mandate 2024 (Ref 29)	Sets out the UK Government's introduction to Sustainable Aviation Fuel (SAF) blending mandate, which will place an obligation on fuel suppliers to supply a certain percentage of sustainable low-carbon aviation fuels from 2025. The Jet Zero Strategy, published in July 2022, sets out the government's wider strategy for decarbonising the UK aviation sector, and confirmed the expectation that SAF will play an important role in this transition
Stockton-on-Tees Borough Council Local Plan 2019 (Ref 55)	Sets out STBC's general policies for development and use of land throughout the borough as well as justification of these policies from a range of topics. Many of these policies includes positions on the assessment of cumulative effects.
Legislation	
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('The EIA Regulations') (Ref 257)	The EIA Regulations cover the process of EIA in the context of Nationally Significant Infrastructure Projects. They apply the amended EU Directive 2014/52/EU. Schedule 4, paragraph 5 and 5(e) (see paragraph 1.1.3 above) is of relevance to Cumulative Effects.
The Town and Country Planning (Environmental Impact Assessment)	These Regulations provide specific thresholds of scale to determine if a development requires EIA. Planning Inspectorate Advice Note 17 specifies that statutory definitions of EIA screening thresholds can be of assistance when considering whether the scale and nature of developments identified

Policy / Legislation / Guidance	Description
Regulations 2017 (Ref 42)	in Zone of Influence (ZoI) are likely to interact with the proposed project development and to result in a cumulative effect.
Guidance	
Demystifying Cumulative Effects, Impact Assessment Outlook Journal 2020 (Ref 258)	The EIA process requires the consideration of Cumulative Effects to be undertaken. However, guidance on this area of practice is often lacking, and a variety of methodologies are adopted by different practitioners. Volume 7 of the Impact Assessment Outlook Journal brings together a selection of articles, thought and opinion pieces on the subject of CEA in EIA.
Planning Inspectorate Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects (2025) (Ref 260)	This Advice Note identifies the nature of projects (referred to as 'Other Developments') that should be considered in a CEA. It advises that a pragmatic approach should be used, in respect of what is feasible and reasonable, where there is a lack of information to identify impacts and assess effects.

21.3.14 At the time of writing the long list has not been drafted but will be produced as part of the PEIR. However an initial review of major developments in the area has identified the following three NSIPs that meet the criteria outlined above for inclusion in the draft long-list when it produced at the PEIR stage:

a. H2North-east - a proposed carbon capture and storage (CCS) enabled blue Hydrogen production facility with up to approximately 1 gigawatt thermal Hydrogen production capacity and Hydrogen distribution pipeline network on land at Seal Sands, in Stockton-on-Tees and Redcar and Cleveland, Teesside;

b. H2Teesside – A proposed 1,200 megawatt capacity CCS enabled Hydrogen Production facility and associated infrastructure, including connectivity to the Net Zero Teesside Project (see below). The development has a pipeline corridor located within the Seal Sands industrial area, with Order Limits overlapping that of the Proposed Development; and

c. Net Zero Teesside Project - A full chain Carbon capture, utilisation and storage (CCUS) project, comprising a CO_2 gathering network, a combined cycle gas turbine (CCGT) electricity generating station and other associated infrastructure (including connectivity with the Proposed Development). The development has a pipeline corridor within the Seal Sands industrial area and Redcar, with Order Limits overlapping that of the Proposed Development.

Stage 2 – Identify a Short-List of 'Other Developments'

21.3.15 After Stage 1, applicants should develop and apply threshold criteria to the long list. These criteria should be used to establish a shortlist of the existing and, or approved development to be included in the cumulative effects assessment. This will ensure that the assessment is proportionate. The criteria should be used to include or exclude development projects which fall with the ZoI for the NSIP being promoted by an applicant.

