DOGGER BANK D
WIND FARM

Preliminary Environmental Information Report

Volume 2

Appendix 21.4 Water Environment Regulations Compliance Assessment

Document Reference No: 2.21.4 **Date**: June 2025 **Revision**: V1

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Document Title: **Volume 2, Appendix 21.4 Water Environment Regulations Compliance Assessment**	Document BIM No. **PC6250-RHD-XX-ON-RP-EV-0079**
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Revision No.	Date	Status / Reason for Issue	Author	Checked by	Approved by
V1	23/05/2025	Final	SF	AT	AT

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Glossary

Term	Definition
Additional Mitigation	Measures identified through the EIA process that are required as further action to avoid, prevent, reduce or, if possible, offset likely significant adverse effects to acceptable levels (also known as secondary (foreseeable) mitigation). All additional mitigation measures adopted by the Project are provided in the Commitments Register.
Birkhill Wood Substation	The onshore grid connection point for DBD identified through the Holistic Network Design process. Birkhill Wood Substation which is being developed by National Grid Electricity Transmission and does not form part of the Project.
Commitment	Refers to any embedded mitigation and additional mitigation, enhancement or monitoring measures identified through the EIA process and those identified outside the EIA process such as through stakeholder engagement and design evolution. All commitments adopted by the Project are provided in the Commitments Register.
Design	All of the decisions that shape a development throughout its design and pre-construction, construction / commissioning, operation and, where relevant, decommissioning phases.
Development Consent Order (DCO)	A consent required under Section 37 of the Planning Act 2008 to authorise the development of a Nationally Significant Infrastructure Project, which is granted by the relevant Secretary of State following an application to the Planning Inspectorate.
Effect	An effect is the consequence of an impact when considered in combination with the receptor's sensitivity / value / importance, defined in terms of significance.
Embedded Mitigation	Embedded mitigation includes: • Measures that form an inherent part of the project design evolution such as modifications to the location or design of the development made during the pre-application phase (also known as primary (inherent) mitigation); and • Measures that will occur regardless of the EIA process as they are imposed by other existing legislative requirements or are considered as standard or best practice to manage commonly occurring environmental impacts (also known as tertiary (inexorable) mitigation). All embedded mitigation measures adopted by the Project are provided in the Commitments Register.
Energy Storage and Balancing Infrastructure (ESBI)	A range of technologies such as battery banks to be co-located with the Onshore Converter Station, which provide valuable services to the electrical grid such as storing energy to meet periods of peak demand and improving overall reliability.
Enhancement	Measures committed to by the Project to create or enhance positive benefits to the environment or communities, as a result of the Project. All enhancement measures adopted by the Project are provided in the Commitments Register.
Environmental Impact Assessment (EIA)	A process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information and includes the publication of an Environmental Statement.
Environmental Statement (ES)	A document reporting the findings of the EIA which describes the measures proposed to mitigate any likely significant effects.
Grid Connection	The offshore and onshore electricity transmission network connection to Birkhill Wood Substation.
Haul Roads	Temporary tracks set aside to facilitate transport access during onshore construction works.
Impact	A change resulting from an activity associated with the Project, defined in terms of magnitude.
Jointing Bays	Underground structures constructed at regular intervals along the onshore export cable corridor to facilitate the joining of discrete lengths of the installation of cables.
Landfall	The area on the coastline, south-east of Skipsea, at which the offshore export cables are brought ashore, connecting to the onshore export cables at the transition joint bay above Mean High Water Springs.
Link Boxes	Structures housing electrical equipment located alongside the jointing bays in the onshore export cable corridor and the transition joint bay at the landfall, which could be located above or below ground.
Mitigation	Any action or process designed to avoid, prevent, reduce or, if possible, offset potentially significant adverse effects of a development. All mitigation measures adopted by the Project are provided in the Commitments Register.

Term	Definition
Mitigation Hierarchy	A systematic approach to guide decision-making and prioritise mitigation design. The hierarchy comprises four stages in order of preference and effectiveness: avoid, prevent, reduce and offset.
Monitoring	Measures to ensure the systematic and ongoing collection, analysis and evaluation of data related to the implementation and performance of a development. Monitoring can be undertaken to monitor conditions in the future to verify any environmental effects identified by the EIA, the effectiveness of mitigation or enhancement measures or ensure remedial action are taken should adverse effects above a set threshold occur. All monitoring measures adopted by the Project are provided in the Commitments Regi
Onshore Converter Station (OCS)	A compound containing electrical equipment required to stabilise and convert electricity generated by the wind turbines and transmitted by the export cables into a more suitable voltage for grid connection into Birkhill Wood Substation.
Onshore Converter Station (OCS) Zone	The area within which the Onshore Converter Station and Energy Storage and Balancing Infrastructure will be located in vicinity of Birkhill Wood Substation.
Onshore Development Area	The area in which all onshore infrastructure associated with the Project will be located, including any temporary works area required during construction and permanent land required for mitigation and enhancement areas, which extends landward of Mean Low Water Springs. There is an overlap with the Offshore Development Area in the intertidal zone.
Onshore Export Cable Corridor (ECC)	The area within which the onshore export cables will be located, extending from the landfall to the Onshore Converter Station zone and onwards to Birkhill Wood Substation.
Scoping Opinion	A written opinion issued by the Planning Inspectorate on behalf of the Secretary of State regarding the scope and level of detail of the information to be provided in the Applicant's Environmental Statement. The Scoping Opinion for the Project was adopted by the Secretary of State on 02 August 2024.
Scoping Report	A request by the Applicant made to the Planning Inspectorate for a Scoping Opinion on behalf of the Secretary of State. The Scoping Report for the Project was submitted to the Secretary of State on 24 June 2024.

Term	Definition
Temporary Construction Compounds	Areas set aside to facilitate the construction works for the onshore infrastructure, which include the landfall construction compound, main and intermediate construction compounds for onshore export cable works and OCS and ESBI construction compounds.
The Applicant	SSE Renewables and Equinor acting through 'Doggerbank Offshore Wind Farm Project 4 Projco Limited'.
The Project	Dogger Bank D (DBD) Offshore Wind Farm Project, also referred to as DBD in this PEIR.
Transition Joint Bay (TJB)	An underground structure at the landfall that houses the joints between the offshore and onshore export cables.
Trenching	Open cut method for cable or duct installation.
Trenchless Techniques	Trenchless cable or duct installation methods used to bring offshore export cables ashore at landfall, facilitate crossing major onshore obstacles such as roads, railways and watercourses and where trenching may not be suitable. Trenchless techniques included in the Project Design Envelope include Horizontal Directional Drilling (HDD), auger boring, micro-tunnelling, pipe jacking / ramming and Direct Pipe.

21.4 Water Environment Regulations Compliance Assessment

21.4.1 Introduction

1. This appendix to the Dogger Bank D Offshore Wind Farm (hereafter 'the Project' or 'DBD') Preliminary Environmental Information Report (PEIR) supports **Volume 1, Chapter 21 Water Resources and Flood Risk**. This appendix forms part of the PEIR for the onshore and offshore (to the edge of the coastal water body) elements of the Project.

