

The Lighthouse Green Fuels Order

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Abbreviations

Abbreviation	In Full / Term
BGS	British Geological Survey
CEMP	Construction Environmental Management Plan
CFMP	Catchment Flood Management Plan
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ES	Environmental Statement
FBG	Fisheries, Biodiversity and Geomorphology (Environment Agency team)
fCEMP	Framework Construction Environmental Management Plan
FRA	Flood Risk Assessment
FRAP	Flood Risk Activity Permit
GPP	Guidance for Pollution Prevention
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HEWRAT	Highways England Water Risk Assessment Tool
HMWB	Heavily Modified Water Body
LLFA	Lead Local Flood Authority
LSO	Long Sea Outfall
MAGIC	Multi-Agency Geographic Information for the Countryside
MMO	Marine Management Organisation
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NWL	Northumbrian Water Limited
PFRA	Preliminary Flood Risk Assessment
PPG	Planning Practice Guidance
RCBC	Redcar and Cleveland Borough Council
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SFRA	Strategic Flood Risk Assessments
SMP	Shoreline Management Plan
SPA	Special Protection Area

Abbreviation	In Full / Term
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
STBC	Stockton-on-Tees Borough Council
SuDS	Sustainable Drainage Systems
WER	Water Environment Regulations
WFD	Water Framework Directive
WwTW	Wastewater Treatment Works
ZoI	Zone of Influence

12 Water Environment

12.1 Introduction

Overview

- 1.1.1 This chapter of the Environmental Statement (ES) provides an assessment of the potential likely significant effects in relation to the Water Environment and Flood Risk from the construction, operation, maintenance and decommissioning of the Proposed Development.
- 1.2.1 The location and extent of the Proposed Development is shown in **Figure 1.1: Site Location and Figure 1.2: Proposed Development Boundary (ES Volume II, Application Document Ref. 6.2)**. The Proposed Development comprises the Main Site where the SAF Production Facility will be located, and the Wider Site. The Wider Site includes the construction of marine infrastructure, including construction of a quay and dredging activities, access routes and utility connection corridors associated with the SAF Production Facility. The 'Site' refers to the whole site (including the Main Site and Wider Site). The elements of the Proposed Development are described in further detail in **Chapter 4: Proposed Development (ES Volume I, Application Document Ref. 6.1)**.
- 1.3.1 For the purpose of this chapter, receptors include surface water features (main rivers, ordinary watercourses, other surface water bodies such as ponds, and abstractions), groundwater receptors (aquifers, source protection zones (SPZ), and abstractions), and flood risk (to the Proposed Development and elsewhere associated with tidal, fluvial, surface water, and other sources). Further information on the marine environment receptors can be found in **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**.
- 1.4.1 This chapter describes the baseline conditions of the existing water environment in the Study Area. It considers the potential impacts of the Proposed Development from construction, operational and decommissioning activities and the effects on the quality and quantity of surface and groundwater bodies, geomorphology and flood risk. Given the historic uses of the Site, groundwater contamination risks have been carefully considered within the scope of this Environmental Statement. The results of this assessment are outlined in **Chapter 21: Geology and Soils (ES Volume I, Application Document Ref. 6.1)** and not duplicated here.
- 1.5.1 This chapter should be read in conjunction with **Chapter 4: Proposed Development (ES Volume I, Application Document Ref. 6.1)**, which describes the development parameters against which the effects considered in this chapter have been assessed and **Chapter 2:**

Assessment Methodology (ES Volume I, Application Document Ref.

6.1) which describes the approach to the Environmental Impact Assessment (EIA).

1.6.1 This chapter should also be read in conjunction with the following chapters (**ES Volume I (Application Document Ref. 6.1)**):

- Chapter 10: Terrestrial Ecology;
- Chapter 11: Freshwater and Marine Ecology;
- Chapter 15: Climate Change Resilience; and
- Chapter 21: Geology and Soils.

1.7.1 This chapter is also supported by the following documents:

- Flood Risk Assessment (**FRA**) (**Application Document Ref. 5.7**);
- Water Environment Regulations (**WER**) **Assessment (Application Document Ref. 5.10)**;
- Nutrient Neutrality Assessment (**Application Document Ref. 5.9**); and
- Framework Drainage **Strategy (Appendix to the FRA (Application Document Ref. 5.7)**;

12.2 Legislation and planning policy context

Overview

2.1.1 This ES Chapter has been prepared in accordance with the relevant legislation, planning policy and guidance which underpin the assessment methodology for the Water Environment and Flood Risk and is detailed below.

Table 12.1 Summary of key legislation and policy

Legislation/Policy/Guidance	Summary
Legislation	
Environmental Protection Act 1990 [Ref 3]	This Act makes provision to control pollution arising from industrial and other processes for waste management. This is relevant to the identification and control of pollution potentially arising from construction, operation and decommissioning of the Proposed Development.
Environment Act 1995 [Ref 4]	Sets standards for environmental management, such as requiring national strategies for air quality and waste. It also deals with the establishment of the Environment Agency (EA), the primary regulator for the

Legislation/Policy/Guidance	Summary
	water environment. The Act includes measures related to drainage and flood defence which have informed the design of the Proposed Development.
Environment Act 2021 [Ref 5]	This Act relates to the Secretary of State's ability to manage water resources and wastewater infrastructure. It gives powers to the Secretary of State to specify what chemicals should be taken into account in assessing water quality and further controls over licenced abstractions. This assessment identifies how the Proposed Development will comply with the Environment Act.
The Environmental Permitting Regulations 2016 [Ref 6]	These regulations require an environmental permit for flood risk activities, together with potentially polluting activities. The permitting requirements for flood risk activities allow the EA (as regulator for England) to concentrate on higher risk activities. Permits and consents may be required for the Proposed Development during construction and operation.
Water Resources Act 1991 [Ref 7]	Establishes the EA's powers and duties for the protection of water resources, flood defence, fisheries, recreation, conservation and navigation. It also sets out provisions for control of pollution of water, abstraction, working in or near watercourses and consent for the erection of temporary and permanent obstructions of watercourses. The Proposed Development is located within areas of flood risk associated with the River Tees and has the potential to result in the pollution and disruption of watercourses; therefore this Act is relevant to the assessment.
The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD) [Ref 8]	Aims to provide an integrated framework for the protection and restoration of the water environment through the delivery of actions set out in the 11 River Basin Management Plans (RBMPs) (which include the Northumbria River Basin RBMP which covers the River Tees. This is pertinent to the protection of the River Tees.
Land Drainage Act 1991 [Ref 9]	Provides functions to drainage boards and local authorities to manage watercourses and provide consenting powers for proposed works to watercourses associated with development. The Proposed Development must consider its impact on Ordinary Watercourses and obtain necessary consents for any works affecting Ordinary Watercourses.
The Water Resources (Abstraction and Impounding) Regulations 2006 [Ref 11]	Contains provisions relating to the licensing of abstraction and impounding of water in England and Wales in the light of amendments made by the Water Act 2003 to the Water Resources Act 1991. The 2006 regulations have been updated by the Water Abstraction and Impounding (Exemptions) Regulations 2017. Any required abstraction and impoundment licences relating to the Proposed Development would

Legislation/Policy/Guidance	Summary
	be granted by the EA and must be thoroughly assessed for their environmental impact.
The Water Abstraction and Impounding (Exemptions) Regulations 2017 [Ref 12]	Contains circumstances where water abstractions and impounding works are exempt from licensing requirements. Dewatering or abstractions may be required as part of the construction or operation of the Proposed Development, which may be undertaken in line with the Water Abstraction and Impounding (Exemptions) Regulations 2017.
The Flood Risk Regulations 2009 [Ref 13]	The regulations designate Local Lead Flood Authorities (LLFA) and impose duties on the EA and LLFAs to prepare a number of documents including: • Preliminary flood risk assessments • Flood risk and flood hazard maps • Flood risk management plans The Proposed Development has the potential to impact flood risk and therefore takes account of these documents.
The Water Supply (Water Quality) Regulations 2018 [Ref 14]	Provides the framework for drinking water quality in England in respect of public supplies provided by water companies and licensed water suppliers. There is the potential that the Proposed Development may result in impacts upon drinking water, this document is therefore relevant to the assessment.
Flood and Water Management Act 2010 [Ref 15]	Gives the EA a strategic overview of the management of flood and coastal erosion risk in England. It also gives upper tier local authorities in England responsibility for preparing and putting in place strategies for managing flood risk from groundwater, surface water and ordinary watercourses in their areas. The principles outlined in the Act must inform the design of the Proposed Development and mitigation through consideration of changes to flood risk.
The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 [Ref 16]	These regulations are based on the 'polluter pays' principle and impose obligations on operators of economic activities requiring them to prevent, limit or remediate environmental damage. They apply to damage to protected species, natural habitats, sites of Special Scientific Interest (SSSI), water and land and implement directive 2004/35/EC, on environmental liability.
The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 [Ref 17]	The WFD Directions present the updated environmental standards to be used in the second cycle of the WFD (2000/60/EC) river basin management planning process in England and Wales. The principles of the Directive have been applied to develop the assessment methodology.

Legislation/Policy/Guidance	Summary
The Groundwater (Water Framework Directive) (England) Direction 2016 [Ref 18]	The direction sets out instructions to the EA on obligations to protect groundwater, including requirements to monitor and set thresholds for pollutants, add new pollutants to the monitoring list and change the information reported to the European Commission. The principles relating to the prevention of risks to groundwater have informed this assessment and design of the Proposed Development.
The Conservation of Habitats and Species Regulations 2017 (as amended) [Ref 19]	Ensures the conservation of a range of rare or threatened species. Projects affecting designated sites require specific assessment.
Reservoirs Act 1975	Establishes the framework for the safety and management of large raised reservoirs in England and Wales, including requirements for inspection, supervision and maintenance to reduce the risk of reservoir failure and associated flooding. The Act is relevant to the assessment of residual flood risk from reservoirs and informs consideration of reservoir flood mapping and emergency planning associated with the Proposed Development.
Policy	
25 Year Environment Plan (25YEP) (2018) [Ref 21]	Commits to improving water quality and managing resources sustainably by reducing pollution, tackling nutrient enrichment, and restoring natural river processes. Promotes catchment-based approaches, wetlands, and natural flood management to enhance biodiversity and resilience, while aiming for good ecological status under the Water Framework Directive and integrating water efficiency into development.
National Planning Policy Framework (NPPF) (2026) [Ref 22]	Section 18 of the NPPF (and supporting Annex F) outlines the policies to minimise risks to development arising from all sources of flooding, taking into account climate change, ensuring that development will be safe for its lifetime without increasing flood risk elsewhere and incorporating sustainable drainage systems where appropriate. Site-specific flood risk assessments are to be appropriate to the scale, nature and location of development and support an assessment of whether the development proposal satisfies the sequential and exception tests. The Proposed Development is located within areas of flood risk. This policy is therefore relevant to the assessment.
The Overarching National Policy Statement (NPS) for Energy (EN-1) (2025) [Ref 23]	NPS EN-1, Section 4.12 (Pollution control and other environmental regulatory regimes) considers discharges and emissions including indirect and direct impacts to terrestrial and freshwater onshore environments. It notes that before consenting any potentially polluting developments, it should be confirmed that the relevant pollution control authority is

Legislation/Policy/Guidance	Summary
	satisfied that potential releases can be adequately regulated under the pollution control framework. Section 15 of the NPPF relating to protection of the water environment states that it should also be confirmed that the effects of existing sources of pollution in and around the Site are not such that the cumulative effects of pollution when the proposed development is added would make that development unacceptable, particularly in relation to statutory environmental quality limits. NPS EN-1, Section 5.8 (Flood Risk) addresses the assessment and management of flood risk for energy infrastructure projects. It mandates that a comprehensive Flood Risk Assessment (FRA) be conducted to evaluate potential impacts under both current and future conditions. The Sequential Test must be applied to prioritize locating projects in areas with the lowest flood risk. If this is not feasible, this must be demonstrated by the Exception Test. Developers are required to propose mitigation measures, such as flood defences and sustainable drainage systems, to manage and reduce flood risk. Additionally, assessments must consider climate change impacts, including increased rainfall and sea level rise, to ensure long-term sustainability and resilience. Consultation with relevant authorities, including the EA, is essential to confirm compliance with national and local flood risk policies. The Proposed Development must be designed to mitigate the impact of flooding and must be completed in line with the requirements outlined in this policy.
NPS for Renewable Energy Infrastructure (EN-3) (2025) [Ref 24]	The NPS EN-3, section 2.1 (Background) outlines the Government's commitment to ensuring that by 2035, all electricity will come from low-carbon sources, while maintaining security of supply and meeting increased demand. This policy, in conjunction with EN-1, provides the primary framework for decisions on applications for nationally significant renewable energy schemes, and is therefore relevant to this assessment.
Cycle 3 River Basin Management Plans (RBMPs) 2022-2028 [Ref 25]	These plans provide a framework for protecting and enhancing the benefits provided by the water environment. They also inform decisions on land use planning. The Proposed Development falls within the Northumbria River Basin District RBMP, management catchment Tees, Operational Catchment Tees Lower and Estuary
Stockton-on-Tees Borough Council (STBC) Local Plan (2019) [Ref 26]	Requires development to avoid flood-prone areas and incorporate SuDS, reducing pressure on watercourses. Protects water resources through policies on green infrastructure and climate resilience.