21.3.16 Following the data collection (Stage 1) the long list will be refined to a short list by reviewing each of the 'Other Developments' identified against the following criteria:

a. Is there a concurrent construction or operation phase between the Other Development and the Proposed Development?
b. Is there potential that the Other Development shares some of the same Sensitive Receptors with the Proposed Development?
c. Those Other Development that have no, or insufficient, environmental assessment information will, typically, not be considered as it will not be possible to accurately identify shared Sensitive Receptors or Inter-project Effects.

Table 21.21: Assigning Certainty to "Other Developments" PINS Advice Note 17

Tier	Certainty
Tier 1	• Under construction; • Permitted application(s), whether under the Planning Act (PA2008) (Ref 2) or other regimes, but not yet implemented; • Submitted application(s) where a full ES or an equivalent has been submitted; • All refusals subject to appeal procedures not yet determined.
Tier 2	• Projects on the Planning Inspectorate's Programme of Projects (where a Scoping Report, PEIR or an equivalent has been submitted).
Tier 3	• Projects on the Planning Inspectorate's Programme of Projects where a Scoping Report or PEIR has not been submitted. • Identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight being given as they move closer to adoption) recognising that there will be limited information available on the relevant proposals. • Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

Stage 3 – Information Gathering

21.3.17 Information on Other Development(s) included within the short list will be gathered from available third party information sources within the public domain. The information captured should include, but not necessarily limited to:

a. proposed design and site boundary information;
b. proposed programme of construction and operation; and
c. technical information that sets out baseline data and effects arising from the Other Development on Common Receptors.

Stage 4 – Assessment

21.3.18 Assessments should:

a. be undertaken at a level of detail proportionate to the information available,
b. explain and record any limits or gaps in the information,

c. consider all Tier 1 and Tier 2 other existing and, or approved developments where possible,
d. consider all Tier 3 other existing and, or approved development where possible, although this may be qualitative and high level,
e. be documented in the ES.

21.4 Limitations and Assumptions

21.4.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

a. The assessment of Intra-project Effects resulting from the Proposed Development will be focused on the residual effects from the construction and operation phases following the implementation of mitigation measures that are secured through DCO requirements or other mechanisms.
b. The assessment of Inter-project Effects will be based on the interpretation and assessment of publicly available data and limited by the level of information available.
c. There may be cases that Other Development screened into the short-list present information for some or most of the technical topics, but not for others. In such instances, the Inter-project Effects assessment for the given Other Development(s) may be limited to only those topics for which there is appropriate information available. However, this will be avoided where practicable with efforts made to make an assessment based upon the available information, assumptions and professional judgement. This will be stated in the ES where appropriate.
d. Although information may be available for Other Developments, it may be limited in its compatibility where different assessment methodologies or criteria have been used in the technical topic assessments. Where this occurs and limits and/or prevents the Inter-project Effects assessment, it will be stated in the ES.

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Figures



Proposed Development Boundary

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Coordinate System: British National Grid

Basemap credits: Esri, Intermap, NASA, NGA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, GeoTechnologies, Inc, METI/NASA, USGS

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Lighthouse GREEN FUELS

Drawing Title
Figure 1.1
Site Location

Client
LGF Projects Ltd.

