

The Lighthouse Green Fuels Order

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Glossary

Acronym	In Full / Term
AOD	Above Ordnance Datum
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
ASU	Air Separation Unit
AWB	Artificial Water Body
BGS	British Geological Survey
CATS	Central Area Transmission System
CD	Chart Datum
CHP	Combined Heat and Power
CO ₂	Carbon dioxide
COMAH	Control of Major Accident Hazards
DCO	Development Consent Order
Defra	Department for Environment Food and Rural Affairs
DIN	Dissolved inorganic nitrogen
DrWPA	Drinking Water Protected Area
EA	Environment Agency
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
fCEMP	Framework Construction Environmental Management Plan
FRA	Flood Risk Assessment
GCN	Great Crested Newt
GDTE	Groundwater Dependent Terrestrial Ecosystem
GEP	Good Ecological Potential
GES	Good Ecological Status
GWMU	Groundwater Management Unit
ha	Hectares
HBCDD	Hexabromocyclododecane
HMWB	Heavily Modified Water Body
HV	High Voltage
INNS	Invasive Non-Native Species
LSO	Long Sea Outfall
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographic Information for the Countryside

MBC	Middlesbrough Borough Council
MCA	Marine Character Area
MMO	Marine Management Organisation
MW	Megawatt
NCA	National Character Area
NFPD	National Fish Populations Database
NIA	Noise Important Area
NNR	National Nature Reserve
NO ₂	Nitrogen dioxide
NSIP	Nationally Significant Infrastructure Project
NSR	Noise Sensitive Receptor
NWL	Northumbrian Water Limited
OD	Ordnance Datum
PA 2008	Planning Act 2008
PAH	Polycyclic aromatic hydrocarbons
PBDE	Polybrominated diphenyl ethers
PEIR	Preliminary Environmental Information Report
PFOS	Perfluorooctane sulphonate
PINS	Planning Inspectorate
PM	Particulate Matter
PRoW	Public Right of Way
PSRs	Pipeline Safety Regulations
RBMP	River Basin Management Plan
RCBC	Redcar and Cleveland Borough Council
RFD	Reasons for Deterioration
RNAG	Reason for Not Achieving Good
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SAF	Sustainable Aviation Fuel
SoS	Secretary of State
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
STBC	Stockton-on-Tees Borough Council
WER	Water Environment Regulations
WFD	Water Framework Directive
WRMU	Water Resource Management Unit
WwTW	Wastewater Treatment Works

1 Executive Summary

- 1.1.1 This assessment has been developed for the Lighthouse Green Fuels Project (the Proposed Development), in accordance with The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WER, 2017) [Ref 3]. The purpose of the assessment is to determine whether the Proposed Development has the potential to cause deterioration in the status of relevant surface water or groundwater bodies, or to prevent the achievement of their objectives under the WER 2017. This report forms an Appendix to **Chapter 12: Water Environment (ES Volume I, Application Document Ref. 6.1)** submitted as part of the Development Consent Order (DCO) Application.
- 1.1.2 The Proposed Development comprises a commercial-scale Sustainable Aviation Fuel (SAF) production facility at Seal Sands, Teesside, together with other development which requires development consent and associated development including a biomass and waste wood-fired Combined Heat and Power (CHP) plant, marine infrastructure, utility connections, industrial waste water infrastructure and operational drainage arrangements. Key components relevant to the water environment include the proposed quay on the River Tees, capital and maintenance dredging, use of existing tunnel infrastructure beneath the River Tees for utilities and industrial waste water export, on-site chemical handling and surface water management, and the discharge of industrial waste water via the proposed Northumbrian Water Ltd (NWL) Long Sea Outfall (LSO) to the North Sea.
- 1.1.3 The assessment has been undertaken through screening and scoping stages, informed by Environment Agency (EA) WER 2017 baseline data, other publicly available datasets, information requested from the EA, relevant ES chapters, and site walkover information. The assessment considers the relevant surface water and groundwater bodies that are functionally linked to, or could potentially be affected by, the Proposed Development at the water body scale.
- 1.1.4 The Proposed Development lies in a sensitive estuarine setting associated with the River Tees and Teesmouth and Cleveland Coast designated sites. The water environment includes tidal and inland watercourses, designated habitats, surface water bodies and groundwater bodies. The River Tees is a Main Riverⁱ and estuarine watercourse in this location, and the site is located within the Teesmouth and Cleveland Coast nutrient neutrality

ⁱ A Main River is defined as a watercourse, or any part of a watercourse, that is shown as a main river on the Environment Agency statutory Main River Map.

catchment. A **Nutrient Neutrality Assessment** is provided to accompany this application (**Application Document Ref. 5.9**).

- 1.1.5 Five water bodies were screened into the WER assessment, namely: the Tees Water Body; Tees Estuary (South Bank) Water Body; Tees Coastal Water Body; Tees Sherwood Sandstone Groundwater Body; and Tees Mercia Mudstone and Redcar Mudstone Groundwater Body. Marton West Beck Water Body was screened out due to its position upstream of the Proposed Development and therefore hydrologically disconnected from potential project impacts.
- 1.1.6 The scoping assessment identified potential effects on the water environment associated with construction and operational activities, including dredging, quay construction, jetty removal, operational drainage, industrial waste water infrastructure, chemical handling and surface water runoff. Embedded mitigation, construction environmental management measures, operational drainage design, pollution prevention measures, spill response procedures, water quality monitoring and relevant permitting controls are expected to reduce the risk of adverse effects on water quality and groundwater to negligible levels. Although included through screening to ensure all plausible pathways were addressed, no plausible impacts to groundwater bodies at the scoping stage were identified.
- 1.1.7 The principal residual effects relate to localised hydromorphological and biological effects within the River Tees associated with the new quay, removal of existing jetties, capital dredging, maintenance dredging and potential scour protection. These effects are expected to be localised and have a minor adverse impact on the Tees Water, and are not anticipated to result in deterioration in status at the water body scale. Effects on the Tees Coastal Water Body from industrial waste water discharge via the proposed LSO are expected to be negligible due to dispersion, dilution and tidal exchange within the coastal system.
- 1.1.8 Overall, the Proposed Development is not anticipated to cause deterioration in the status of any relevant WER 2017 water body, nor to prevent the future achievement of water body status objectives. On this basis, the Proposed Development is considered to be compliant with the requirements and objectives of the WER, subject to the embedded mitigation, construction management measures and operational controls identified in this assessment.

2 Introduction

2.1 Overview

- 2.1.1 This **Water Environment Regulations Assessment (Application Document Ref. 5.10)** has been prepared by Ove Arup and Partners Limited (Arup) on behalf of LGF Projects Limited (the Applicant), to support an application (the Application) seeking development consent for the construction, operation, maintenance and decommissioning of the Lighthouse Green Fuels (LGF) project (the Proposed Development) on land within the administrative boundaries of Stockton-on-Tees Borough Council (STBC) and Redcar and Cleveland Borough Council (RCBC).
- 2.1.2 The Order limits for the Proposed Development are made up of the Main Site and Wider Site, together 'the Site'. A more detailed description of the Site is set out at Section 2.4.
- 2.1.3 The Application has been submitted to the Planning Inspectorate (PINS), and the decision whether to grant a Development Consent Order (DCO) will be made by the Secretary of State (SoS) for Energy Security and Net Zero pursuant to the Planning Act 2008 (the PA 2008) [Ref 1].
- 2.1.4 The Proposed Development comprises a commercial-scale second generation Sustainable Aviation Fuel (SAF) production facility and associated infrastructure.

2.2 The Applicant

- 2.2.1 The Applicant is wholly owned by Alfanar Energy Limited (Alfanar). Alfanar is part of a global project development, manufacturing, and engineering group headquartered in Saudi Arabia. Alfanar has developed significant in-house feedstock-to-SAF expertise. This experience will be utilised to construct and operate the Proposed Development.

2.3 Overview of the Proposed Development

- 2.3.1 The Proposed Development is anticipated to be the UK's first commercial-scale second generation SAF production facility.
- 2.3.2 The Proposed Development includes the construction, operation, maintenance and decommissioning of a commercial-scale facility that will produce approximately 180 million litres of advanced SAF and approximately 30 million litres of renewable naphtha each year.
- 2.3.3 The Proposed Development includes the following elements (the location of each Work No. is shown on the **Works Plans (Application Document Ref 2.4)**):

Table 2.1 Works Description Summaries

Work Number:	
Work No. 1	SAF production facility comprising: 1A - feedstock pre-treatment facility including flue gas treatment and stack 1B - SAF processing facility including thermal oxidiser, flue gas treatment, and stack 1C - up to two flare structures
Work No. 2	Combined heat and power (CHP) generating station comprising: 2A - boilers and steam turbine generators 2B - flue gas treatment and stack
Work No. 3	Feedstock and intermediate and final product handling and storage
Work No. 4	Cooling infrastructure for SAF production facility and CHP plant
Work No. 5	Bridge and culvert crossings of existing infrastructure
Work No. 6	Marine infrastructure comprising: 6A - construction of permanent quay 6B - permanent quay 6C - capital and maintenance dredging
Work No. 7	Electrical connection works comprising: 7A - underground and overground cable connections to the existing North Bank Supply Point 7B - electrical connection works
Work No. 8	Modified or new natural gas connection and above ground infrastructure (AGI)
Work No. 9	Supply of industrial gases: Only one of Work No. 9A or Work No. 9B would be developed; 9A - industrial gases connection works comprising installation of new and repurposing of oxygen and nitrogen pipeline connections, and connection to existing low pressure nitrogen supply 9B - air separation unit (ASU) facility and connections to Work No. 1
Work No. 10	Modification or removal and replacement of industrial effluent pipeline connection works
Works No. 11	Export connection works: 11A - pipeline(s) for the export of SAF and renewable naphtha 11B or 11C - a pipeline for the export of carbon dioxide (CO ₂) connecting to AGI by others (being either AGI C1 or C2 of the Northern Endurance Partnership (NEP) transport and storage pipeline) Only one of Work No. 11B or Work No. 11C would be developed
Works No. 12	Surface water attenuation, and drainage and discharge works
Works No. 13	Laydown areas comprising: 13A - temporary construction compounds and laydown areas 13B - permanent laydown and storage
Work No. 14	Access works and private street improvements

- 2.3.4 In addition a range of associated development, both specified and unspecified, is proposed in relation to the above.
- 2.3.5 The new quay on the River Tees (**Work No. 6**) will allow delivery of modular plant and construction materials by ship during construction and biomass and waste wood feedstock during operation, reducing reliance on road transport. Feedstock will be stored (**Work No. 3**) then pre-treated at the Main Site and processed into SAF through gasification and gas-to-liquids processes (**Work No.1**).
- 2.3.6 To support operations, the Proposed Development will include a biomass and waste wood-fired CHP plant (**Work No. 2**) with an electrical output capacity of up to 200 megawatts electrical (MWe), providing a low-carbon energy supply for the SAF process. Cooling infrastructure (**Work No. 4**) will be required for the SAF process and the CHP plant. Connections will provide electricity for start-up and to maintain ancillary site supplies (**Work No. 7**), natural gas for start-up and as auxiliary fuel for some processes during operation (**Work No. 8**), and oxygen and nitrogen which will either be delivered to the Site via pipelines or produced by a new ASU in the Main Site (**Work No. 9A or 9B** respectively). Waste materials, including off-specification materials will be exported from the Main Site by road. Finished products (SAF, and a secondary product of the process, renewable naphtha) will be transferred via pipeline(s) (**Work No. 11A**) to local marine loading facilities for marine export or export by road. CO₂ from the acid gas removal unit in **Work No. 1B** will be exported via pipeline (**Work No. 11B or Work No. 11C**) subject to a suitable agreement to connect to one of two proximate AGIs in the NEP project.
- 2.3.7 The Proposed Development will also include replacement and new wastewater pipeline connection works (**Work No. 10**), surface water drainage systems (**Work No. 12**) and access and street improvements (**Work No. 14**). Space within the Wider Site is identified for temporary construction and laydown and space within the Main Site identified for permanent laydown and storage areas (**Work No. 13**).
- 2.3.8 The preliminary layout of the Proposed Development is shown on Indicative General Arrangement Plan (**Application Document Ref. 2.5.1**) and Indicative General Arrangement Isometric (**Application Document Ref 2.5.2**).
- 2.4 [The Site](#)
- 2.4.1 The Site location and boundary (which is also known as the 'Order limits') are shown on Site Location Plan (**Application Document Ref. 2.1**). The Site is located in Teesside on land to the north and south of the River Tees with connection corridors crossing the Tees.

- 2.4.2 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, on the north bank of the River Tees in the borough of Stockton-on-Tees). The majority of the Main Site lies south of Seal Sands Road and largely comprises previously developed land formerly used as a chemical plant from the early 1970s. It was last operated by INEOS Nitriles.
- 2.4.3 The Main Site comprises the main SAF facility development area of the Site, lying to the south and north sides of Seal Sands Road and bounded by the proposed quay in the River Tees, with the River Tees to the east.
- 2.4.4 The eastern boundary of the Main Site is formed by the River Tees, where existing jetties will be demolished and a new quay developed.
- 2.4.5 The Wider Site comprises the connection corridors, including land required for road access, pipelines (including under the River Tees), dredging near to the Main Site, and utility connections and construction laydown in both North Tees and (in the borough of Redcar and Cleveland) South Tees.

2.5 The DCO Process

- 2.5.1 Part 3 of the PA 2008 defines which projects constitute a nationally significant infrastructure project (NSIP). Once classed as an NSIP, development consent (in the form of a DCO) is required under Part 4 of the PA 2008.
- 2.5.2 In legislative terms the Proposed Development comprises both a SAF production facility and a CHP generating station together with development associated with the SAF production facility and the CHP generating station.
- 2.5.3 The construction and operation of the main SAF production facility does not automatically fall within the definition of an NSIP. Therefore, on 12 August 2025, the Applicant formally requested a direction by the SoS for Energy Security and Net Zero, pursuant to section 35 (1) of the PA 2008, that the following elements be treated as one for which development consent is required. The Section 35 direction request was made in respect of: a main gasification facility to process sustainably sourced biomass; feedstock pre-treatment, syngas clean-up apparatus; Fischer-Tropsch process units; refining units; feedstock, intermediates and finished product storage; quayside with ship loading/ offloading infrastructure; supporting infrastructure and utility connections (hereafter called the 'Specified Elements').
- 2.5.4 The SoS for Energy Security and Net Zero issued a direction under Section 35 of the PA 2008 [Ref 1] on 08 September 2025 to confirm that the Specified Elements of the Proposed Development, together with any

matters/ development associated with them, should be treated as development for which development consent under the PA 2008 is required.

- 2.5.5 The CHP plant (**Work No. 2**) surpasses the 50 Megawatt (MW) threshold for generating stations defined in Section 15 of the PA 2008 and is therefore a NSIP in its own right.
- 2.5.6 An application for development consent for the Proposed Development has been submitted to PINS acting on behalf of the SoS. Subject to the Application being accepted, PINS will then examine it and make a recommendation to the SoS who will then decide whether to grant a DCO.
- 2.5.7 The application for development consent for the Proposed Development supersedes a previous application that was being progressed by Lighthouse Green Fuels Limited centred on a site off Huntsman Drive in Seal Sands, TS2 1TT (PINS ref. EN010150). Statutory consultation on that application took place between 16 May 2024 and 20 June 2024. As shown on the PINS websiteⁱⁱ, that application is discontinued.

2.6 The Purpose and Structure of this Document

- 2.6.1 The purpose of this document is to provide a WER 2017 compliance assessment (also referred to as a Water Framework Directive (WFD) compliance assessment) for the Proposed Development in respect of the requirements of the WER 2017 [Ref 3] (see Annex A:). The WER 2017 requires that new developments demonstrate that no deterioration in the status of water bodies will occur unless a relevant derogation applies. This report should be read in conjunction with **Chapter 12: Water Environment (Environmental Statement (ES) Volume I (Application Document Ref. 6.1)**.

ⁱⁱ <https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN010150>

3 Scope

3.1 Report context

- 3.1.1 This report provides a summary of the Proposed Development, the assessment methodology and results. It has been undertaken in accordance with relevant WER legislative context and guidance (Annex A:) and has involved a desk-based study using readily available Environment Agency (EA) WER baseline information and internal datasets held by the EA, supported by a site walkover. The assessment is based on the design of the Proposed Development as presented within the DCO Application.
- 3.1.2 The assessment methodology has had regard to the Environment Agency's Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive [**Error! Reference source not found.**], which provides guidance on the assessment of deterioration, status objectives and compliance with the Water Environment Regulations for NSIPs.
- 3.1.3 The assessment is a final assessment, provided as part of the ES submitted with the DCO Application.

3.2 Assumptions and limitations

- 3.2.1 The following assumptions and limitations apply:
- the WER compliance assessment is based on the design information available in August 2026. Where design details are still under development or flexibility is sought, assumptions have been made based on professional judgment and the assessment has been based on the parameters set;
 - targeted walkover surveys were undertaken in March 2026 and information gathered has been used as part of this assessment. Due to the nature of the site, access to watercourses was limited'
 - this assessment assumes that the information provided from public sources is correct and accurately reflects baseline conditions; and
 - the findings presented in this assessment are subject to change as and when the detailed design is developed following the DCO Application and appointment of a contractor.

3.3 Scoping opinion responses

- 3.3.1 The following responses have been provided by the regulators in Table 3.1.