Legislation/Policy/Guidance	Summary
Stockton-on-Tees Local Flood Risk Management Strategy (2016) [Ref 27]	Surface water drainage strategies are a key consideration for major development, where the proposals must not increase the risk of surface water run-off or the risk of flooding to neighbouring sites or downstream of the development.
Stockton-on-Tees Preliminary Flood Risk Assessment (PFRA) [Ref 28]	The PFRA is a high-level screening assessment that identifies areas where flood risk is significant (known as Flood Risk Areas). It considers the risk of flooding from local sources, namely Ordinary Watercourses, surface water and groundwater. No areas in Stockton-on-Tees were identified as meeting the national thresholds to be classed as a Flood Risk Area.
Stockton-on-Tees Strategic Flood Risk Assessments (SFRA) (2018) Level 1 [Ref 29] and Level 2 [Ref 30]	The SFRA includes a Level 1 SFRA, an SFRA review, a Level 2 Stage 1 SFRA and a Level 2 Stage 2 SFRA. They provide the evidence base to support a review of the Stockton-on-Tees Borough Council local plan and have an ongoing purpose in providing guidance to developers on flood risk management. The Level 1 SFRA [Ref 29] includes guidance to developers on flood risk identification, management and mitigation, flood risk regulatory compliance (including obtaining necessary permits), and community engagement. The Level 2 Stage 1 SFRA [Ref 30] includes further guidance to developers on site-specific flood risk identification and mitigation, Sequential and Exception Tests for flood risk assessment, and emergency planning. It also includes further guidance to developers on flood defence infrastructure, flood hazard mapping, residual risk management, and the alignment of development proposals with local and national flood risk policies.
Middlesbrough Council Draft Local Plan (2024) [Ref 31]	Strengthens requirements for SuDS and water efficiency in new developments. It also promotes water efficiency measures to minimise demand on resources and supports the integration of blue-green infrastructure, such as wetlands, swales, and green spaces, to improve water quality, enhance biodiversity, and build resilience against climate change impacts.
Middlesbrough Local Flood Risk Management Strategy (2016) [Ref 32]	Outlines Middlesbrough's approach to managing flood risk from local sources. Key objectives include reducing surface water flooding and ensuring planning decisions consider flood risk.
Middlesbrough Borough Council Strategic Flood Risk Assessment (2018) Level 1 [Ref 33] and Level 2 [Ref 34]	The SFRA includes a Level 1 SFRA, an SFRA review, a Level 2 Stage 1 SFRA and a Level 2 Stage 2 SFRA. They provide the evidence base to support a review of the Middlesbrough Borough Council local plan and have an ongoing purpose in providing guidance to developers on flood risk management. The Level 1 SFRA includes guidance to developers on flood risk identification, management and mitigation,

Legislation/Policy/Guidance	Summary
	flood risk regulatory compliance (including obtaining necessary permits), and community engagement. The Level 2 Stage 1 SFRA includes further guidance to developers on site-specific flood risk identification and mitigation, Sequential and Exception Tests for flood risk assessment, and emergency planning. It also includes further guidance to developers on flood defence infrastructure, flood hazard mapping, residual risk management, and the alignment of development proposals with local and national flood risk policies.
Middlesbrough Borough Council Preliminary Flood Risk Assessment [Ref 35]	The PFRA is a high-level screening assessment that identifies areas where flood risk is significant (known as Flood Risk Areas). It considers the risk of flooding from local sources, namely Ordinary Watercourses, surface water and groundwater. No areas in Middlesbrough were identified as meeting the national thresholds to be classed as a Flood Risk Area.
Redcar and Cleveland Local Plan 2018 [Ref 36]	The plan integrates flood risk management with coastal protection measures to safeguard communities and critical infrastructure from tidal and fluvial flooding. It places strong emphasis on preserving marine and estuarine environments, ensuring that development does not compromise ecological integrity or water quality. Policies encourage water-sensitive urban design, including SuDS and green infrastructure, to manage surface water, reduce runoff, and maintain healthy aquatic ecosystems. The strategy aligns with climate resilience objectives, promoting adaptive approaches to protect biodiversity and support sustainable growth along the coast.
Redcar and Cleveland Borough Council Preliminary Flood Risk Assessment [Ref 37]	The PFRA is a high-level screening assessment that identifies areas where flood risk is significant (known as Flood Risk Areas). It considers the risk of flooding from local sources, namely Ordinary Watercourses, surface water and groundwater. No areas in Redcar and Cleveland were identified as meeting the national thresholds to be classed as a Flood Risk Area.
Redcar and Cleveland Borough Council Strategic Flood Risk Assessments (2018) Level 1 [Ref 38] and Level 2 [Ref 39]	The SFRA includes a Level 1 SFRA, an SFRA review, a Level 2 Stage 1 SFRA and a Level 2 Stage 2 SFRA. They provide the evidence base to support a review of the Middlesbrough Borough Council local plan and have an ongoing purpose in providing guidance to developers on flood risk management. The Level 1 SFRA includes guidance to developers on flood risk identification, management and mitigation, flood risk regulatory compliance (including obtaining necessary permits), and community engagement. The Level 2 Stage 1 SFRA includes further guidance to developers on site-specific flood risk identification and mitigation, Sequential and Exception Tests for flood risk assessment, and emergency planning. It also

Legislation/Policy/Guidance	Summary
	includes further guidance to developers on flood defence infrastructure, flood hazard mapping, residual risk management, and the alignment of development proposals with local and national flood risk policies.
Redcar and Cleveland Borough Council Local Flood Risk Management Strategy [Ref 40]	The Strategy noted a flood event (2013) was as a result of surface water run-off and sewer flooding rather than from the rivers. Work has been done with Northumbrian Water to improve the drainage system. Sustainable drainage is critical to achieving effective surface water management and the Authority is developing its policy in this area. All major planning applications now must include proposals on drainage and flood risk reduction. Surface water drainage strategies are a key consideration for major development, where the proposals must not increase the risk of surface water run-off or the risk of flooding to neighbouring sites or downstream of the development.
Guidance	
EA (EA)'s Climate Change Allowance Guidance (2022) [Ref 41]	Outlines when and how local authorities, developers, and their agents should use climate change allowances in flood risk assessments to ensure that developments are resilient to future climate change. It promotes an adaptive planning approach to managing flood risk, ensuring that all potential risks are identified and mitigated, thereby protecting communities and infrastructure. The guidance will inform design and the identification of mitigation measures to manage the impact of climate change on flood risk.
EA's Approach to Groundwater Protection (2018) [Ref 42]	Provides detailed guidance on protecting groundwater from pollution and managing activities that could impact groundwater quality. It outlines the necessary environmental permits and risk assessments for activities that may affect groundwater, and provides a framework for implementing controls, overall helping to identify and mitigate potential risks to groundwater quality. Groundwater will be protected from pollution and any other activities that could impact groundwater quality in accordance with the guidance.
Guidance for Pollution Prevention (GPP) [Ref 43]	Provides guidance to help businesses prevent pollution and meet environmental responsibilities and meet requirements of EA, Scottish Environmental Protection Agency, Natural Resources Wales, and Northern Ireland EA.
Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (C532) [Ref 44]	Provides guidance on environmental best practice for controlling water pollution resulting from construction activities, emphasising potential pollution sources within construction sites and effective prevention methods. It also covers benefits and obligations, water pollution management, legislative frameworks,

Legislation/Policy/Guidance	Summary
	construction contracts, and water management techniques.
Planning Inspectorate Guidance: Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (WFD) (2025) [Ref 45]	A non-statutory advice note that summarises the requirements of the WFD Regulations in relation to nationally significant infrastructure project applications. The advice note provides a guide to the Proposed Development in informing the WFD Compliance Assessment and is being used to inform the approach.
Clearing the Waters for All (Defra) (2016) [Ref 46]	This guidance provides practical advice for developers and operators to prevent water pollution during both construction and operational phases of projects. The document promotes best practice measures such as controlling site runoff, managing sediment and chemicals, and implementing robust drainage systems.
National standards for sustainable drainage systems (2025) [Ref 47]	This document sets out national standards for sustainable drainage systems in England, providing a consistent framework for managing surface water runoff from new developments. It focuses on controlling runoff volume and rate to mimic natural drainage, reducing flood risk and downstream impacts. The standards also address water quality improvements through treatment stages, alongside requirements for amenity and biodiversity benefits, ensuring SuDS deliver multifunctional outcomes.
Tees Valley Authorities Sustainable Drainage Systems (SuDS) Guidance (2019) [Ref 48]	This guidance provides detailed, region-specific advice for incorporating SuDS into new developments across the Tees Valley area. The document outlines preferred SuDS components such as swales, retention ponds, permeable paving, and green roofs, and encourages developers to adopt a hierarchical approach, prioritising infiltration where possible.
CIRIA C753 The SuDS Manual (2015) [Ref 49]	Provides guidance on sustainable drainage design, focusing on reducing runoff, improving water quality, and delivering amenity and biodiversity benefits. It covers all stages from planning to maintenance, details performance criteria for SuDS components, and promotes a treatment train approach for resilience and pollutant removal. The manual also addresses climate adaptation, integration with green infrastructure, and regulatory compliance, making it a key reference for practitioners.
CIRIA 532 Control of Water Pollution from Construction Sites (2001) [Ref 50]	Provides guidance on environmental best practices for controlling water pollution resulting from construction activities, emphasising potential pollution sources within construction sites and effective prevention methods. It also covers benefits and obligations, water pollution management, legislative frameworks, construction contracts, and water management techniques.

Legislation/Policy/Guidance	Summary
Environmental good practice on site (C692) (2015) [Ref 51]	Provides practical guidance for managing construction sites to deliver sustainable construction and minimise environmental impacts. This guidance is designed to help site managers and environmental managers implement good environmental practices, ensure compliance with regulations and promoting sustainable construction.
Groundwater control: design and practice (second edition) (C750) (2016) [Ref 52]	Provides guidance on groundwater control for construction projects, focusing on pumping and dewatering methods used in temporary works. It covers the impact of groundwater on excavation stability, techniques for groundwater control, and associated safety, environmental, and legal considerations. The publication includes advice on site investigation requirements, design principles, and practical steps for the installation and operation of groundwater control systems, ensuring effective and safe management of groundwater during construction.
Natural England Water Quality and Nutrient Neutrality Advice (2022) (NE785) [Ref 53]	The guidance sets out Natural England's advice in relation to proposals that could affect water quality and lead to adverse nutrient impacts on designated Habitats Sites (e.g. Special Protection Areas, and Ramsar sites). Where nutrient impacts cannot be ruled out and introduces the nutrient neutrality approach, which ensures new development does not increase nutrient loads by applying mitigation measures either on-site or off-site. As part of this ES submission for the Proposed Development a Nutrient Neutrality assessment has been undertaken and is submitted alongside (Application Document Ref. 5.9).
Design Manual for Road and Bridges (DMRB) LA113 Road Drainage and the Water Environment (2019, as amended) [Ref 54]	Provides comprehensive guidelines for assessing and managing the impacts of projects on the water environment. It offers a framework for evaluating potential impacts and implementing mitigation measures to minimise adverse effects on water quality, flood risk, and aquatic ecosystems. Specifically, it outlines procedures for assessing environmental sensitivity, the magnitude of impact, and the significance of potential effects on the water environment.
Using modelling for flood risk assessments [Ref 55]	Outlines when to use hydrological and hydraulic modelling as part of a flood risk assessment for a planning application, and the expected standards
River modelling standards: who they're for and how to use them [Ref 56]	Summarises the EA's river modelling standards, who they are for and how they are to be utilised.
River modelling: technical standards and assessment [Ref 57]	A range of standards for the flood risk management industry on how to build and review hydraulic models and provide evidence for flood risk management decisions.

12.3 Assessment methodology and significance criteria

Study area

- 3.1.1 The Study Area 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 Proposed Development. For the **Nutrient Neutrality Assessment, (Application Document Ref. 5.9)**, the Study Area encompasses the boundary of the Proposed Development (the draft Order Limits). These buffers have been selected based on professional judgement of the maximum extent of water environment-related impacts potentially caused by the Proposed Development.

Baseline methodology

- 3.2.1 The baseline conditions have been informed by a desk-based study and site walkover. The key sources of information used to determine the baseline water environment and flood risk conditions are:
- EA Catchment Data Explorer [Ref 58];
 - Ordnance Survey Mapping [Ref 59];
 - Department for Environment, Food and Rural Affairs (Defra) Multi-Agency Geographic Information for the Countryside (MAGiC) online Mapping [Ref 60];
 - British Geological Survey (BGS) Geology of Britain Viewer [Ref 61];
 - EA Flood Map for Planning (online) [Ref 62];
 - EA Risk of Flooding from Surface Water Map (online) [Ref 63];
 - EA Risk of Flooding from Reservoirs Map (online) [Ref 64];
 - EA Recorded Flood Outlines Map (online) [Ref 65];
 - EA National Fish Populations Database on the EA's Ecology and Fish Data Explorer [Ref 74];
 - EA Water Quality Data Archive [Ref 75];
 - Groundwater Dependent Terrestrial Ecosystems (GWDTEs) (EA) [Ref 66];
 - Stockton upon Tees Borough Council (STBC) SFRA [Ref 29 and Ref 30];

- Redcar and Cleveland Borough Council (RCBC) SFRA [Ref 38 and Ref 39];
- Middlesbrough Borough Council SFRA [Ref 33 and Ref 34];
- Bathing Waters Area [Ref 67];
- Nutrient Neutrality Catchment [Ref 68];
- Natural England Statutory Advice Note [Ref 73];
- EA “Cycle 3 River Basin Management Plan (RBMP)”, “Northumbria River Basin District Flood Risk Management Plan 2021 to 2027”. [Ref 77]; and
- Northumbria River Basin District Cycle 3 RBMP 2022 and 2019 water body status classification and status objectives data [Ref 76].

Consultation

- 3.3.1 The consultation undertaken with statutory consultees to inform this chapter, including a summary of comments relevant to the Water Environment is set out in Table 12.2.
- 3.4.1 The following meetings have also been held in the development of this ES Chapter to discuss consultation responses in more detail.
- 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.
 - 3 September 2026 – Meeting with Lead Environmental Regulator, EA, NE and MMO – Freshwater and Marine
 - 9 September 2026 – Meeting with Lead Environmental Regulator, EA, NE and MMO – Terrestrial

Table 12.2 Summary of consultation feedback

Stakeholder	Date	Summary of Consultee comment	Summary of response
EA (EA)	Scoping Opinion (November 2025)	Summary of the Flood Risk Assessment (FRA) response: The FRA must confirm Flood Zone classification (3a or 3b), define vulnerability under NPPF Annex 3, and demonstrate compliance for essential infrastructure—ensuring it remains operational during flooding, does not reduce floodplain storage, and does not increase flood risk elsewhere. Highly vulnerable uses are generally unsuitable in Flood Zone 3. The FRA should include site layouts overlaid on flood maps, apply a sequential approach to prioritize lower-risk areas, and consider climate change impacts. It must reference key guidance (NPPF, Planning Practice Guidance (PPG), Shore Management Plan) and address technical issues such as reservoir risk, culverts, pipelines, quayside works, and watercourse crossings. Culverting should be avoided unless temporary, and pipeline crossings must prevent debris accumulation. The Environmental Statement should show floodplain interactions and access routes, while DCO documents must include pipeline and crossing details. The design life is unclear; PPG recommends assuming at least 75 years for non-residential developments to inform future flood extent assessments. The FRA must state climate change allowances and epochs. For essential infrastructure, assess higher	The FRA (Application Document Ref. 5.7) details the Level 3 FRA that has been prepared in support of this application. The FRA states the parts of the Proposed Development that are within Flood Zones. The FRA outlines how the Proposed Development will interact with the flood risk receptors and how the development satisfies both the sequential and exception tests in respect of site selection, in line with the NPPF. The FRA has followed the NPPF guidance and considers the impacts of climate change. Hydraulic modelling has been agreed with the EA and undertaken to inform the FRA. Whilst the expected design life of the Proposed Development will be at least 25 years the operational life is expected to be longer, subject to market conditions The FRA has considered a 75-year design life in accordance with EA climate change guidance. A 100 year period is also assessed so that the long term implications of ground raising can be assessed, acknowledging that decommissioning of the Proposed

Stakeholder	Date	Summary of Consultee comment	Summary of response
		central and upper end allowances for river flow and sea level rise, with sensitivity tests including H++. In line with EN-1, the development must remain operational during the design flood and consider the credible maximum scenario to ensure resilience.	Development will not result in ground levels being reinstated to original levels. The FRA states the climate change allowances and epochs considered.
		The Scoping Report proposes a qualitative assessment of potential impacts to water environment in accordance with the approach outlined in the Design Manual for Roads and Bridges (DMRB) guidance. The assessment would be based only on the review of existing data and site surveys, with no water quality sampling proposed. Considering the methodology set out within the DMRB guidance is aimed at road schemes, the ES should ensure the suitability of this methodology, align it with relevant policy and adapt it where necessary. The applicant should seek to agree the methodology with relevant consultees	The DMRB LA113 [Ref 54] has been adapted to make it suitable for this Application. Adaptations include the omission of Highways England Water Risk Assessment Tool (HEWRAT) due to stage of design, and ensuring any increase in flood risk is seen as a significant effect.
		The Scoping Report proposes a 1km Study Area with potential to extend beyond to capture potential impacts to receptors beyond the 1km buffer. The Inspectorate considers that the ES should clearly define the Study Area based on the Zol, the hydrology of the site and potential for significant effects. Consideration of upstream receptors should also be included where appropriate.	The zone of influence (Zol) for surface water receptors has been increased to 2km from the Main Site, due to the nature of the works proposed and the designated sites within the area.
		Waste effluent will be sent to Bran Sands Wastewater Treatment Works (WwTW) for treatment, and the ES must assess downstream environmental impacts. It should outline assumptions on the timing and risks of	The Long Sea Outfall (LSO) is proposed for the discharge of treated effluent associated with the Proposed Development and has been assumed as the operational scenario within the assessment. The ES assesses the potential