Project Name
Lighthouse Green Fuels

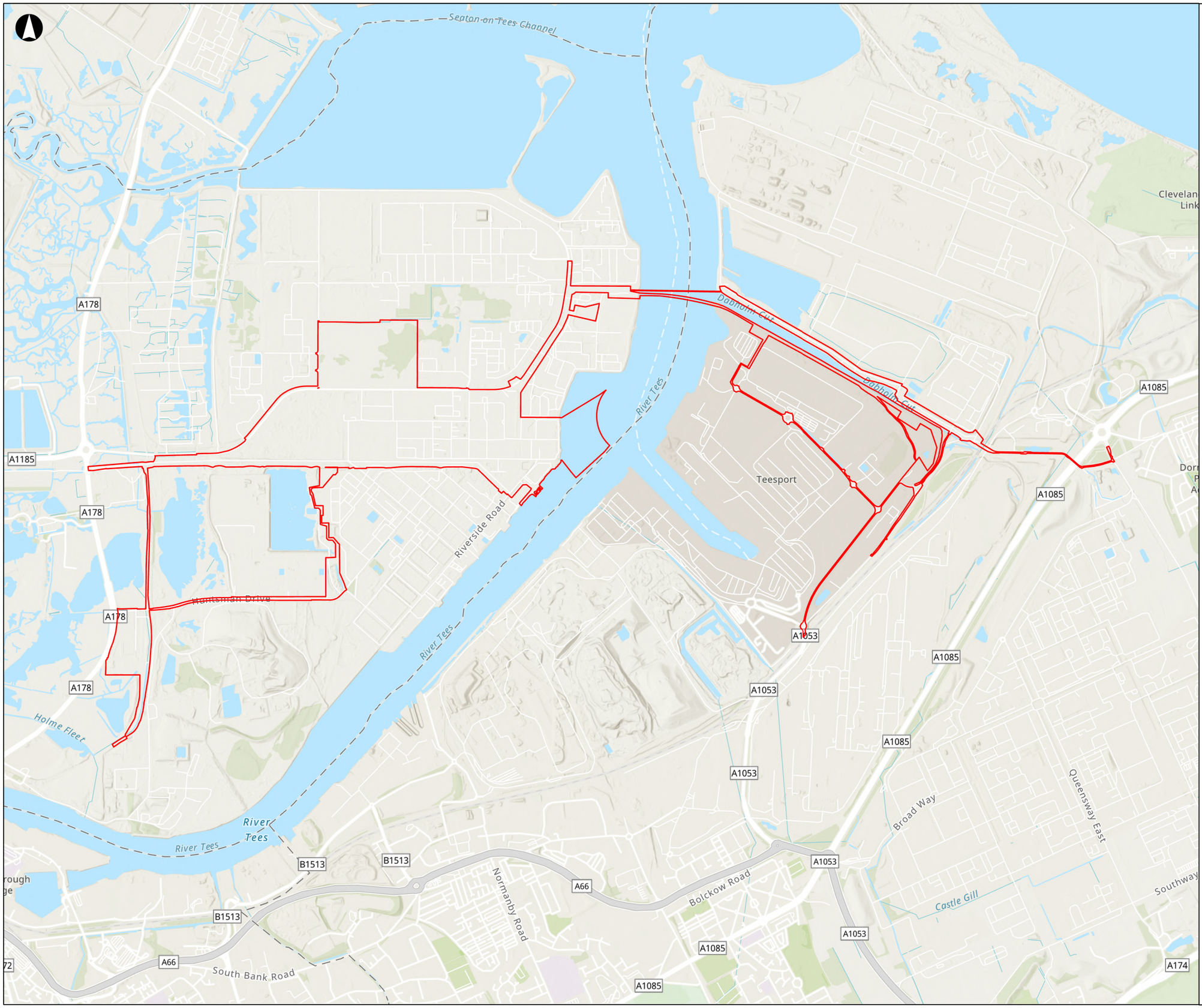
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Lighthouse GREEN FUELS

Drawing Title

Figure 1.2
Extent of the Proposed Development

Client

LGF Projects Ltd.