Table 3.1 Scoping Opinion Responses

Key stakeholders	Consultation response	Applicant Response to Feedback
Natural England	The PEIR assesses water quality impacts based on water being discharged through a proposed Long Sea Outfall (LSO). However, there is insufficient information provided at this stage to judge what mitigation would be required if the LSO was not delivered in time or if mitigation would be feasible. The ES should include estimates of the likely nutrient and other contaminant loading of the potential wastewater and a feasibility study of potential mitigation options.	The Northumbrian Water Ltd.'s (NWL) Bran Sands LSO is programmed to be operational for the discharge of waste water to Tees Bay before the Proposed Development becomes operational. Chapter 12: Water Environment (ES Volume I, Application Document Ref. 6.1) assesses the potential impacts of this discharge strategy, including implications for the Tees Estuary and Tees Bay. In the unlikely event that the LSO is not operational in advance of the Proposed Development, a further assessment would be required to report the impacts and any associated mitigation of any interim discharge arrangement on WER water bodies and catchments.
	Potential for interactions and cumulative effects with a number of projects that involve significant dredging activity within the River Tees, as well as quay works, have been scoped out for cumulative impacts. These projects should either be scoped in for cumulative / in-combination effects or specific rationale should be provided as to why there is no potential for cumulative / in-combination effects	Cumulative impacts from the Proposed Development are assessed in Chapter 22, (ES Volume I, Application Document Ref. 6.1). Impacts to WFD water bodies are assessed in this document.
Environment Agency (EA)	A WFD Assessment is proposed as an appendix to the Water Environment Chapter of the Environment Impact Assessment (EIA). It will assess the impacts the increase in nitrogen will have on the area, as well as implement mitigation. This approach is welcomed. However, the WFD Assessment should be broader in scope than just the impact of increase in nitrogen. It should consider wider potential water quality impacts on receiving water bodies such as water clarity,	This WFD assessment has been produced to support the application. The assessment considers a broad range of potential impacts beyond nutrient loading, including water quality parameters such as suspended solids/turbidity, dissolved oxygen, salinity and temperature, where relevant to the receiving water bodies. The assessment scope includes all relevant WFD water bodies and

Key stakeholders	Consultation response	Applicant Response to Feedback
	temperature, salinity, oxygen levels, nutrients and microbial patterns. The WFD should also: • assess WFD Protected Areas; • determine if the development is exempt under Article 4.7 of WFD; • assess contributions that the development can make towards achieving the objectives in the Northumbria River Basin Management Plan. These should be set apart from any necessary mitigation measures; • describe any enhancement measures or positive contributions that the project can make towards achieving the objectives in the Northumbria River Basin Management Plan. These should be set apart from any necessary mitigation measures; and • Section 4.2.2 to 4.2.4 in Chapter 12 (Water Environment and Flood Risk) describes the WFD surface water, transitional and coastal water bodies located within the study area which will be scoped in and assessed within the WFD assessment at the ES stage. The Water Environment Regulations (WER) applies to all bodies of water. The WFD assessment should ensure that it assesses all bodies of water against the relevant overarching objectives of WER.	Protected Areas and considers compliance with overarching WER objectives, including no deterioration in status and protection of WFD objectives. Abstractions are not required for the Proposed Development so WER Regulation 19 derogations will not be required for the site. This assessment also considers the potential for physical modification of water bodies and identifies mitigation measures required to avoid or minimise impacts. The relationship between mitigation (to ensure compliance) and any potential beneficial or enhancement measures is clearly distinguished. Consideration is also given to how the Proposed Development interacts with the objectives of the Northumbria River Basin Management Plan. A Nutrient Neutrality Assessment has also been undertaken and is included in the Nutrient Neutrality Assessment (Application Document Ref. 5.9) to assess increases in nitrogen loading and wider water quality effects. No further assessments or modelling have been undertaken at this stage but may be undertaken in subsequent stages of the application process or to inform permitting and detailed design.
	Potential for interactions and cumulative effects with a number of projects that involve significant dredging activity within the River Tees, as well as quay works, have been scoped out for cumulative impacts. These projects should either be scoped in for cumulative / in-combination effects or specific rationale should be provided as to why there is no potential for cumulative / in-combination effects	Cumulative impacts from the Proposed Development are assessed in Chapter 22: Cumulative and Combined Effects (ES Volume I, Application Document Ref. 6.1). Impacts to WFD water bodies are assessed in this chapter

Key stakeholders	Consultation response	Applicant Response to Feedback
	Chapter 11: Freshwater and Marine Ecology, paragraph 6.1.1 states that the activity of construction of the proposed quay has the potential to result in loss of intertidal habitat. Chapter 11 also references in Table 9-1 (Summaries of the potential significant effects during construction), and assess the potential impact of, 'Change of intertidal habitats and species from construction works'. The 'change' of intertidal habitat is assessed as being limited to the 'Loss of species in the existing jetty' with a 'minor adverse impact'. This information should also be included in a WFD assessment and appropriate mitigation determined at the ES stage. While the footprint of any such loss is relatively small, the proposed development is within an already heavily modified waterbody where 90% of intertidal habitats have been lost through development over time. The entirety of the remaining estuary and intertidal habitats are designated as a WFD Protected Area (SPA). The cumulative effect of such losses from this and other developments could represent a deterioration unless appropriately mitigated.	Potential impacts to intertidal habitats arising from quay construction have been assessed with further detail included in Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1). This WER Assessment also considers these impacts in the context of the Tees Estuary Heavily Modified Water Body (HMWB), including potential implications for WFD Protected Areas.
	<u>Outline Drainage Strategy for Construction and Operation</u> The PEIR states that site drainage systems will collect surface water and direct it to attenuation ponds where it will be tested prior to being discharged to the River Tees. In the event of contamination, the water can be directed to the onsite treatment plant for further processing before export by pipeline to Bran Sands Waste Water Treatment Works (WwTW). The Outline Drainage Strategy should be updated to include the following information: • full details on how surface water will be collected, treated, and discharged during construction and operation;	A Framework Drainage Strategy has been produced in support of the application and is appended to the Flood Risk Assessment (Application Document Ref. 5.7) which includes details on how surface water will be managed during operation. This covers the information requested by the EA, save that "full details" are not included on how surface water will be collected, treated, and discharged during operation because this is a framework strategy. As is standard practice, the full details will be included in the details on operational drainage which must be submitted to and approved by the Environment Agency in accordance with the requirements of the environmental permit required for

Key stakeholders	Consultation response	Applicant Response to Feedback
	• how the proposed drainage strategy will be managed and maintained throughout the operational phase; • how contaminated water will be contained, treated and removed to prevent pollution; and • further details of the onsite treatment plan, including a development layout plan. Is this an interim treatment process before wastewater is taken to Bran Sands WwTW? Clarification is required on this matter. We note the choice of a new surface water outfall versus use of the existing outfall to the River Tees is still under consideration. The potential impact on the receiving watercourse should be assessed in the Water Framework Directive (WFD) Assessment.	operation of the Proposed Development. Detail on construction drainage is included in the Framework Construction Environmental Management Plan (fCEMP) (ES Volume III, Appendix 5A, Application Document Ref. 6.3).
	The Sherwood Sandstone principal aquifer is a regionally important resource. Therefore, we cannot accept deterioration to principal aquifers due to WFD requirements. Additionally, in the absence of site-specific ground investigation and confirmed development plans, it is difficult to accurately assign magnitude of impact and an appropriate level of residual risk. Reconsideration should be given to the magnitude of impact and residual risk.	This has been re-considered within this WER assessment and in Chapter 12: Water Environment (ES Volume I, Application Document Ref. 6.1).

4 Assessment Methodology

4.1 Scope of the Assessment

- 4.1.1 WER compliance assessments comprise a phased process undertaken in parallel with the design development for a Proposed Development. This includes the following key steps, described in detail in Annex A: of this document:
- Screening assessment;
 - Scoping assessment; and
 - Detailed impact assessment (where deemed required).
- 4.1.2 This report comprises the screening and scoping assessment phases of the process. In advance of preparing this document, site walkovers have been undertaken for a number of watercourses in the vicinity of the Proposed Development and the results have been reported within this document.
- 4.1.3 The spatial scope of the assessment includes all WER designated surface water and groundwater bodies which could be potentially affected by the Proposed Development, as outlined in **Figure 12.3: Surface Water Features (ES Volume II, Application Document Ref. 6.2)** and **Figure 12.4: Groundwater Features (ES Volume II, Application Document Ref. 6.2)**. The Study Area for the WER Assessment comprises the Site and all the surface and groundwater bodies functionally linked to or potentially impacted by Proposed Development, as the assessment considers the potential impacts of the Proposed Development on all the relevant quality elements associated with the surface water and groundwater bodies potentially affected, at the water body scale.
- 4.1.4 The assessment focuses on the long-term impacts of the Proposed Development. Temporary impacts are not considered to result in deterioration in WER status and so have not been considered within the assessment in accordance with current EA guidance [Ref 4]. Construction impacts are considered temporary if individual activities do not extend beyond approximately two years in duration, which is the case for the construction phase of the Proposed Development, as outlined in the project's construction programme within **Chapter 5: Construction Programme and Management (ES Volume I, Application Document Ref. 6.1)**.

5 Data sources and consulted reports

5.1 Data sources

5.1.1 The following EA datasets and resources are available online and have been used to support this assessment:

- EA (2022) “Cycle 3 River Basin Management Plan (RBMP)” [Ref 5];
- EA (2022) “Northumbria River Basin District Flood Risk Management Plan 2021 to 2027” [Ref 6];
- EA (2015) Northumbria River Basin District River Basin Management Plan [Ref 7];
- EA (2022) Northumbria River Basin District Cycle 3 RBMP [Ref 8]; and
- EA (2024) Water Body Status Classification and Status Objectives Data (2019 classification) (Catchment Data Explorer) [Ref 9];
- EA (2024) WER Protected Area data (Catchment Data Explorer) [Ref 10];
- EA (2024) National Fish Populations Database (NFPD): Fish Survey Data - freshwater and saltwater fish survey data collated from fisheries monitoring work, including monitoring site locations, dates and fish species count results [Ref 11];
- EA (2024) Water Quality Monitoring Data Archive - water quality monitoring datasets, including monitoring site locations, dates and results [Ref 12]; and
- EA (2024) Ecology and Fish Data Explore: Ecological Monitoring Datasets - ecological datasets, including benthic invertebrates monitoring data, phytoplankton monitoring datasets, macrophyte survey data, invertebrate biological data and diatom assemblages [Ref 13].

5.1.2 A data request was submitted to the EA on 23 February 2026 for information relevant to this assessment which is not publicly available. Data was requested for the following surface water and groundwater bodies:

- Tees Water Body
- Tees Estuary (South Bank)
- Tees Coastal Water Body
- Tees Sherwood Sandstone Water Body
- Tees Mercia Mudstone & Redcar Mudstone Water Body

- Marton West Beck Catchment (tributary of Tidal Tees)

5.1.3 The data provided by the EA is set out in Annex B: and includes:

- EA (2024) Extended Waterbody Summary Reports (Catchment Planning System (CPS)) [Ref 14];
- EA (2024) Reason for Not Achieving Good (RNAG) and cause of failure investigation reports (Catchment Planning System (CPS) and investigation reports database) [Ref 15];
- EA (2015) Cycle 2 River Basin Management Plan (RBMP) measures and actions dataset - including any Heavily Modified Water Body (HMWB) mitigation measures identified to support achievement of status objectives (Catchment Planning System) [Ref 16];
- EA (2024) BIOSYS Freshwater macroinvertebrate monitoring datasets - including biotic indices (WHPTNTAXA, WHPTASPT, LIFE, PSI), taxa lists, and associated environmental and observed variables required for RICT analysis (Ecology & Fish Data Explorer) [Ref 17];
- EA (2024) BIOSYS Freshwater macrophyte monitoring datasets - including biotic indices (RMNI, RMHI, NTAXA, NFG, ALG PCT, MTR, MFR), taxa lists, and associated environmental and observed variables required for LEAFPACS analysis (Ecology & Fish Data Explorer) [Ref 18];
- EA (2024) BIOSYS Freshwater phytobenthos (diatom) monitoring datasets - including biotic indices (TDI4, % motile taxa, % planktonic taxa), taxa lists, DARLEQ outputs, and associated environmental variables required for running DARLEQ (Ecology & Fish Data Explorer) [Ref 19];
- EA (2024) National Fish Populations Database (NFPD) Freshwater fish survey datasets and FCS2 outputs - including raw survey data (species presence, counts and fork lengths), FCS2 outputs (species- and site-level EQRs), and any available HABSCORE data (Ecology & Fish Data Explorer) [Ref 20]; and
- EA (2024) Non-native invasive species records - for the water body, derived from Environment Agency monitoring, incident reporting and catchment investigations (Ecology and Fish Data Explorer and Internal EA Records) [Ref 21].

5.1.4 The following additional key sources of data have also been used to inform this WER Assessment:

- MAGIC Map (Defra) [Ref 22]; and
- British Geological Survey (BGS) GeoIndex viewer [Ref 23].

5.2 Other relevant environmental reports

5.2.1 This assessment should be read in conjunction with the following ES documents available at statutory consultation which have been used to inform this assessment:

- **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1);**
- **Nutrient Neutrality Assessment (Application Document Ref. 5.9);**
and
- **Framework Drainage Strategy, Appendix to the Flood Risk Assessment (FRA) (Application Document Ref. 5.7).**

5.3 Watercourse receptor valuation

5.3.1 Activities associated with the Proposed Development have the potential to affect a number of watercourse receptors. The watercourses present within each WER water body catchment that have the potential to be affected by the Proposed Development have therefore been identified, assessed and assigned a receptor value using desktop information and professional judgement. The receptor value was then verified with site visits. The criteria used to classify watercourse receptor value are summarised in Table 5.1. These criteria have been established based upon available guidance, legislation, statutory designation and / or professional judgement.

Table 5.1 Watercourse receptor valuation

Receptor value	Criteria
Very High	• Within or in close hydraulic connectivity with a statutory designated site (e.g. Site of Special Scientific Interest (SSSI) or Special Protection Area (SPA)). • Main River, not an Ordinary watercourseⁱⁱⁱ.^{iv} • Part of main WER river water body extent. • Permanent baseflow. Definable flow types. • Evidence of active fluvial geomorphological processes and features (e.g. fluvial bank erosion and bars). • Supports freshwater fish, macroinvertebrate and/or macrophyte communities. Subject to EA freshwater monitoring regime

ⁱⁱⁱ An Ordinary Watercourse is defined as any stream, river, ditch, drain, culvert, or other channel where water flows that is not designated as a Main River.

^{iv} An Ordinary Watercourse is defined as any stream, river, ditch, drain, culvert, or other channel where water flows that is not designated as a Main River.

Receptor value	Criteria
High	- Channel may be subject to physical modifications (e.g. historically straightened or reprofiled). - Riparian zone typically exhibits some structural diversity. May be impacted or heavily modified by adjacent land uses (e.g. agricultural) and/or vegetation maintenance. - Main River or significant Ordinary watercourse - Part of main WER water body extent - Permanent baseflow. Definable flow types - Evidence of active fluvial geomorphological processes and features (e.g. fluvial bank erosion and bars) - Supports freshwater fish, macroinvertebrate and/or macrophyte communities. Typically subject to EA freshwater monitoring regime - Channel may be subject to physical modifications (e.g. historically straightened or reprofiled) - Riparian zone may be impacted or heavily modified by adjacent land uses (e.g. agricultural) and/or regular vegetation maintenance.
Moderate	- Ordinary watercourse - Tributary of main WER water body - Some limited baseflow. Generally shallow flows with limited hydraulic diversity - Some limited evidence of active fluvial geomorphological processes and features (e.g. fluvial bank erosion and bars) - Potential to support some freshwater fish, macroinvertebrate and/or macrophyte communities (but typically low diversity and/or abundance). Generally, not subject to EA freshwater monitoring regime - Channel may be subject to physical modifications (e.g. historically straightened or reprofiled) - Riparian zone may be impacted or heavily modified by adjacent land uses (e.g. agricultural) and/or regular vegetation maintenance.
Low	- Ordinary watercourse - Minor tributary (within WER water body catchment). Typically comprising artificially created drainage ditch or small and/or ephemeral channel - Little or no baseflow. Largely very shallow and/or ponded flows under normal conditions, with potential to dry-out during periods of dry weather - Little evidence of active fluvial geomorphological processes and features (e.g. fluvial bank erosion and bars) - Little or no potential to support freshwater fish, macroinvertebrate and/or macrophyte communities. Not subject to EA freshwater monitoring - Riparian zone typically impacted or heavily modified by adjacent land uses (e.g. agricultural).

6 Stakeholder engagement and consultation

6.1 Scoping and Statutory consultation stage

6.1.1 Feedback from regulators, other interested parties and the public was received in the Scoping and Statutory Consultation stages. Further consultation will be available through the DCO process. Detail on previous consultations are provided in **Chapter 12: Water Environment (ES Volume I, Application Document Ref. 6.1)**. Key feedback relevant to the WER assessment is summarised above in Table 3.1, Section 3.3.

6.1.2 As part of the Statutory Consultation, the EA and Natural England have responded to the Preliminary Environmental Information Report (PEIR), including comments relevant to the WER Compliance Assessment.

6.2 WER consultation meetings

6.2.1 The following meetings related to development of the WER Assessment have taken place during the development of this assessment. Engagement has included discussion of scope of assessment, assessment approach and responses to Scoping Opinion and PEIR responses:

- 5 March 2026 – Meeting with Natural England;
- 17 April 2026 – Meeting with EA's area Fisheries, Biodiversity and Geomorphology (FBG) team; and
- 20 April 2026 – Meeting with EA's area Water Quality, Water Resources and Groundwater teams.

7 Existing site

7.1 Study Area

- 7.1.1 The Study Area for water environment includes surface water, flood risk features and designated sites within a 2km radius of the Proposed Development and is based on professional judgement, applying the 'source-pathway-receptor' pollutant linkage principle. For groundwater features (including Groundwater Dependent Terrestrial Ecosystems (GWDTEs)) the study area is a 1km radius surrounding the Site. These buffers have been selected based on professional judgement of the potential impacts posed by the Proposed Development. For the purpose of the WER assessment, watercourses within the Wider Site and also those located in adjacent water bodies that could potentially be impacted have been considered.
- 7.1.2 A number of tidal and inland watercourses have been identified within the Study Area, including main rivers, ordinary watercourses, and unnamed drains. All watercourses identified within the Study Area can be found within Section 9. Screening and baseline assessment (see also **Chapter 12: Water Environment (ES Volume I, Application Document Ref. 6.1))**.
- 7.1.3 One WER surface water body and two groundwater bodies are located within the Wider Site. These comprise: the Tees Water Body, the Tees Sherwood Sandstone Groundwater Body, and the Tees Mercia Mudstone and Redcar Mudstone. The Tees Coastal water body is not within the boundary of the Proposed Development Site but is hydrologically connected to WER water bodies located within the boundary of the Proposed Development Site and is downstream of the Tees surface water body.
- 7.1.4 Marine baseline conditions reflect an industrialised estuary with moderate existing water and sediment quality challenges, including elevated concentrations of some metals and Polycyclic aromatic hydrocarbons (PAHs) in both water and sediments, although generally indicating low to moderate contamination overall; hydrodynamic conditions are tide-dominated downstream of the barrage, with variable salinity, turbidity and current speeds typical of a transitional estuarine environment.
- 7.1.5 Further detail on the screening in or out of water bodies can be found within Section 9. Screening and baseline assessment.

7.2 Ecology

- 7.2.1 The Main Site is located adjacent to, alongside and within, the lower tidal River Tees within a heavily modified industrial estuary, with marine receptors associated principally with the River Tees and Tees Estuary, and freshwater receptors associated with nearby ponds, drains, becks and

ordinary watercourses all located within approximately 2km of the Main Site.