2. The purpose of this appendix is to determine whether the Project is compliant with the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (hereafter 'the Water Environment Regulations' (WER)). The Regulations continue to enforce 'Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for community action in the field of water policy' following the UK's withdrawal from the European Union (EU) under the terms of the Floods and Water (EU Exit) Regulations 2019.

21.4.2 Approach to Assessment

3. A published methodology for undertaking WER compliance assessments across all types of water bodies is not available. However, the following relevant guidance and case law exists to support the assessment of various water body types:

   - Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Planning Inspectorate, 2024): This advice note provides an overview of the Water Framework Directive (WFD) and provides an outline methodology for considering the WER as part of the Development Consent Order Process;
   - Clearing the Waters for All: Water Framework Directive assessment – estuarine and coastal waters (Environment Agency, 2023a): Outlines a methodology for assessing impacts on transitional and coastal water bodies;
   - WFD risk assessment (Environment Agency, 2016): This provides information on how to assess the risk of a proposed activity; and
   - EUECJ C-461-13. Bund für Umwelt und Naturshutz Deutschland eV v Bundesrepublik Deutschland (Court of Justice of the European Union, 2015). This case confirms the detail around determining a deterioration in the status of a water body.

4. For the purposes of this assessment, the broad methodologies outlined in the guidance documents listed above have been brought together to develop an assessment methodology that can be used for strategies in all types of water body. The assessment process therefore covers the following stages, which are described in more detail in the subsequent sections:

   - Stage 1: Screening Assessment;
   - Stage 2: Scoping Assessment; and
   - Stage 3: Detailed Compliance Assessment.

21.4.2.1 Stage 1: Screening Assessment

5. This stage consists of an initial screening exercise to identify relevant water bodies in the proposed Onshore and Offshore Development Areas. Water bodies would be selected for inclusion in the compliance assessment using the following criteria, with reference to the Humber River Basin District Management Plan (RBMP), as presented in the online Catchment Data Explorer (Environment Agency, 2023b):

   - All surface water bodies that could potentially be directly impacted by the Project – including coastal water bodies crossed by the Offshore Development Area out to one nautical mile (the assessment for DBD extends to the edge of the coastal water body at approximately 2 km (1.08 nautical miles);
   - Any surface water bodies that have direct connectivity (e.g. downstream) that could potentially be affected by the Project; and
   - Any groundwater bodies that underlie the Project.

6. The screening results are included in **Section 21.4.3**. Surface water bodies and groundwater bodies are shown in **Figure 21.4-1** and **Figure 21.4-2** respectively.

21.4.2.2 Stage 2: Scoping Assessment

7. This stage identifies whether there is potential for deterioration in water body status or failure to comply with objectives for any of the water bodies identified in Stage 1. This stage considers potential non-temporary impacts of the Project and impacts on critical or sensitive habitats. Potential impacts on improvement and mitigation measures (identified for artificial or heavily modified water bodies (A/HMWB) to achieve status targets) in the RBMP are also evaluated.

8. Water bodies and activities can be scoped out of further assessment if it can be satisfactorily demonstrated that there would be no impacts. If impacts are predicted, it would be necessary to undertake a detailed compliance assessment. The water body and activity under assessment would be progressed to the detailed compliance assessment (Stage 3) if potential impacts on quality elements cannot be ruled out.

9. The scoping assessment results are included in **Section 21.4.4**.

21.4.2.3 Stage 3: Detailed Compliance Assessment

10. If appropriate, a Stage 3 impact assessment would consider whether any activities that have been carried forward from Stage 2 would cause deterioration, and whether any such deterioration would have a significant effect on the status of one or more quality elements at water body level.

11. Potential measures to avoid effects or achieve reasonable improvements would be investigated if it is established that:

- The Project is likely to affect status at water body level (that is, by causing deterioration in status or by preventing achievement of objectives and the implementation of mitigation measures for A/HMWBs); and
- An opportunity may exist to contribute to improving status at a water body level.

12. Where applicable, this stage considers such measures and, where necessary, evaluates them in terms of cost and proportionality in relation to the scale of the proposed activity and the nature of any impacts.

13. The results of the detailed compliance assessment are included in **Section 21.4.5**.

21.4.2.4 Determination of Deterioration

14. The Environment Agency has not issued detailed guidance on how deterioration in the status of water bodies should be assessed. If the potential for a deterioration in water body status is identified, the assessment would draw upon the following relevant guidance documents (note that some of these documents refer to the WFD rather than WER as they predate the Floods and Water (EU Exit) Regulations 2019):

- The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015: Provides the most up to date standards used to determine the ecological and chemical status of surface water bodies, and the quantitative and chemical status of groundwater;
- UKTAG (2011) Defining and Reporting on Groundwater Bodies: Provides information on the approaches used to classify groundwater bodies;
- Joint Defra/Environment Agency Flood and Coastal Erosion Risk Management Research and Development Programme (2009) WFD Expert Assessment of Flood Management Impacts: Provides a framework for the assessment of changes to hydromorphology;
- UKTAG (2003) Guidance on Morphological Alterations and the Pressures and Impacts Analyses: Provides additional information on hydromorphological pressures;
- WFD risk assessment (Environment Agency, 2016): Provides an assessment of the level of risk of deterioration in water body status associated with different activities, based upon activity type and risk screening thresholds;
- Clearing the Waters for All: Water Framework Directive assessment – estuarine and coastal waters (Environment Agency, 2023a): Outlines a methodology for assessing impacts on transitional and coastal water bodies.

15. The assessment considers the potential for deterioration in water body status between classes, within classes, and including temporary deterioration. Where deterioration is not predicted, the activity would also be considered against the water body objectives to ensure the achievement of status objectives, i.e. Good Ecological Status (GES) or Good Ecological Potential (GEP) would not be prevented.

21.4.2.5 Approach to Decommissioning

16. No decision has yet been made regarding the final decommissioning policy for the onshore and offshore project infrastructure. It is recognised that legislation and industry best practice change over time.

17. The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and would be agreed with the regulator. It is anticipated that for the purposes of a worst-case scenario, the impacts would be no greater than those identified for the construction phase.

18. For the purposes of this assessment, it is assumed that:

- The same water bodies screened into the assessment for construction and operation would also be affected during decommissioning. No additional water bodies would be affected;
- Scoping answers would be the same for decommissioning as for construction and operation. No additional quality elements for any water bodies would be scoped in or out; and
- Detailed compliance assessment results and overall conclusions would be the same for decommissioning as for construction and operation.

21.4.2.6 Regulation 19 Assessment

19. In the unlikely event that no suitable measures can be identified to mitigate potential adverse impacts of the Project, it may be necessary to present a case for a derogation under Regulation 19 of the WER.

20. It should be noted that the Project would look to prevent deterioration in water body status in the first instance, e.g. through project design and, where necessary, the adoption of further mitigation measures, therefore avoiding the need for an application for an exemption under Regulation 19.

21. To determine the scope of any assessment required to demonstrate compliance with the requirements of Regulation 19, consultation with the Environment Agency would be required.

21.4.3 Screening

21.4.3.1 Proposed Activities

22. Full details of the construction and operational activities associated with the Project can be found in **Volume 1, Chapter 4 Project Description**. Full details of worst-case parameters for are presented in **Volume 1, Chapter 21 Water Resources and Flood Risk**.