Project Name

Lighthouse Green Fuels

Scale at A3

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Project Number

306732-00

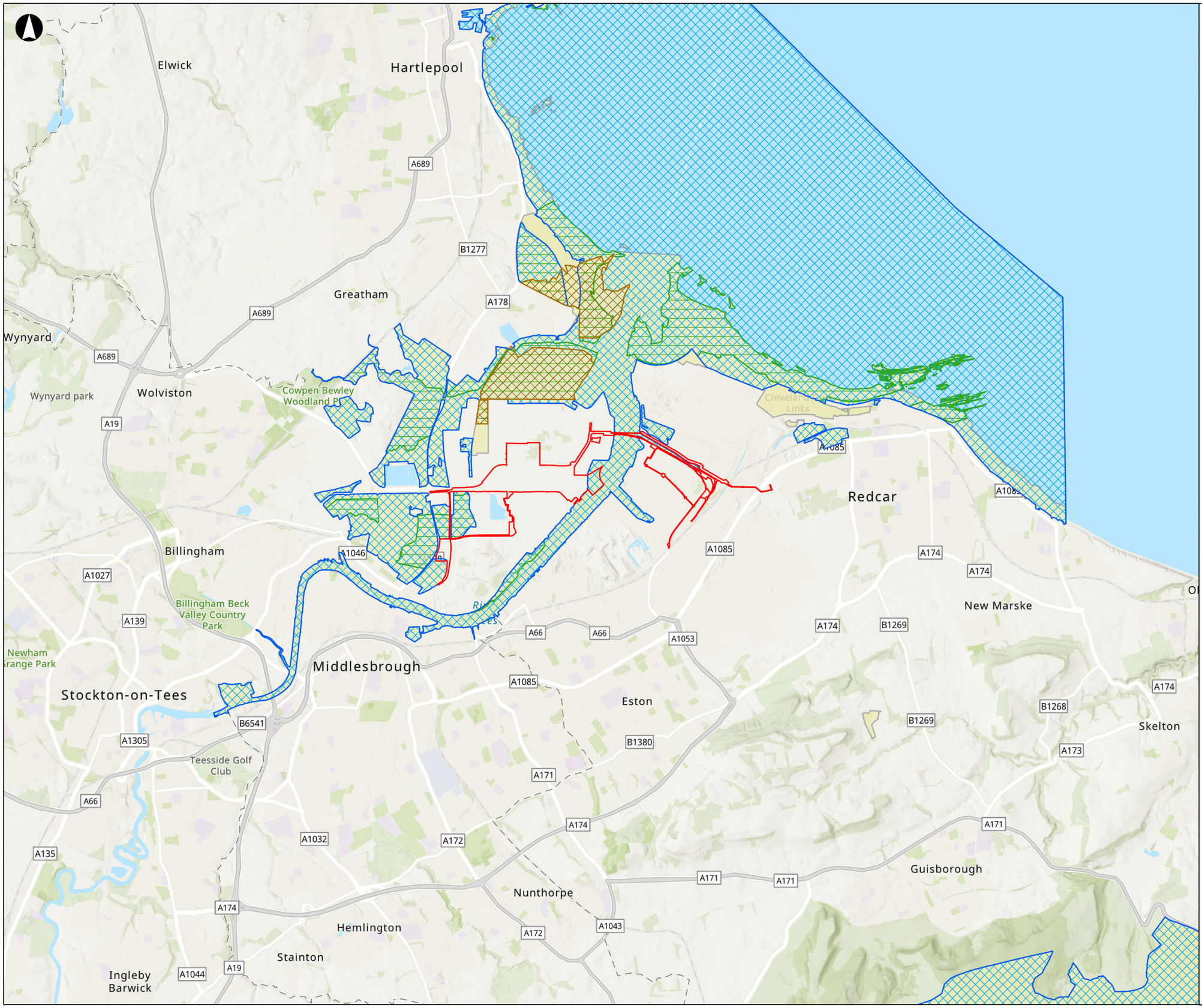
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Elwick
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Greatham
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Wynyard
A689
Wynyard park
Wolviston
Cowpen Bewley Woodland Pl
A19
Billingham
A1046
A1085
Redcar
A1085
A174
A174
New Marske
A1027
Billingham Beck Valley Country Park
A139
A66
A66
A1053
A174
B1269
Newham Grange Park
Middlesbrough
A1085
Eston
Stockton-on-Tees
B6541
A1305
B1380
B1268
B1269
Skelton
A173
Teesside Golf Club
A171
A66
A174
A171
A1032
A172
A135
Guisborough
A171
A171
Nunthorpe
A174
A1043
Hemlington
A172
Stainton
Ingleby Barwick
A1044
A19
Proposed Development Boundary
National Nature Reserve
Special Protection Area
Ramsar
Site of Special Scientific Interest
A3
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Lighthouse GREEN FUELS
Drawing Title
Figure 3.1
Nationally and Internationally Designated Conservation Sites
Client
LGF Projects Ltd.
Project Name
Lighthouse Green Fuels
Scale at A3
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- Proposed Development Boundary
- Study Area (1km)
- Study Area (2km)
- Surface Water
- Ramsar
- SSSI
- Special Protection Area
- Special Area of Conservation
- WFD Transitional Water Bodies Cycle 3
- WFD Coastal Water Bodies Cycle 3