- 7.2.2 The water environment adjacent to the site is ecologically sensitive due to the presence of internationally and nationally designated sites in close proximity, which support important estuarine habitats, migratory and overwintering birds, and seal haul-out/breeding areas.
- 7.2.3 The biological status of the WER designated water bodies impacted by the Proposed Development is set out below in Section 10: Screening and baseline assessment: WER water body baseline.
- 7.2.4 The estuary supports a diverse assemblage of marine and transitional ecological receptors, including intertidal mudflat and nearby saltmarsh habitats, benthic communities dominated by annelids and estuarine taxa, phytoplankton communities typical of UK estuaries, fish assemblages including marine migrants and diadromous species (notably salmonids, eel, herring, sprat, plaice and flounder), and marine mammals including harbour and grey seals. There is evidence of Invasive Non-Native Species (INNS) also present in both freshwater and marine environments. Further detail is set out in Chapter 11 in the ES (**Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**).

7.3 [Geology](#)

- 7.3.1 The Main Site and connection corridors are underlain by made ground (including dredged material in North Tees and ash and slag in South Tees), The underlying superficial deposits are Tidal Flat Deposits (estuarine and marine alluvium) composed of sand, silt, and clay, which in turn overlie Glaciolacustrine Deposits (clay and silt) and Glacial Till.
- 7.3.2 According to the BGS Geology Viewer [Ref 23], the bedrock beneath the Main Site and the majority of the Wider Site is the Mercia Mudstone Group. This comprises mudstone and subordinate siltstones, thin beds of gypsum/anhydrite and thin sandstones which generally exhibits low permeability. The Mercia Mudstone is a Secondary B Aquifer and is underlain by the Sherwood Sandstone Group (a Principal Aquifer) which comprises red, yellow and brown sandstone, pebbly in parts with subordinate mudstone and siltstone. The Sherwood Sandstone also subcrops beneath superficial deposits 75m to the west of the Main Site.
- 7.3.3 Along the Dabholm Gut, the bedrock comprises mudstones of the Penarth Group and Mercia Mudstone Group overlain by superficial deposits and Made Ground.
- 7.3.4 For further detail on the geology of the site, please refer to the **Chapter 21: Geology and Soils (ES Volume I, Application Document Ref. 6.1)**.

7.4 Topography

- 7.4.1 The area within the Study Area is low-lying and generally flat to gently sloping. To the north of the study area, Seal Sands forms a broad, low-lying intertidal sand and mudflat complex on the north bank of the Tees Estuary. Low-lying wetlands around Swallow Fleet and Holme Fleet are located to the west of the study area, and low-lying brownfield industrial sites are located to the south and east of the study area. Outside the study area, there are a number of sand dunes along the coast at Coatham Sands to the south of the Tees and Seaton Sands to the north.
- 7.4.2 Ground levels are typically close to sea level, with elevations generally ranging between approximately 1 and 10m Above Ordnance Datum (AOD). Landfill sites located over 2km to the north west from the Proposed Development form localised, artificial topographic features within the surrounding low lying landscape.

7.5 Land use

- 7.5.1 The land use within the Study Area is predominantly industrial brownfield. The land cover along the River Tees banks within the site and the vicinity of the study area is dominated by large industrial plant, hardstanding, disturbed land of bare earth and aggregate as well as derelict former industrial land with ruderal vegetation including grassland, scattered scrub and isolated trees. The land use within the boundary of the Main Site is predominantly cleared industrial land with an historic, vegetated former landfill site to the west and undeveloped land to the north. The Main Site was used for chemical manufacturing from the 1970s, with operations most recently undertaken by INEOS Nitriles. These industrial activities have ceased operation and the facility has been decommissioned, demolished, and the site cleared, leaving hardstanding as brownfield land. There are also two existing redundant jetties located on the River Tees within the Proposed Development boundary.
- 7.5.2 Further to the west, the landscape comprises an area of wetlands at Royal Society for the Protection of Birds (RSPB) Saltholme, coastal floodplains, intertidal mudflats, reedbeds and saline lagoons. To the north along the coast lies an area of sand dunes. Further to the north west and south east the study area comprises farmland, predominately arable with sparse and gappy hedgerow field boundaries. Woodland cover within the farmland to the north is sparse with isolated woods, including the wooded areas at Cowpen Bewley Woodland Park and Summerhill Country Park as well as tree belts along watercourses. Within the farmland to the south east there are areas of woodlands along the steep slopes of Eston Moor and Errington

Wood as well as along water courses and within Flatts Lane Woodland Country Park.

- 7.5.3 To the north, south, east and west lie the urban areas of Hartlepool, Stockton-on-Tees, Middlesbrough and Redcar.

7.6 Designated sites

- 7.6.1 The following designated sites lie within the Study Area for the WER Assessment, and are included in **Figure 3.2: Designated Conservation Sites (ES Volume II, Application Ref. 6.2)**

- Teesmouth and Cleveland Coast variously designated as a Site of Special Scientific Interest (SSSI), Special Protection Area (SPA), and Ramsar site - which includes the wider Seal Sands area and the intertidal habitat within the River Tees – passes through the Proposed Development, and located immediately to the east of the Main Site.
- Teesmouth National Nature Reserve (NNR), within the Teesmouth and Cleveland Coast SSSI and containing parts of the Teesmouth and Cleveland Coast Ramsar site, is located approximately 850m north of the Proposed Development.
- Four nature reserves are located within the Study Area to the west and north west of the Proposed Development. These sites are also part of the Teesmouth and Cleveland Coast SSSI, SPA, and Ramsar site and are under the protection of the RSPB. The nature reserves are: Dorman's Pool Nature Reserve; Saltholme East Pool Nature Reserve; Saltholme West Pool Nature Reserve; and Paddy's Pool Nature Reserve.
- There are no Source Protection Zones and Nitrate Vulnerable Zones within the Study Area. There are no surface water and groundwater drinking water safeguard zones within the Study Area.
- The Site is located within a Nutrient Neutrality Catchment (Teesmouth and Cleveland Coast SPA and Ramsar site). Further information can be found in the **Nutrient Neutrality Assessment (Application Document Ref. 5.9)**.

7.7 Hydrology

- 7.7.1 The River Tees (a Main River) crosses the Proposed Development Boundary and is located to the south and east of the Main Site. The Tees is crossed by the industrial gas and waste water connections to South Tees. The River Tees is an estuary in this location, and is tidally influenced upstream to the Tees Barrage in Stockton-on-Tees, 12km to the south west.

7.7.2 There are numerous other watercourses located in the vicinity of the Proposed Development. These include:

- Dabholm Gut (an Ordinary Watercourse) is located to the east of the Proposed Development adjacent to Bran Sands WwTW in South Tees;
- Mill Race (an Ordinary Watercourse) intersects the Trunk Road at the eastern extent of the Proposed Development in South Tees;
- The Fleet (an Ordinary Watercourse) located approximately 200m north of the Proposed Development in South Tees;
- Holme Fleet (a Main River) located approximately 900m south west of the Proposed Development (through the Saltholme Nature Reserve) in North Tees;
- Knitting Wife Beck (an Ordinary Watercourse) located approximately 300m south west of the eastern extent of the Proposed Development (Tees Dock roundabout) in South Tees;
- Greatham Creek (a Main River) located approximately 1.5km north of the Main Site in North Tees; and
- Several unnamed land drains;

7.7.3 In addition, there are several other surface water features in the vicinity of the Proposed Development:

- Dorman's Pool, plus other water bodies within RSPB Saltholme Nature Reserve, including Saltholme East Pool, Saltholme West Pool and several unnamed ponds which are close to the pipeline connection corridor to Navigator North Tees Inland Terminal; and
- The man-made Saltholme Brine Reservoirs located approximately 600m west of the Proposed Development.

8 Key interactions with Water Bodies

8.1 Connection corridors

- 8.1.1 For industrial gases, connections will be installed. Oxygen would be supplied via an existing oxygen pipeline in North Tees which links to an existing industrial gases facility in South Tees via a crossing under the Tees. The section of the existing oxygen pipeline in North Tees which runs adjacent to Seal Sands Road will need upgrading, and any other replacement and/or improvement works along the route will be confirmed by future surveys and engineering studies. The Applicant is also exploring whether high-pressure nitrogen could be supplied using an existing section of currently unused pipeline beneath the Tees, with new pipeline infrastructure required on land to the north and south of the river.
- 8.1.2 Industrial waste water will be exported for any required treatment and discharge using a replacement for an existing disused pipeline. The pipeline to be replaced runs from the Main Site, through an existing tunnel under the River Tees and along the northern side of the Dabholm Gut in South Tees. It will then be necessary to construct a new connecting pipeline into NWL's Bran Sands WwTW. The pipeline will carry industrial waste water treated using the treatment plant on the Main Site for any required additional treatment and appropriate discharge from Bran Sands WwTW.
- 8.1.3 The utility crossings of the Tees will utilise existing pipeline and tunnel infrastructure and will be wholly beneath the bed of the River Tees. Following consultation with the Marine Management Organisation (MMO), there is no identified need for a marine licence for these components of the Proposed Development.

8.2 Marine infrastructure

- 8.2.1 The proposed quay will be located at the eastern boundary of the Main Site on the River Tees. It would have a berth including topside infrastructure to facilitate the import of feedstock for the Proposed Development for Panamax sized vessels. It would also be used during the construction phase for the shipborne import of prefabricated plant modules, fill material and other construction materials required for construction (see **Chapter 5: Construction Programme and Management (ES Volume I, Application Document Ref. 6.1))**).
- 8.2.2 It will be necessary to demolish two existing jetties and associated infrastructure to enable quay construction.

Construction: capital dredging

- 8.2.3 Capital dredging of the River Tees will be required to form the berthing pocket and access channel for ships using the quay during construction. This is anticipated to comprise:
- A dredged pocket in front of the quay approximately 300m long and 55m wide, which would allow vessels to remain moored at the quay at all states of the tide. It would be dredged to a maintained depth of -14m relative to Chart Datum (CD) and 16.85m below Ordnance datum (OD). The capital dredging would excavate to approximately 300mm-600mm below the maintained depth level to allow for siltation. The dredged level would be lower in front of the quay in order to place scour protection, if this is required.
 - An approach channel between the nearby existing turning circle in the River Tees and the dredged pocket, which would be tidally restricted, would be dredged to a maintained depth of -10.4m to -11mCD (13.25m to 13.85m below OD).
 - Side slopes between the dredged areas at different depths.
 - In front of the quay wall, it may be necessary to provide underwater scour protection on the riverbed. This would comprise a concrete or asphalt mat or rock, or a combination of these. It would be necessary to temporarily dredge a trench in which to place the scour protection.
 - Material dredged during quay construction will be disposed of at designated and licensed offshore disposal sites, such as Tees Bay C, under a Deemed Marine Licence. It is possible that some of the dredged material is previously undisturbed mudstone that could be used as fill material to raise site levels; this would be confirmed following testing of the material quality.
 - Periodic maintenance dredging is expected to be required to achieve the maintained depth.
- 8.2.4 In addition to the dredging for the berthing pocket, the riverbed would also need to be dredged between the turning circle and the quay in order to facilitate vessel access to the sea during the construction phase.
- 8.2.5 During construction of the Proposed Development, dredge operations are anticipated to be continuous and operate 24 hours a day and seven days a week. Dredging could take around five months to carry out, depending on the final dredged volume, the dredging equipment selected and the ease of dredging. It is estimated that up to 800,000m³ of material (just for capital works) would need to be dredged.

Operation: ongoing dredging works

- 8.2.6 Ongoing maintenance dredging is expected to be required throughout operation of the Proposed Development to maintain the target depths of the new berth and associated access channel achieved by the capital dredge to retain safe navigational access between the berth and the River Tees main channel.
- 8.2.7 The frequency of dredging requirements throughout the operation of the Proposed Development may be either annual (which is considered the maximum frequency as a worst-case scenario) or at intervals supported by the marine licensing approach. This is consistent with the wider established maintenance dredging regime within the Tees Estuary, where dredging of the main channel and berths is already a routine activity.

8.3 Proposed waste water discharge from the Proposed Development

- 8.3.1 The SAF production process will be designed to recycle water back into the process where possible, using treatment facilities within the Main Site. Treated industrial waste water will be exported to NWL's Bran Sands WwTW as described in paragraph 8.1.2. Currently, Bran Sands WwTW discharges treated waste water to the Dabholm Gut, which in turn discharges to the Tees Estuary. NWL is proposing to construct a long sea outfall (LSO) underground northward from Bran Sands to Tees Bay. NWL is in the process of submitting a planning application for the LSO to Redcar and Cleveland Borough Council as the Local Planning Authority which is currently at the scoping stage (planning application reference R/2026/0419/SCP). This LSO will comprise an approximately 3km onshore and 4.5km offshore pipeline and is planned to be operational by 2030. The LSO will divert treated waste water discharges from the Tees Estuary to the North Sea to reduce nutrient nitrogen concentrations within the Tees Transitional Waterbody and Tees Bay. When operational, this LSO will discharge treated waste water from industries within Teesside including the Proposed Development.
- 8.3.2 Assuming an approximate three-and-a-half-year construction programme followed by a period of commissioning, the Proposed Development is unlikely to commence commercial operation before 2031. As the LSO is expected to be operational by April 2030, it will be operational from the commencement of operations at the Proposed Development and industrial waste water from the Proposed Development will be discharged through the LSO to the North Sea.

Design mitigation and assumptions

Embedded mitigation

- 8.3.3 Embedded mitigation measures are actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects (direct and indirect). Good practice measures are standard approaches and actions that avoid or reduce environmental impacts in line with good practice guidance and legislative requirements.
- 8.3.4 The Proposed Development will be served by a site-wide drainage network for the management of surface water, foul water and industrial waste water. Surface water drainage will be managed through a Framework Drainage Strategy appended to the **Flood Risk Assessment (FRA) (Application Document Ref. 5.7)** which sets out the drainage hierarchy, discharge arrangements, attenuation requirements and water quality treatment measures for the operational phase.
- 8.3.5 The surface water drainage design will include attenuation of surface water runoff via retention ponds located on the Main Site, to control discharge rates and volumes and to reduce the risk of adverse effects on receiving watercourses.
- 8.3.6 The Proposed Development's drainage systems have been designed to segregate waste streams, including chemical drainage, hydrocarbon drainage, and foul drainage, to mitigate the risk of cross-contamination.
- 8.3.7 Given the nature of the Proposed Development and the presence of process areas and chemical storage, a robust pollution control strategy will be incorporated into the operational drainage design. This would include upstream treatment of runoff, provision of emergency isolation valves, and routine monitoring of the drainage system to identify and respond to any pollution incidents or abnormal discharges.
- 8.3.8 Operational pollution prevention measures (as described within the Environmental Permit [Ref 2]) will also include the storage and handling of chemicals within surfaced and bunded areas, together with rapid spill response procedures and staff training. Where required by the environmental permitting regime, monitoring plans for groundwater and/or surface water quality will be implemented during operation.
- 8.3.9 Industrial waste water generated by the Proposed Development will be managed as set out in paragraph 8.3.1.

Construction mitigation

- 8.3.10 Construction mitigation refers to the measures and controls implemented during the construction phase of a development to avoid, reduce, or neutralise potential adverse impacts on environmental, human, and physical receptors. In addition to embedded (design) mitigation, specific mitigation and good practice will be implemented during construction to prevent permanent effects on water bodies from construction. The Proposed Development would be managed during its construction in accordance with the detailed Construction Environmental Management Plan (CEMP) and any other associated management plans relevant to this assessment which will be developed.
- 8.3.11 **A fCEMP** has been submitted alongside the DCO Application (**ES Appendix 5A: fCEMP (ES Volume III, Application Document Ref. 6.3)**). The detailed CEMP(s) prepared by the appointed Contractor prior to construction will confirm exact roles and responsibilities and include contact details for key members of staff. Clearly establishing roles and responsibilities is vital to ensure the successful construction of the Proposed Development, including the implementation of the detailed CEMP(s). The detailed CEMP(s) will be submitted to and approved by the local planning authority prior to construction in accordance with Requirement 4 of the **draft DCO (Application Document Ref. 3.1)**.
- 8.3.12 The detailed CEMP will be confirmed (including confirming that the absence or change to such control measures would not lead to any materially new or materially different effects than those reported in the ES) at the time of submission to the relevant planning authority.
- 8.3.13 The Proposed Development has evolved through an iterative design process, which will be further refined through the detailed CEMP. Mitigation and management measures for the Proposed Development relevant to water resources and flood risk to be included as a minimum in the detailed CEMP includes:
- Management of groundwater and surface water contamination risks (including through ground disturbance or contaminant leaching into groundwater or surface water bodies during construction). Mitigation measures will include:
 - i. Preparation of a ground investigation and risk assessment prior to construction, with remediation strategies developed as appropriate to manage contamination risks.

- ii. Pollution prevention controls, with reference to the EA's Groundwater Protection Guidance, including how impacts on the River Tees will be managed during construction.
- iii. Preparation of a temporary surface drainage strategy (as part of the construction surface water management plan, submitted and approved as part of the detailed CEMP) to limit any contaminated run-off from entering surface watercourses, including ensuring stockpiled materials are kept to a minimum, as far as is reasonably practicable, and stored away from watercourses.
- iv. Development of a watching brief and discovery strategy for managing unexpected contamination identified during excavations.
- Management of impacts on water quality as a result of construction activities, and risk of spillages to enter watercourses and impact ecology. Mitigation measures will include:
 - v. The Proposed Development will involve pipelines crossing the River Tees, which lies within the Teesmouth and Cleveland Coast SSSI, SPA and Ramsar site. These crossings will use either existing pipelines or an existing tunnel under the River Tees, removing the need for additional crossings and impacts to the designated sites.
 - vi. Good practice measures for pollution prevention to minimise impacts on surrounding habitats (including water quality), such as a suitable drainage design and use of silt fences, where necessary.
- Management of leakage or accidental spillage of construction materials and potential pollutants used on-site, or any flooding during construction releasing pollutants and infiltrating groundwater and surface watercourses. Mitigation measures include:
 - vii. Construction works in the River Tees will involve decommissioning and removal of two existing jetties and associated infrastructure, new quay construction and dredging for the berthing pocket and access channel. The removal and dispersal of potentially contaminated sediment within the Tees Estuary is anticipated to change the baseline conditions. Material dredged during quay construction will be disposed of at designated and licensed offshore disposal sites, such as Tees Bay C, under a Deemed Marine Licence.
 - viii. Good practice construction mitigation and temporary construction drainage will be used to trap and remove pollutants before reaching the receiving environment

ix. Existing flood defence infrastructure will be retained during construction of the Proposed Development with no expected change to form or function. Works within 16m of flood defences will be subject to a Flood Risk Activity Permit. Consideration will also be given to maintenance access requirements during construction.