Stakeholder	Date	Summary of Consultee comment	Summary of response
		delivering the long sea outfall to Tees Bay and confirm agreement with Northumbrian Water. If not agreed, the ES must assess alternative discharge arrangements and their impacts. It also notes wastewater will go to an existing treatment plant with no normal discharge to the River Tees, but it is unclear where treated effluent will be released and if abnormal discharges could occur. The proposal to use NWL Bran Sands WwTW, which currently discharges to the Tees estuary via Dabholme Gut, will increase nitrogen loading. The ES must assess water quality impacts and include a nutrient neutrality mitigation scheme for the Tees Estuary Transitional Waterbody.	impacts of this approach, including implications for the Tees Estuary. This chapter outlines the assumptions relating to the delivery and timing of the LSO based on published information and discussions with NWL. Water quality effects, including the potential for deterioration of receiving waterbodies have been assessed in this chapter and in the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WER) Assessment (Application Document Ref. 5.10). A Nutrient Neutrality Assessment (Application Document Ref. 5.9) has also been undertaken to assess the implications of increased nitrogen loading to the Tees Estuary Transitional Waterbody from land use change as a result of construction of the Proposed Scheme and to identify the mitigation required to ensure no adverse effect on designated sites. This includes consideration of appropriate nutrient neutrality mitigation measures which will need to be agreed in consultation with the LPA and Natural England and will potentially be secured through the DCO, or through offsite measures.
		The assessment of the hydromorphological impacts of the proposal and associated mitigation measures should have regard to such 'coastal squeeze'. It is recommended that Table 13.5 Summary of scope for CCR Assessment scopes IN 'Sea level rise, storm surge effects' from this perspective	The hydromorphological impacts of the proposed development have been considered within this ES Chapter in 12.6. Impacts on Marine Ecology are included in Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1).

Stakeholder	Date	Summary of Consultee comment	Summary of response
		New quay and WFD The construction of a new quay. The proposed development involves physically modifying a waterbody designated as a Heavily Physically Modified Waterbody (HMWB). The proposal should be assessed to determine if the development is exempt under Article 4.7 of WFD. Appropriate Mitigation Measures must be provided. The proposals relating to construction of a new quay may result in additional physical modifications of the Tees Estuary that may have the potential to jeopardise attainment of the environmental objective of achieving Good Ecological Potential.	The WER Assessment (Application Document Ref. 5.10) assesses the effects of quay construction on the Tees Estuary, in conjunction with Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1). The assessment in this chapter considers the potential for physical modification, risk of deterioration in status, and implications for achieving Good Ecological Potential, including relevance of Article 4.7 of the WFD where applicable. Mitigation measures have been identified to avoid or minimise impacts and ensure compliance with WER objectives. The Tees Coastal waterbody has also been included within the assessment to ensure all relevant receptors are considered.
		The impacts which have the potential to be significant to the water environment during the construction phase. Existing wooden open quay structures and underlying intertidal habitats may be replaced by closed structures. The list of impacts provided in this section should include permanent loss of natural and artificial intertidal habitats from the demolition of existing jetties, construction of the new quay (including possible removal of foreshore and revetment, capital dredging and piling). Appropriate mitigation should be put in place to address this loss.	The loss of these habitats from the existing quay has been included in the assessment in this chapter and the WER Assessment (Application Document Ref. 5.10). Additional assessment is included in Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1).

Stakeholder	Date	Summary of Consultee comment	Summary of response
	Statutory Consultation Response (January 2026)	Water Quality Framework Construction Environmental Management Plan (fCEMP) We previously set out a list of items for inclusion in the fCEMP as part of our response to the Scoping Opinion consultation. In addition to those items, the fCEMP should also include: • provisions to ensure that works are undertaken in a dry environment wherever possible, either at low tide or through appropriate dewatering methods, to contain pollutants and minimise the risk of contamination to the Tees estuary waterbody; and • measures to ensure that each stage of the works, particularly concrete-related and welding activities, is managed in a way that prevents pollution of the wider estuarine environment.	Measures required during construction to mitigate impacts on the water environment have been outlined within the assessment in this chapter.
		Outline Drainage Strategy for Construction and Operation 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 (Annex A.3 to the FRA (Application Document Ref. 5.7) and a framework CEMP (ES Volume III, Application Document Ref. 6.3) have been prepared in support of the application and these set out how surface water runoff will be collected, treated and discharged during both the construction and operational phases of the Proposed Development. Clean surface water will be discharged to a new surface water outfall. Contaminated water will be treated and piped to the LSO via Bran Sands WwTW for discharge to the North Sea. The WER Assessment (Application Document Ref. 5.10) and the Nutrient Neutrality Assessment (Application Document Ref. 5.9) assess the impacts of the development on the receiving watercourse.

Stakeholder	Date	Summary of Consultee comment	Summary of response
		• 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.	
		Foul Drainage The PEIR states that effluent from construction activities and foul water from welfare facilities are expected to be tankered offsite to a local treatment facility. In respect of operational foul drainage, Northumbrian Water (NWL) should be consulted at the earliest opportunity if welfare facilities require a connection to the NWL sewage treatment network.	No connection to NWL sewerage system is currently proposed for foul water disposal. Foul water will be tankered offsite to an appropriate treatment facility for processing and discharge.
		WFD Assessment 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.	The WER Assessment (Application Document Ref. 5.10) 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

Stakeholder	Date	Summary of Consultee comment	Summary of response
		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 waterbodies such as water clarity, 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 waterbodies 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. It is noted that a Nutrient Neutrality and WFD	suspended solids/turbidity, dissolved oxygen, salinity and temperature, where relevant to the receiving waterbodies. The assessment scope includes all relevant WFD waterbodies and Protected Areas and considers compliance with overarching WER objectives, including no deterioration in status and protection of WFD objectives. The assessment also considers the potential for physical modification of waterbodies, including relevance of Article 4.7 of the WFD where applicable, 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 (Application Document Ref. 5.9) has also been undertaken 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

Stakeholder	Date	Summary of Consultee comment	Summary of response
		assessment will be undertaken to evaluate the impacts of increased nitrogen on the area. This approach is welcomed. Depending on the outcomes of these assessments, further work including additional assessments and potentially modelling may be required.	subsequent stages of the application process to inform permitting and detailed design.
		Flood Risk The Flood Risk Assessment (FRA) should include the following: • details of all the defences within the Study Area, including their condition, crest level and standard of protection. The EA requires a 16m setback from any flood defence assets wherever possible. Where this cannot be achieved, it must be demonstrated that unrestricted access to defences is retained to enable their maintenance, repair, operation, and replacement, as necessary. Any proposed structures proposed in the River Tees must be structurally independent from any flood defence assets; • an assessment of residual flood risk, taking into account the risk of flooding should defences be breached; • details of all proposed watercourse crossings. Crossings should be minimised wherever possible, and opportunities to consolidate existing and proposed crossings should be explored. The impact of on flood risk and hydrogeomorphology from the proposed dredging activities. The FRA should specify the volume of material to be dredged, the	As above, the FRA (Application Document Ref. 5.7) details the Level 3 FRA that has been produced in support of this application. This includes characterisation of flood defence infrastructure within the Study Area, an assessment of residual flood risk including breach scenarios, and an assessment of watercourse crossings and associated activities.

Stakeholder	Date	Summary of Consultee comment	Summary of response
		destination of the dredged material, and the anticipated frequency of maintenance dredging. Hydraulic modelling We acknowledge the Applicant's intention to undertake site-specific modelling to further assess the flood risks associated with the proposed development and to inform any necessary flood risk mitigation. Any modelling submitted in support of the DCO application will need to be reviewed by the EA and confirmed as suitable for use. The hydraulic modelling should be undertaken in accordance with the following guidance: • https://www.gov.uk/guidance/using-modelling-for-flood-risk-assessments • https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment/river-modelling-standards-who-theyre-for-and-how-to-use-them • https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment We would advise that any modelling be undertaken as soon as possible to allow sufficient time for model reviews to take place and for any issues to be resolved.	Hydraulic modelling has been undertaken to support the Level 3 FRA (Application Document Ref. 5.7). The modelling approach was agreed in consultation with the EA and undertaken in accordance with suggested guidance.
		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	Potential impacts to intertidal habitats arising from the new proposed quay construction have been assessed with further detail included in Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1). The WER Assessment (Application Document Ref. 5.10) also considers these impacts in the

Stakeholder	Date	Summary of Consultee comment	Summary of response
		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.	context of the Tees Estuary HMWB, including potential implications for WFD Protected Areas.
		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 considered within the assessment in this chapter in Section 12.6 and the WER Assessment (Application Document Ref. 5.10) .
Natural England	Statutory Consultation Response (January 2026)	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 Applicant proposes to use LSO for the discharge of treated effluent associated with the Proposed Development. As the programme for construction and commissioning of the LSO is compatible for the commencement of operation of the Proposed Development, the use of the LSO has been assumed as the operational scenario within the assessment. The ES assesses the potential impacts of this approach, including implications for the Tees Estuary and Tees Bay.

Stakeholder	Date	Summary of Consultee comment	Summary of response
			These assessments are included in this chapter and in the WER Assessment (Application Document Ref. 5.10) and the Nutrient Neutrality Assessment (Application Document Ref. 5.9) .
		The worst-case scenario that the LSO at Bran Sands will not be constructed or operational in time has been mentioned, but no further consideration has been given to the impacts from this scenario in the outlined assessment. The worst-case scenario should be further developed and impacts from this scenario, and potential mitigation considered as part of the impact assessment.	As above, it is assumed that the LSO will be consented and operational in advance of the Proposed Development. operation of the development is contingent on completion of the Bran Sands LSO. In the unlikely event that the LSO is not completed in advance of operation of the Proposed Development, a further assessment would be required to identify any impacts and any associated mitigation of any interim discharge arrangements.
		The magnitude of impact from the potential of polluted surface water runoff to enter the river during the construction phase is assessed to be negligible. Depending on the pollution of the soil that will be released this could have moderate impact and moderate adverse effect. This should be assessed when soil testing has been carried out. Without soil test results available a more precautionary assessment should be made of the potential impacts from polluted surface water runoff into the designated sites.	This has been considered within the assessment within Section 12.6 of this chapter.
		The risk assessment from the potential effect of discharge of foul and effluent water to the designated sites in the worst-case scenario of a delay to the Long Sea Outfall is not assessed sufficiently precautionary. The magnitude of change is stated as small, and minor adverse effect. Without a clear overview of the volumes and pollutant concentration levels, or a mitigation strategy, this magnitude and significance should be considered higher detailed worst-case scenario with	As above, it is assumed that the operation of the development is contingent on completion of the Bran Sands LSO. As such, alternative discharge arrangements have not been assessed.

Stakeholder	Date	Summary of Consultee comment	Summary of response
EA		discharge volumes and concentration levels, and a mitigation strategy, should be provided to accurately assess the risk of the discharges to the designated sites without a long sea outfall.	
		Water quality monitoring is not a mitigation measure in its own right. Monitoring should be paired with clear triggers and actions to be put in place if triggers are breached. Mitigation measures and trigger pollution levels should be specified.	This has been considered within the assessment in this chapter in Section 12.7.
	Targeted Consultation Response (May 2026)	Insufficient information on proposed method(s) to replace the Process Wastewater Pipeline including removal and replacement of the pipeline within the Sembcorp No.2 Tunnel. Insufficient information on proposed open cut and trenchless techniques (e.g. in respect of C02 connection and additional electrical connection)	Further detail on pipeline removal and replacement within the Sembcorp No.2 Tunnel will be developed during subsequent stages of detailed design.
		Limited information on the proposed on-site treatment works and drainage strategy in the PEIR.	A Framework Drainage Strategy (Annex A.3 to the FRA (Application Document Ref. 5.7) has been produced in support of this application.
		There are no additional flood risk concerns arising from the proposed changes to the development, and no comments are raised in relation to the PEIR Addendum. However, several points previously raised during the January 2026 PEIR consultation require reiteration.	The January 2026 Statutory Consultation comments have been considered and addressed within this assessment.
		The project description identifies raw water supply from NWL to meet the demands of operational water use. This increase in demand for water supplied by NWL may be dependent on improvements to existing infrastructure as water is transferred via an extensive	The Proposed Development assumes the use of NWL raw water supply for operational water demand. The ES recognises that the availability of

Stakeholder	Date	Summary of Consultee comment	Summary of response
		network.	supply may be dependent on wider infrastructure capacity and transfer within the regional network. Early engagement with NWL has been undertaken and will continue throughout subsequent design stages to confirm supply availability, timescales and any required infrastructure improvements.
		Not enough detail has been provided on the quantities required for process water/demineralisation or cooling water demands.	Water demand estimates for process, demineralisation and cooling requirements have been developed at a preliminary level and will be refined through subsequent stages of detailed design.
		A cooling water circulation system including cooling towers is described in the project proposal, however alternative options and considerations for water efficiency have not been documented.	The Proposed Development includes a cooling water circulation system and incorporates principles of water reuse and recycling where practicable to minimise demand on water resources. Consideration of water efficiency measures and alternative design approaches will be further developed at subsequent stages to support optimisation of water use in line with best practice and regulatory expectations.
Natural England	Targeted Consultation Response (May 2026)	Natural England would like to highlight the comments provided in our previous response letter to the PEIR consultation, dated 13 January 2026. The comments provided in our previous response should be considered to equally apply to the current submitted addendum to the PEIR.	The January 2026 statutory consultation comments have been considered and addressed within this assessment.

Assessment methodology

- 3.5.1 The assessment methodology used within this ES Chapter is adapted from DMRB LA 104 [Ref 69] and DMRB LA 113 [Ref 54]. Whilst this guidance is based on assessing the impacts of road schemes, it provides a clear methodology to assessing the effects to the water environment. It has been adapted, where necessary, using professional judgement, to apply to the assessment of impacts of the Proposed Development on the Water Environment. This includes the omission of the use of the HEWRAT risk assessment tool and adaptation of the flood risk impacts and effects methodology.

Assessment of importance

- 3.6.1 The sensitivity of each water environment feature within the Study Area has been determined according to the DMRB criteria set out in Table 3.70 of DMRB LA 113 [Ref 54] and as shown in Table 12.3.
- 3.7.1 It should be noted that the receptor importance terminology has been updated since the PEIR to align with the wider DCO application methodology. This change relates solely to the classification labels used and does not indicate any change in the underlying importance or sensitivity of receptors. The relative importance of receptors should therefore be considered unchanged from the PEIR assessment.