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Drawing Title
Figure 9.1
Water Environment Study Area

Client
LGF Projects Ltd.

Project Name
Lighthouse Green Fuels

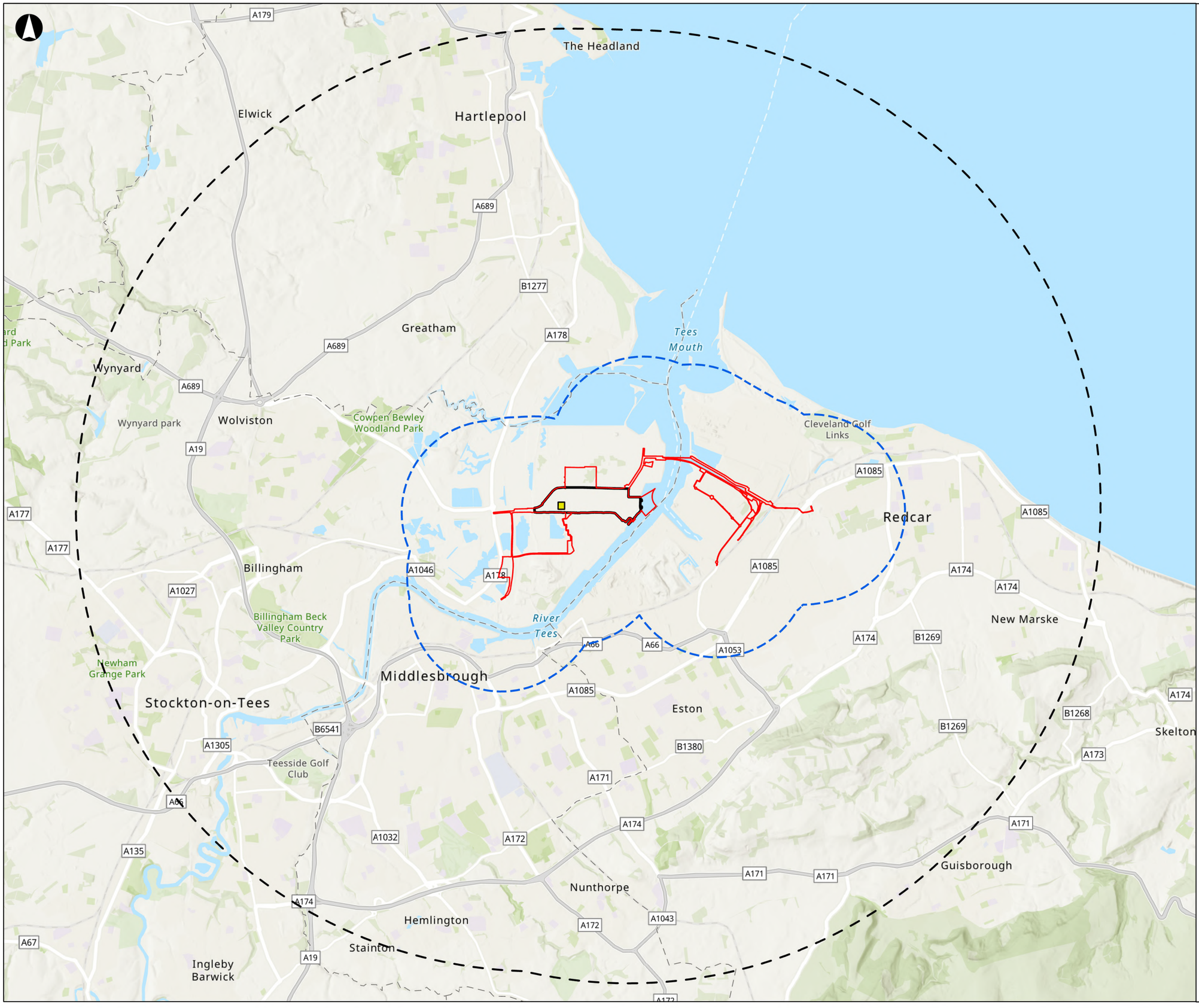
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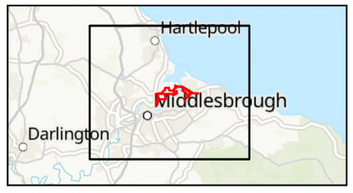
- Proposed Development Boundary
- Main Site
- Proposed Flare Stack (140m)
- 2km Study Area for Landscape Assessment
- 10km Study Area for Visual Assessment