- There are no plans for consumptive abstraction for the Proposed Development. Temporary dewatering may be required during construction, however this would be non-consumptive and temporary in nature, and would be undertaken in accordance with relevant consents required by the EA.
- It is assumed that, in addition to the above mitigation and management measures, dredging operations, both during the construction and operation phases, will include approaches to prevent the accidental extraction of fish and limit other disturbance to fish by avoiding key ecological periods.

9 Screening and baseline assessment: Methodology

9.1 Overview

- 9.1.1 The screening and baseline assessment stage has identified the relevant WER water bodies that will potentially be affected by the Proposed Development. The information relating to these water bodies, alongside the relevant EA WER data, is summarised in the sections below.

9.2 River Basin Management Plan

- 9.2.1 The Proposed Development is partly located within the Tees Lower and Estuary operational catchment, within the Northumbria River Basin District (RBD). The groundwater bodies are located within the Tees Mercia Mudstone and Redcar Mudstone Operational Catchments. The WER status objectives and programme of measures derived by the EA for water bodies located within this RBD are outlined within the Cycle 3 Northumbria river basin district river management plan: updated 2022 (RBMP).

9.3 Relevant water bodies

- 9.3.1 There are three WER surface water bodies and two WER groundwater bodies present within or adjacent to the study area: Tees water body; Tees Estuary (South Bank) water body, Tees Coastal water body; Tees Sherwood Sandstone water Body; and Tees Mercia Mudstone & Redcar Mudstone water body. These are summarised in Table 9.1. Two of the surface water bodies contain watercourses which are within the Proposed Development Site: the Tees Water Body and the Tees Estuary (South Bank).
- 9.3.2 Surface water bodies which have been screened into this WER assessment include the Tees water body (River Tees), Tees Estuary (South Bank) water body, and Tees Coastal water body due to their direct or indirect hydrological connectivity to the Proposed Development. The Proposed Development includes the use of an existing tunnel and an existing pipeline beneath the River Tees (Tees water body) for connections across the Tees, minimising risk pathways to the water body from construction. The Tees Estuary (South Bank) water body lies immediately downstream and to the east of the Main Site, and downstream of Dabholm Gut where works will be required to join connections from the Proposed Development to Bran Sands WwTW. As the Tees Estuary ultimately discharges to the Tees Coastal water body, this receptor has also been included to capture any downstream effects from construction or operational impacts from the Tees. Treated industrial effluent from the Proposed Development will be directly discharged through the LSO to the Tees Coastal water body.
- 9.3.3 The Main Site is located within the Tees Lower and Estuary TraC and Tees Lower and Estuary WFD operational catchments. Additionally, any plausible

hydrological connections to WFD water bodies have been identified and assessed within the scope of this assessment to ensure all potential impact pathways are appropriately considered.

- 9.3.4 The Tees Sherwood Sandstone and Tees Mercia Mudstone and Redcar Mudstone groundwater bodies have been screened into the WFD assessment due to their spatial extent and potential hydraulic connectivity with the Proposed Development.
- 9.3.5 The Tees Sherwood Sandstone groundwater body underlies the north side of the Tees Estuary beneath the Main Site and therefore represents a primary receptor with a potential pathway for impact associated with construction and operational activities. Within the Proposed Development area, the Sherwood Sandstone occurs only beneath site access routes and is protected by low-permeability superficial deposits.
- 9.3.5.1 The Tees Mercia Mudstone and Redcar Mudstone groundwater body underlies the Main Site beneath low permeability tidal flat and glacial till deposits. The Tees Sherwood Sandstone and Tees Mercia Mudstone and Redcar Mudstone groundwater bodies are therefore considered within the scope of this assessment to ensure that all potential pathways for deterioration in groundwater status or impacts to dependent surface water bodies are robustly assessed. The bedrock aquifers for both groundwater bodies are protected by low permeability alluvial and glacial deposits. A piling risk assessment will be undertaken to ensure there is no risk to groundwater from the construction of the Proposed Development. For further information please refer to **Chapter 21: Geology and Soils (ES Volume I, Application Document Ref. 6.1)**.
- 9.3.6 Marton West Beck Catchment water body is within the vicinity of the Proposed Development, and adjacent to the Tees water body, but was screened out of further assessment as it is approximately 3km upstream of the Proposed Development and therefore hydrologically disconnected from the study area in terms of potential project impacts. There is no identified plausible pathway by which the Proposed Development could affect its status or supporting quality elements.

Table 9.1 WER water bodies within the Study Area

Water Body Name	Water Body ID	Water Body Type	Hydromorphological Designation	Catchment Area/length	Screened in or out?
Tees Water Body	GB510302509900	Transitional water	Heavily modified	11.48km ²	Screened in
Tees Estuary (S	GB103025072320	River	Heavily modified	32.46km ² , 8.721km	Screened in

Water Body Name	Water Body ID	Water Body Type	Hydromorphological Designation	Catchment Area/length	Screened in or out?
Bank) Water Body					
Tees Coastal water body	GB650301500005	Coastal Water	Heavily modified	88.44km ²	Screened in
Tees Sherwood Sandstone Water Body	GB40301G702000	Groundwater Body	Not applicable	293.01km ²	Screened in
Tees Mercia Mudstone & Redcar Mudstone Water Body	GB40302G701300	Groundwater Body	Not applicable	494.57km ²	Screened in
Marton West Beck Catchment (trib of Tidal Tees)	GB103025072210	River	Heavily modified	25.797km ² , 22.50km	Screened out

9.3.7 Annex B of this report also contains more detail about information discussed in the following sections pertaining to Reasons for Not Achieving Good (RNAG), Protected Areas and EA monitoring locations

10 Screening and baseline assessment: WER water body baseline

10.1 Tees Water Body (GB510302509900)

Status and objectives

- 10.1.1 The Tees Water Body is designated as a heavily modified water body (HMWB) in recognition of physical modifications by human activity and a resultant substantial change in character. It is currently assessed (as of 2022) as having an Overall Status of Moderate, Ecological Status of Moderate and a Chemical Status of Fail^v. The water body is therefore failing its Good Overall Status objective under the WER at present.
- 10.1.2 A breakdown of the current status and status objectives of the water body is provided in Table 10.1. The quality elements currently limiting the Ecological Status of the water body are Angiosperms (Moderate), Fish (Moderate), Dissolved Inorganic Nitrogen (Moderate), and the Mitigation Measures Assessment (Moderate or less). The quality elements limiting the Chemical Status of the water body are Benzo(g-h-i)perylene (Fail), Mercury and Its Compounds (Fail), Polybrominated diphenyl ethers (PBDE) (Fail), Tributyltin Compounds, and Cypermethrin (Priority) (Fail).

Table 10.1 The Tees (GB510302509900) Water Body status and objectives

Quality Element	Cycle 3 RBMP		Objective (year)
	2019 status	Current status (2022)	
Ecological	Moderate	Moderate	Moderate (2015)
<i>Biological quality elements</i>	Moderate	Moderate	Moderate (2015)
Angiosperms	Moderate	Moderate	Moderate (2015)
Saltmarsh	Moderate	Moderate	N/A
Fish	Moderate	Moderate	Good (2015)
Invertebrates	Good	Good	Good (2021)
Infaunal Quality Index	Good	Good	N/A
Macroalgae	Moderate	Good	Moderate (2015)
Opportunistic Macroalgae	Moderate	Good	N/A
Phytoplankton	Good	Good	Good (2015)
<i>Physico-chemical quality elements</i>	Moderate	Moderate	Moderate (2015)
Dissolved Inorganic Nitrogen	Moderate	Moderate	Moderate (2015)

^v Following the Environment Agency's updated methodology and evidence base for chemical status assessment, from 2019 all water bodies in England now fail chemical status.

Quality Element	Cycle 3 RBMP		Objective (year)
	2019 status	Current status (2022)	
Dissolved oxygen	High	High	Good (2015)
<i>Hydromorphological Supporting Elements</i>	Not high	Not high	Not High (2015)
Hydrological Regime	Supports good	Supports good	Supports Good (2015)
<i>Supporting elements (Surface Water)</i>	Moderate	Moderate	Good (2027 (low))
Mitigation Measures Assessment	Moderate or less	Moderate or less	Good (2027 (low))
Specific pollutants	High	High	High (2015)
2,4-dichlorophenol	High	High	High (2015)
2,4-dichlorophenoxyacetic acid	High	High	High (2015)
Arsenic	High	High	High (2015)
Chlorothalonil	High	High	High (2015)
Chromium (VI)	High	High	High (2015)
Copper	High	High	High (2015)
Diazinon	High	High	High (2015)
Dimethoate	High	High	High (2015)
Iron	High	High	High (2015)
Linuron	High	High	High (2015)
Mecoprop	High	High	High (2015)
Pendimethalin	High	High	High (2015)
Permethrin	High	High	High (2015)
Phenol	High	High	High (2015)
Toluene	High	High	High (2015)
Triclosan	High	High	High (2015)
Un-ionised ammonia	High	High	High (2015)
Zinc	High	High	High (2015)
Chemical	Fail	Does not require assessment ^{vi}	Good (2063)
<i>Priority hazardous substances</i>	Fail	Does not require assessment	Good (2063)

^{vi} Chemical status is only measured once per RBMP cycle, therefore the 2019 status remains applicable.

Quality Element	Cycle 3 RBMP		Objective (year)
	2019 status	Current status (2022)	
Anthracene	Good	N/A	Good (2015)
Benzo(a)pyrene	Good	N/A	Good (2015)
Benzo(b)fluoranthene	Good	N/A	Good (2015)
Benzo(g-h-i)perylene	Fail	N/A	Good (2033)
Benzo(k)fluoranthene	Good	N/A	Good (2015)
Cadmium and Its Compounds	Good	N/A	Good (2015)
Di(2-ethylhexyl)phthalate (Priority hazardous)	Good	N/A	Good (2015)
Dioxins and dioxin-like compounds	Good	N/A	Good (2015)
Endosulfan	Good	N/A	Good (2015)
Heptachlor and cis-Heptachlor epoxide	Good	N/A	Good (2015)
Hexabromocyclododecane (HBCDD)	Good	N/A	Good (2015)
Hexachlorobenzene	Good	N/A	Good (2015)
Hexachlorobutadiene	Good	N/A	Good (2015)
Hexachlorocyclohexane	Good	N/A	Good (2015)
Mercury and Its Compounds	Fail	N/A	Good (2040)
Nonylphenol	Good	N/A	Good (2015)
Pentachlorobenzene	Good	N/A	Good (2015)
Perfluorooctane sulphonate (PFOS)	Good	N/A	Good (2015)
Polybrominated diphenyl ethers (PBDE)	Fail	N/A	Good (2063)
Quinoxifen	Good	N/A	Good (2015)
Tributyltin Compounds	Fail	N/A	Good (2027 (low))
Trifluralin (Priority hazardous)	Good	N/A	Good (2015)
<i>Priority substances</i>	Fail	Does not require assessment	Good (2027 (low))
1,2-dichloroethane	Good	N/A	Good (2015)
Aclonifen	Good	N/A	Good (2015)
Alachlor	Good	N/A	Good (2015)
Atrazine	Good	N/A	Good (2015)
Benzene	Good	N/A	Good (2015)
Bifenox	Good	N/A	Good (2015)
Chlorfenvinphos	Good	N/A	Good (2015)

Quality Element	Cycle 3 RBMP		Objective (year)
	2019 status	Current status (2022)	
Chlorpyrifos	Good	N/A	Good (2015)
Cybutryne	Good	N/A	Good (2015)
Cypermethrin (Priority)	Fail	N/A	Good (2027 (low))
Dichloromethane	Good	N/A	Good (2015)
Dichlorvos (Priority)	Good	N/A	Good (2015)
Diuron	Good	N/A	Good (2015)
Fluoranthene	Good	N/A	Good (2015)
Isoproturon	Good	N/A	Good (2015)
Lead and Its Compounds	Good	N/A	Good (2015)
Napthalene	Good	N/A	Good (2015)
Nickel and Its Compounds	Good	N/A	Good (2015)
Octylphenol	Good	N/A	Good (2015)
Pentachlorophenol	Good	N/A	Good (2015)
Simazine	Good	N/A	Good (2015)
Terbutryn	Good	N/A	Good (2015)
Trichlorobenzenes	Good	N/A	Good (2015)
Trichloromethane	Good	N/A	Good (2015)
<i>Other pollutants</i>	Good	Does not require assessment	Good (2015)
Aldrin, Dieldrin, Endrin & Isodrin	Good	N/A	Good (2015)
Carbon Tetrachloride	Good	N/A	Good (2015)
DDT Total	Good	N/A	Good (2015)
Tetrachloroethylene	Good	N/A	Good (2015)
Trichloroethylene	Good	N/A	Good (2015)
para - para DDT	Good	N/A	Good (2015)

Protected Areas

- 10.1.3 The water body falls within three Protected Areas (Annex B) Table 13.2 Protected areas for the Tees Coastal (GB650301500005) coastal water body

EA monitoring locations

- 10.1.4 Eleven monitoring locations have been used to inform water body classifications in Cycle 3. These include one macrobenthic monitoring site and ten water quality sites.

Reason for Not Achieving Good Status

- 10.1.5 The EA has identified eleven RNAG for this water body (Annex B: Table 13.6). These include classifications from dissolved inorganic nitrogen from agriculture, the water industry and wider industrial practices; angiosperms from industry, presence of tributyltin compounds from industry, and mercury and its compounds (no sector responsible), mitigation measures assessment from flood protection use and Polybrominated diphenyl ethers (PBDE) (no sector responsible). There are pending investigations into RNAG and Reasons for Deterioration (RFD) for fish, benzo(g-h-i)perylene and cypermethrin (Priority).

Measures and actions

- 10.1.6 Additional information on RBMP measures/actions (including HMWB mitigation measures assessment) identified for the water body to support achievement of its status objectives was requested from the EA. Information into investigations into the dissolved inorganic nitrogen (DIN) and macroalgal failures were received, relating to the high macroalgal growth in the Seal Sands intertidal habitat to the north of the Study Area. Dissolved Inorganic Nitrogen (DIN) inputs were initially identified as contributing to the failures due to nitrogen inputs from Bran Sands WwTW and industrial point sources, however the investigation found that nutrient removal at Bran Sands WwTW would not sufficiently affect the growth of macroalgae.
- 10.1.7 No additional information on the programme of measures or actions has been made available by the EA.

10.2 Tees Coastal Water Body (GB650301500005)

- 10.2.1 The Tees Coastal Water Body is designated as a HMWB, in recognition of physical modifications by human activity and a resultant substantial change in character. It is currently assessed (as of 2022) as having an Overall Status of Moderate, Ecological Status of Moderate and a Chemical Status of Fail^{vii}. The water body is therefore failing its Good Overall Status objective under the WER at present.
- 10.2.2 A breakdown of the current status and status objectives of the water body is provided in Table 10.2. The quality elements currently limiting the Ecological Status of the water body are the Mitigation Measures Assessment (Moderate or less). The quality elements limiting the Chemical Status of the water body are Mercury and Its Compounds (Fail) and Polybrominated diphenyl ethers (PBDE) (Fail).

^{vii} Following the Environment Agency's updated methodology and evidence base for chemical status assessment, from 2019 all water bodies now fail chemical status.

Table 10.2 The Tees Coastal (GB650301500005) coastal water body status and objectives

Classification Item	2019	2022	Objective (year)
Ecological	Moderate	Moderate	Good (2027 (low))
<i>Biological quality elements</i>	High	High	Good (2015)
Invertebrates	High	High	Good (2015)
Imposex	High	High	N/A
Phytoplankton	N/A	High	N/A
<i>Physico-chemical quality elements</i>	High	High	Good (2015)
Dissolved oxygen	High	High	Good (2015)
<i>Supporting elements (Surface Water)</i>	Moderate	Moderate	Good (2027 (low))
Mitigation Measures Assessment	Moderate or less	Moderate or less	Good (2027 (low))
<i>Specific pollutants</i>	High	High	High (2015)
Arsenic	High	High	High (2015)
Chromium (VI)	High	High	High (2015)
Copper	High	High	High (2015)
Iron	High	High	High (2015)
Zinc	High	High	High (2015)
Chemical	Fail	Does not require assessment	Good (2063)
<i>Priority hazardous substances</i>	Fail	Does not require assessment	Good (2063)
Benzo(a)pyrene	Good	N/A	Good (2015)
Cadmium and Its Compounds	Good	N/A	Good (2015)
Dioxins and dioxin-like compounds	Good	N/A	Good (2015)
Heptachlor and cis-Heptachlor epoxide	Good	N/A	Good (2015)
Hexabromocyclododecane (HBCDD)	Good	N/A	Good (2015)
Hexachlorobenzene	Good	N/A	Good (2015)
Hexachlorobutadiene	Good	N/A	Good (2015)
Mercury and Its Compounds	Fail	N/A	Good (2040)
Perfluorooctane sulphonate (PFOS)	Good	N/A	Good (2015)
Polybrominated diphenyl ethers (PBDE)	Fail	N/A	Good (2063)
<i>Priority substances</i>	Good	Does not require assessment	Good (2015)

Fluoranthene	Good	N/A	Good (2015)
Lead and Its Compounds	Good	N/A	Good (2015)
Nickel and Its Compounds	Good	N/A	Good (2015)
<i>Other Pollutants</i>	Does not require assessment	Does not require assessment	Does not require assessment (2015)

Protected areas

- 10.2.3 The water body falls within two Protected Areas. These are listed in Annex B: Table 13.2, and are the Teesmouth and Cleveland Coast Ramsar and SPA designations.

EA monitoring locations

- 10.2.4 Four monitoring locations have been used to inform water body classifications in Cycle 3. These include one macrobenthic monitoring site and three water quality monitoring sites.

RNAG status

- 10.2.5 The EA have identified four RNAG status for this water body (Annex A: Table 8.2.B). These include classifications from Polybrominated diphenyl ethers (PBDE), Mercury and Its Compounds, alongside Mitigation Measures Assessment for flood and coast protection use.

Measures and actions

- 10.2.6 Additional information on RBMP measures/actions (including the mitigation measures assessment) identified for the water body to support achievement of its status objectives was requested from the EA. No information on the programme of measures or actions has been made available.

10.3 Tees Estuary (S Bank) Water Body (GB103025072320)

- 10.3.1 The Tees Estuary (S Bank) Water Body is designated as a HMWB, in recognition of physical modifications by human activity and a resultant substantial change in character. It is currently assessed (as of 2019) as having an Overall Status of Moderate, Ecological Status of Moderate and a Chemical Status of Fail^{viii}. The water body is therefore failing its Good Overall Status objective under the WER at present.
- 10.3.2 A breakdown of the current status and status objectives of the water body is provided in Table 10.3. The quality elements currently limiting the Ecological Status of the water body are the Invertebrates (Bad), and Mitigation Measures Assessment (Moderate or less). The quality elements limiting the

^{viii} Following the Environment Agency's updated methodology and evidence base for chemical status assessment, from 2019 all water bodies now fail chemical status.