Table 12.3 Estimating the importance of water environment receptors

Receptor Importance	Criteria	Examples	
High	Nationally significant receptor of high importance	Surface water	- Watercourse having a WFD classification shown in a RBMP) and $Q95^* \geq 1.0 \text{ m}^3/\text{s}$. - Site protected / designated under EC or UK legislation (Special Area of Conservation (SAC), SPA, Site of Special Scientific Interest (SSSI), Ramsar site, salmonid water) / Species protected by UK legislation Ecology and Nature Conservation
		Groundwater	- Principal aquifer providing a regionally or locally important resource and / or supporting a site protected under EC and UK Legislation. - Groundwater locally supports GWDTE. - Source Protection Zone (SPZ) 1.
		Flood risk	Essential infrastructure or highly vulnerable development.

Receptor Importance	Criteria	Examples	
Medium	Locally significant receptor of high importance	Surface water	- Watercourse having a WFD classification shown in a RBMP and Q95 < 1.0 m³/s. - Species protected under EC or UK legislation.
		Groundwater	- Principal aquifer providing locally important resource or supporting a river ecosystem. - Groundwater supports GWDTE. - SPZ 2.
		Flood risk	More vulnerable development.
Low	Of moderate quality and rarity	Surface water	Watercourse not having a WFD classification shown in the RBMP and Q95 > 0.001 m³/s.
		Groundwater	- Aquifer providing water for agricultural or industrial use with limited connection to surface water. - SPZ 3.
		Flood risk	Less vulnerable development.
Negligible	Lower quality	Surface water	Watercourse not having a WFD classification shown in the RBMP and Q95 ≤ 0.001 m³/s.
		Groundwater	Unproductive strata.
		Flood risk	Water compatible development.

* Typically defined as the percentage of time that the flow in a river is greater than the stated probability. For example, Q95 is the flow exceeded 95% of the time and is typical of a dry summer flow.

Magnitude of impact

- 3.8.1 The approach used to assess magnitude of impacts on water environment features considers the change to the receptor, as a result of the Proposed Development. This considers the severity of impact of the Proposed Development together with the vulnerability of the receptor to change.
- 3.9.1 Table 12.4 summarises the potential magnitude of any construction or operation impact on the receptor. Table 3.71 of DMRB LA 113 [Ref 54] has been adapted to remove specific attributes linked to highways methodologies such as Highways England's Water Risk Assessment Tool and accidental spillage assessments, which are not relevant to the Proposed Development.

Table 12.4 Estimating the magnitude of impact on a receptor¹

Magnitude of impact	Criteria	Examples	
High	Results in loss of attribute and/or quality and integrity of the attribute	Surface water	- Loss of, or extensive change to, a fishery. - Loss of regionally important public water supply. - Loss of, or extensive change to, a designated nature conservation site. - Reduction in water body WFD classification.
		Groundwater	- Loss of, or extensive change to, an aquifer. - Loss of regionally important water supply. - Loss of, or extensive change to GWDTE or baseflow contribution to protected surface water bodies. - Reduction in water body WFD classification. - Loss or significant damage to major structures through subsidence or similar effects.
		Flood risk	Increase in peak flood level (> 100 mm)
Medium	Results in effect on integrity of attribute, or loss of part of attribute	Surface water	- Partial loss in productivity of a fishery. - Degradation of regionally important public water supply or loss of major commercial/industrial/agricultural supplies. - Contribution to reduction in water body WFD classification.
		Groundwater	- Partial loss of, or change to, an aquifer. - Degradation of regionally important public water supply or loss of significant commercial/industrial/agricultural supplies. - Partial loss of the integrity of GWDTE. - Contribution to reduction in water body WFD classification.

¹ IEMA magnitudes in parentheses

Magnitude of impact	Criteria	Examples	
			Damage to major structures through subsidence or similar effects or loss of minor structures.
		Flood risk	Increase in peak flood level > 50 mm
Low	Results in some measurable change in attributes, quality, or vulnerability	Surface water	Minor effects on water supplies.
		Groundwater	Minor effects on an aquifer, GWDTEs, abstractions, and structures.
		Flood risk	Increase in peak flood level > 10 mm
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use or integrity	Surface water	The proposed project is unlikely to affect the integrity of the water environment.
		Groundwater	
		Flood risk	Negligible change to peak flood level ($\leq \pm 10$ mm).
Low (Beneficial)	Results in some beneficial effect on attribute or a reduced risk of adverse effect occurring	Surface water	Potential for slight reduction in pollution to a surface water body. However, the impact is insufficient to cause noticeable benefit in quality, fishery, productivity or biodiversity.
		Groundwater	- Potential for slight reduction in pollution to a groundwater body. However, the impact is insufficient to cause noticeable benefit in quality, baseflow, GWDTE. - Reduction of groundwater hazard to existing structures. - Reductions in waterlogging and groundwater flooding.
		Flood risk	Creation of flood storage and decrease in peak flood level > 10 mm
Medium (Beneficial)	Results in moderate improvement of attribute quality	Surface water	- Potential increase in the productivity of a fishery. - Contribution to improvement in water body WFD classification.
		Groundwater	- Contribution to improvement in water body WFD classification. - Improvement in groundwater Catchment Abstraction Management Strategy (or equivalent) classification.

Magnitude of impact	Criteria	Examples	
			Support to significant improvements in damaged GWDTE.
		Flood risk	Creation of flood storage and decrease in peak flood level > 50 mm
High (Beneficial)	Results in major improvement of attribute quality	Surface water	- Significant improvement to a fishery / designated nature conservation site. - Removal of existing polluting discharge or removing the likelihood of polluting discharges occurring. - Improvement in water body WFD classification.
		Groundwater	- Removal of existing polluting discharge to an aquifer or reducing the likelihood of polluting discharges occurring. - Recharge of an aquifer. - Improvement in water body WFD classification.
		Flood risk	Creation of flood storage and decrease in peak flood level > 100 mm

Significance of effect

3.10.1 For this assessment, significance of moderate and above is defined as a likely significant effect. Where the matrix suggests more than one likely outcome, professional judgement has been used in conjunction with Table 12.4.

Table 12.5 Effect significance matrix

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

Assumptions and limitations

- 3.11.1 This chapter has been prepared using publicly available information for desk-based assessment. It is assumed the information provided from public sources is correct and reflects baseline conditions.
- 3.12.1 Targeted walkover surveys were undertaken in March 2026. Due to the nature of the Wider Site, access to watercourses was limited in places.
- 3.13.1 In advance of detailed design, the assessment of potential effect has taken account of the 'worst case' scenarios using Rochdale Envelope principles.
- 3.14.1 Currently, Bran Sands WwTW discharges treated effluent to the Dabholm Gut, which in turn discharges to the Tees Estuary. NWL is proposing to construct an LSO pipeline both above ground and underground northward from Bran Sands WwTW to discharge into Tees Bay. This LSO will comprise an approximately 3km onshore and 4.5km offshore pipeline. This proposed pipeline aims to divert treated effluent discharges from the Tees Estuary to the North Sea and to reduce nutrient nitrogen concentrations within the Tees Transitional Waterbody and Tees Bay. The LSO is expected to be operational by 2030. When operational, the LSO will discharge treated effluent from industries within Teesside including from the Proposed Development.
- 3.15.1 Construction of the Proposed Development could (subject to the necessary consents being granted and an investment decision being made) commence in 2028. Assuming an approximate four-year construction programme followed by a period of commissioning, the Proposed Development is unlikely to commence commercial operation before late 2031. It is therefore expected that the Bran Sands LSO will be operational in advance of the Proposed Development becoming operational. The assessment therefore assumes this will apply from the first day of operation of the Proposed Development. In the unlikely event that the LSO is not completed in advance of operation of the Proposed Development, a further assessment would be required as agreed with Natural England and the EA, post-submission as necessary.
- 3.16.1 The findings of this assessment are based on the current stage of design and may be subject to change as the detailed design is progressed following submission of the Development Consent Order (DCO) Application and appointment of a contractor.
- 3.17.1 Where design details remain under development or where flexibility has been retained, reasonable assumptions have been made based on professional judgement. The assessment has therefore been undertaken in accordance with the parameters and design envelope defined at this stage.

- 3.18.1 Site-specific hydraulic flood modelling has been undertaken for the DCO submission due to the Proposed Development's location and the requirement to build within the River Tees and is appended to the **Flood Risk Assessment (Application Document Ref. 5.7)**.
- 3.19.1 The assessment has been informed by the **Framework Drainage Strategy (Application Document Ref. 5.7)**. Aspects of the detailed drainage design, including the final drainage layout, attenuation volumes, confirmed discharge arrangement(s), specific SuDS measures and pollution control infrastructure remain subject to further investigation, site-specific drainage modelling and stakeholder agreement post-DCO during the detailed design stage. Information relating to existing drainage infrastructure within the Main Site is limited at the time of submission and assumptions have been made regarding the condition, capacity and connectivity of existing systems. The assessment is therefore based on the commitment that the detailed drainage design will accord with the principles and performance standards set out within the Framework Drainage Strategy and relevant regulatory requirements.

12.4 Baseline conditions

Designated sites

- 4.1.1 The following statutory designated sites are located within the Study Area (see **Figure 3.2: Designated Conservation Sites (ES Volume II, Application Document Ref. 6.2)**)
- Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI), Special Protection Area (SPA), and Ramsar site - which variously includes the wider Seal Sands area and the Tees Estuary – running through the Proposed Development, and located immediately to the eastern extents of the Proposed Development; and
 - Teesmouth National Nature Reserve, located approximately 850m north of the Proposed Development.
 - Four local 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 and are under the protection of the Royal Society for the Protection of Birds (RSPB).
 - Four nature reserves form part of RSPB Saltholme and are known as:
 - i. Dorman's Pool Nature Reserve;
 - ii. Saltholme East Pool Nature Reserve;

iii. Saltholme West Pool Nature Reserve; and

iv. Paddy's Pool Nature Reserve.

- 4.2.1 There are no SPZs and Nitrate Vulnerable Zones within the Study Area. There are no surface water and groundwater drinking water safeguard zones within the Study Area.
- 4.3.1 The Proposed Development is located within a Nutrient Neutrality Catchment (Teessmouth and Cleveland Coast SPA/Ramsar).
- 4.4.1 Approximately 4.5km downstream of the Site, the coast at Seaton Carew North Gare is designated by the EA as having Excellent Bathing Water under the Bathing Water Regulations [Ref 67], as is that at Redcar Lifeboat Station and Redcar Gravelle approximately 6km downstream. The coast at Redcar Coatham approximately 5.5 km downstream of the Proposed Development is designated as having Good Bathing Water.

Surface water

Hydrology

- 4.5.1 There are several surface water receptors within the 2km Study Area (see **Figure 12.3: Surface Water Features (ES Volume II, Application Document Ref. 6.2)**):
- Several unnamed land drains, located immediately adjacent to the north, east, south and west of the Proposed Development and are within the Study Area;
 - Dorman's Pool and Saltholme West Pool and several unnamed ponds, located south and west of the Proposed Development and are within the Study Area;
 - The River Tees (a Main River) is located to the south and east of the Proposed Development and is crossed by the gas and wastewater connections to South Tees;
 - Saltholme Brine Reservoirs located approximately 600m west of the Proposed Development;
 - Greatham Creek (a main river) located approximately 1km north-west of the Proposed Development;
 - Dabholm Gut (an Ordinary Watercourse) is located to the east of the Proposed Development adjacent to Bran Sands Waste Water Treatment Work (WwTW);

- Knitting Wife Beck (an Ordinary Watercourse) is located approximately 300m south-west of the eastern extent of the Proposed Development (Tees Dock roundabout);
- Mill Race (an Ordinary Watercourse) intersects the Trunk Road at the eastern extent of the Proposed Development;
- The Fleet (an Ordinary Watercourse) is located approximately 200m north of the Proposed Development;
- Holme Fleet (a Main River) is located approximately 920m southwest of the Proposed Development (through the Saltholme Nature Reserve); and
- Ormesby and Normanby Beck (Ordinary Watercourses) are both located approximately 1.2km south-east of the Proposed Development.

Water Framework Directive water bodies

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

- The 'Tees Water Body' (GB510302509900), a transitional water body, which is located immediately adjacent to the east of the Proposed Development. As of WFD RBMP Cycle 3 (2022), this water body has been assessed to have 'Moderate' status;
- The Tees Estuary (S Bank) water body (ID: GB103025072320) is located at the eastern extent of the Proposed Development. As of Cycle 3 (2022), this water body has a 'Moderate Ecological Potential' status; and
- The Tees Coastal water body (ID: GB650301500005) is located approximately 3km downstream from the Proposed Development in Tees Bay.

Groundwater

Bedrock

4.7.1 The Proposed Development and Study Area are underlain by several bedrock aquifers. See **Figure 12.4: Groundwater Features (ES Volume II, Application Document Ref. 6.2)**.

4.8.1 The bedrock beneath the Main Site is the Mercia Mudstone Group. This comprises mudstone and subordinate siltstones with thick halite-bearing units, widespread thin beds of gypsum/anhydrite and thin sandstones. The Mercia Mudstone Group is classified by the EA as a Secondary B Aquifer, a

lower permeability layer that may store and yield limited amounts of groundwater, primarily through thin cracks (fissures) and specific layers.

- 4.9.1 The Mercia Mudstone is underlain by the Sherwood Sandstone Group which comprises red, yellow and brown sandstone, pebbly in parts with subordinate mudstone and siltstone. The Sherwood Sandstone subcrops beneath superficial deposits approximately 75m west of the Main Site and underlies the western sections of the access corridors (Wider Site) and Study Area. The Sherwood Sandstone Group is classified by the EA as a Principal Aquifer, a strategically important rock formation that provides significant groundwater supplies or base flow to rivers, lakes, and wetlands due to its high permeability and water storage capacity.
- 4.10.1 In South Tees, the easternmost extents of Wider Site are underlain by mudstone of the Penarth Group and Redcar Mudstone Formation.
- 4.11.1 Previous ground investigation across the Main Site has encountered bedrock at depths ranging from approximately 6 to 33m below ground level. Beneath the Main Site bedrock is generally anticipated to be at a depth of greater than 25.0m below ground level.

Superficial deposits

- 4.12.1 Geological mapping indicates that the Proposed Development is predominantly underlain by Tidal Flat Deposits (estuarine and marine alluvium), comprising sand, silt and clay. The Tidal Flat Deposits are interpreted to overlie Glaciolacustrine Deposits (clay and silt) and Till Deposits (diamicton). In South Tees, Blown Sands underlain by Glaciolacustrine Deposits are present. See **Figure 21.3: Superficial Geology (ES Volume II, Application Document Ref. 6.2)**.
- 4.13.1 Historical ground investigations indicate that Tidal Flat Deposits are present at thicknesses of approximately 5.0m to 12.7m, underlain by Glacial Till recorded at thicknesses of up to 14m. A deep borehole drilled in 1974 in the eastern part of the Main Site recorded superficial deposits to approximately 30m depth.
- 4.14.1 Within the River Tees channel, the riverbed is expected to comprise recent river sediments overlying Tidal Flat Deposits.
- 4.15.1 At a local scale, groundwater flow within the superficial deposits is generally toward the River Tees. However, this flow direction can vary due to local changes in topography, aquifer structure - such as the presence of clay or fine-grained sediments - rainfall patterns, and man-made features (e.g. drainage systems). The River Tees is likely to be hydraulically connected to the shallow groundwater contained within the superficial (Tidal Flat) deposits.