23. A summary of different elements of the Project are provided below.

24. The key offshore components for this assessment comprise:

- Installation of the offshore export cables within the coastal water body. This includes construction of trenchless installation exit pits and installation of the offshore export cables; and
- The use of cable protection in the coastal water body if the cables cannot be buried.

25. The anticipated landfall trenchless drill exit would be 5 to 10m below the lowest astronomical tide (LAT), avoiding the intertidal zone. The entry pits for the trenchless installation will be located onshore. Open cut trenching is not proposed for landfall construction, rather a long trenchless installation exit in the subtidal zone will be used (see Commitment ID CO23, **Appendix 6.3 Commitments Register)**. This means there is no requirement for dewatering or temporary water exclusion using cofferdams or other similar temporary structures in the intertidal zone.

26. The offshore export cables will be installed using a combination of jetting, ploughing and trenching (jet assisted mechanical cutting), which have a maximum disturbance width of 15m.

27. Cable protection may take the form of rock placement, concrete mattresses, rock bags, and flow dissipation devices. The width of protection would be 10m.

28. The key onshore construction components for this assessment comprise:

- Construction at the landfall:
  - Indicative temporary landfall construction compound area: 12,500m^2 (including construction footprint of transition joint bay (TJB) and underground link box);
  - Maximum number of transition joint bay at landfall: 1;
  - Maximum horizonal length of trenchless installation: 2,000m; and
  - Anticipated duration of landfall construction works: approximately three years (including one year of trenchless installation works).
- Construction in the onshore ECC from the landfall to the OCS zone and onward connection to the National Grid substation at Birkhill Wood:
  - Maximum length of High Voltage Direct Current (HVDC) export cable corridor: 50km;
  - Maximum length of High Voltage Alternating Current (HVAC) export cable corridor: 5km;
  - Indicative temporary construction corridor width for HVDC onshore export cables: 32m (50m at trenchless crossing locations)
  - Indicative temporary construction corridor width for HVAC onshore export cables: 55m (60m at trenchless crossing locations)
  - Indicative number of main construction compounds for onshore export cable works: 4;
  - Indicative main construction compound area: 20,000m^2 (per compound);
  - Indicative number of intermediate construction compounds for onshore export cable works: 8;
  - Indicative intermediate construction compound area: 5,625m^2 (per compound);
  - Maximum land area temporarily disturbed during construction: 1,700,000m^2;
  - Indicative trenchless installation compound area for HVDC export cables: 300m^2 (5,625m^2 for non-HDD techniques) (per compound);
  - Indicative trenchless installation compound dimensions for HVAC export cables: 800m^2 (5,625m^2 for non-HDD techniques) (per compound);
  - Maximum number of trenches of HVDC onshore export cables: 2;
  - Maximum number of trenches of HVAC onshore export cables: 4;
  - Indicative width of cable trench at surface: 3m;
  - Target minimum cable burial depth using open cut trenching: 1.2m;
  - Indicative haul road width: 6m (8.5m where passing places are required); and
  - Anticipated duration of onshore export cable construction works: approximately four years.
- Construction of the OCS zone (OCS and ESBI):
  - Maximum developable area for OCS and ESBI: 25ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement);
  - Total temporary area: 4.5ha (including 2 temporary construction compounds for the OCS and ESBI);

- Total permanent area: 20.5ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement);
  - Indicative quantity of topsoil excavated within OCS zone: 100,000m^3 (assumed 50% of topsoil to be removed off-site – 50,000m^3);
  - Dewatering details: Pumped and discharged to temporary attenuation/settlement ponds or mechanical plant (e.g. siltbuster);
  - Indicative access road width (including site access road from the public highway and internal tracks within the site): 7.3m; and
  - Anticipated duration of OCS and ESBI construction works: approximately five years

29. The key onshore operational components for this assessment comprise:

- Landfall:
  - Maximum permanent TJB area: 30m^2; and
  - Maximum permanent underground link box area: 10m^2.
- Onshore ECC:
  - Jointing bay and associated link box locations would require periodic access by technicians for inspection and testing during operation and maintenance;
  - Indicative number of jointing bay locations along onshore ECC: 62; and
  - Indicative number of link box locations along onshore ECC: 56 (for the purposes of the PEIR assessment, it is assumed that at approximately 20 link box locations for the HVDC export cables and all link box locations for the HVAC export cables will involve the use of above-ground link boxes).
- OCS zone:
  - Staffing: Unmanned asset except for routine inspections, planned maintenance works and unplanned emergency maintenance works;
  - Maximum developable area for OCS and ESBI: 25ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement);
  - Total permanent area: 20.5ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement);
  - Indicative impermeable area (OCS): 2.2ha;
  - Indicative impermeable area (ESBI): 3.7ha; and
  - Anticipated duration of operation and maintenance (O&M) phase: approximately 35 years

30. Full details of worst-case parameters are presented in **Volume 1, Chapter 21 Water Resources and Flood Risk**. In **Section 21.4.3.2**, water bodies that could be affected by these activities are identified and screened in or out for further assessment.

21.4.3.2 Water Body Identification

31. Surface and groundwater bodies that could potentially be affected by the Project are shown in **Figure 21.4-1** and **Figure 21.4-2** and assessed in **Table 21.4-1**. Details of water body status are taken from the Environment Agency's Catchment Data Explorer (Environment Agency, 2023b). Water bodies have been screened into the assessment where there is potential for hydrological connectivity (direct or indirect) between the water body and construction and operational activities associated with the Project.

32. The ecological status (or ecological potential for A/HMWBs) is Moderate across the Onshore Development Area. Most water bodies are either artificial or heavily modified. The main pressures affecting water bodies are related to diffuse agricultural pollution, sewage discharges and physical modifications.

33. The chemical status of water bodies is not reported in **Table 21.4-1**. This is because all water bodies in England were assessed by the Environment Agency as Fail for chemical status in 2019 due to a group of global pollutants. These are polybrominated diphenyl ethers (PBDEs – a group of brominated flame retardants), mercury, certain polycyclic aromatic hydrocarbons (PAHs), and perfluorooctane sulfonate (PFOS – a group of per- and polyfluoroalkyl substances (PFAS)). No feasible technical solution exists to remove these chemicals entirely and they will take time to naturally drop to required levels; 2040 to 2063 is listed by the Environment Agency as the objective date for recovery for water bodies assessed in **Table 21.4-1**. The most recent update for chemical status (Cycle 3 (2022)) for all water bodies in England has therefore been classified as 'does not require assessment' by the Environment Agency.