Chemical Status of the water body are Mercury and Its Compounds (Fail) and Polybrominated diphenyl ethers (PBDE) (Fail).

Table 10.3 Tees Estuary (S Bank) Water Body (GB103025072320) status and objectives

Classification Item	2019	2022	Objective (year)
Ecological	Moderate	Moderate	Good (2027 (low))
<i>Biological quality elements</i>	Bad	Bad	Good (2027 (low))
Invertebrates	Bad	Bad	Good (2027 (low))
<i>Hydromorphological Supporting Elements</i>	Not high	Not high	Not High (2015)
Hydrological Regime	Supports good	Supports good	Supports Good (2015)
<i>Supporting elements (Surface Water)</i>	Moderate	Moderate	Good (2027 (low))
Mitigation Measures Assessment	Moderate or less	Moderate or less	Good (2027 (low))
Chemical	Fail	Does not require assessment	Good (2063)
<i>Priority hazardous substances</i>	Fail	Does not require assessment	Good (2063)
Benzo(a)pyrene	Good	N/A	Good (2015)
Dioxins and dioxin-like compounds	Good	N/A	Good (2015)
Heptachlor and cis-Heptachlor epoxide	Good	N/A	Good (2015)
Hexabromocyclododecane (HBCDD)	Good	N/A	Good (2015)
Hexachlorobenzene	Good	N/A	Good (2015)
Hexachlorobutadiene	Good	N/A	Good (2015)
Mercury and Its Compounds	Fail	N/A	Good (2040)
Perfluorooctane sulphonate (PFOS)	Good	N/A	Good (2015)
Polybrominated diphenyl ethers (PBDE)	Fail	N/A	Good (2063)
<i>Priority substances</i>	Good	Does not require assessment	Good (2015)
Cypermethrin (Priority)	Good	N/A	Good (2015)
Fluoranthene	Good	N/A	Good (2015)
<i>Other Pollutants</i>	Does not require assessment	Does not require assessment	Does not require assessment (2015)

10.4 Protected areas

- 10.4.1 The water body falls within twenty Protected Areas. These are listed in Annex B: Table 13.4, and include Teesmouth And Cleveland Coast SPA and Ramsar site.

EA monitoring locations

- 10.4.2 One monitoring location has been used to inform water body classifications in Cycle 3. This is an invertebrates monitoring site.

RNAG status

The EA have identified five RNAG status for this water body (Annex B:

- 10.4.3 Table 13.8). These include two classifications from impacts to invertebrates, alongside measures which have been delivered to address impacts from Mercury and Its Compounds and Polybrominated diphenyl ethers (PBDE). There is a pending investigation into invertebrates.

Measures and actions

- 10.4.4 Additional information on RBMP measures/actions (including the mitigation measures assessment) identified for the water body to support achievement of its status objectives was requested from the EA. No information on the programme of measures or actions has been made available.

10.5 Tees Sherwood Sandstone Groundwater Body (GB40301G702000)

- 10.5.1 The Tees Sherwood Sandstone Groundwater Body is assessed (as of 2019) as having an Overall Status of Good, Quantitative Status of Good and a Chemical Status of Good^{ix}. The water body is therefore achieving its Good Overall Status objective under the WER at the most recent assessment.
- 10.5.2 A breakdown of the current status and status objectives of the water body is provided in Table 6.

Table 10.4 Tees Sherwood Sandstone Groundwater Body (GB40301G702000) status and objectives

Quality Element	Cycle 3 RBMP	Objective (year)
	2019 status	
Overall Water Body	Good	Good (2015)
Quantitative	Good	Good (2015)
<i>Quantitative Status element</i>	Good	Good (2015)
Quantitative Dependent Surface Water Body Status	Good	Good (2015)
Quantitative GWDTEs test	Good	Good (2015)
Quantitative Saline Intrusion	Good	Good (2015)
Quantitative Water Balance	Good	Good (2015)
Chemical (GW)	Good	Good (2015)
<i>Chemical Status element</i>	Good	Good (2015)
Chemical Dependent Surface Water Body Status	Good	Good (2015)
Chemical Drinking Water Protected Area	Good	Good (2015)
Chemical GWDTEs test	Good	Good (2015)

^{ix} Following the Environment Agency's updated methodology and evidence base for chemical status assessment, from 2019 all water bodies now fail chemical status.

Chemical Saline Intrusion	Good	Good (2015)
General Chemical Test	Good	Good (2015)
<i>Supporting elements (Groundwater)</i>	N/A	N/A
Prevent and Limit Objective	Active	N/A
Trend Assessment	No trend	N/A

Protected areas

- 10.5.3 The water body falls within eight Protected Areas. These are listed in Annex B: Table 10.4, and include Teesmouth and Cleveland Coast SPA, the Teesmouth and Cleveland Coast Ramsar site, the Tees Sherwood Sandstone Drinking Water Protected Area and five sites protected under the EU Nitrates Directive as transposed in UK law by the Nitrate Pollution Prevention Regulations 2015.

RNAG status

- 10.5.4 The groundwater body is achieving good status so there are no RNAG in effect.

Measures and actions

- 10.5.5 The groundwater body is achieving good status so there are no measures and actions in effect.

10.6 Tees Mercia Mudstone & Redcar Mudstone (GB40302G701300) Water Body

- 10.6.1 The groundwater body is currently assessed (as of 2019) as having a Poor Overall Status, with a Good Quantitative Status but Poor Chemical Status. The groundwater body is therefore failing its Good Overall Status objective under the WER at present.
- 10.6.2 A breakdown of the current status and status objectives for the groundwater body are provided in Table 10.5. The quality elements limiting the Chemical (GW) status is the Chemical Dependent Surface Water Body Status. Investigations into the Trend Assessment Classification status were undertaken in Cycle 2 (2015) which found an upward trend, which continued the 2019 assessment.

Table 10.5 Tees Mercia Mudstone & Redcar Mudstone Water Body (GB40302G701300) status and objective

Quality Element	Cycle 3 RBMP	Objective (year)
	2019 status	
Overall Water Body	Poor	Poor (2015)
<i>Quantitative</i>	Good	Good (2015)

Quantitative Status element	Good	Good (2015)
Quantitative Dependent Surface Water Body Status	Good	Good (2015)
Quantitative GWDTEs test	Good	Good (2015)
Quantitative Saline Intrusion	Good	Good (2015)
Quantitative Water Balance	Good	Good (2015)
Chemical (GW)	Poor	Poor (2015)
<i>Chemical Status element</i>	Poor	Poor (2015)
Chemical Dependent Surface Water Body Status	Poor	Poor (2015)
Chemical Drinking Water Protected Area	Good	Good (2015)
Chemical GWDTEs test	Good	Good (2015)
Chemical Saline Intrusion	Good	Good (2015)
General Chemical Test	Good	Good (2015)
<i>Supporting elements (Groundwater)</i>	N/A	N/A
Prevent and Limit Objective	Active	N/A
Trend Assessment	Upward trend	N/A

10.7 Protected areas

10.7.1 The groundwater body falls within nine Protected Areas (Annex B:, Table 13.5). These include Teesmouth and Cleveland Coast SPA and Ramsar Site, the North York Moors SPA and SAC, the Tees Sherwood Sandstone Drinking Water Protected Area and four sites protected under the EU Nitrates Directive as transposed in UK law by the Nitrate Pollution Prevention Regulations 2015.

10.8 RNAG status

10.8.1 The EA have identified 2 RNAG status for this water body (Annex B: Table 13.9). The identified RNAG is related to point source pollution from an

abandoned mine related to mining and quarrying. There is a pending investigation related to the Trend Assessment.

10.9 Measures and actions

- 10.9.1 Additional information on RBMP measures/actions (including the mitigation measures assessment) identified for the water body to support achievement of its status objectives was requested from the EA. No information on the programme of measures or actions have been made available.

11 Screening and baseline assessment: Watercourse baseline and receptor valuation

- 11.1.1 Activities associated with the Proposed Development have been reviewed against the watercourses present within or in the vicinity of the Proposed Development. A receptor value has been assigned to each of the relevant watercourses which have the potential to be impacted by the Proposed Development, based on the available desktop information and expert judgement. Reconnaissance surveys were undertaken on several locations within the Tees and Tees Coastal water bodies.
- 11.1.2 For watercourses where reconnaissance surveys have not been undertaken expert judgement has been used to assign a receptor value (as described in Section 4: Assessment Methodology). A precautionary approach has been taken where no sufficient information was available.
- 11.1.3 The relevant watercourses and their receptor valuations are summarised in the sections below.

11.2 Tees Water Body (GB510302509900)

- 11.2.1 Two watercourses in the Tees Water Body water body catchment are within the boundary of the Proposed Development. These are listed in Table 11.1 below and shown in **Figure 12.3: Surface Water Features (ES Volume II, Application Document Ref. 6.2)**:
- 11.2.2 The watercourses within the Tees Water Body surface water catchment are assessed as being of very high and high value, respectively.
- The River Tees comprises the main WER river water body and is a key part of the Teesmouth and Cleveland Coast SPA and SSSI site. The River Tees is tidal between Teesmouth and the Tees Barrage and has a permanent baseflow, and supports both marine and freshwater ecological receptors. Cetacean populations have been identified in the river, particularly seals at Seal Sands to the north of the Proposed Development. There is also a substantial data on the fish baseline, including marine and migratory fish, and supports macroinvertebrate and macrophyte communities. Given its designation status, hydrological connectivity, tidal influence, and the presence of sensitive and internationally important ecological receptors, the River Tees is considered to have very high environmental value and vulnerability. As such, it has been assigned a receptor valuation of very high.
 - The Dabholm Gut is an ordinary watercourse located within the Teesmouth and Cleveland Coast SSSI and SPA, is a tributary of the River Tees collecting the flow from The Fleet, Ash Gill and The Mill Race

and delivering it into the River Tees. NWL's Bran Sands WwTW currently discharges to the River Tees through the Dabholm Gut, however as set out in Section 2.2, following completion of the NWL LSO this will change to discharging directly to Tees Bay and the North Sea. The Dabholm Gut has a permanent baseflow and macrophyte populations have been identified in the watercourse, dominated by mosses and liverworts. EA surveys have not identified protected or notable aquatic macroinvertebrate species, with the exception of the invasive non-native New Zealand mud snail. The Dabholm Gut has been assigned a receptor value of 'high' as a precautionary measure given its location within an internationally designated site, hydraulic connectivity to the River Tees, and its role in conveying flows from multiple upstream watercourses, which together indicate a moderate to high ecological importance and a potential pathway for impacts to downstream designated and sensitive receptors.

Table 11.1 Watercourses in the Tees WER Water Body within or adjacent to the Proposed Development

Watercourse name	Designation	Receptor value
River Tees	Main River	Very High
Dabholm Gut	Ordinary Watercourse	High

11.3 Tees Estuary (South Bank) Water Body (GB103025072320)

11.3.1 A total of two watercourses in the Tees Estuary (S Bank) water body catchment are within or close to the Proposed Development: The Fleet and The Mill Race. Further detail is set out in Table 11.2 below and shown in **Figure 12.3: Surface Water Features (ES Volume II, Application Document Ref. 6.2)**.

11.3.2 The watercourses in the Tees Estuary (S Bank) Water Body within or adjacent to the Proposed Development are assessed as following:

- The Fleet is an ordinary watercourse which connects Ash Gill and the Mill Race to Dabholm Gut. It is therefore a minor tributary to a WER water body and it comprises an artificially created channel, which connects to Dabholm Gut through a culvert. It is unknown whether it has potential to support some fish, macroinvertebrate and macrophyte communities but these are assumed to be low diversity and abundance. It is not subject to an EA freshwater monitoring programme. The Fleet has therefore been assigned a moderate receptor valuation.
- The Mill Race is a heavily modified ordinary watercourse adjacent to Trunk Road to the east of the Proposed Development in South Tees. The watercourse has potential to support some fish, macroinvertebrate

and macrophyte communities but these are assumed to be low diversity and abundance, and there is no EA freshwater monitoring regime in place. As a heavily modified watercourse there is very little evidence of active fluvial geomorphological processes. The Mill Race has therefore been assigned a moderate receptor valuation.

Table 11.2 Water bodies within the Tees Estuary (South Bank) Water Body within the Study Area

Watercourse name	Designation	Receptor value
The Fleet	Ordinary Watercourse	Moderate
The Mill Race	Ordinary Watercourse	Moderate

11.4 Watercourses not within a surface WER catchment area but relevant to WER water bodies

11.4.1 A total of 2 watercourses have been identified as not within a surface water WER catchment area but relevant to WER water bodies within the Study Area of the Proposed Development. These are listed in Table 11.3 below and shown in **Figure 12.3: Surface Water Features (ES Volume II, Application Document Ref. 6.2)**:

11.4.2 The watercourses not within a surface WER catchment area but relevant to WER water bodies within or adjacent to the Proposed Development are assessed as following:

- Unnamed Watercourse 1 does not fall within the footprint of the Proposed Development, but is located within 250m west of the works to the west of the Proposed Development near Seaton Carew Road in North Tees. It has therefore been evaluated on a precautionary basis. The watercourse is hydrologically connected to Greatham Creek within the Teesmouth and Cleveland Coast SSSI, which discharges to the Tees through the Seaton on Tees Channel. The ordinary watercourse comprises an artificially created drainage ditch adjacent to the highway. It has little to no baseflow and is likely to dry out during periods of dry weather and therefore has little or no potential to support freshwater aquatic organisms. It is therefore not considered to have significant flow or impact on the more sensitive downstream water bodies. Unnamed Watercourse 1 has therefore been assigned a low receptor valuation.
- Unnamed Watercourse 2 is located to the south west of the Proposed Development site in North Tees, and comprises an artificially created drainage channel from Huntsman Drive to connect to Holme Fleet before discharging to the River Tees. It is a minor ditch which has little to no baseflow and therefore has little or no potential to support freshwater aquatic organisms. In periods of heavy flow, its relative

proximity to the River Tees (a receptor with very high value) has the potential to have minor flow into the river. The watercourse has therefore been assigned a moderate receptor valuation.

Table 11.3 Watercourses not within a surface WER catchment area but relevant to WER water bodies

Watercourse name	Designation	Downstream WER body	Receptor value
Unnamed Watercourse 1	Ordinary Watercourse	TEES Water Body	Low
Unnamed Watercourse 2	Ordinary Watercourse	TEES Water Body	Moderate

12 Scoping assessment

12.1 Overview

12.1.1 A scoping assessment has been undertaken to establish the likely effects of the Proposed Development on the WER status elements of the water bodies screened in for assessment.

12.1.2 Effects have been considered with regard to the risk of the Proposed Development:

- causing a deterioration in current status of the water body, whether for individual quality elements or for the water body as a whole; and/or
- preventing the future achievement of water body status objectives.

12.1.3 The assessment process for determining the potential risk of status deterioration uses the following colour rating system to assign the magnitude of the likely effect anticipated on each of the quality elements of the affected water bodies:

- **Dark Blue:** beneficial effect of a scale sufficient to increase status class for the quality element at water body scale.
- **Light Blue:** minor/localised beneficial effect resulting in a localised improvement but insufficient to increase status class for the quality element at water body scale.
- **Green:** negligible effect on (or no measurable change to) status class for the quality element at water body scale.
- **Yellow:** minor localised adverse effect when balanced against mitigation included in the design – insufficient to affect status class for the quality element at water body scale.
- **Amber:** an adverse effect is possible when balanced against mitigation included in the design – the extent of effect is uncertain, and there remains a potential to affect status class for the quality element at water body scale. Additional mitigation and residual effects need to be considered.
- **Red:** adverse effect of sufficient scale to impact on status class for the quality element at a water body scale (certain). Additional mitigation or re-design required to avoid non-compliance.

12.2 Relevant components

Construction phase

- 12.2.1 The indicative construction methodology and outline activities for the Proposed Development are described in **Chapter 5: Construction Programme and Management (ES Volume I, Application Document Ref. 6.1)**. Activities will be required during construction to install the Proposed Development, such as:
- industrial gas connection works: installation and tie-in of oxygen and nitrogen pipeline connections, including onshore pipeline construction to the north and south of the river including along the Dabholm Gut;
 - industrial waste water pipeline from the Main Site to the South Bank: installation of a replacement pipeline within an existing tunnel beneath the Tees;
 - new industrial waste water pipeline works along the Dabholm Gut: installation of new pipelines to connect the above along the Dabholm Gut to Bran Sands WwTW;
 - demolition of existing river infrastructure: removal of two existing jetties and associated infrastructure to facilitate quay construction;
 - quay construction: works to develop a new quay and associated topside infrastructure along the River Tees.
 - construction-phase dredging operations: dredging of the River Tees to form the berthing pocket, approach channel, and access channel, including side slopes and localised trench dredging for scour protection (if required). Continuous (24-hour) dredging over an anticipated period of up to ~5 months, including vessel movements and plant operation within the estuary. The dredged pocket in front of the quay will be dredged to a maintained depth of -14m relative to Chart Datum (CD) (16.85m below Ordnance datum (OD)). A further 300-600mm below the maintained depth level will be excavated. The approach channel would be dredged to a maintained depth of -10.4 to -11m CD (13.25m to 13.85m below OD);
 - dredged material handling and disposal: transport and disposal of up to 800,000 m³ of dredged material to a licensed offshore disposal site (or alternative onshore disposal/reuse subject to agreement);
 - temporary deepening of navigation routes: the riverbed may need to be dredged to a maintained depth of -7m to -8mCD (9.85m to 10.85m below OD) on a worst-case, precautionary basis between the turning

circle and the quay in order to facilitate vessel access to the sea during the construction phase;

- scour protection installation (if required): underwater scour protection may be required in front of the quay wall, using concrete, asphalt, rock, or a combination. A temporary trench would be dredged to install this protection. The installed layer would sit 300–1000mm below the maintained dredge level, with the trench extending up to 2 m beneath it, reaching approximately –17 mCD (19.85m below OD); and
- construction vessel activity: shipborne transport of prefabricated plant, materials and fill via the River Tees during quay construction and wider site development.
- the fCEMP (**ES Appendix 5A: fCEMP (ES Volume III, Application Document Ref. 6.3)**). and Framework Drainage Strategy (Appendix to the **FRA (Application Document Ref. 5.7)**) includes details on pollution prevention throughout the construction of the Proposed Development. Similar measures would be expected for demolition as relevant.