- 4.16.1 The majority of the Proposed Development is underlain by a Secondary (undifferentiated) aquifer corresponding to the Tidal Flat Deposits, with the eastern extent and along the coast designated a Secondary A aquifer corresponding to Blown Sands and beach deposits.

Groundwater levels

- 4.17.1 Groundwater monitoring undertaken in October 2024 across the Main Site using existing monitoring boreholes recorded groundwater levels ranging from approximately 0.78m to 2.86m below ground level (bgl), indicating relatively shallow groundwater conditions. Similar shallow groundwater conditions are anticipated within the superficial deposits across the Wider Site on both sides of the River Tees. Groundwater within the superficial deposits is expected to be in hydraulic continuity with the River Tees.

Groundwater Dependent Terrestrial Ecosystems

- 4.18.1 The following designated Groundwater Dependent Terrestrial Ecosystems (GWDTE) are located within the Study Area: 'Cowpen Marsh' and 'Tees & Hartlepool Foreshore and Wetlands' parts of which are adjacent to the Proposed Development (see **Figure 12.4: Groundwater Features (ES Volume II, Application Document Ref. 6.2)**).
- 4.19.1 Further detail on designated sites is outlined in **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1)**, including the Teesmouth and Cleveland Coast Ramsar site.

Springs

- 4.20.1 There are no springs mapped within the Study Area.

Water Framework Directive groundwater bodies

- 4.21.1 The Study Area, including the Proposed Development, overlies two WFD groundwater bodies: 'Tees Sherwood Sandstone Water Body' (GB40301G702000) to the north of the River Tees and 'Tees Mercia Mudstone & Redcar Mudstone Water Body' (GB40302G701300) to the south of the River Tees. See the **WER Assessment (Application Document Ref. 5.10)**.

Water resources

Catchment abstraction management

- 4.22.1 The approach to managing new and existing abstractions and impoundments within the Tees catchment are outlined in the Tees Abstraction Licensing Strategy [Ref 78].
- 4.23.1 At the location of the Proposed Development (in the Lower Tees), groundwater is generally available for licensing, with new licences

considered depending on impacts on other abstractors and on surface water.

4.24.1 A number of restrictions on groundwater abstractions in the Tees area apply to the different WFD groundwater bodies:

- For the Tees Sherwood Sandstone, a 5km buffer is in place along the coast to prevent saline intrusion occurring; and
- No specific restrictions apply to abstractions from the Tees Mercia Mudstone & Redcar Mudstone water body.

4.25.1 The strategy also notes that ‘Applications for groundwater abstraction would also need to be rigorously considered in relation to the potential impact to any groundwater fed designated sites’.

Licensed abstractions

4.26.1 There are two active groundwater abstractions licences within 1km of the Proposed Development of which both are within 250m of the draft Order Limits: a licence located less than 100m south of the Main Site comprising abstraction from a number of boreholes within the Mercia Mudstone for general industrial use (Licence 1/25/04/164), and a number of boreholes to the west (approximately 600m from the Main Site at its closest) comprising abstractions from the Sherwood Sandstone for general industrial use (Licence 1/25/04/134). The next closest licensed groundwater abstraction is greater than 1km from the draft Order Limits and related to dewatering from the Redcar Mudstone.

4.27.1 There is one active surface water abstraction licence within 2km of the Proposed Development approximately 1km to the west related to surface water transfer between water bodies at RSPB Saltholme.

4.28.1 Further details are provided in the Groundsure Insights Report (included in **Appendix 21A: Geoenvironmental Preliminary Risk Assessment (ES Volume III, Application Document Ref. 6.3))**).

Private water supplies

4.29.1 Stockton on Tees Borough Council and Redcar and Cleveland Borough Council have confirmed in April 2026 that they have no records of any private water supplies within the Study Area.

Consented discharges

4.30.1 There are 29 live consented discharges within 1km of the draft Order Limits; 24 to surface water and five to ground.

Existing drainage

- 4.31.1 Based on discussions with the Applicant, it is understood that much of the existing drainage infrastructure on the Main Site has been abandoned, although a remaining drain that runs to a pumping station adjacent to the River Tees is believed to still be operational.
- 4.32.1 During a site visit, the location of an existing outfall was identified in the south eastern part of the Main Site. This piped outfall appears to be fitted with a flap valve. This outfall is assumed to form part of the former drainage system associated with the previous industrial use of the Main Site.
- 4.33.1 Pre-construction utility survey and verification works will be undertaken at the detailed design stage to confirm the location and condition of all existing services.

Flood defences

- 4.34.1 The EA asset management website [Ref 72] identifies several flood defences in Seal Sands near the Main Site (**Figure 2 within Annex A of FRA, Application Document Ref. 5.7**). These are not formally maintained by risk management authorities (such as the EA). Assets noted below can be found on this figure.
- 4.35.1 Asset ID 395472 (5149.5m in length) extends along the left (north) bank of the River Tees through the Main Site, where the proposed quay will be built, and extending 200m to the south, and 319m to the north. This feature does not present as, nor retain higher ground, and as such does not provide flood protection where it passes through the site.
- 4.36.1 Asset ID 395472 is however considered to be a flood defence asset by the EA. As the quay will be constructed along its line, the quay will take on its role as a flood defence asset. The EA will require access for inspection and maintenance, but will not place maintenance obligations on the client provided the structure is safe and lasts for the proposed lifetime. A Flood Risk Activity Permit (FRAP) will be required for the construction of the quay, which will effectively move the defence line to the riverside of the quay.
- 4.37.1 North of the Main Site, Asset ID 395472 features sections of raised embankment that may offer some level of protection to neighbouring sites. This does not provide any protection to the location of the Tees services tunnel, as the embankment ends at this location, and would be bypassed by flooding from the north.
- 4.38.1 Assets ID 183041 (2214.74m in length) and 29649 (2615.15m in length) extend along the right hand (south) bank of the River Tees. These features are providing partial protection against tidal flooding of South Tees from the River Tees (FRA Figure 5 Annex A).

- 4.39.1 Flood defences within the area surrounding the Main Site are understood to be maintained by private third parties (i.e. not the EA). Accordingly, the EA asset dataset [Ref 72] contains no recorded information on its ownership, operator, condition, design characteristics, or standard of protection (Annual Exceedance Probability (AEP) %). It is also noted that these assets are not included within the EA Flood Map for Planning [Ref 62]. The presence of such flood defences is not, therefore, reflected in the published flood zone extents.
- 4.40.1 The closest 'formal' (i.e. EA owned and/or maintained) flood defences to the Proposed Development are located >4km upstream along the River Tees (near Port Clarence) and approximately 2km downstream along the banks of the Greatham Creek.

Flood risk

- 4.41.1 A detailed assessment of flood risk is included within the **FRA (Application Document Ref. 5.7)**;

Rivers and sea

- 4.42.1 The majority of the Main Site falls within Flood Zone 1 and is at low fluvial and tidal flood risk under baseline conditions (see **Figure 12.5: Flood Mapping (ES Volume II, Application Document Ref. 6.2)**) however several sections of the Wider Site are situated within higher-risk areas classified (Flood Zones 2 and 3) under baseline conditions. These include: the initial 800m of Seal Sands Road east of Seal Sands Roundabout; the intertidal area along the River Tees; and areas along the north bank of Dabholm Gut in South Tees.
- 4.43.1 There are no areas mapped as Flood Zone 3b within the vicinity of the Site.
- 4.44.1 Hydraulic modelling has also been undertaken for the project and indicates that the following areas are potentially affected by tidal flooding:
- Connection Pipeline Corridors and access routes, South Teesside. Some areas of pipeline corridor are flooded in the 2030 1-in-100 annual exceedance probability (AEP) flood event
 - Northbank Switchyard (Sabic site)(proposals connect to this existing switchyard). Flood likelihood approximately a 1-in-500 AEP at the end of the 30 year operational life of the proposals. A likelihood of 1-in-200 AEP by 2080.
 - Marine Assessment Area (including the proposed new quay). Flood levels at the location of the quays are as shown in **Error! Reference source not found.-3**, below. Existing low ground immediately adjacent

to the quays are noted as being at 4.55mAOD, but general ground levels in the site are an average of 5.08mAOD.

- 4.45.1 Two breach scenarios have been modelled, representing breach to the Greatham Creek defences immediately to the east of the Tees Road, and breach to the Port Clarence defences, beside the Transporter Bridge. The 2105 1-in-200 AEP events were modelled for both the Higher Central and Upper End scenarios.
- 4.46.1 Modelling indicates that neither breach would result in flooding of the Main Site, although flooding of surrounding roads could temporarily isolate the Main Site. The Greatham Creek breach scenario would result in the highest flood level but this remains more than 1 m below site levels, and therefore does not represent a significant flood risk to the Main Site.
- 4.47.1 Fluvial flooding poses no risk to the Site due to the high volumes of storage available within the fluvial floodplain adjacent to Main Site.

Surface water

- 4.48.1 There are localised areas of low (area has a chance of flooding of between 0.1% and 1% each year) to high (area has a chance of flooding of greater than 3.3% each year) surface water flood risk across the Site and Study Area (see **Figure 12.6: Risk of Flooding – Surface Water (ES Volume II, Application Document Ref. 6.2))**).
- 4.49.1 The EA Long-Term Flood Risk Map indicates that there is predominantly a low chance of surface water flooding to depths of approximately 20–30cm along the northern boundary of the Main Site, with some minor areas exhibiting a medium chance of flooding. This is potentially associated with Seal Sands Road, and the immediately surrounding areas.
- 4.50.1 Overall, the Site and surrounding area are associated with a variable but generally low risk of surface water flooding, with isolated areas of higher risk associated with low-lying ground and the Main Site access route. Surface water flood risk is considered secondary to tidal influences at this site. However, localised ponding in low-lying areas may occur during high-intensity rainfall events.

Groundwater

- 4.51.1 The Main Site is underlain at depth by the Mercia Mudstone (Secondary B Aquifer) which is of low permeability and which is underlain at depth by the high permeability Sherwood Sandstone Group Principal Aquifer. The bedrock is overlain by superficial deposits including Tidal Flat deposits. The superficial deposits are also predominantly of lower permeability that may store and yield limited amounts of groundwater.

- 4.52.1 At a local scale, groundwater within superficial deposits and made ground generally flows toward the River Tees, which is likely to be hydraulically connected to shallow groundwater in the Tidal Flat deposits.
- 4.53.1 STBC hold no records of groundwater flooding problems in their area. Both the RCBC Level 1 SFRA [Ref 38 and Ref 39] and PFRA [Ref 37] state that the overall risk of groundwater flooding in Redcar and Cleveland is low. It is noted in these assessments, that the majority of the borough may be subject to very wet ground conditions as a result of winter waterlogging.
- 4.54.1 The Tees Catchment Flood Management Plan (CFMP) states that there is little documented evidence of groundwater flooding in the Tees catchment and groundwater flooding is not known to be a major problem due to the geology of the catchment.
- 4.55.1 It is anticipated that any localised, emergent groundwater seepages would be managed by the new drainage system. The detailed design for the Proposed Development will also need to ensure foundation design does not adversely affect (and is not adversely affected by) changes in groundwater elevation in made ground (Main Site) and underlying superficial deposits (River Tees).

Reservoir

- 4.56.1 Reservoir flooding is categorised as flooding from an artificial source, typically resulting from the overtopping, structural failure, or breach of a reservoir or its associated outfall structures. The likelihood of such events is considered very low, owing to stringent regulatory and inspection regimes. However, the consequences of a breach can be severe, making reservoir flooding a residual but high-impact risk.
- 4.57.1 The EA Reservoir Flood Map indicates that the Main Site is not directly at risk of flooding from reservoirs [Ref 64]. However, the Main Site lies adjacent to areas identified as being at potential risk of flooding from this source; under both normal river conditions and combined fluvial–reservoir flood scenarios.
- 4.58.1 The reservoir flood map indicates a flood level of 3.5-3.6mAOD associated with the “Wet Day” failure. As such, the Main Site has significant freeboard against failure from reservoirs. The only proposals within the reservoir floodplain are the access routes and existing pipeline corridors. The reservoir flood risk floodplain already includes residential properties, and as such, the reservoirs behind the floodplain will be Category A under the Reservoir Act 1975 [Ref 79] and shall not need to change category because of the Proposed Development.

Other artificial water retaining structures

- 4.59.1 The residual risks associated with canal flooding are primarily influenced by the location and nature of any potential structural failure.
- 4.60.1 There are no canal systems within the Proposed Development or the surrounding area (as noted in the STBC and RCBC SFRA). On this basis, there is no risk of canal flooding to the Proposed Development.

Sewer flooding

- 4.61.1 Currently there is no data or information included in the STBC and RCBC SFRA on whether the Proposed Development and surrounding Study Area is at risk of sewer flooding.

Historical flooding

- 4.62.1 STBC holds no records of historical flooding within the vicinity of the Main Site.
- 4.63.1 Historical flooding has been recorded within the RCBC SFRA [Ref 39], as well as the EA maintained database [Ref 72], which records the flood outlines historical events caused by rivers, the sea, groundwater and surface water. Historic flood outlines are shown in the EA recorded flood outlines dataset (FRA Figure 3, Annex A within the **Flood Risk Assessment (Application Document Ref. 5.7)**).
- 4.64.1 Within the boundary of RCBC, historical flooding has predominantly arisen from sources such as surface water sewers, combined sewer systems, and smaller ordinary watercourses and drains. All major urban areas within RCBC have experienced localised flooding. Across Redcar and Cleveland, nearly 800 flooding incidents have been documented by multiple data holders, affecting approximately ten key locations. The RCBC SFRA identifies Eston, Guisborough, and Redcar as the principal local flood risk areas, designating them as Critical Drainage Areas (CDAs).

Future baseline

- 4.65.1 There is scientific consensus that man-made climate change will cause higher temperatures, increases in frequency and duration of heat waves, along with changes to the hydrological regime. In the UK, this likely means that precipitation events are likely to become more variable, with more frequent and/or intense storms, resulting in increased flood risk from most if not all sources. In addition, projected rise in sea levels and peak river flows may further increase the risk of tidal and fluvial flooding over the lifetime of the Proposed Development.
- 4.66.1 Hydraulic modelling has incorporated climate change into the assessment of flood risk, explicitly modelling events in the 2030, 2080, 2105 and 2130

epochs (and relevant values from these epochs are quoted above in the flood risk baseline). Results from 2060 (corresponding to the end of the worst case estimate of operational life) have been inferred where necessary from modelling results. Confidence can be had in such inferred values because flood levels on the site are highly dependent on the tidal boundary.

- 4.67.1 Within the 30 year worst case operational life of the proposed development, there are some areas of wave hazard to pedestrians along the Tees. Within the 75 year assessment period required by the EA (to 2105), significant levels of hazard could be posed by wave overtopping to pedestrian staff.
- 4.68.1 The future baseline is expected to reflect ongoing and reasonably foreseeable industrial and infrastructure development within the Teesside area. Such development has the potential to influence water quality, hydromorphology and associated ecological receptors within the Tees catchment, and may affect the ability of water bodies to achieve the objectives of the WFD, as implemented through the WER, including Good Ecological Potential for Heavily Modified Water Bodies.
- 4.69.1 These future changes have the potential to affect individual WFD quality elements and, in turn, overall water body status, with the potential for future deterioration or constraints on achieving WER objectives.
- 4.70.1 Conversely, the future baseline also reflects the potential for improvements in water quality and WFD status as a result of the continued implementation of RBMPs, which aim to achieve 'good' status or maintain Good Ecological Potential for water bodies.