Table 21.4-1 Water Body Screening Assessment

Water body name, ID, type and designation	Ecological Status / Potential	RNAG1 Activity	Classification elements affected	Screening decision
Barmston Sea Drain from Skipsea Drain to N Sea GB104026077780 River Artificial	Moderate	Poor nutrient management	Phosphate	Screened out because approximately 600m^2 of the catchment (0.009%) would be affected by the Project, which relates to a very short section of existing access track that would only be used in an emergency. No construction work would take place and onshore infrastructure would not be installed in this catchment. Impacts on water body status are therefore considered extremely unlikely.
		Private sewage treatment		
		Not applicable	Mercury and Its compounds PBDE	
Barmston Sea Drain / Skipsea Drain to Conf GB104026077770 River Not designated artificial or heavily modified	Moderate	Sewage discharge (continuous) Private sewage treatment	Macrophytes and Phytobenthos Combined	Screened in because components of the Project would be located within the catchment of this water body.
			Phosphate	
			Invertebrates	
		Sewage discharge (continuous)	Ammonia	
		Private sewage treatment	Dissolved oxygen	
		Not applicable	Mercury and Its compounds PBDE	
Old Howe / Frodingham Beck to R Hull GB104026067021 River Heavily modified	Moderate	Other (not listed but linked to physical modification)	Mitigation Measures Assessment	Screened in because components of the Project would be located within the catchment of this water body.
		Not applicable	Mercury and Its compounds PBDE	
Foredyke Stream Lower to Holderness Dr GB104026066910 River Artificial	Moderate	Land drainage Land leaching	Fish	Screened in because components of the Project would be located within the catchment of this water body.
		Poor nutrient management Sewage discharge (continuous)	Phosphate	
		Sewage discharge (continuous) Land leaching	Ammonia	
		Sewage discharge (continuous) Land drainage - operational management Landfill leaching	Dissolved oxygen	

[1] Reason for Not Achieving Good (water body status/potential)

Water body name, ID, type and designation	Ecological Status / Potential	RNAG1 Activity	Classification elements affected	Screening decision
		Other (not listed but linked to physical modification)	Mitigation Measures Assessment	
		Unknown (pending investigation)	PFOS	
		Not applicable	Mercury and Its compounds PBDE	
Mickley Dike Catchment GB104026066990 River Artificial	Moderate	Poor nutrient management Private sewage treatment Drought	Dissolved oxygen	Screened in because components of the Project would be located within the catchment of this water body.
		Other (not listed but linked to physical modification)	Mitigation Measures Assessment	
		Not applicable	Mercury and Its compounds PBDE	
Hull from West Beck to Arram Beck	Moderate	Land drainage - operational management	Fish	
GB104026067000 River Heavily modified		Other (not listed but linked to physical modification)	Mitigation Measures Assessment	Screened in because components of the Project would be located within the catchment of this water body.
		Not applicable	Mercury and Its compounds PBDE	
Holderness Drain Source to Foredyke Stream GB104026066950 River Artificial	Moderate	Not applicable (no sector responsible)	Phosphate	Screened in because components of the Project would be located within the catchment of this water body.
		Not applicable (no sector responsible)	Ammonia	
		Land drainage - operational management	Dissolved oxygen	
		Other (not listed but linked to physical modification)	Mitigation Measures Assessment	
		Not applicable	Mercury and Its compounds PBDE	
Beverley and Barmston Drain	Moderate	Land drainage - operational management	Phosphate	

Water body name, ID, type and designation	Ecological Status / Potential	RNAG1 Activity	Classification elements affected	Screening decision
GB104026067211 River Artificial		Riparian / in-river activities (inc. bankside erosion) Poor nutrient management		Screened in because components of the Project would be located within the catchment of this water body.
		Riparian / in-river activities (inc. bankside erosion) Poor nutrient management	Dissolved oxygen	
		Other (not listed but linked to physical modification)	Mitigation Measures Assessment	
		Not applicable	Mercury and Its compounds PBDE	
Bryan Mills Beck Source to Bryan Mills Farm GB104026066960 River Not designated artificial or heavily modified	Moderate	Poor soil management Sewage discharge (continuous)	Phosphate	Screened in because components of the Project would be located within the catchment of this water body.
		Other (not listed but linked to physical modification)	Mitigation Measures Assessment	
		Not applicable	Mercury and Its compounds	
			PBDE	
Scorborough Beck GB104026066901 River Not designated artificial or heavily modified	Moderate	Poor soil management Sewage discharge (continuous)	Macrophytes and Phytobenthos Combined	Screened in because components of the Project would be located within the catchment of this water body.
		Not applicable	Mercury and Its compounds PBDE	
Ella Dyke GB104026066941 River Heavily modified	Moderate	Sewage discharge (continuous) Unknown (pending investigation)	Phosphate	Screened in because components of the Project would be located within the catchment of this water body.
		Not applicable (no sector responsible)	Dissolved oxygen	
		Other (not listed but linked to physical modification)	Mitigation Measures Assessment	
		Not applicable	Mercury and Its compounds PBDE	