Permanent components of the Proposed Development

12.2.2 The relevant components of the Proposed Development that have the potential to impact upon water bodies screened into this assessment are:

- industrial gas pipeline connections: tie-ins to existing oxygen and nitrogen pipelines beneath the Tees, including replacement or new connecting pipelines and associated onshore infrastructure;
- industrial waste water pipeline from the Main Site to the South Bank: the newly constructed pipeline within an existing tunnel beneath the Tees would be a permanent feature of the Proposed Development;
- industrial waste water pipeline at Dabholm Gut: the new pipelines to connect the above along Dabholm Gut to Bran Sands WwTW would constitute a permanent component of the Proposed Development;
- industrial waste water will be discharged through the LSO at Bran Sands to Tees Bay. The Proposed Development estimates a discharge rate of 135.3m³/hr, which would be processed on-site to required environmental quality standards before discharge to Tees Bay via the Bran Sands' LSO. The LSO discharge point is understood to be located outside the Tees Water Body WFD catchment and within the Tees Coastal Water Body WFD catchment;
- on-site chemical handling and transport: The Proposed Development would introduce new risks associated with the storage, transfer and use

of potentially hazardous raw materials, process chemicals, intermediates and final products within the Main Site. These substances would be handled across a range of operational activities, including feedstock pre-treatment, gasification, syngas clean-up, acid gas removal, flue gas treatment, CHP operation, water treatment, cooling systems, and product storage and export;

- runoff and surface water management: The Proposed Development will create increased operational areas where runoff could come into contact with stored materials, chemical handling areas, process plant, waste storage areas, or accidental spillages;
- new quay: the new quay will be a permanent component of the Proposed Development, located along the eastern boundary of the Main Site. The quay will be sized for Panamax sized vessels and approximately 300m in length, 50m width, and will include topside infrastructure for import of construction materials and feedstock;
- quay enabling works: two existing jetties and associated infrastructure will be permanently removed to facilitate construction of the new quay;
- dredged berthing pocket and approach channel: permanently altered riverbed to provide navigational access to the quay. This includes the ongoing requirement for maintenance dredging of the berth and access channel to retain safe vessel access;
- scour protection works: potential placement of concrete, asphalt mat and/or rock protection on the riverbed in front of the quay wall as required; and
- modified navigation infrastructure: potential permanent removal or relocation of existing navigation buoy (Tees No. 21).

Potential effects on water environment

12.2.3 Embedded mitigation for the Proposed Development is outlined in Section 8.3. The potential permanent effects of the Proposed Development (identified in Section 12.2) on surface water and groundwater WER water bodies, factoring in consideration of the embedded mitigation measures are summarised below:

- industrial gas pipeline connections: There is limited potential for hydromorphological effects on the Tees Water Body and Tees Estuary (South Bank) Water Body, as works would be confined to existing pipeline corridors and associated infrastructure. Limited potential risks are expected from the permanent presence and operation of this component, associated primarily with maintenance activities, particularly

where works are undertaken in proximity to surface waters, estuarine margins, or hydraulically connected land, or accidental failure. Potential effect pathways include temporary disturbance of adjacent ground, sediment mobilisation, polluted runoff, and the risk of accidental releases (e.g. fuels or lubricants);

- industrial waste water pipeline: Similarly to the industrial gas pipeline connection infrastructure beneath the River Tees, there is limited potential for effects to the Tees Estuary (S Bank) Water Body associated with the permanent presence and operation of a pipeline conveying industrial waste water to Bran Sands WwTW. The export pipeline would be constructed within the existing tunnel under the Tees and therefore have minimal impact on the Water Body. Key WFD-relevant pathways include risk of accidental leakage/failure from the pipeline or associated infrastructure, with consequent deterioration in water quality if untreated or partially treated waste water were released;
- industrial waste water pipeline at Dabholm Gut: no hydromorphological impacts are anticipated. In the event of malfunction or loss of containment of effluent flow through the new pipeline this component would carry a potential risk to physico-chemical and chemical water quality objectives of the Tees Water Body;
- industrial waste water: there are no identified impacts from industrial waste water discharge from the Proposed Development to the Tees Water Body as the proposed LSO is planned to discharge outside the catchment. However, under the proposals, the waste water from the Proposed Development would be discharged to the Tees Coastal WFD Water Body, resulting in sustained chemical and physico-chemical loading to that water body;
- water quality impacts to the Tees Coastal Water Body are not expected to result in significant adverse effects to the Water Body due to dispersion and dilution of the treated discharge occurring under coastal processes;
- on-site chemical handling and transport: the storage, transfer and use of potentially hazardous materials introduces the potential for pollutant release through accidental spills, leaks, overfilling, equipment or pipework failure, or the generation of contaminated residues and waste streams. These risks would be managed through the use of bunded storage, impermeable containment surfaces, and regulatory controls under the Environmental Permit, with additional controls under the Hazardous Substances and COMAH regimes where relevant thresholds

are exceeded, thereby reducing the risk of impacts to nearby watercourses to negligible levels;

- runoff and surface water management: The creation of operational areas for contaminant handling could create the potential for contaminated runoff to enter the site drainage system and, if not appropriately controlled, to affect receiving waters. In addition, the modification of hardstanding could potentially modify surface runoff pathways into receiving water bodies. Surface water runoff generated within the Main Site will be managed through a controlled drainage system designed to collect runoff and direct it to attenuation ponds, which would be tested prior to discharge to the River Tees via the outfall. In the event that contamination is identified within the system, collected water will be diverted to the onsite treatment plant and managed appropriately. For further information refer to the Framework Drainage Strategy (appended to the **FRA (Application Document Ref 5.7))**). The drainage and treatment strategy is intended to prevent uncontrolled releases to the water environment and therefore reduce the risk of impacts to nearby watercourses to negligible levels; and
- quay: The new quay represents a permanent modification to the estuarine margin of the River Tees, within the Tees WFD Water Body. Potential hydromorphological effects of the works include alteration of the bank/bed interface, local changes to flow patterns, turbulence, erosion and deposition, and loss or modification of existing river-edge habitat. The quay may also affect local conditions for species or estuarine habitats depending on detailed design. Operation of the quay and berthing vessels also introduces an ongoing risk of accidental spills or leaks (e.g. fuels, oils, feedstock handling losses), with associated water quality implications, as well as modifying flows and potential sediment disturbance locally. The quay will be operated under the conditions granted by the environmental permit, which includes regulatory controls including criteria for feed acceptance and handling controls to mitigate for risks to the Water Body.
- The potential permanent effects from construction of the Proposed Development, factoring in implementation of the CEMP set out in Section 8.3, are summarised below:
- the piling risk assessment for the construction of the quay structure will be submitted to the Local Planning Authority prior to commencement of construction. It is assumed that as a worst-case piled foundations would extend into the underlying Mercia Mudstone bedrock. Given the significant depth of Sherwood Sandstone beneath the Main Site piled

foundations will not extend into the principal aquifer. Impacts to the Mercia Mudstone Groundwater body are therefore expected to be unlikely;

- quay enabling works: demolition of two existing jetties and associated infrastructure: The removal of existing structures and replacement with the new quay and associated infrastructure will represent a permanent effect on the Tees Water Body. This may result in a change in local hydrodynamics and sedimentation patterns, depending on the existing function of the jetties and the geometry of the replacement quay. Removal of the jetties may also alter existing areas of shelter, scour, or habitat association around those structures. The principal impacts are likely to be through changes to morphology and local habitat conditions, rather than water quality, once construction is complete;
- dredged berthing pocket and approach channel (including ongoing maintenance dredging): Dredging works have strong likelihood of hydromorphological effects to the Tees Water Body due to the permanent change to bed levels and channel form to facilitate navigation. Potential effects include alteration of river bed morphology, sediment transport processes, flow velocities, scour/deposition patterns, and the physical character of the estuary bed. Ongoing maintenance dredging also creates a continuing mechanism for disturbance and reworking of sediments over the operational life of the Proposed Development. In addition, maintenance dredging may periodically increase suspended sediment concentrations and could mobilise contaminants bound to sediments, with potential implications for water quality impacts. Ecological impacts to the Tees Water Body include removal and disturbance of refuge habitats from construction dredging, and maintenance dredging throughout operation of the Proposed Development. These impacts to the overall biological quality elements of the WFD water body are expected to be minimal and therefore works are anticipated to have a negligible effect on the overall status of the river, subject to measures being put in place to minimise impacts during dredging works; and
- potential scour protection works: Placement of concrete, asphalt mat and/or rock scour protection would introduce a permanent artificial layer over a section of the Tees riverbed if required by the Proposed Development. Potential effects to the Water Body may include impacts on substrate composition, bed processes and local habitat character. Scour protection may alter local hydraulics, including creation or transfer of scour to adjacent areas, and may reduce the natural mobility of sediments.

- 12.2.4 A summary of permanent components of the Proposed Development and their potential effects on surface water bodies is provided in Table 12: Permanent components of the Proposed Development and their potential effects on surface water bodies. A tick (✓) indicates a potential effect may arise and a dash (-) indicates no effect.

Potential effects on groundwater bodies

- 12.2.5 Potential impacts on groundwater bodies have been screened out of the detailed WER assessment because the Proposed Development is not anticipated to result in a direct or indirect pathway for significant effects on groundwater body status, having regard to the nature of the works, the embedded design mitigation and the operational controls that will be in place.
- 12.2.6 The principal activities with potential to interact with groundwater include:
- temporary construction works;
 - piling
 - limited excavations; and
 - the handling of fuels, oils and other potentially polluting materials.
- 12.2.7 The risks identified above are standard construction and operational environmental management issues and would be controlled through embedded mitigation, including appropriate drainage design, impermeable surfacing and bunding in relevant areas, pollution prevention measures, implementation of a CEMP and operational environmental controls. Piling works would be subject to a piling risk assessment which will need to be submitted to and approved by the relevant planning authority in consultation with Natural England and the Environment Agency, prior to commencement of works.
- 12.2.8 On this basis, there are no identified impacts from the Proposed Development which are anticipated to cause deterioration in the quantitative or chemical status of the groundwater bodies.
- 12.2.9 No groundwater abstractions are planned for construction or operation of the Proposed Development. It is therefore not expected to alter groundwater flow regimes at a scale relevant to groundwater body status or affect groundwater-dependent receptors through sustained dewatering or other hydrogeological change.
- 12.2.10 Any excavations or temporary dewatering required during construction would be localised, short term and managed in accordance with good

practice, set out in the detailed CEMP, and any necessary permitting requirements.

- 12.2.11 In conclusion, any effects to either of the groundwater bodies would be negligible, temporary and not of a scale capable of affecting groundwater body objectives under the WER. On that basis, both the Tees Sherwood Sandstone Water Body and Tees Mercia Mudstone & Redcar Mudstone Water Body have been screened out from further detailed assessment, as the Proposed Development is not expected to result in deterioration of groundwater status or prevent the achievement of their status objectives.

Table 12.1 Permanent components of the Proposed Development and their potential effects on surface water bodies. A tick (✓) indicates a potential effect may arise and a dash (-) indicates no effect

Proposed Development component		Industrial gas pipeline connections	Industrial waste water export pipeline	Industrial waste water discharge	On-site chemical handling and transport	Runoff and surface water management	New quay structure	Quay enabling works – jetty demolition	Dredged berthing pocket and approach channel	Scour protection works (if scour protection works are required)	Modified navigation infrastructure
Potential effect		Localised disturbance, sediment mobilisation, and accidental pollution risk	Leakage risk causing localised water quality deterioration if failure occurs.	No estuary impact; pollutant and nutrient loading to Tees Coastal catchment via offshore discharge	Risks of contamination from operational usage, Storage, transfer and use of hazardous materials	Risk of runoff contamination through contact with plant and materials.	Permanent morphological change, habitat loss, altered flow, spill risk	Changes to local hydrodynamics, sedimentation, and habitat conditions.	Altered morphology, sediment dynamics, increased turbidity, contaminant mobilisation.	Artificial substrate alters bed processes, hydraulics, and local habitat.	Local disturbance and indirect navigation effects
WER surface water quality elements	Biological quality elements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Hydromorphological Supporting Elements	-	-	-	-	-	✓	✓	✓	✓	✓
	Physicochemical quality elements	✓	✓	✓	✓	✓	-	-	✓	-	-
	Specific pollutants	✓	✓	✓	✓	✓	-	-	✓	-	-
	Chemical Status	✓	✓	✓	✓	✓	-	-	✓	-	-

Potential effects on current status

- 12.2.12 The scoping assessment has considered the potential effects of the key permanent components of the Proposed Development on the current status of the surface water bodies screened into the assessment in Section 11. These are described in the sections below.
- 12.2.13 The assessment is based on the currently available desk study and outline design information.

Potential effects on surface water bodies

Changes to surface water runoff to watercourses

- 12.2.14 The Proposed Development site is currently dominated by previously developed and existing industrial land, including brownfield areas associated with the former industrial landuse, together with smaller areas of semi-natural habitat such as grassland, scrub, wetland, sparsely vegetated land, woodland, and intertidal/marine habitat within parts of the Wider Site.
- 12.2.15 Changes from the construction and operation of the Proposed Development to runoff pathways relevant to WER would primarily arise from redevelopment of existing brownfield and disturbed land for the Proposed Development including associated infrastructure, utility corridors, laydown areas and marine works, modifying hardstanding or other urban/industrial land cover, and potentially increasing runoff rates to the WFD catchment area.
- 12.2.16 The Main Site's position on the estuarine margin means that surface runoff has the potential to affect the River Tees, a WFD water body. The increase in impermeable cover will reduce drainage into the area around the Main Site, resulting in increased risk of runoff from the development into the water body.
- 12.2.17 However, the majority of land use change occurs within an existing industrial context and is associated largely with previously developed land. Therefore, effects related to water body habitat quality are expected to be localised and should be considered alongside embedded mitigation and the wider water environment assessment.
- 12.2.18 Section **Error! Reference source not found.** of this Assessment and the **Framework Drainage Strategy** (appended to the **FRA (Application Document Ref. 5.7)**) of the Proposed Development includes measures to mitigate and minimize the impacts of on-site chemical handling and transport and runoff and surface water management pollution or contamination risk through surface water runoff or spills to the WFD catchment. This includes through:

- segregated drainage systems;
- upstream treatment of runoff before discharge (for example through oil-water separators, forebays, silt traps);
- temporary construction drainage controls;
- good site management / housekeeping, including keeping the site tidy, using labelled waste receptacles, preventing debris entering drains, and controlling waste and materials storage;
- Site management and spill prevention and response measures;
- sampling and water quality monitoring before release;
- off-site disposal for contaminated water that cannot be safely discharged to the environment; and
- open drainage sumps.

- 12.2.19 There is one very high value watercourse - the Tees Main River (GB510302509900) – within the vicinity of the Proposed Development with potential to be impacted by surface water runoff from the Main Site. Given the embedded mitigation measures and drainage design, the size of the water body and the relatively minor change to runoff pathways the impact of surface water runoff changes to the waterbody resulting from the Proposed Development are anticipated to have a negligible impact.
- 12.2.20 Dabholm Gut is a high value watercourse and is also located in the Tees Water Body (GB510302509900) WFD catchment, a tributary on the South Bank where negligible changes to surface runoff are anticipated as a result of the Proposed Development. The permanent components of the Proposed Development related to surface runoff in the vicinity of the watercourse are therefore anticipated to have a negligible effect on the WFD water body.
- 12.2.21 No impacts to the two watercourses of moderate value assessed within the Tees Estuary (S Bank) Water Body (GB103025072320) – The Fleet and The Mill Race are expected from changes to surface water runoff, given their location on the south bank of the Tees Estuary, opposite the Main Site, where no surface modifications are expected from the Proposed Development or associated land use change.
- 12.2.22 There are two identified watercourses of moderate and low value which are not within a WFD catchment but relevant to the Tees Water Body so have been screened into the assessment. These watercourses are located near access roads to the Proposed Development, but are not located close enough to the Main Site to be at risk of being affected by surface water

runoff changes. Any impacts resulting from the Proposed Development would therefore result in negligible impacts to the watercourses, and the Tees Water Body.

Potential sources of watercourse pollution from runoff and development associated infrastructure

- 12.2.23 The industrial gas pipeline connection, industrial waste water export pipeline, on-site chemical handling and transport, and runoff and surface water management could, without effective construction management plans and embedded mitigation measures provide a source and pathway for potential contaminants to enter the water environment, This could have the potential to impact on the water quality of watercourses downstream, which in turn could adversely affect the biological, physico-chemical, specific pollutants and chemical status of the relevant surface water bodies.
- 12.2.24 As summarised in Section 8, the construction of the Proposed Development will be subject to a detailed CEMP, as required by Requirement 4 of the **draft DCO (Application Document Ref. 3.1)**, in advance of any works taking place, to mitigate risks of contaminant release throughout construction resulting in permanent impacts to the nearby watercourses and WFD water bodies. While risks of contamination from the malfunctioning of permanent features and operation of the Proposed Development, including hazardous chemical handling and runoff risks, and pipe and collection failure, have the potential to impact nearby watercourses, these risks are mitigated through environmental permit operational drainage requirements, hazardous waste management practices and appropriate management and maintenance measures (with design secured through a Requirement in the **draft DCO (Application Document Ref. 3.1)**) and operation secured through the Environmental Permit and any COMAH licensing requirements. These measures reduce the risk and impacts of contaminant release to nearby water receptors and any potential effects are therefore expected to be negligible.

Potential impacts for industrial waste water discharges

- 12.2.25 Industrial waste water will be discharged directly to the North Sea via the NWL LSO, therefore no discharges from the site will be made to the River Tees, a very high value watercourse. No significant adverse effects to the Tees Coastal body from operational discharge of industrial waste water to the Tees WFD for biological, physico-chemical, specific pollutants and chemical impacts are expected due to dispersion, dilution and tidal exchange within the coastal system. Any effects to WER status or quality elements are therefore expected to be negligible. The impacts to the Tees Water Body from the elements listed above are avoided as the discharge location in the Tees Coastal Body will be downstream of the water body.

- 12.2.26 Discharge of industrial waste water from the Proposed Development to Tees Coastal Body via the LSO outfall is expected to result in increased chemical loading to the Tees Coastal Body, in particular for nitrogen. Such discharge is expected to result in minor localised adverse effects, with limited impact at the waterbody scale to the Tees Coastal Body, given the large scale of the water body, and as the industrial waste water will be diluted and dispersed within the water body through marine and coastal processes.