12.5 Development design and impact avoidance

Overview

- 5.1.1 This section describes the embedded and good practice mitigation for the water environment and flood risk that has been incorporated into the Proposed Development design or assumed to be in place before undertaking the assessment of likely significant effects.
- 5.2.1 The Proposed Development will be designed to avoid and prevent adverse environmental effects on the water environment and flood risk through the process of design development and consideration of good design principles, and to reduce the impacts if complete avoidance is not possible. This process has been, and continues to be, influenced by the ongoing assessment of potential impacts.
- 5.3.1 The impacts during the decommissioning of the Proposed Development are considered comparable with, or likely less than, those of the construction stage.

Construction and decommissioning

- 5.4.1 The following key impact avoidance measures have been embedded within construction-phase activities.
- 5.5.1 With the exception of revetment removal associated with the quay works below, 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.
- 5.6.1 The construction of the proposed new quay will require the demolition of the two existing jetties and the removal of the revetment at the eastern end of the Main Site. Quay construction will involve earthworks and percussive piling. The quay construction works will include capital dredging for the berthing pocket at the quay and access channel. Works below Mean High Water Springs will be undertaken under a Deemed Marine Licence within the **draft DCO (Application Document Ref. 3.1)**.
- 5.7.1 Material dredged during quay construction will be disposed of offshore by deposit at a disposal site carrying reference TY150– "Tees Bay C" or other site agreed with the MMO. Otherwise, dredged material may be disposed of at an onshore permitted landfill site. It is possible that if some of the dredged material may include previously undisturbed and uncontaminated bedrock which could be used as fill material to raise site levels if proved suitable following appropriate testing. Further construction phase mitigation is outlined within **ES Appendix 5A: fCEMP (ES Volume III, Application Document Ref. 6.3)**. The fCEMP includes measures that are considered standard good practice to be implemented by the construction contractor. Such measures are intended to reduce the likelihood of impacts, or the magnitude of effects, if they were to occur.

Surface water quality and contamination

- 5.8.1 Management of surface water quality during construction will address the risk of pollution arising from sediment-laden runoff, accidental spillages (e.g. fuels, oils and chemicals), and leaching of contaminants from soils. Pollutants may otherwise enter surface water bodies or drains and impact hydrologically connected environments. Mitigation measures will include:
- Undertaking a ground investigation and risk assessment prior to construction, with remediation strategies developed as appropriate to manage contamination risks with respect to surface water receptors.
 - A water quality monitoring programme (sampling plan) prior to and during construction works must be established.

- During construction, a temporary surface water drainage strategy will be implemented to limit any contaminated run-off from entering surface watercourses (see **Framework Drainage Strategy (Appendix to Flood Risk Assessment, Application Document Ref. 5.7)**). Rainfall runoff from areas where there is a risk of contamination will be managed using temporary drainage systems and/ or tankered offsite for treatment (including settlement of suspended solids and or oil interceptors) prior to discharge to local watercourses with the approval of the EA pursuant to a discharge licence. The drainage systems will incorporate pollution control systems designed in line with the Control of Water Pollution from Construction Sites – Guidance for consultants and contractors C532 [Ref 50] (or as agreed with the relevant authorities). Foul flows and effluent arising from the Proposed Development will be kept separate from the surface drainage network, via sealed, onsite storage before being tankered off-site by a permitted waste contractor to an off-site wastewater treatment works.
- Stockpiled materials will be kept to a minimum as far as is reasonably practicable and stored away from watercourses. If necessary, suitable measures will be put in place to prevent sediment being washed outside of the Site, and the stockpiles will be monitored/checked during periods of high rainfall or flooding. Any suspected contaminated material encountered during earthworks would be segregated and placed on an impermeable membrane to prevent leaching of contaminants. These measures will be outlined in the **fCEMP (Appendix 5A, ES Volume III, Application Document Ref. 6.3)**.
- Water at a higher risk of contamination which requires discharge, including groundwater pumped out of excavations or during concrete pouring for example, will be contained and treated using appropriate measures. Examples of these measures may include one or more of the following: coagulation of sediments, dewatering, and pH neutralisation prior to discharge. Such discharges will be regulated through the **fCEMP (Appendix 5A, ES Volume III, Application Document Ref. 6.3)** under the DCO.
- Use of heavy machinery near waterbodies must be minimised, as far as reasonably practicable (i.e. unless works are required to interface with the river environment to construct the Proposed Development).
- Refuelling of machinery and heavy goods vehicles must take place in bunded areas with a minimum 10m buffer from surface water features and drainage assets.

- All entry and exit points must have wheel wash facilities in place with machinery cleaned in accordance with good industry practice, relevant guidance and approved Flood Risk Activity Permit (FRAP) if applicable.
- Drip trays must be used under machinery at risk of leaks or spillages to prevent contaminated runoff from polluting nearby surface water features. High-risk areas for spillage should be located as far from surface water features as practicable to minimise environmental impact.
- Hazardous substances must be contained within fully bunded (and lined) impermeable areas within adequate storage capacity plus an appropriate safety margin;
- Concrete washout must take place in designated washout areas, and construction materials such as cement must be mixed a suitable distance from surface water features.
- Reasonably practicable measures will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing waterbody during construction taking into account relevant industry guidelines including CIRIA report 'C532: Control of water pollution from construction sites' [Ref 50]. This may typically include use and maintenance of temporary lagoons, tanks, seeding/covering of earth stockpiles, earth bunds, straw bales and sandbag walls, other proprietary measures, fabric silt fences or silt screens and consideration of the type of plant used;
- Where reasonably practicable, earth moving works will seek to avoid periods of very wet weather, to minimise the risk of generating runoff contaminated with fine particulates. Where this is not reasonably practicable, mitigation measures will be implemented to control fine sediment laden runoff;
- To protect waterbodies from fine sediment runoff, should there be any topsoil/subsoil, this would be stored a minimum of 20m from watercourses on flat lying land (and further where any ground is sloping). Where this is not reasonably practicable and material is to be stockpiled for longer than two weeks, with runoff from the stockpile prevented from draining to any watercourses, without prior treatment;
- In the event of a pollution incident, an Emergency Response Plan will be in place prior to the commencement of construction works. The plan will outline key pollution mitigation measures to be adopted including a Control of Substances Hazardous to Health/fuel inventory and key contacts to be notified in the event of a significant pollution incident,

which could subsequently lead to the contamination of controlled waters or soils.

- Emergency Response Plan;
- Flood Warning and Evacuation Plan; and
- Spill kit training and toolbox talks.

Quay and pipeline construction

- 5.9.1 The construction of the proposed new quay will require the demolition of the two existing jetties and the removal of the revetment, mooring dolphins, an outfall and pipelines at the eastern end of the Main Site. Quay construction will involve earthworks and percussive piling. The quay construction works will include capital dredging for the berthing pocket at the quay and access channel. Works below Mean High Water Springs will be undertaken under a Deemed Marine Licence within the **draft DCO (Application Document Ref. 3.1)**.
- 5.10.1 This has the potential to disturb sediments and temporarily increase turbidity within the water column, resulting in mobilisation of sediment-bound contaminants and changes to hydromorphological processes. Piling, required for the new quay construction also has the potential to impact groundwater features through contamination or altering flow paths.
- 5.11.1 Embedded mitigation measures will include:
- Best practice will be required to minimise impacts to water quality, fish and habitats, for example through use of low turbidity dredging techniques to reduce sediment dispersal, preventing accidental extraction of fish and scheduling major dredging works to avoid key ecological periods.
 - Material dredged during quay construction will be disposed of offshore by deposit at a disposal site carrying reference TY150– "Tees Bay C" if acceptable to the Marine Management Organisation. Otherwise, dredged material may be disposed of at an onshore permitted landfill site. It is possible that if some of the dredged material may include previously undisturbed and uncontaminated bedrock which could be used as fill material to raise site levels if proved suitable following appropriate testing.
 - Further detail is included within Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1). Pipeline works are proposed to be confined to existing corridors and associated infrastructure.

- A piling risk assessment for the construction of the quay will be submitted to the Local Planning Authority, in consultation with the Environment Agency, prior to commencement of construction. It is assumed that as a worst-case piled foundations would extend into the underlying Mercia Mudstone bedrock or other competent strata. Given the depth of Sherwood Sandstone beneath the Main Site piled foundations will not extend into the Principal Aquifer.

Drainage and overland flow pathways

5.12.1 Construction activities may alter surface water flow paths, site drainage patterns and overland flow regimes, potentially increasing the risk of pollution pathways or localised flood risk. Mitigation measures will include:

- A temporary surface water drainage strategy will be implemented during construction to maintain existing drainage pathways, manage runoff and prevent uncontrolled discharge from the Proposed Development. To support this, the Principal Contractor will prepare, implement and maintain a Construction Surface Water Management Plan (CSWMP) as part of the approved CEMP prior to the commencement of the relevant earthwork operations. This will set out the temporary drainage, attenuation and pollution control measures required during each phase of construction and will be maintained and adapted as necessary until the permanent drainage infrastructure becomes operational or the affected area has been reinstated.
- The temporary construction site surface water drainage system will take into consideration best practice guidance for site surface water drainage systems, such as the National Standards for sustainable drainage systems (SuDS).
- Drainage measures will be designed to capture, convey and attenuate runoff, including provision of temporary drainage features such as channels, attenuation areas, settlement lagoons or tanks, as appropriate.
- Exceedance flows will be managed safely, with overland flow routes maintained or replicated where practicable to prevent diversion of flows in a manner that could increase flood risk off-site.
- Where practical, the permanent drainage systems will be installed early in the construction programme to reduce the duration over which temporary drainage measures are required.

Groundwater levels, flow pathways and water quality

- 5.13.1 Construction activities have the potential to affect groundwater levels, flow pathways and water quality, for example through dewatering, excavation, and disturbance of potentially contaminated ground. Mitigation measures will include:
- Ground investigation and risk assessment prior to construction, with remediation strategies and verification plans developed and implemented as appropriate to deal with any contamination risks;
 - A foundation or piling risk assessment will be produced to ensure any associated risks are mitigated;
 - The **fCEMP (Appendix 5A, ES Volume III, Application Document Ref. 6.3)** specifies pollution prevention measures to protect underlying soils and groundwater with reference to the EA's Groundwater Protection Guidance [Ref 42] and will set out how impacts on the River Tees will be managed during construction;
 - Emergency Response Plan;
 - Flood Warning and Evacuation Plan;
 - Spill kit training and toolbox talks;
 - 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 licences and permits required by the EA; and
 - Implementation of containment measures (e.g. cut-off trenches, low permeability barriers or temporary linings) where necessary to prevent mobilisation of contaminants and protect underlying groundwater, taking into consideration mounding.
- 5.14.1 Further details on measures to protect sub-surface controlled waters (i.e. groundwater) are outlined in **Chapter 21: Geology and Soils (ES Volume I, Application Document Ref. 6.1)**.

Flood risk during construction

- 5.15.1 The construction activities, including management of temporary site drainage during construction, will be managed through a Construction Environmental Management Plan (CEMP). A **fCEMP** is provided in **Appendix 5A (ES Volume III, Application Document Ref. 6.3)**. A Flood Risk Activity Permit (FRAP) will be secured, which will include a construction-specific FRA.

- 5.16.1 Construction activities have the potential to cause increased flood risk to the Main Site associated with temporary works (e.g. construction laydown areas or stockpiles or the construction of the quay) or elsewhere during construction. Mitigation measures will include:
- 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. It is nonetheless noted that all areas of temporary set down are located outside the 2030 Higher Central 0.5% AEP flood outline. Modelling may be required to demonstrate that temporary works conditions associated with piling of the quay do not adversely impact flood risk, but as modelling has already demonstrated high insensitivity of local flood conditions, these are likely to have minimal impact (< 0.01m).
 - Works will be planned to avoid periods of elevated flood risk, with activities suspended during out-of-bank flows or intense rainfall events.
 - A site-specific flood response approach will be implemented, including monitoring of weather forecasts and flood warnings to inform construction activities.
 - Temporary works and construction areas will be located, where practicable, outside areas of highest flood risk to reduce exposure.
 - A temporary surface water drainage strategy will be implemented during construction to manage runoff, reduce pluvial flood risk, and ensure no increase in flood risk elsewhere.
- 5.17.1 The potential impacts associated with decommissioning activities are likely to be similar to or less than those for construction activities, as the activities are expected to be broadly similar but without the works on the quay and infrastructure.

Operational

- 5.18.1 Operational is defined as the post-construction phase of the Proposed Development, including maintenance activities. The duration of the Operational phase is from commissioning until there is additional development or until the Proposed Development ceases to operate.

Water supply and demand

- 5.19.1 It is proposed that raw water will be supplied by NWL to the Proposed Development via existing or new raw water connections (which will be provided by NWL subject to further survey and engineering work to be

undertaken by NWL) within the Main Site to NWL water supply infrastructure located within the Wider Site. Raw water connections will be developed by NWL. Raw water will require treatment on-site for use as process water.

- 5.20.1 It is proposed that potable water will be supplied by NWL to the Proposed Development via existing or new potable mains water connections (which will be provided by NWL subject to further survey and engineering work to be undertaken by NWL) within the Main Site to NWL water supply infrastructure located within the Wider Site.
- 5.21.1 The availability of supply may be dependent on wider infrastructure capacity and transfer within the regional network. The Proposed Development will be designed to recycle water back into the process wherever possible, using treatment facilities within the Main Site to reduce pressure on infrastructure in the region. Ongoing engagement with NWL will be undertaken during the detailed design stage to confirm capacity and to ensure that all necessary consents and approvals are secured.

Surface water drainage, attenuation and discharge

- 5.22.1 Drainage design will incorporate the principles of **the Framework Drainage Strategy (Appendix to the FRA (Application Document Ref. 5.7))**, ensuring that runoff rates and volumes are controlled and that there is no increase in flood risk elsewhere, in accordance with relevant policy and regulatory requirements.
- 5.23.1 Surface water runoff will be managed close to source and any SuDS features will be kept as close to the surface as possible. All surface water features, including SuDS, will be lined or sealed to prevent contamination.
- 5.24.1 Attenuation of surface water is proposed via three new retention ponds located on the Main Site. These ponds will be sized to accommodate runoff from the full contributing catchment area(s), based on detailed site hydrology and drainage connectivity at detailed design. The ponds (in combination with any upstream features) will provide sufficient attenuation for events up to and including the 1 in 100-year rainfall event plus climate change.
- 5.25.1 The detailed surface water drainage design will be designed such that flooding from the drainage system does not occur on any part of the Main Site during the 1 in 30-year return period event. Flooding during the 1 in 100-year event plus climate change allowance will be managed within the Proposed Development boundary such that flooding does not occur within buildings, affect critical infrastructure, or occur off-site. Managed surface flooding in non-critical areas can be accepted, provided it is safely routed

on-site (exceedance management) and does not pose a risk to people, property, access or third parties.