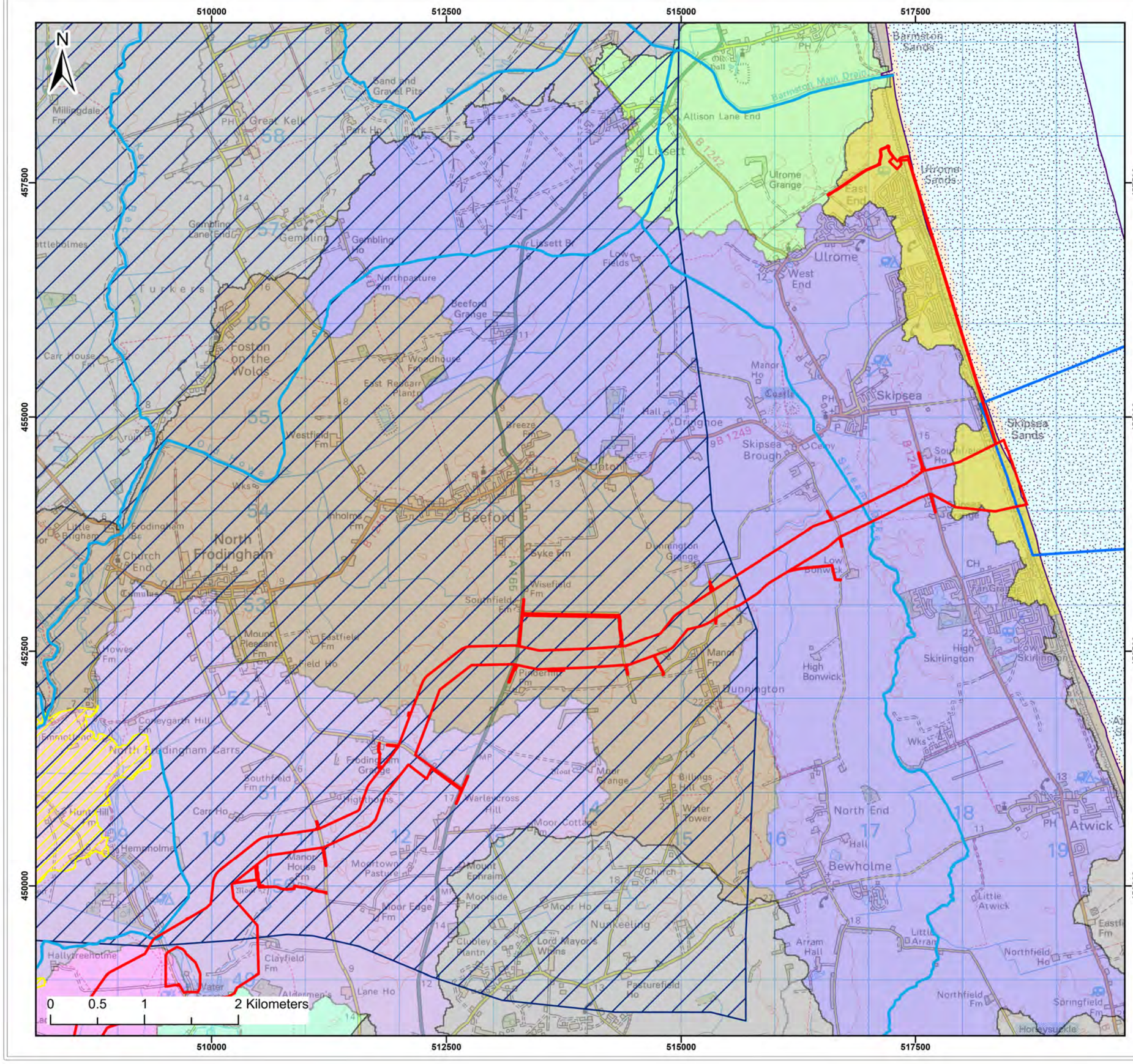
Water body name, ID, type and designation	Ecological Status / Potential	RNAG1 Activity	Classification elements affected	Screening decision
High Hunsley to Arram Area GB104026066841 River Artificial	Moderate	Not applicable (no sector responsible)	Ammonia	Screened in because components of the Project would be located within the catchment of this water body.
		Poor nutrient management	Phosphate	
		Other (not listed but linked to physical modification)	Mitigation Measures Assessment	
		Not applicable	Mercury and Its compounds PBDE	
		Unknown (pending investigation)	Benzo(g-h-i)perylene Benzo(k)fluoranthene Benzo(b)fluoranthene	
High Hunsley to Woodmansey Area GB104026066820 River Artificial	Moderate	Not applicable (No sector responsible)	Fish	Screened in because components of the Project would be located within the catchment of this water body.
		Not applicable	Mercury and Its compounds PBDE	
		Urbanisation - urban development	Invertebrates	
		Other (not listed but linked to physical modification)	Mitigation measures assessment	
		Not applicable	Mercury and Its compounds PBDE	
Leven Canal GB70410003 Canal Artificial	Moderate	Not applicable	Mercury and Its compounds PBDE	Screened in because components of the Project would be located within the catchment of this water body.
Yorkshire South GB640402491000 Coastal Heavily modified	Moderate	Physical modifications	Mitigation Measures Assessment	Screened in because offshore components of the Project will be located in this water body.
		Unknown (pending investigation)	Benzo(g-h-i)perylene Tributyltin compounds	
Humber Middle GB530402609202 Transitional Heavily modified	Moderate	Natural	Angiosperms	Screened out. The water body is located 5.25km away from the Project. As described in **Volume 1, Chapter 21 Water Resources and Flood Risk**, embedded mitigation will be in place to manage potential impacts on the water environment. Given the distance of the water body from the Project and with mitigation in place impacts on the water body are not anticipated.
		Physical modification	Mitigation measures assessment	
		Unknown (pending investigation)	Benzo(g-h-i)perylene Benzo(k)fluoranthene Benzo(b)fluoranthene	
		Not applicable	Mercury and Its compounds PBDE	

Water body name, ID, type and designation	Ecological Status / Potential	RNAG1 Activity	Classification elements affected	Screening decision
Humber lower GB530402609201 Transitional Heavily modified	Moderate	Natural	Angiosperms	Screened out. The water body is located 10km away from the Project. As described **Volume 1, Chapter 21 Water Resources and Flood Risk**, embedded mitigation will be in place to manage potential impacts on the water environment Given the distance of the water body from the Project and with mitigation in place impacts on the water body are not anticipated.
		Unknown (pending investigation)	Invertebrates	
		Physical modification	Mitigation measures assessment	
		Unknown (pending investigation)	Benzo(g-h-i)perylene Benzo(b)fluoranthene PFOS	
		Not applicable	Mercury and Its compounds PBDE	
Hull and East Riding Chalk GB40401G700700 Groundwater	Poor	Sewage discharge (continuous)	Chemical Drinking Water Protected Area	Screened in because all onshore components of the Project will overlie this water body.
		Private sewage treatment		
		Poor nutrient management		
		Farm/site infrastructure		
		Atmospheric deposition		
		Sewage discharge (continuous)	Trend assessment	
		Private sewage treatment		
		Poor nutrient management		
		Atmospheric deposition		
		Groundwater abstraction	Quantitative saline intrusion	
			Chemical saline intrusion	
		Atmospheric deposition	General chemical test	
		Poor nutrient management		
		Private sewage treatment		
		Sewage discharge continuous		
		Unknown (sector under investigation)	Chemical GWDTEs test	

21.4.3.3 Screening summary

34. The assessment presented in **Table 21.4-1** demonstrates that three water bodies (Barmston Sea Drain from Skipsea Drain to N Sea (GB104026077780); Humber Middle (GB530402609202) and Humber Lower (GB530402609201)) can be screened out of the assessment due to the small-scale of the proposed works and significant distance from the Project.

35. All other water bodies have been screened in for further assessment in Stage 2 Scoping (**Section 21.4.4**).



Legend:

- Onshore Development Area
- Offshore PEIR Corridors
- Tophill Low Drinking Water Safeguard Zone Surface Water
- Hull from West Beck to Arram Beck Drinking Water Protected Area

WFD River, Canal & Surface Water Transfer Water Bodies

- River

WFD Transitional & Coastal Water Bodies

- Yorkshire South

WFD River Water Body Catchments

- Barmston Sea Drain / Skipsea Drain to Conf
- Barmston Sea Drain from Skipsea Drain to N Sea
- Foredyke Stream Lower to Holderness Dr
- Holderness Drain Source to Foredyke Stream
- Hull from West Beck to Arram Beck
- Mickley Dike Catchment
- Old Howe/Frodingham Beck to R Hull
- Coastal

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Surface Water Body Catchments - Sheet 1 of 4

Figure: 21.4-1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0125

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	21/05/2025	JH	AB	A3	1:40,000
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Co-ordinate system: British National Grid