Hydromorphological impacts from the Proposed Development

- 12.2.27 The removal of the existing jetties and associated infrastructure, modified navigational structure and construction of a new quay structure will impact on the hydromorphology of the Tees and the habitat of biological quality elements. These impacts would be limited in extent and in the context of the waterbody the impact is expected to be negligible.
- 12.2.28 Dredging works required for the construction of the Proposed Development will result in permanent hydromorphological changes to the River Tees riverbed during the lifetime of the Proposed Development. This will be maintained through the operation of the Proposed Development, resulting in ongoing impacts to the water body's hydromorphology. However, dredging works are already carried out across the Tees and the effects of dredging from the Proposed Development are expected to have a negligible impact. Good practice will be required to minimise impacts to fish and habitats, for example through use of low turbidity dredging techniques, preventing accidental extraction of fish and scheduling major dredging works to avoid key ecological periods. The dredging works are expected to result in a localised minor adverse effect, not resulting in a change in status at the water body level.
- 12.2.29 A site-specific sediment quality survey was undertaken in the River Tees close to the proposed quay during April 2026 and results are presented in **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**.
- 12.2.30 If scour protection is required, this may also result in ecological and hydromorphological impacts to the Tees water body. However, in the event that it is required, these impacts are expected to be small in extent and localised to the new quay wall. Any effects to the Tees Water Body are thus expected to be negligible.

Table 12.2 Summary of anticipated effects of the Proposed Development on WER status elements of relevant watercourses in the Tees Water Body (GB510302509900), the Tees Estuary (S Bank) Water Body (GB103025072320), and watercourses not within a surface WER catchment area but relevant to Tees Water Body (GB510302509900)

WER water body	Watercourses	Receptor value	Relevant component	Expected effects on WER status elements of relevant watercourses					
				Biological Status	Hydromorphological Supporting elements	Physico-chemical quality elements	Specific Pollutants	Chemical Status	Overall effect at watercourse level
Tees Water Body (GB510302509900)	River Tees	Very High	Industrial gas pipeline connections, industrial waste water export pipeline, industrial waste water discharge, on-site chemical handling and transport, runoff and surface water management, new quay structure, quay enabling works, dredged berthing pocket and approach channel, scour protection (if required), modified navigational infrastructure	Minor localised adverse	Minor localised adverse	Negligible	Negligible	Negligible	Minor localised adverse effect - no change in status class at the water body scale
	Dabholm Gut	High	Industrial waste water pipeline connections, industrial waste water discharge	Negligible	-	Minor localised adverse	-	-	Minor localised adverse effect - no change in status class at the water body scale
Tees Estuary (S Bank) Water Body (GB103025072320)	The Fleet	Moderate	None identified	-	-	-	-	-	
	The Mill Race	Moderate	None identified	-	-	-	-	-	
Watercourses not within a surface WER catchment area but relevant to Tees Water Body (GB510302509900)	Unnamed Watercourse 1 - Ordinary Watercourse	Low	Runoff and surface water management	-	-	Negligible	-	Negligible	
	Unnamed Watercourse 2 - Ordinary Watercourse	Moderate	Runoff and surface water management	-	-	Negligible	-	Negligible	

Table 12.3 Summary of anticipated effects of the Proposed Development on WER status elements of the Tees Coastal (GB650301500005)

WER water body	Receptor value	Relevant component	Expected effects on WER status elements of relevant watercourses					
			Biological Status	Supporting elements	Physico-chemical quality elements	Specific Pollutants	Chemical Status	Overall effect at watercourse level
Tees Coastal (GB650301500005)	Very High ^x	Industrial waste water discharge to the Coastal Water Body	Negligible	-	Minor localised adverse	-	Negligible	Minor localised adverse effect - no change in status class at the water body scale

^x Please note that this receptor valuation has been determined through examination of the coastal waterbody features. The coastal water body is considered to be of Very High value due to its statutory protection under the WER, its ecological function as part of the wider estuarine and coastal ecosystem, the presence of a Ramsar Site (Teesmouth and Cleveland Coast) within the extent of the waterbody and its contribution to the achievement of WFD environmental objectives. The water body supports a range of marine habitats and species and is linked to nationally and internationally designated sites within the study area.

Potential effects on future status objectives

- 12.2.31 The Proposed Development is not anticipated to adversely impact on or exacerbate any existing RNAGs for the existing surface water bodies assessed. Whilst the Proposed Development will not contribute towards the achievement of the water body level measures and actions available at the time of writing, it is not expected to affect or prevent the implementation of these measures in the future.

Mitigation requirements and compliance

- 12.2.32 Based on the latest design information available at this stage, there is the potential for the Proposed Development to have minor, localised adverse effects on biological status and hydromorphological supporting elements (River Tees), and physico-chemical quality elements (Dabholm Gut) in the Tees water body.
- 12.2.33 Dredging during construction and operation are also considered to potentially be a cause of minor, localised adverse effect to hydromorphological and biological quality elements by reducing existing marginal habitats, mitigated by good practice and appropriate environmental management measures to reduce sediment dispersal and impact to biological quality elements as set out in the **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**. Additional mitigation options are limited as the channel is already regularly dredged. Given the localised extent of the material removal for construction, it is not expected this would cause deterioration at the water body scale. Undergoing sediment dispersal model results will be reviewed when available.
- 12.2.34 The remaining components of the Proposed Development are anticipated to have negligible effects on the surface water bodies present, and no effects are expected to the groundwater bodies.
- 12.2.35 As such, the Proposed Development is considered to be compliant with the WER and no additional mitigation beyond the above is expected to be required at this stage to avoid the risk of a deterioration in the current status of the water bodies, or the prevention of the future achievement of status objectives.
- 12.2.36 Whilst the Proposed Development is not deemed to pose a risk of non-compliance at this stage, opportunities for environmental enhancements should continue to be developed over subsequent design stages.

13 Conclusions

13.1 Overview

- 13.1.1 An assessment of the compliance of the Proposed Development with the requirements of the WER has been undertaken.
- 13.1.2 This has included a baseline and screening assessment to identify the relevant WER water bodies potentially affected and collate available data regarding water body baseline condition and WER status and objectives. This has also included identification of the relevant permanent Proposed Development components with the potential to affect the water bodies, together with the relevant embedded design and construction mitigation developed at this stage.
- 13.1.3 The screening assessment has concluded that the Proposed Development has the potential to affect the following surface water WER water bodies:
- Tees Water Body (GB510302509900)
 - Tees Coastal water body (GB650301500005)
- 13.1.4 There were no identified impacts to groundwater bodies or to the Tees Estuary (S Bank) surface water body.
- 13.1.5 A scoping assessment has been undertaken to identify the potential effects of the Proposed Development on the current status and status objectives of these water bodies. This assessment has been based on the currently available site and design information, set out in further detail in the **Chapter 4: Proposed Development (ES Volume I, Application Document Ref. 6.1)** and assumptions regarding good practice and mitigation included within the **fCEMP ES Appendix 5A: fCEMP (ES Volume III, Application Document Ref. 6.3)**.
- 13.1.6 For the WER river water bodies a desk-based study and reconnaissance walkovers have been undertaken at this stage to identify and determine receptor values for all watercourses within the water body catchments within the vicinity of the Proposed Development.
- 13.1.7 The Proposed Development is not anticipated to cause a deterioration in WER status or preventing the future attainment of status objectives for the relevant water bodies screened in for assessment. As such, the Proposed Development is deemed to be compliant with the requirements and objectives of the WER.
- 13.1.8 This WER compliance assessment provides an indication of the likely compliance of the Proposed Development at the time the assessment was prepared. This assessment would be reviewed to consider if there have

been any substantial changes to the Proposed Development design, additional information becomes available, and as part of seeking any necessary approvals. Such reviews would consider:

- new baseline information that becomes available for the site, including from any further walkover surveys, and/or the relevant WER water bodies present at the site; and
- developing updates to the design details and construction methodology for the Proposed Development.

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Annex A: Background information - WER status determination and compliance

A.1 WER background

Legislative context

A.1.1 The European Union (EU) Water Framework Directive (WFD) [Ref 28] has been in force since 2000 and remains one of the most important pieces of EU legislation relating to the water environment. The Directive was transposed into UK law by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 [Ref 3] (the “WER” 2017). The EA is the competent authority responsible for delivering the regulations in England. The WER aims to protect and enhance the quality of the water environment in England and Wales. It takes a holistic approach to the sustainable management of water by considering the interactions between surface water, groundwater and water-dependent ecosystems.

A.1.2 Under the WER, ‘water bodies’ are the basic management units and are defined as all or part of a river system or aquifer. These water bodies form part of a larger RBD, for which RBMPs are developed by the EA (in England) and environmental objectives are set. These RBMPs are produced every six years, in accordance with the river basin management planning cycle. The statutory objective of the WER is to prevent deterioration of all designated water bodies at good or high status or potential and to prevent water bodies at less than good status or potential from deteriorating further. A series of objectives for maintaining or improving conditions so that water bodies reach and/or maintain ‘good status or potential’ have also been set out in the WER. These overall Environmental Objectives are:

A.1.3 For surface water bodies:

- prevent the deterioration in the status of each body of surface water;
- protect, enhance and restore each body of surface water (other than an artificial or heavily modified water body) with the aim of achieving good ecological status and (subject to paragraph (3)) good surface water chemical status, if not already achieved, by 22nd December 2021;
- protect and enhance each artificial or heavily modified water body with the aim of achieving good ecological potential and (subject to paragraph

(3)) good surface water chemical status, if not already achieved, by 22nd December 2021;

- aim progressively to reduce pollution from priority substances and aim to cease or phase out emissions, discharges and losses of priority hazardous substances.

For groundwater bodies:

- prevent deterioration of the status of each body of groundwater;
- prevent or limit the input of pollutants into groundwater;
- protect, enhance and restore each body of groundwater, and ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater chemical status and good groundwater quantitative status, if not already achieved, by 22nd December 2021;
- reverse any significant and sustained upward trend in the concentration of any pollutant resulting from the impact of human activity in order to progressively reduce pollution of groundwater.

A.1.4 For shellfish water protected areas, in addition to the objectives for the surface water bodies in which they are located, the objectives are those necessary or desirable to improve or protect the shellfish water protected area in order to support shellfish life and growth and to contribute to the high quality of shellfish products suitable for human consumption as the appropriate authority may direct. For other protected areas, the objective is to achieve compliance with any standards and objectives required by or under any EU instrument under which the area or body is protected.

A.1.5 Where two or more objectives set under this regulation apply to the same body of water, or the same part of a body of water, the most stringent objective applies.

A.1.6 All activities with the potential to impact upon the water environment need to be guided by the requirements of the WER. This includes ensuring that no changes occur that cause a deterioration of current status of a body of water or prevents the achievement of the future status objectives of a body of water. This principle is now integrated into consenting processes for proposed schemes/developments.

A.2 Determination of WER status

Introduction

- A.2.1 “Surface water” and “groundwater” are defined within WER legislation. There are three types of surface water body, as follows:
- natural water bodies (not designated HMWBs or Artificial Water Bodies (AWBs) under regulation 15);
 - HMWBs (designated as such under regulation 15); and
 - AWBs (designated as such under regulation 15).
- A.2.2 The overall status of natural surface water bodies is determined on the basis of their ecological status and chemical status. The overall status of heavily modified and artificial water bodies is classified based on their ecological potential and chemical status. The overall status of groundwater is determined on the basis of their quantitative status and chemical status.
- A.2.3 Bodies of groundwater are defined within WER legislation as a distinct volume of groundwater within an aquifer or aquifers.
- A.2.4 The means by which these determinations are made for both surface water and ground water bodies, in accordance with Annex V to the WFD and such directions as the appropriate authority may give to the appropriate agency, as described in Part 2, regulation 6 of the WER. Key consideration for classification is summarised below.

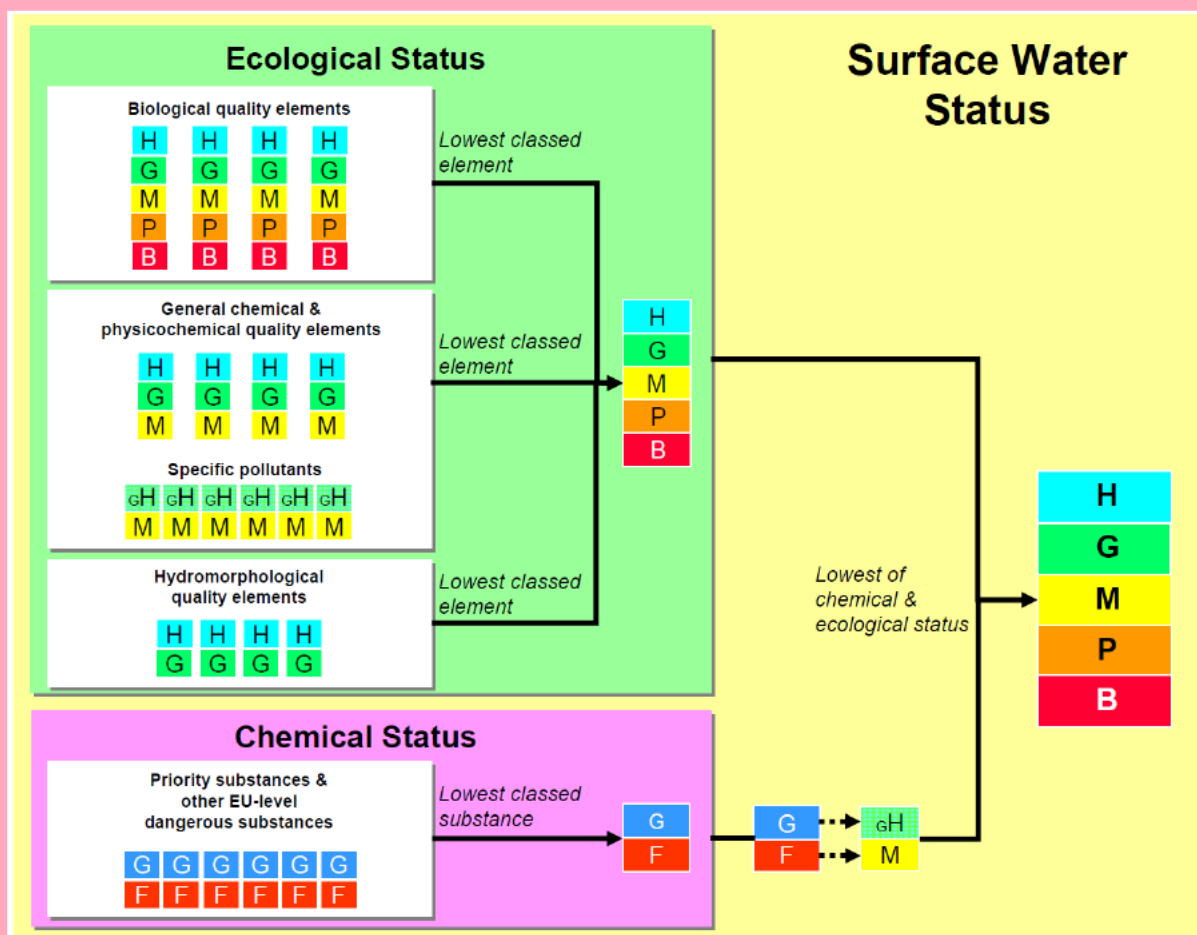
A.3 Surface water bodies

Ecological status

- A.3.1 Ecological status is categorised by the overall quality of the structure and functioning of aquatic ecosystems associated with surface waters, i.e. the condition of the watercourse. This is assigned on a scale of high, good, moderate, poor or bad, and on the basis of four classification elements, as follows:
- Biological - this test is designed to assess the status indicated by Biological quality elements such as fish, invertebrates, macrophytes or phytobenthos (diatoms). The Biological quality elements can influence an overall water body status from bad through to high. It is also important to note that the presence of invasive species prevents a water body from achieving high status when all other elements attain high;

- Physicochemical - this test is designed to assess the status indicated by physicochemical quality elements such as dissolved oxygen, phosphorus and ammonia, against environmental standards. The physicochemical quality elements can only influence an overall water body status from moderate through to high; and
- Hydromorphology - for natural surface water bodies this test is undertaken by the EA during classification when the biological and physicochemical tests indicate that a water body may be of high overall status. It specifically assesses hydromorphological quality elements such as water flow, sediment composition and movement, continuity, and structure of the habitat against reference or 'largely undisturbed' conditions. If the hydromorphological quality elements do not support high ecological status, then the status of the water body is limited to good overall status. Hydromorphological assessments are used to determine 'high' overall status only and are not used to drive a water body status class below good. The 'does not support good' classification should be reported for the purposes of identifying water bodies which fail the flow test.

A.3.2 The worst-case classification is assigned as the overall surface water body status, in a 'one-out all-out' system. This system is summarised in Inset 1.



Inset 1 Ecological status classification process (Source: UK Technical Advisory Group on the Water Framework Directive (2009)) [Ref 3]. Key: "H" means high; "G" means good; "GH" means good or better and is normally treated as high for calculating, as relevant, ecological status and surface water status¹⁰; "M" means moderate; "P" means poor; "B" means bad; and "F" means failing to achieve good surface water chemical status.

Chemical status

A.3.3 Chemical status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality Standards Directive (2013/39/EU) [Ref 25]. This is assigned on a scale of good or fail.

A.3.4 Surface water bodies are only monitored for priority substances where there are known discharges of these pollutants; otherwise, surface water bodies are reported as being of good chemical status.