Coordinate System: British National Grid

Basemap credits: Esri, Intermap, NASA, NGA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, GeoTechnologies, Inc, METI/NASA, USGS

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Lighthouse GREEN FUELS

Drawing Title
Figure 10.1
Landscape Study Area

Client
LGF Projects Ltd.

Project Name
Lighthouse Green Fuels

Scale at A3
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Project Number
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Drawing Number
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- Proposed Development Boundary
- Main Site
- Proposed Flare Stack (140m)
- 2km Study Area for Landscape Assessment
- 10km Study Area for Visual Assessment
- European Long Distance Path
- Teesdale Way
- King Charles III England Coast Path
- Public Right of Way
- National Cycle Network
- North York Moors National Park
- Country Parks
- Registered Parks and Gardens
- Conservation Areas

Listed Buildings (Grade)

- I
- II*
- II

- Scheduled Ancient Monuments
- National Nature Reserves
- Local Nature Reserves
- Ancient Woodland

Redcar and Cleveland Local Plan Area

- N1 Restoration Landscape Areas
- N1 Sensitive Landscape Areas

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Lighthouse GREEN FUELS

Drawing Title

Figure 10.2
Landscape Designations

Client

LGF Projects Ltd.

Project Name

Lighthouse Green Fuels

Scale at A3

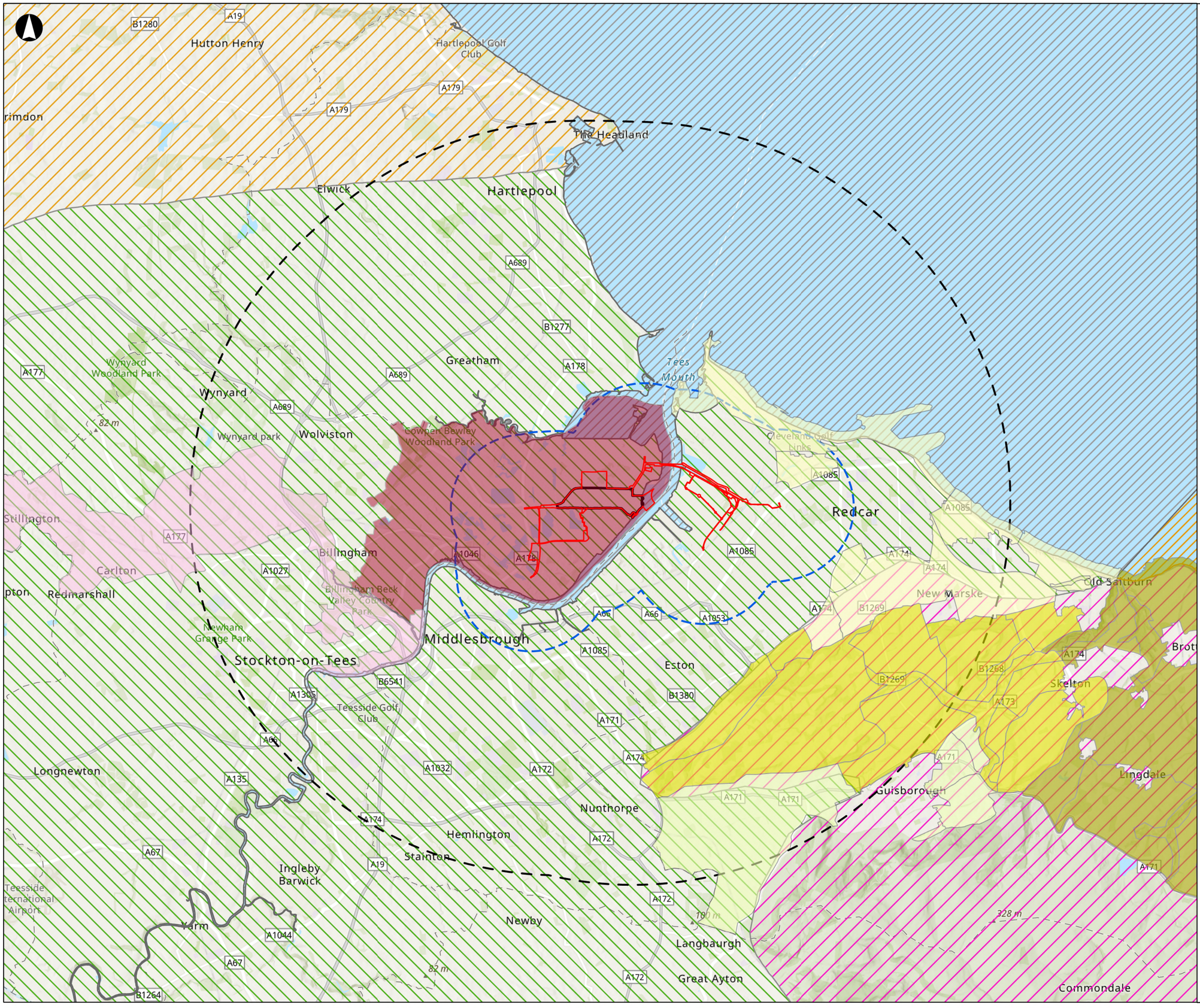
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- Proposed Development Boundary
- Main Site
- 2km Study Area for Landscape Assessment
- 10km Study Area for Visual Assessment

Redcar and Cleveland Landscape Character SPD 2011

Landscape Character Tract

- East Cleveland Plateau
- Eston Hills
- Guisborough Lowlands
- Redcar Flats

Stockton On Tees Landscape Character Assessment 2011

Landscape Character Area

- East Billingham to Teesmouth
- Thorpe & Billingham Beck Valley

Marine Character Areas - MMO 2018

- North Yorkshire Coastal Waters
- Tyne, Tees and Wear Estuaries and Coastal Waters

National Character Areas - Natural England 2003

- Durham Magnesian Limestone Plateau
- North York Moors and Cleveland Hills
- Tees Lowlands

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Lighthouse GREEN FUELS

Drawing Title

Figure 10.3
Published Landscape Character Areas

Client

LGF Projects Ltd.