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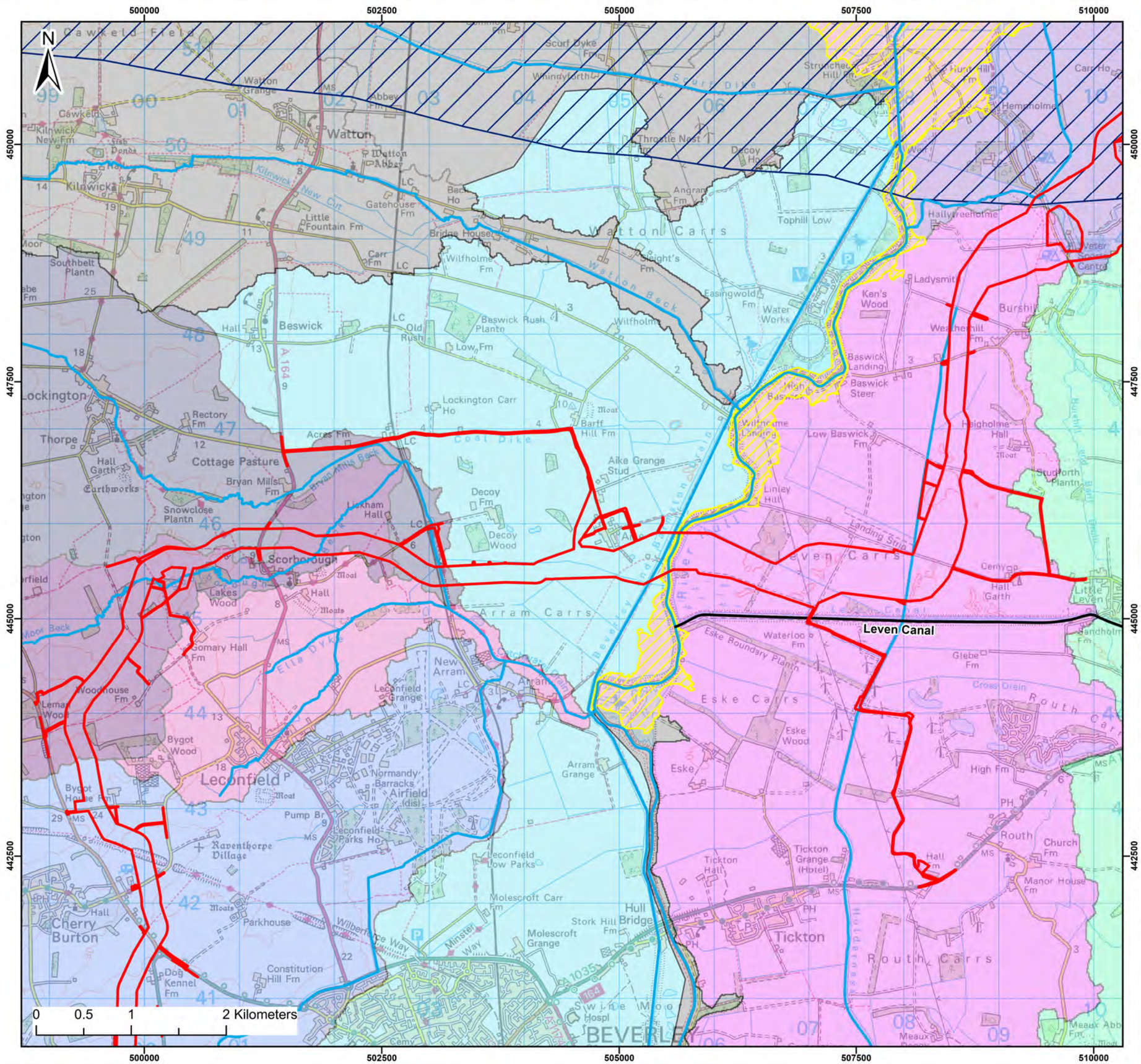

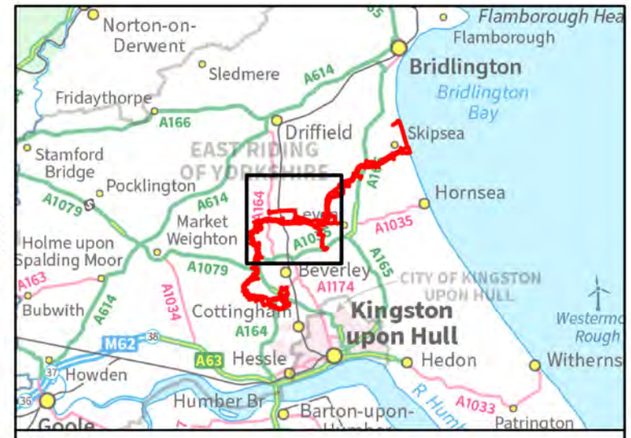

Legend:

- Onshore Development Area
- Tophill Low Drinking Water Safeguard Zone Surface Water
- Hull from West Beck to Arram Beck Drinking Water Protected Area

WFD River, Canal & Surface Water Transfer Water Bodies

- Canal
- River

WFD River Water Body Catchments

- Beverley and Barmston Drain
- Bryan Mills Beck Source to Bryan Mills Farm
- Ella Dyke
- Foredyke Stream Lower to Holderness Dr
- High Hunsley to Arram Area
- Holderness Drain Source to Foredyke Stream
- Hull from West Beck to Arram Beck
- Mickley Dike Catchment
- Scorborough Beck
- Catchments Outside of the Study Area

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Surface Water Body Catchments - Sheet 2 of 4

Figure: 21.4-1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0125

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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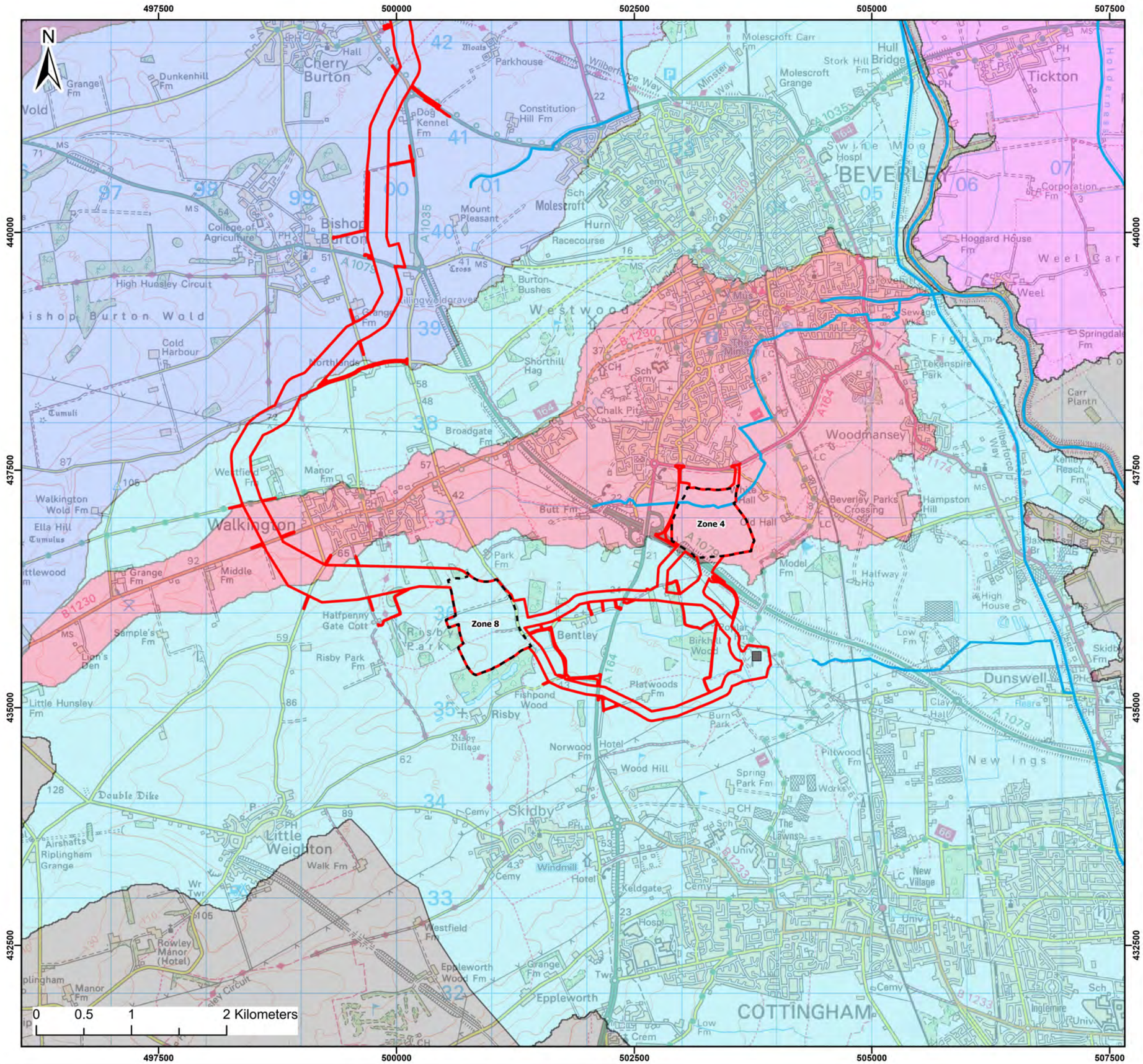

Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Surface Water Body Catchments - Sheet 3 of 4

Figure: 21.4-1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0125

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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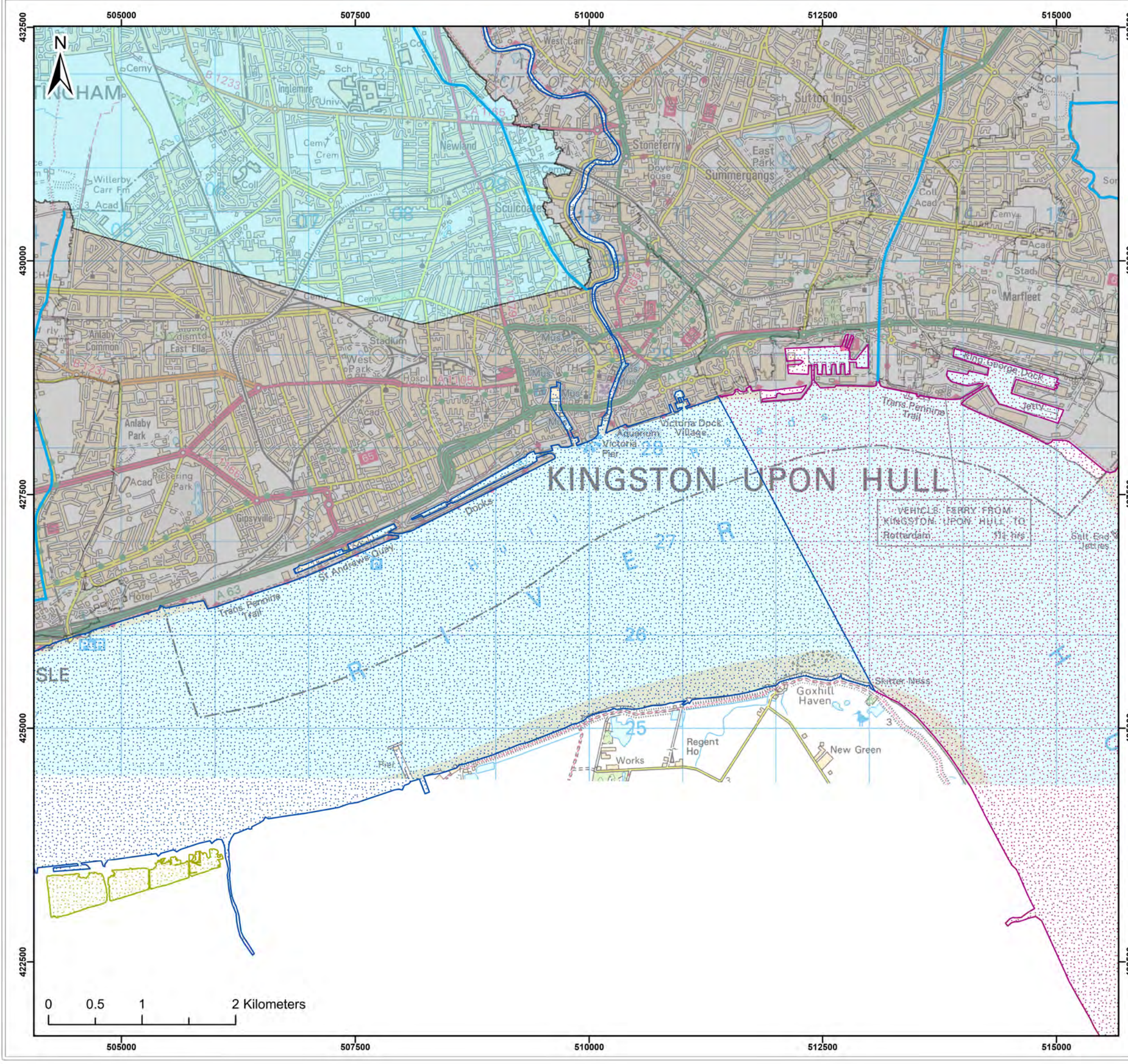

Legend:

WFD River, Canal & Surface Water Transfer Water Bodies

- River

WFD Transitional & Coastal Water Bodies

- Barrow Clay Pits
- Humber Lower
- Humber Middle

WFD River Water Body Catchments

- Beverley and Barmston Drain
- Catchments Outside of the Study Area

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Surface Water Body Catchments - Sheet 4 of 4