Ecological potential for heavily modified (and artificial) water bodies

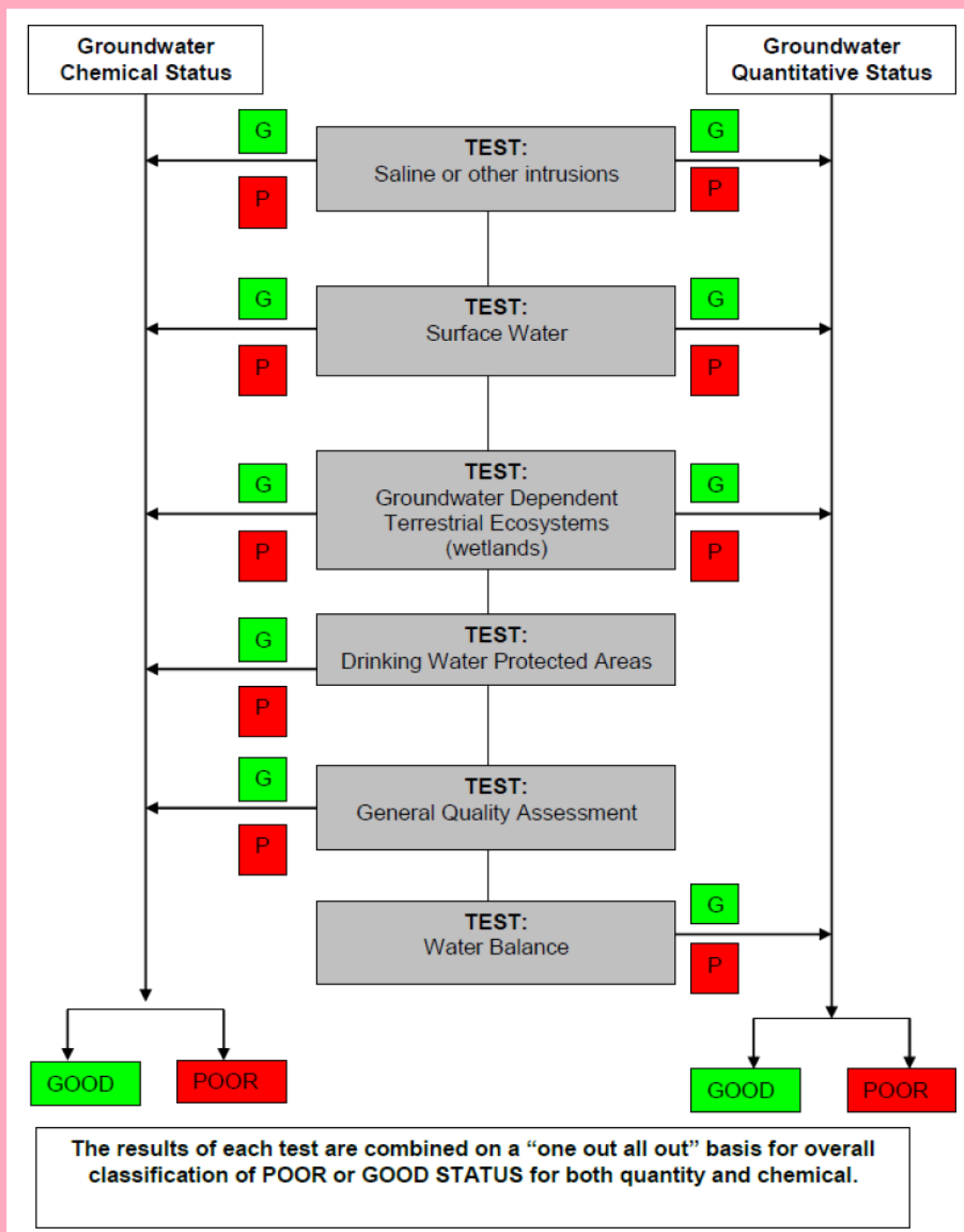
A.3.5 Ecological Potential is assigned to AWB (such as reservoirs and canals), or natural water bodies which, as a result of physical alterations by human activity, are substantially changed in character. The latter are termed

HMWB. The term 'ecological potential' is used to classify AWBs and HMWBs as it may be impossible for these water bodies to achieve Good Ecological Status (GES) because of their creation or modification for a specific use, such as navigation, water supply or flood protection. The Ecological Potential of an AWB or HMWB represents the degree to which the quality of the water body approaches the optimum condition it could achieve given its artificial or heavily modified state.

- A.3.6 AWB and HMWB are subject to an additional set of rules that need to be implemented prior to running the one-out-all-out process. These rules determine which Biological quality elements should be used in the water body Ecological Potential classification. Under normal circumstances, AWB and HMWB are classified according to an assessment of mitigation measures, which defines Good Ecological Potential (GEP) in water bodies where all applicable mitigation is in place, and moderate ecological potential in water bodies where some or all relevant mitigation is missing.
- A.3.7 However, to prevent AWB and HMWB being incorrectly classified as good potential in situations where all mitigation is in place, but other pressures are causing an impact (e.g. nutrient enrichment or pollution from toxic substances), the methodology adopted in the UK additionally considers biological indicators providing they are not sensitive to the heavily modified nature of the water body. AWB and HMWB hydromorphological elements are assessed using a three-stage process, firstly looking at flow, then mitigation measures assessment and biological quality elements. Flow conditions are assessed initially on a fail or pass basis to determine which of the biological and physicochemical quality elements should be used in the classification of ecological potential. Where the flow conditions are unaffected by the physical modification (flow conditions pass), the water body ecological potential is determined by the worst of either the mitigation measures assessment, or any element that is not sensitive to the modified nature of the water body. Where the flow conditions are significantly impacted by the physical modification (flow conditions fail), the water body ecological potential is determined by the worst of any of the mitigation measures assessments or the assessment of biological quality elements, physicochemical quality elements or specific pollutants.
- A.3.8 Where a water body is designated as artificial or heavily modified for water resources usage, either solely or jointly with other uses, the flow condition is assumed to be good (pass).

A.4 Groundwater bodies

- A.4.1 Under the WER, groundwater body overall status is classified on the basis of quantitative status and chemical status.
- A.4.2 The worst-case classification dictates the overall status, via a 'one-out all-out' system. This system is summarised in Inset 2.



Inset 2 Groundwater body status classification (Source: UKTAG (2012) [Ref 26])

Quantitative status

A.4.3 Quantitative status is defined by the quantity of groundwater available as base flow to watercourses and water-dependent ecosystems and as 'resource' available for use as drinking water and other consumptive purposes. It is assigned on a scale of good or poor, and on the basis of four classification elements or 'tests' as follows:

- *saline or other intrusions* - this test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions;
- *surface water* - this test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the ecological status of associated surface water bodies;
- *Groundwater Dependent Terrestrial Ecosystems (GWDTE)* - this test is designed to identify groundwater bodies where groundwater abstraction is leading to significant damage to associated GWDTE; and
- *water balance* - this test is designed to identify groundwater bodies where groundwater abstraction exceeds the 'available groundwater resource', defined as the rate of overall recharge to the groundwater body itself less the rate of flow required to meet the ecological needs of associated surface water bodies and GWDTE.

Chemical status

A.4.4 Chemical status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of groundwater available for drinking water purposes. This is assigned on a scale of good or poor, and on the basis of five classification elements or 'tests', as follows:

- *saline or other intrusions* - this test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions;

- *surface water* - this test is designed to identify groundwater bodies where groundwater is leading to a significant diminution of the chemical status of associated surface water bodies;
- *GWDTE* - this test is designed to identify groundwater bodies where groundwater is leading to significant damage to associated GWDTE;
- *Drinking Water Protected Areas (DrWPA)* - this test is designed to identify groundwater bodies failing to meet the DrWPA objectives defined in Regulation 8 of the WER or at risk of failing in the future. The aim is no deterioration in quality of waters for human consumption, and
- *general quality assessment* - this test is designed to identify groundwater bodies where widespread deterioration in quality has, or will, compromise the strategic use of groundwater. The aim is no significant impairment of human use of groundwater and no significant environmental risk from pollutants across a groundwater body. Status is assessed primarily using data collected from the EA monitoring network; therefore, the scale of assessment means that groundwater status is mainly influenced by larger scale effects such as significant abstraction or widespread diffuse pollution.

A.5 Environmental standards

- A.5.1 Under the WER, a range of environmental standards and condition limits are applied in order to help the classification of water body status and the setting of status objectives via the RBMP process. These environmental standards define the range of environmental conditions that support “healthy” aquatic life. For instance, standards are set for the composition of biological communities, the physicochemical water quality parameters, the concentration of pollutants, and the level of flows in rivers (as described above).
- A.5.2 These standards [Ref 4] inform the EA on the implementation of the RBMP process, including the identification of measures required to support the achievement of the GES / GEP objectives, as well as underpinning efforts to protect the water environment by helping to regulate activities that could cause adverse impacts.
- A.5.3 WER Assessment requirements for new developments to ensure compliance with the WER, decision makers must consider whether proposals for new developments have the potential to:
- cause a deterioration of a water body from its current status or potential;

- prevent future attainment of good status or potential where not already achieved;
- impact on protected or priority species and habitats; and/or
- provide opportunities to improve the water environment.

A.6 Case Law

A.6.1 A ruling by the European Union Court of Justice on 1 July 2015 [Ref 27], considered and endorsed by domestic courts [Ref 29] has significant implications for projects that may impact water bodies, namely:

- consent for development must not be granted by an authorising authority – unless a derogation is granted - where the project may cause a deterioration in the status of a body of surface water or where it jeopardises the attainment of Good Ecological Status or of Good Ecological Potential and Good Chemical Status by the date laid down in the Directive;
- that deterioration of the status of the relevant body of surface water includes a fall by one class of any element of the quality elements within the meaning of Annex V of the WER even if the fall does not result in a fall of the classification of the body of surface water as a whole; and
- if the quality element is already in the lowest class, any deterioration of that element represents deterioration of status within the meaning of Article 4(1)(a)(i)^{xi}.

A.7 Guidance

A.7.1 Whilst there is no established methodology for assessing compliance with WER legislation, the WER Compliance Assessment is based upon expert judgement, established good practice and consultation with the EA, and is undertaken in accordance with relevant EA guidance and the guidance provided by The Planning Inspectorate [Ref 30].

WER assessment process

A.7.2 The assessment process described has been followed pursuant to the PINS Advice Note on WFD assessments [Ref 30].

^{xi} Article 4(1)(a)(i) states 'In making operational the programmes of measures specified in the river basin management plans for surface waters Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water, subject to the application of paragraphs 6 and 7 and without prejudice to paragraph 8.'

A.8 Overview

- A.8.1 WER Compliance Assessment is undertaken as an iterative, stepped process, which typically includes the following:
- Step 1: Screening assessment (baseline);
 - Step 2: Scoping assessment;
 - Step 3: Detailed impact assessment (where required); and
 - Step 4: Application of Regulation 19 (where applicable).
- A.8.2 These key process steps are described in further detail in the following sections. Consultation with regulatory authority should be undertaken to share the findings of each step, where necessary/applicable.

A.9 Screening Assessment (baseline)^{xii}

- A.9.1 The key objective of the screening (baseline) assessment is to identify the zone or zones of influence (Study Area) based on specific activities and/or characteristics of the Proposed Development that could affect water bodies. Relevant WER surface water and groundwater bodies (including any undesignated tributary watercourses) potentially affected by the Proposed Development can then be identified and their baseline condition established.
- A.9.2 The water body baseline condition of relevant water bodies has been identified via desk-top assessment, utilising readily available information and environmental, asset and operations data obtained from relevant stakeholders, including the EA and Natural England.
- A.9.3 WER baseline datasets have been obtained from the EA's Catchment Data Explorer website [Ref 10] and through internal data request to the EA. This includes:
- RBMP Cycle 2 current status and status objectives data;
 - WER Protected Areas data;
 - Reasons for not achieving good status (RNAG) data;
 - Measures / actions data; and
 - Mitigation measures assessment data (if applicable).

^{xii} Aligns to Stage 1 Screening of the PINS guidance (**Error! Reference source not found.**).

A.9.4 The 2019 EA WER water body status data has been used to inform the assessment. These data are considered to provide the current best estimate of status and the formal baseline against which the EA will assess compliance with the 'no deterioration' objective. Where baseline data is limited, professional judgement has been used in the assessment and a precautionary approach taken with regard to screening.

A.9.5 The relevant WER water bodies present within the potential zone of influence of the Proposed Development are taken through to the subsequent preliminary assessment (scoping) stage.

A.10 Scoping assessment^{xiii}

A.10.1 The objective of the preliminary (scoping) assessment is to establish the relevant likely effects of the Proposed Development on the WER status elements of the relevant WER surface water and groundwater bodies. This includes identification of potential impact types, and any relevant mitigation embedded within the design of the Proposed Development at this stage.

A.10.2 The scoping assessment considers both the beneficial and adverse effects of the relevant elements of the Proposed Development and applies a risk-based method in line with existing EA and Natural Resources Wales (although the Proposed Development is not in Wales, the principles within the guidance are of general relevance) guidance.

A.10.3 Effects are considered with regard to the risk of the Proposed Development causing a deterioration in current status and/or a failure to achieve status objectives. The assessment identifies those Proposed Development components/impacts that pose a risk to current status or status objectives and thus may require more detailed impact assessment. The scoping assessment therefore comprises two parts, as follows:

- likely effects on current status or potential, involving:
 - i. identification of relevant Proposed Development components with potential to impact upon water body status;
 - ii. identification of likely potential impact and magnitude of effects of the relevant Proposed Development components on the current status of the water body (taking account of any 'embedded' mitigation); and

^{xiii} Aligns to Stage 2 Scoping of the PINS guidance [**Error! Reference source not found.**].

- iii. identification of potential risks of deterioration in current status and associated requirements for additional mitigation and/or further detailed assessment.
- likely effects on status objectives, involving:
 - i. scoping of the relevant Proposed Development components to identify where the Proposed Development may pose a risk of worsening existing pressures responsible for current status failures (RNAGs) and/or prevent the implementation of measures identified by the EA to address existing status failures; and
 - ii. scoping of relevant Proposed Development components against any available EA HMWB / AWB 'mitigation measure assessment' outputs, in order to identify where the Proposed Development may pose a potential risk of inhibiting the implementation of measures derived to mitigate the impacts of existing physical modifications and operational regimes to support the achievement of Good Ecological Potential objectives.

A.11 Detailed impact assessment^{xiv}

- A.11.1 Where required, the objective of the detailed impact assessment is to establish the nature and anticipated magnitude of the effects of relevant elements of the Proposed Development on the WER quality elements of the surface water and groundwater bodies affected. These effects are considered in terms of the potential for deterioration of current status and/or the prevention of status objectives. This detailed assessment may be based on targeted baseline surveys, monitoring or modelling assessments completed at the impact sites.
- A.11.2 As with the scoping assessment stage, the detailed impact assessment is therefore comprised of two key parts, as follows:
 - assessment of effects on current status of quality element; and
 - assessment of effects on status objectives, with regards to any water body RNAG or measures/actions identified as potentially being at risk from the Proposed Development under the preceding preliminary (scoping) assessment. This is done via expert judgement and consultation with the EA, based on the currently available information.
- A.11.3 Where significant effects are identified with regard to the risk of status deterioration and/or the prevention of status objectives, the assessment

^{xiv} Aligns to Stage 3 Impact Assessment of the PINS guidance [Error! Reference source not found.].

should identify 'further mitigation' required in order to avoid and/or minimise risks and the residual effects on quality elements at the water body scale.

- A.11.4 The detailed impact assessment will also identify if Regulation 19 tests need to be prepared for affected water bodies, where a residual risk to status deterioration and/or prevention of future status objectives has been identified.
- A.11.5 A detailed impact assessment has not been deemed required for the Proposed Development, based on the information available at this stage, as there is not expected to be any risk of deterioration in current WER status or prevention of achieving a Good WER status in the future for relevant water bodies identified.

A.12 Regulation 19 tests

- A.12.1 Regulation 19 of the WER states that the appropriate agency will not be in breach of the environmental objectives set for it under Regulation 12 if the failure is the result of either new modifications to the physical characteristics of a water body or as a result of new human sustainable development, on the proviso that the modifications or new development proposed are compliant with the four key conditions listed below. In doing so, Regulation 19 provides a means whereby a derogation for a proposed modification or sustainable development may be granted where it meets these four conditions.
- all practicable steps have been taken to mitigate the adverse impact on the status of the water body;
- One or both of the following is the case:
- the reasons for the modifications or alterations are of overriding public interest and/or the benefits to the environment and to society of achieving the objectives are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable development;
 - the beneficial objectives served by the modifications or alterations of the water body cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option; and
- A.12.2 Where the above applies, the reasons for the modifications or alterations, or the sustainable development activities, must be set out and explained in the

river basin management plan, and the environmental objectives must be reviewed every six years.

- A.12.3 Regulation 19 tests are not deemed required for the Proposed Development, based on the information available at this stage, as the Proposed Development is deemed compliant with the WER.

Annex B: Additional WER water body data

B.1 Protected areas for the WER water bodies

Table 13.1 Protected areas for the TEES (GB510302509900) water body

Protected area name	Protected area code	Protected area type
		ection Area
		e Water Treatment Directive

Table 13.2 Protected areas for the Tees Coastal (GB650301500005) coastal water body

Protected Area Label	Protected Area Code	Protected Area Type
		Directive
		Directive
		Directive
		Directive
		Directive
		Directive
		Directive
		ter Directive
		ter Directive
		ter Directive
		ter Directive
		ter Directive

Directive

Directive

ion Area

Directive

Directive

Directive

Directive

Directive

Table 13.3 Protected areas for the Tees Estuary (S Bank) (GB103025072320) Water Body

Protected Area Label	Protected Area Code	Protected Area Type
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ion Area

Table 13.4 Protected areas for the Tees Sherwood Sandstone Water Body (GB40301G702000) Water Body

Protected Area Label	Protected Area Code	Protected Area Type
		ctive
		ction Area
		ctive
		er Protected Area
		ctive
		ctive
		ctive

Table 13.5 Protected areas for the Tees Mercia Mudstone & Redcar Mudstone Water Body (GB40302G701300) Water Body

Protected Area Label	Protected Area Code	Protected Area Type
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ve

ve

f Conservation

Protected Area

ve

tion Area

tion Area

ve

B.2 Reasons For Not Achieving Good (RNAG) for the WER Water Bodies

Table 13.6 Reasons for Not Achieving Good (RNAG) for the TEES (GB510302509900) water body

Failing element	ID	Category	Business sector	Surface Water Management Issue (SWMI)	Activity
					Poor nutrient management
					Sewage discharge (continuous)
					Trade/Industry discharge
					Coastal squeeze
					Flood protection use
					Unknown (pending investigation)
					Contaminated water body bed sediments
					Not applicable
					Unknown (pending investigation)
					Not applicable

Table 13.7 Reasons for Not Achieving Good (RNAG) for the Tees Coastal (GB650301500005) coastal water body

<i>Failing element</i>	<i>ID</i>	<i>Category</i>	<i>Business sector</i>	<i>Surface Water Management Issue (SWMI)</i>	<i>Activity</i>
				delivered to	Not applicable
				ason,	
				recovery	
				modification	Flood protection use
				delivered to	Not applicable
				ason,	
				recovery	
				modification	Coast protection use

Table 13.8 Reasons for Not Achieving Good (RNAG) for the Tees Estuary (S Bank) (GB103025072320) Water Body

Failing element	ID	Category	Business sector	Surface Water Management Issue (SWMI)	Activity
					Not applicable
				on (RFD	
				delivered to ason, covery	Not applicable
				modification	Urbanisation - urban development
				delivered to ason, covery	Not applicable
				pending n)	Unknown (pending investigation)

Table 13.9 Tees Mercia Mudstone & Redcar Mudstone Water Body (GB40302G701300) Water Body

<i>Failing element</i>	<i>ID</i>	<i>Category</i>	<i>Business sector</i>	<i>Surface Water Management Issue (SWMI)</i>	<i>Activity</i>
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(pending
on)
Unknown (pending
investigation)
ce
Abandoned mine