- 5.26.1 Final attenuation sizing will consider climate change allowances, future development, and additional storage needs such as firewater or process discharges. Storm durations will be tested to identify the critical event to ensure compliance with LLFA guidance and operational resilience.
- 5.27.1 The proposed retention ponds do not provide primary water quality treatment, and upstream measures will be prioritised to protect the storage function and reduce sediment build-up in the ponds. These include appropriate SuDS and full retention oil-water separators at high-risk locations.
- 5.28.1 The discharge of surface water is proposed to the River Tees via an outfall in the south-east corner of the Main Site. The final discharge rate will be confirmed at detailed design in accordance with LLFA guidance, with flows managed to ensure that there is no increase in flood risk elsewhere, which supports the conclusions of this FRA. The detailed drainage design will be confirmed post-DCO and will be developed in accordance with the drainage principles, design parameters, and commitments set out within the **Framework Drainage Strategy (Appendix to the FRA, Application Document Ref. 5.7)**.

Foul drainage

- 5.29.1 Foul water generated during operation will be tankered off-site to a suitable treatment facility. Engagement will be undertaken with the appropriate body/organisation during the detailed design phase to confirm off-site treatment arrangements, where required.

Industrial wastewater treatment

- 5.30.1 The Proposed Development will be designed to minimise water use by recycling process water wherever possible, using treatment facilities within the Main Site. Industrial wastewater will be treated on site and then exported to Bran Sands WwTW 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 in an existing pipeline corridor. It will then be necessary to construct a new connecting pipeline into NWL's Bran Sands WwTW. The treated wastewater will then discharge to the North Sea via NWL's proposed LSO under Bran Sands WwTW's Environmental Permit.
- 5.31.1 Discharge of treated wastewater via the LSO to the North Sea is outside the nutrient neutrality catchment and as such, will avoid nutrient-related effects

on the Teesmouth and Cleveland Coast SPA and Ramsar site. The LSO will discharge into the Tees Coastal Water Body.

Land use change

- 5.32.1 The Proposed Development will require a change in land use across parts of the site, with existing habitats and land cover converted to developed uses including hardstanding, buildings, access infrastructure and other urban land. This is expected to increase surface water runoff, increasing risks of nitrogen loading to the River Tees.
- 5.33.1 The current annual nitrogen nutrient export across the Proposed Development was calculated as 79.85kg TN/year and post-development was calculated as 91.02kg TN/year. When adjusted for the 20% uplift in nitrogen calculations as required by the Natural England nutrient neutrality guidance, a net nitrogen increase of 13.40kg TN/year is estimated as a result of proposed changes to land cover under the Proposed Development.
- 5.34.1 The Proposed Development plans to mitigate for the net increase in nitrogen from land use change through onsite or offsite measures, or a combination thereof. Further work will be undertaken to identify and secure a suitable mitigation site, confirm existing land management practices and calculate the nitrogen reduction achieved through these measures. This will enable the final area of land required for mitigation to be established and secured prior to operation of the Proposed Development.

Hydromorphological impacts

- 5.35.1 Periodic maintenance dredging is expected to be required to maintain required depths within the berthing pocket and approach channel during operation.
- 5.36.1 PD Ports, as the Statutory Harbour Authority for the Tees Estuary, is responsible for maintaining navigable depths through routine maintenance dredging in the main channel and turning circles. Any potential increase in dredging requirements resulting from the new quay is expected to be minimal and would be managed within the existing maintenance dredging and offshore disposal regimes regulated by the Marine Management Organisation (MMO).
- 5.37.1 Best practice will be required to minimise impacts to water quality, fish and habitats, for example through use of low turbidity dredging techniques to reduce sediment dispersal, preventing accidental extraction of fish and scheduling major dredging works to avoid key ecological periods.
- 5.38.1 **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)** provides a detailed assessment of dredging impacts on the marine environment.

Flood risk

- 5.39.1 To maintain resilience within the Main Site, a tiered approach is proposed: general ground levels at a minimum of 5.08mAOD, adaptable components at a minimum of 5.38mAOD, and vulnerable assets up to a minimum of 5.68mAOD. The quay will be constructed to a level of 5.65mAOD.
- 5.40.1 The proposed ground level is effectively the 0.5% AEP 2105 Higher Central flood level + 0.23m Residual Uncertainty Allowance (RUA). A 0.23m RUA corresponds to a 99% chance of non-exceedance in this scenario, above the industry standard.
- 5.41.1 Wave mitigation will be implemented in the design to manage wave hazard to pedestrians at the site boundaries to the north and south ends of the quay. Given the uncertainty and likely conservatism in the wave overtopping assessment, together with the Main Site's sheltered location, residual wave overtopping risk beyond the Proposed Development's worst case 30 year operational life will be managed through a managed adaptive approach. Any requirement for additional physical mitigation measures will be reviewed during the operational life of the Proposed Development and implemented if future monitoring or updated assessments demonstrate they are necessary. This will be managed through the Flood Warning and Evacuation Plan (FWEP) or through physical intervention.
- 5.42.1 Within the Wider Site, the Proposed Development makes use of existing shared utility corridors or roads, and while much of the extent of these corridors lie outside the floodplain, it is not reasonably practicable to locate utilities outside of the floodplain or above flood water to provide flood alleviation given their shared status and connection to existing infrastructure.
- 5.43.1 The materials and finishes of above ground pipelines and their corrosion protection will be selected according to the carried fluid and exposure environment and ground conditions; supports would be designed according to hydraulic forces in this location.
- 5.44.1 A high pressure nitrogen pipeline would be buried underground along the south side of Dabholm Gut. The materials and finishes of the Nitrogen pipeline, and its corrosion protection will be selected according to the carried fluid and exposure environment and ground conditions. Pipework would be fully welded (i.e. no flanges) and designed against flotation. Safety systems would monitor the pressure of pipeline against any breach.
- 5.45.1 Further detail on operational mitigation with respect to flood risk is included within the **FRA (Application Document Ref. 5.7)**.

12.6 Likely impact and effects of the Proposed Development

Introduction

- 6.1.1 The assessment of likely significant effects of the Proposed Development on surface water, flood risk and groundwater receptors are presented in the following sections. Assessment is based upon current available information (June 2026) and professional judgement. At this point a precautionary reasonable worst case assessment has been undertaken, on the basis that the Bran Sands LSO is implemented.

Construction phase

- 6.2.1 Typically, most of the impacts on the Water Environment will occur during the construction phase as this is when the most extensive physical works and changes to the landscape occur (i.e. earthworks, dewatering etc). It should be noted that many of the effects may be temporary, localised and reversible, whilst others have the potential to be more significant in terms of spatial extent, magnitude and/or duration.
- 6.3.1 Potential construction phase impacts are:
- Increase in the amount and/or concentration of pollution entering the water bodies. For example, from mobilised sediment-laden runoff, spillage of fuels, soil contamination or other harmful substances that may enter surface water and/or groundwater receptors;
 - Impacts to the hydromorphological and ecological quality of watercourse(s) associated with works within or near watercourses, including physical change to the watercourses and longer-term changes associated with sediment transport (i.e. erosion and/or deposition). Impacts to the River Tees and freshwater and marine ecology due to the proposed jetty and quay construction works and dredging are addressed in Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1).
 - Potential damage, degradation or loss of habitats within designated conservation sites, from activities such as wave wash (from increased navigation) and previous contaminant release from seabed associated with piling or capital or maintenance dredging;
 - Changes to water quality within the River Tees associated with jetty demolition and quay construction works, with potential increase in turbidity and for release of pre-existing potentially contaminated materials from piling, dredging and increased wave wash (from associated works including navigation);

- Changes to local topography and/or drainage infrastructure. Such changes may alter existing drainage patterns within catchments and provide potential pathways for pollution;
 - Changes to groundwater levels, flow pathways and/or water quality arising from construction activities. These impacts would primarily be associated with dewatering, earthworks and intrusive investigation works creating new flow paths for groundwater;
 - Impacts on receiving surface water and/or groundwater quality from the leaching of contaminants from soils into groundwater during construction;
 - Increased fluvial flood risk associated with temporary works (e.g. construction laydown areas or stockpiles or the construction of the quay); and
 - Changes to surface water flow paths and/or land drainage systems that could modify drainage and increase flood risk.
- 6.4.1 It is likely that the above effects on water quality and quantity would be largely mitigated through the implementation of detailed CEMP(s) by the Contractor.
- 6.5.1 An assessment of the potential significant effects to the water environment and flood risk throughout the Construction Phase is summarised in Table 12.6. The magnitude of impact and significant effects considers the impacts and effects post-embedded mitigation (without additional mitigation).

Table 12.6 Summary of construction and decommissioning effects

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
Changes to water quality within the River Tees associated with jetty demolition and quay construction works, with potential increase in turbidity and release of pre-existing potentially contaminated materials from piling, dredging and increased wave wash (from associated works including navigation)	River Tees Water River Tees Tees WFD Water Body Tees Coastal WFD Water Body Designated sites	High	The construction of the new quay will require the demolition of the two existing jetties and removal of the existing revetment. The quay construction works will include capital dredging for the berthing pocket at the quay and access channel and will also involve percussive piling. Dredging works are already routinely carried out across the Tees and the effects of dredging from the Proposed Development are expected to have a negligible impact.	Negligible	Minor (Not Significant) (Temporary)
Potential damage, degradation or loss of habitats within designated conservation sites, from activities as a result of increased navigation and previous contaminant release from seabed associated with piling or capital dredging			In addition, best practice will be required to minimise impacts to water quality, fish and habitats, for example through use of low turbidity dredging techniques to reduce sediment dispersal,		

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
			preventing accidental extraction of fish and scheduling major dredging works to avoid key ecological periods. Material dredged during quay construction will be disposed of offshore by deposit at a disposal site carrying reference TY150– "Tees Bay C" if acceptable to the Marine Management Organisation. Otherwise, dredged material may be disposed of at an onshore permitted landfill site. It is possible that if some of the dredged material includes previously undisturbed and uncontaminated siltstone this could be used as fill material to raise site levels following appropriate testing.		

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
Degradation of surface water quality, as work within/near to watercourses has the potential to discharge sediment-laden runoff into watercourses. In addition, there is risk of accidental spillage of pollutants (e.g. fuel leakage from the storage of plant) and potential leaching of contaminants from soils.	River Tees Water River Tees Tees WFD Water Body Tees Coastal WFD Water Body Designated sites	High	During construction, a temporary surface water drainage strategy will be incorporated to limit any contaminated run-off from entering surface watercourses. Rainfall runoff from areas where there is a risk of contamination will be managed using temporary drainage systems and/ or tankered offsite for treatment (including settlement of suspended solids and/or oil interceptors) prior to discharge to local watercourses with the approval of the EA pursuant to a discharge license. The drainage systems will incorporate pollution control systems designed in line with the Control of Water Pollution from Construction Sites – Guidance for consultants and contractors C532 or as agreed with the relevant	Negligible	Minor (Not Significant) (Temporary)
	Ordinary Watercourses	Medium			Negligible (Not Significant) (Temporary)
	Holme Fleet	Medium			Negligible (Not Significant) (Temporary)
	Drains	Negligible			Negligible (Not Significant) (Temporary)
	Ponds	High			Minor (Not Significant) (Temporary)

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
			authorities. Foul flows and effluent arising from the Proposed Development will be kept separate from the surface drainage network. Best practice construction mitigation measures outlined in the fCEMP will also be implemented.		
Impacts to the groundwater quantity (level and flow) and quality, as a result of a significant amount of piling required to build the quay and the Main Site	Mercia Mudstone (Secondary B aquifer)	Low	As part of the detailed design, an assessment of potential risks associated with foundations, ground improvement methods or piling with respect to human health and controlled waters will be undertaken. The piling risk assessment will be submitted to the Local Planning Authority in consultation with the EA and Natural England as applicable/appropriate, prior to commencement of piling works. Piled foundations would be installed within the Main	Low	Negligible (Not Significant) (Temporary)
Impacts to groundwater quantity (level and flow) and quality from dewatering activities.	Superficial Deposits (Secondary undifferentiated aquifer)	Low		Low	Negligible (Not Significant) (Temporary)
	Mercia Mudstone (Secondary B aquifer)	Low		Negligible	Negligible (Not Significant) (Temporary)
	Sherwood Sandstone	High		Negligible	Negligible (Not Significant) (Temporary)

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
	(Principal aquifer)		Site the foundation design would be confirmed following ground investigation. It is assumed that as a worst-case piled foundations would extend into the underlying Mercia Mudstone bedrock. Given the significant depth to the Sherwood Sandstone beneath the Main Site piled foundations will not extend into the Principal Aquifer.		
Potential indirect impact to groundwater quality through site activities	GWDTE – The Tees and Cleveland Coast Ramsar/SSSI sites including Dorman's Pool and Saltholme Nature Reserves.	High		Negligible	Minor (Not Significant) (Temporary)
	Licensed Abstractions	Medium		Negligible	Negligible (Not Significant) (Temporary)
	Unmapped receptors (such as private water supplies)	Low-Negligible	Best practice construction mitigation measures outlined in the fCEMP will be implemented.	Negligible	Negligible (Not Significant) (Temporary)
Potential reduction in water level impacting groundwater dependent receptors due to potential dewatering	GWDTE – The Tees and Cleveland Coast Ramsar/SSSI sites including Dorman's Pool and Saltholme Nature	High	Temporary dewatering may be required during construction; however this would be non-consumptive and temporary in nature, and would be undertaken in accordance with	Negligible	Minor (Not Significant) (Temporary)
	Licensed Abstractions	Medium		Negligible	Negligible

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
			relevant consents required by the EA.		(Not Significant) (Temporary)
	Unmapped receptors (such as private water supplies)	Low-Negligible		Negligible	Negligible (Not Significant) (Temporary)
Increased flood risk from temporary construction works within/adjacent to the floodplain.	Flood risk receptors: People, property and the infrastructure in the Proposed Development and surrounding area	High-Medium	The majority of the Proposed Development is not located within Flood Zones 2 and 3, except for the works located within the River Tees. Best practice construction mitigation measures outlined in the fCEMP will be implemented.	Negligible	Minor (Not Significant) (Temporary)
Changes to surface water flow paths and land drainage systems could modify drainage and increase flood risk	Flood risk receptors: People, property and the infrastructure in the Proposed Development and	High-Medium	A temporary surface water drainage strategy will be implemented during construction to maintain existing drainage pathways, manage runoff and prevent uncontrolled	Negligible	Minor (Not Significant) (Temporary)

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
	surrounding area		discharge from the Main Site.		
Potential damage, obstruction or modification of existing flood defence infrastructure, as well as potential changes in flood extents and/or depths	Flood risk receptors: People, property and the infrastructure in the Proposed Development and surrounding area	High-Medium	Existing flood defence infrastructure will be retained and maintained during construction of the Proposed Development will no expected change to form or function. Works within 16m of flood defences will be subject to a FRAP. Consideration will also be given to maintenance access requirements during construction.	Negligible	Minor (Not Significant) (Temporary)
Reduction in channel capacity (flood risk) due to piling in the River Tees.	Flood risk receptors: People, property and the infrastructure in the Proposed Development and surrounding area	High	Existing flood defence infrastructure will be retained during construction of the Proposed Development with no expected change to form or function.	Negligible	Minor (Not Significant) (Temporary)

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
Potential for increase in flood risk as the construction activities required for the quay (dredging) will result in the movement of a significant amount of sediment	Flood risk receptors: People, property and the infrastructure in the Proposed Development and surrounding area	High	Works within 16m of flood defences will be subject to a FRAP. Consideration will also be given to maintenance access requirements during construction.	Negligible	Minor (Not Significant) (Temporary)
Potential damage, obstruction or modification of existing flood defence to construct the quay.	Flood risk receptors: the Proposed Development and surrounding area	High		Negligible	Minor (Not Significant) (Temporary)
Increased flood risk from decommissioning works in the Main Site within/adjacent to the floodplain	Flood risk receptors: People, property and the infrastructure in the Proposed Development and surrounding area	High	Site levels will be maintained throughout operation and following decommissioning. Decommissioning works will take account of the flood risk and climate change allowances applicable at the time, including any future designation of the Main Site within Flood Zone 2 or Flood Zone 3. Appropriate mitigation	Negligible	Minor (Not Significant) (Temporary)

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
			will be determined through a site-specific flood risk assessment undertaken as part of the decommissioning process.		