Project Name

Lighthouse Green Fuels

Scale at A3

1:100,000

Project Number

306732-00

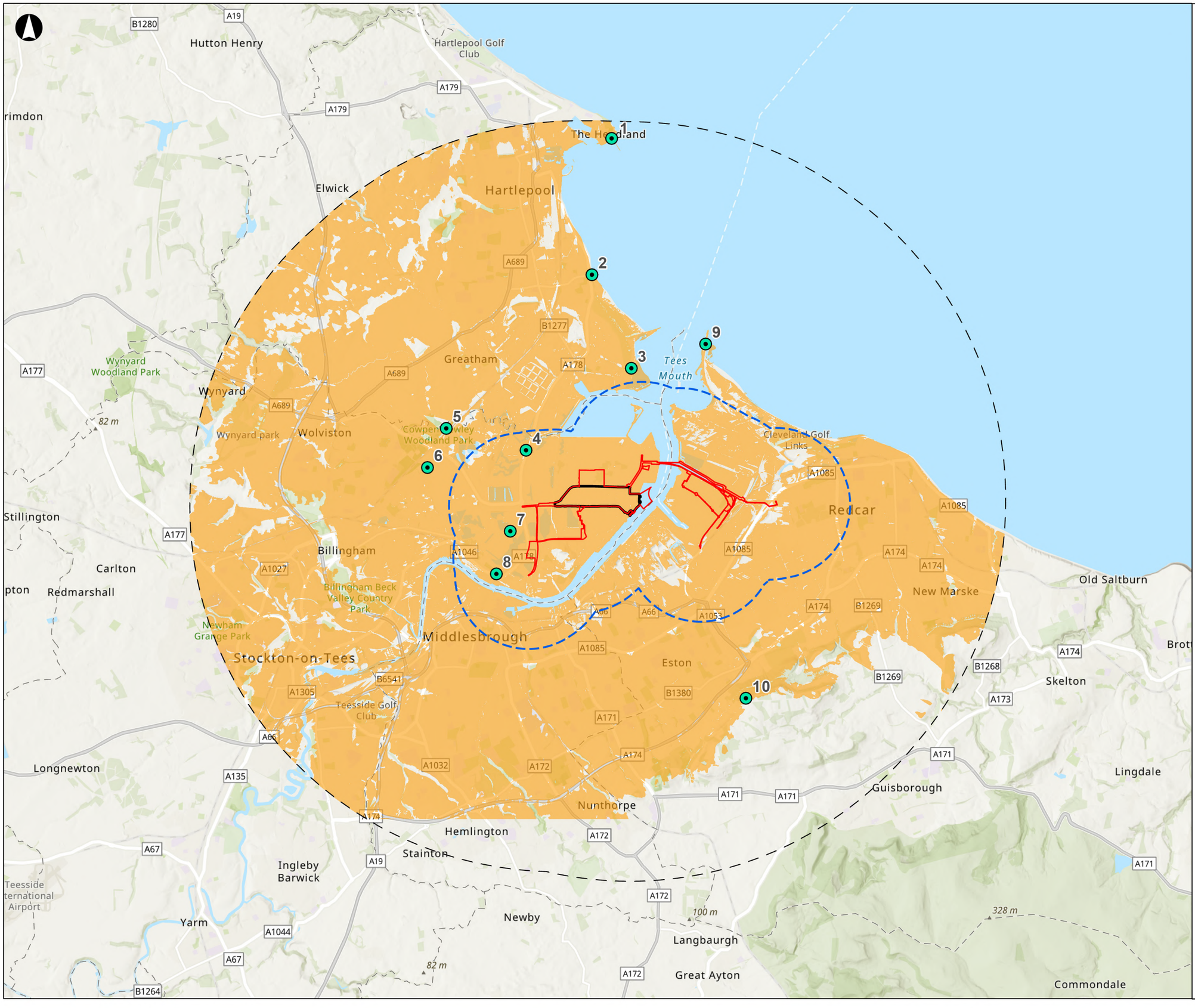
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Lighthouse GREEN FUELS

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Figure 10.4
Zone of Theoretical Visibility and Proposed Representative Viewpoints

Client
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