Operational phase impacts

- 6.6.1 Operational is defined as the post-construction phase of the Proposed Development, including maintenance activities. The duration of the Operational phase is from commissioning until there is additional development or until the Proposed Development ceases to operate.
- 6.7.1 Potential operational phase impacts are:
- Permanent impact to the hydromorphological and ecological quality of water features associated with works within the quay;
 - Changes to water quality (including resuspension of sediment bound contaminants) within the River Tees associated with operational navigation (including from wave wash disturbing sediment) and a larger area where maintenance dredging is required;
 - Potential increases in nutrient loading within the nutrient neutrality catchment arising from the Proposed Development through changes in land use, could contribute to increased nutrient inputs to downstream watercourses and associated designated sites;
 - Permanent impacts to catchment hydrology and/or hydrogeology caused by the introduction of a barrier to river flow, surface water and/or groundwater connectivity;
 - Increased flood risk to the Proposed Development and to people and property elsewhere caused by the new quay affecting flood flow conveyance; and
 - Potential increase to flood risk to the Proposed Development and to third-party receptors (people, property and/or infrastructure) elsewhere due to floodplain displacement and/or increased rates and/or volumes of surface water runoff from an increase in impermeable area.
- 6.8.1 An assessment of the potential significant effects to the water environment and flood risk throughout the Operational Phase is summarised in Table 12.7. The magnitude of impact and significant effects considers the impacts and effects post-embedded mitigation (without additional mitigation).
- 6.9.1 As treated process water would be discharged outside the Tees Estuary WFD catchment, there are no identified direct impacts to the Tees Water Body or its tributaries from operational discharges. No significant adverse effects to the Tees Coastal body from operational discharge of treated effluent 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.

- 6.10.1 Residual WFD effects are therefore limited to indirect or localised impacts associated with permanent infrastructure (e.g. quay construction, dredging, and pipelines), which may lead to minor, localised hydromorphological changes and short-term sediment disturbance.
- 6.11.1 The removal of the existing jetty, 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.
- 6.12.1 Dredging works required for the construction of the Proposed Scheme will result in permanent hydromorphological changes to the River Tees riverbed. This will be maintained through the operation of the scheme, 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. Best practice will be required to minimise impacts to fish and habitats, for example through use of low turbidity dredging techniques to reduce sediment dispersal, 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.
- 6.13.1 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.
- 6.14.1 Increased vessel movements associated with operation of the new quay may result in minor localised effects on the hydrodynamics of the River Tees. However, given that navigation activities would occur within an already heavily modified and commercially navigated estuarine environment, any effects are not expected to result in significant impacts.
- 6.15.1 These effects are small in scale relative to the heavily modified estuarine system and, with embedded mitigation, are not expected to affect WFD status at the water body scale.
- 6.16.1 Discharges to the Tees Coastal Water Body would increase nutrient loading and physico-chemical impacts to the marine catchment. However, these are expected to be sufficiently dispersed and diluted under coastal conditions, resulting in negligible effects on physico-chemical, biological, and chemical status elements.

- 6.17.1 Overall, the Proposed Development is not anticipated to cause deterioration or prevent achievement of WFD objectives.
- 6.18.1 Treated process effluent from the Proposed Development is planned to be discharged via the Bran Sands LSO to Tees Bay, outside the Teesmouth and Cleveland Coast SPA/Ramsar nutrient neutrality catchment. As a result, the only pathway contributing to nitrogen loading within the catchment will be land use change within the Proposed Development. Domestic and sanitary wastewater and other offsite-treated nutrient pathways are screened out as they will not re-enter the catchment.
- 6.19.1 The proposed redevelopment of the Site would increase annual nitrogen export from surface water runoff by 13.40kg TN/year, including a 20% precautionary uplift as required in NE guidance. Overall, although there is a measurable increase in nutrient loading to the Tees as a result of land use change from the Proposed Development, this is limited in magnitude and can be offset through mitigation measures, enabling the scheme to achieve nutrient neutrality and avoid adverse effects on site integrity.
- 6.20.1 Impacts to groundwater receptors would be no greater than those encountered during construction and limited to maintenance activities.
- 6.21.1 The Proposed Development adopts a tiered flood resilience approach. The Main Site will be maintained at a minimum ground level of 5.08 mAOD, with more sensitive infrastructure elevated to a minimum of 5.38 mAOD or 5.68 mAOD depending on vulnerability. The proposed quay will be constructed at a minimum of 5.65 mAOD. These levels provide protection above the modelled design flood events, including future climate change allowances, and are intended to ensure that essential infrastructure remains operational throughout the design life of the development.
- 6.22.1 Wave hazard at the site boundaries to the north and south ends of the quay have been assessed as being a risk to pedestrians during flooding within the 30 year worst case operational life of the Proposed Development. This will be mitigated by low level (<0.30m high) wave defences. Higher wave hazards are identified after the operational life, however, the assessment concludes that the risk is likely to be conservative due to the sheltered nature of the Main Site and the protection afforded by existing surrounding development. A managed adaptive approach is therefore proposed, whereby monitoring is undertaken and additional physical mitigation can be implemented in the future if required.
- 6.23.1 Assessment of exceedance and breach scenarios indicates that residual flood risk to the Main Site is low. Breach modelling of the Greatham Creek and Port Clarence defences demonstrated maximum flood levels that

remain more than 1 m below existing Main Site ground levels, with additional freeboard provided through proposed ground raising. Although extreme breach events could temporarily affect surrounding roads and isolate the Main Site, flood depths and velocities remain relatively low and it is proposed that risk would be managed through a site-specific Flood Warning and Evacuation Plan which identifies safe access and egress in times of flood.

- 6.24.1 Hydraulic modelling indicates that the Proposed Development will not result in any material increase in flood levels, flood extents or flood risk elsewhere within the wider Tees Estuary. Differences between baseline and post-development scenarios are generally negligible, with most changes measured at less than 1 mm and no meaningful changes in flood frequency, flood hazard, or floodplain extent identified.
- 6.25.1 An Operational Surface and Foul Water Drainage Strategy will be implemented in line with the principles of the **Framework Drainage Strategy (Appendix to the FRA (Application Document Ref. 5.7))**. This strategy will be designed to ensure runoff is managed within the Main Site boundary and that flood risk is not increased elsewhere.

Table 12.7 Summary of operational effects

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
Changes to water quality (including suspension of sediment bound contaminants) within the River Tees associated with operational navigation (resulting from wave wash disturbing sediment) and dredging maintenance.	River Tees Tees WFD Water Body Tees Coastal WFD Water Body Designated sites	High	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. Best practice will be required to minimise impacts to fish and habitats, for example through use of low turbidity dredging techniques to reduce sediment dispersal, preventing accidental extraction of fish and scheduling major dredging works to avoid key ecological periods. PD Ports, as the Statutory Harbour Authority for the Tees Estuary, is responsible for maintaining navigable depths through routine maintenance dredging. Any potential increase in dredging requirements resulting from the new quay is expected to be minimal and would be managed within the existing maintenance dredging and offshore disposal regimes regulated by the MMO. Increased vessel movements associated with operation of the new quay may result in minor localised effects on the hydrodynamics of the River Tees. However, given that navigation activities would occur within an already heavily modified and commercially navigated estuarine environment, any impacts are not expected to result in significant effects.	Negligible	Minor (Not Significant)
Potential changes in hydrodynamics on the River Tees as a result of an increase in artificial banks (as			While the quay and any associated scour protection will result in permanent changes to the hydrodynamics of the River Tees, impacts are expected to be small in extent and localised to the new quay wall. Any effects to the	Negligible	Minor (Not Significant)

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
mitigation to accommodate the new quay). This will influence hydrodynamics, with potential to increase erosion up and/or downstream			Tees Water Body are thus not expected to result in significant effects.		
Discharge of foul and effluent water that could cause deterioration of the receiving waterbody	River Tees Tees WFD Water Body Tees Coastal WFD Water Body Designated sites	High	As process water would be discharged outside the Tees Estuary WFD catchment, there are no identified direct effects on the Tees Water Body or its tributaries from operational discharges nor impacts to designated sites. No significant adverse effects on the Tees Coastal body from operational discharge of treated effluent to the Tees WFD for Biological, Physico-chemical, Specific Pollutants and Chemical impacts from are expected due to dispersion, dilution and tidal exchange within the coastal system.	Negligible	Minor (Not Significant)
			For surface water, site drainage systems will collect surface water and direct it to the network of attenuation ponds where it will be tested prior to being pumped and discharged to the Tees via a new extension of the existing outfall incorporated into the quay. In the event of contamination, the water would be directed to the onsite treatment plant for further processing before export by pipeline to Bran Sands WwTW.	Negligible	Minor (Not Significant)
			Site drainage systems will collect surface water and direct it to the network of attenuation ponds where it will be tested prior to being pumped and discharged to the Tees via a new extension of the existing outfall incorporated into the quay. In the event of contamination	Negligible	Minor (Not Significant)

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
			the water would be directed to the onsite treatment plant for further processing before export by pipeline to Bran Sands WwTW.		
Potential increases in nutrient loading within the nutrient neutrality catchment arising from the Proposed Development, including through treated effluent discharges or changes in land use, could contribute to elevated nutrient inputs to downstream watercourses and associated designated sites.	River Tees Tees WFD Water Body Designated sites	High	Treated wastewater from the Proposed Development will be discharged via the LSO to the North Sea, outside the nutrient neutrality catchment. As a result, nutrient-related effects on the Teesmouth and Cleveland Coast SPA/Ramsar site will be avoided. The LSO will discharge to the Tees Coastal Water Body and is designed to prevent additional nutrient loading to the Tees Estuary. Potential increases in nutrient loading arising from land use change associated with the Proposed Development will be mitigated through land fallowing measures.	Negligible	Minor (Not Significant)
Degradation of surface water quality as a result of accidental spillage of pollutants (e.g. fuel leakage from the storage of plant).	River Tees Tees Water Body WFD	High	Site drainage systems will collect surface water and direct it to the network of attenuation ponds where it will be tested prior to being pumped and discharged to the Tees via a new extension of the existing outfall incorporated into the quay. In the event of contamination, the water would be directed to the onsite treatment plant for further processing before export by pipeline to Bran Sands WwTW.	Negligible	Minor (Not Significant)
	Ordinary Watercourses	High			Minor (Not Significant)
	Drains	Negligible			Negligible (Not Significant)
	Ponds	Medium			Negligible (Not Significant)

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
Increased flood risk from changes to flood flow conveyance and storage to third party receptors.	Flood risk receptors: People, property and the infrastructure in the Proposed Development and surrounding area	High-Medium	Drainage design will incorporate the principles of the Framework Drainage Strategy (Annex A.3 in FRA (Application Document Ref. 5.7)), ensuring that runoff rates and volumes are controlled and that there is no increase in flood risk elsewhere, in accordance with relevant policy and regulatory requirements. Hydraulic modelling indicates that the Proposed Development will not result in any material increase in flood levels, flood extents or flood risk elsewhere within the wider Tees Estuary. Differences between baseline and post-development scenarios are generally negligible, with most changes measured at less than 1 mm and no meaningful changes in flood frequency or floodplain extent identified.	Negligible	Minor (Not Significant)
Increased flood risk from increased rates and volumes of surface water runoff from an increase in impermeable area.	Flood risk receptors: People, property and the infrastructure in the Proposed Development and surrounding area	High-Medium	As above, drainage design will incorporate the principles of the Framework Drainage Strategy (Annex A.3 in FRA (Application Document Ref. 5.7)), ensuring that runoff rates and volumes are controlled and that there is no increase in flood risk elsewhere, in accordance with relevant policy and regulatory requirements.	Negligible	Minor (Not Significant)
Potential for increase in flood risk as the quay will require routine maintenance	Flood risk receptors: People, property and the	High-Medium	Dredging activities are routinely undertaken within the River Tees to maintain navigation channels. The scale of dredging associated with the Proposed Development would be small relative to existing and ongoing dredging activities within the wider estuary and in relation to the	Negligible	Minor (Not Significant)

Potential Effect	Receptor	Receptor Sensitivity	Embedded Mitigation Measures	Magnitude of Impact	Significance of Effect
dredging. This will result in the movement of a significant amount of sediment. Dredging typically alters hydrodynamics (river flow and water levels) upstream and/or downstream, with potential to change flood risk	infrastructure in the Proposed Development and surrounding area		River Tees. Sensitivity to large scale changes in the River Tees has been demonstrated to be very low by hydraulic modelling in FRA (Application Document Ref. 5.7) . Consequently, any changes to water levels, flow conveyance, or flood risk are expected to be localised, and not significant.		
Potential for an increased flood risk on third party land from increased rates and volumes of fluvial runoff from an increase in impermeable area.	Flood risk receptors: People, property and the infrastructure in the Proposed Development and surrounding area	High-Medium	Hydraulic modelling indicates that the Proposed Development will not result in any material increase in flood levels, flood extents or flood risk elsewhere within the wider Tees Estuary. Differences between baseline and post-development scenarios are generally negligible, with most changes measured at less than 1 mm and no meaningful changes in flood frequency or floodplain extent identified.	Negligible	Minor (Not Significant)

12.7 Mitigation and enhancement measures

- 7.1.1 The assessment has concluded that there are no likely significant effects in relation to the water environment. Therefore, no additional mitigation measures are required beyond the embedded mitigation and good practice measures outlined in section 12.5.

Monitoring

- 7.2.1 There are no likely significant adverse effects related to the water environment assessment identified either during construction, operation or decommissioning that require monitoring. However, as is good practice, monitoring will be undertaken pre, during and post construction.
- 7.3.1 A water quality monitoring sampling plan will be undertaken under a Requirement to the DCO. It should be undertaken prior to and during construction works.
- 7.4.1 Operational water monitoring will be confirmed as the design develops and will be secured through the site's Environmental Permit.
- 7.5.1 A site-specific sediment quality survey was undertaken in the River Tees close to the proposed quay during April 2026 and results are reported in the Freshwater and Marine Ecology chapter of the ES (**Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**).

12.8 Residual effects and conclusions

- 8.1.1 The assessment presented in Section 12.6 concludes no significant effects on the water environment, after embedded and good practice mitigation has been taken into account. No additional mitigation is proposed or required, therefore the residual effects are the same as reported in Sections 12.6.

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modest amounts of water, and their structure limits their use, although they remain important for rivers, wetlands, and private water supplies in rural areas.

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