Figure: 21.4-1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0125

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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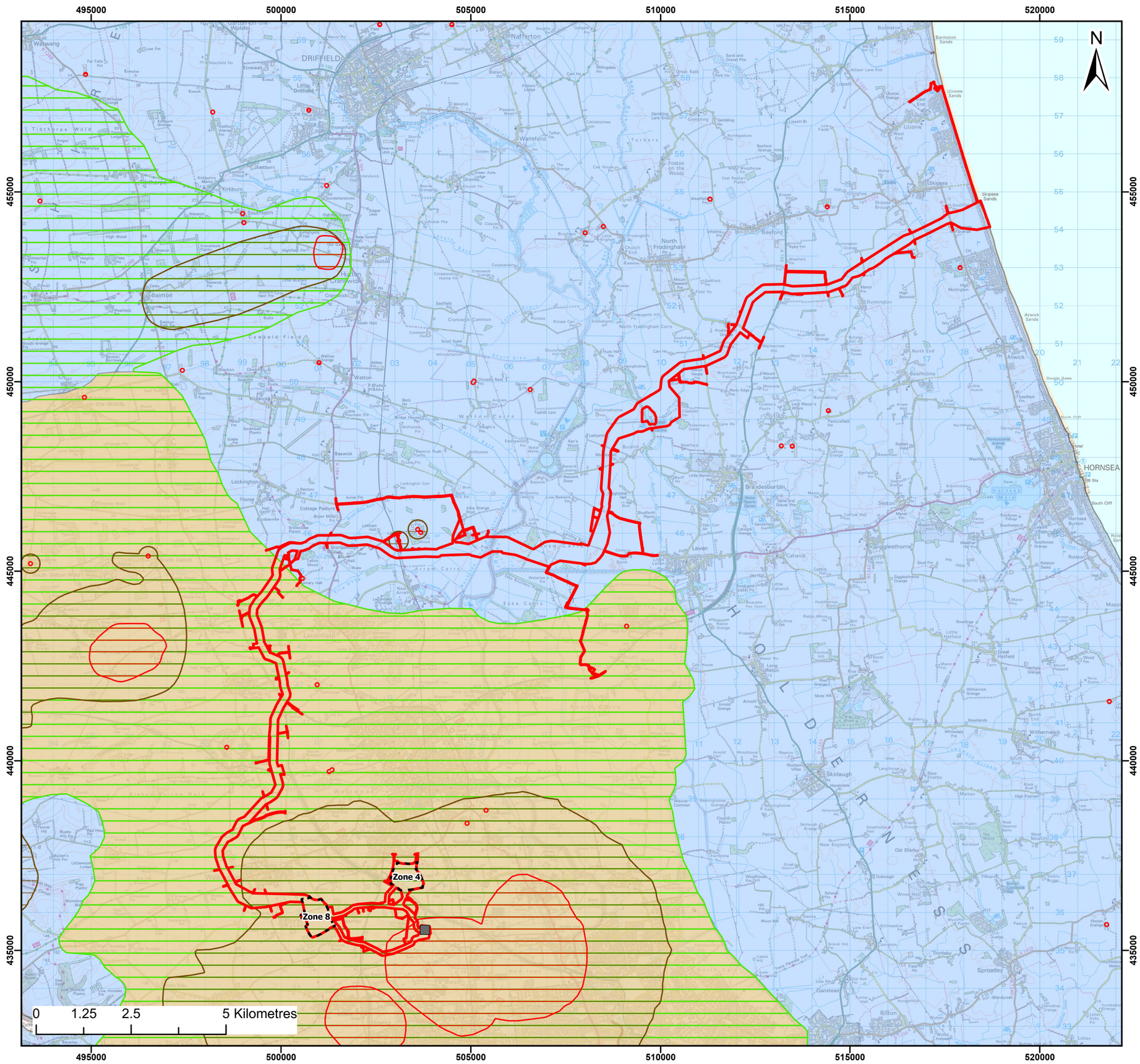

Legend:

- Onshore Development Area
- Onshore Converter Station Options
- Indicative Birkhill Wood Substation Location
- Cottingham Drinking Water Safeguard Zone (Groundwater)

WFD Groundwater Bodies

- Hull and East Riding Chalk

Source Protection Zone

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Groundwater Body Catchment

Figure: 21.4-2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0126

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	21/05/2025	JH	AB	A3	1:100,000
01	19/11/2024	JH	AB	A3	1:100,000

Co-ordinate system: British National Grid

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21.4.4 Scoping

36. The aim of this section is to highlight the quality elements within each water body that could be impacted by the Project, as identified in Stage 1 of the compliance assessment. This assessment therefore determines the scope for any future detailed compliance assessment (Stage 3) which may be required for the Project.

37. Potential impacts of the Project on quality elements for river, canal, coastal and groundwater bodies are presented in **Table 21.4-2, Table 21.4-3** and **Table 21.4-4**.

38. **Section 21.4.4.4** evaluates impacts on improvement and mitigation measures set out in the RBMP, and **Section 21.4.4.5** discusses protected areas that could be affected by the Project. **Section 21.4.4.10** provides a summary of Stage 2 scoping.

21.4.4.1 River and Canal Water Bodies

Table 21.4-2 Scoping Assessment for River and Canal Water Bodies Screened Into the Assessment

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
Hydromorphology	Could the activity change the volume, energy or distribution of flows in the water body?	**Construction** Impacts from ground disturbance and land use change at the landfall, along the onshore ECC (including use of a temporary haul road and associated culverts and bridges at watercourse crossings), OCS zone and ESBI could potentially alter the hydrological regime of river water bodies screened into the assessment. More impermeable surfaces and disturbed ground could alter surface water drainage pathways, resulting in changes to the volume, energy or distribution of flows.	In
		Operation The area of each river catchment occupied by permanent infrastructure is very small, with a maximum of 0.16km^2 for the High Hunsley to Woodmansey Area catchment (1.37% of the catchment area). The proportion of all other river and canal water bodies that would be affected by the installation of permanent infrastructure is significantly less than 1% (average 0.06%). As assessed in **Volume 1, Chapter 21 Water Resources and Flood Risk**, impact magnitude for operational activities associated with changes to surface and groundwater flows and flood risk is negligible in all catchments except High Hunsley to Woodmansey Area where it is low, and effect significance is no worse than minor adverse. Due to the very small area of each catchment that could be affected by operational activities, changes to the volume, energy or distribution of flows in any river or canal water body are not anticipated.	Out
	Could the activity change the width, depth, bank conditions, bed substrates and structure of the riparian zone?	**Construction** Impacts from ground disturbance and land use change at the landfall, along the onshore ECC (including use of a temporary haul road and associated culverts and bridges at watercourse crossings), OCS zone and ESBI may increase fine sediment input to water bodies, which could have impacts on hydromorphology. Any increase in surface runoff has the potential to increase scour to the bed and banks and structure of the riparian zone. Temporary crossings (e.g. culverts or Bailey or similar clear span bridges) would alter bank conditions and the channel bed for culverts.	In
		Operation The area of each river catchment occupied by permanent infrastructure is very small, with a maximum of 0.21km^2 for the High Hunsley to Woodmansey Area catchment (1.37% of the catchment area). The proportion of all other river and canal water bodies that would be affected by the installation of permanent infrastructure is significantly less than 1% (average 0.06%). As assessed in **Volume 1, Chapter 21 Water Resources and Flood Risk**, impact magnitude for operational activities associated with changes to surface and groundwater flows and flood risk, is negligible in all catchments except High Hunsley to Woodmansey Area where it is low, and significance of effect is no worse than minor adverse. Due to the very small area of each catchment that could be affected by operational activities, changes to the width, depth, bank conditions, bed substrates and structure of the riparian zone in any river or canal water body are not anticipated.	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
	Could the activity create a permanent barrier to the downstream movement of water and / or sediment, or the upstream movement of fish?	**Construction** and **operation** Onshore infrastructure would not create a permanent barrier to the downstream movement of water or sediment, or the upstream movement of fish. Although temporary barriers to river continuity may be required during construction (e.g. to facilitate watercourse crossings), they would be removed following construction, and any effects would be reversed. The maximum duration that temporary crossings could be in place for the haul road is approximately 4 years. In addition, in cases where open cut trenching methods or temporary haul road watercourse crossings are required, measures will be employed to maintain water flow along the watercourse (see Commitment ID CO35, **Volume 2, Appendix 6.3 Commitments Register**). Operational infrastructure at river crossings would be buried below the channel (at least 2 m depth at trenched crossings). No permanent mechanism for impact on the movement of sediment or fish has been identified.	Out
Physico-chemistry and chemistry	Could the activity change the temperature, pH, oxygenation, salinity or nutrient concentrations in the water body?	**Construction** Impacts from ground disturbance and land use change at the landfall, along the onshore ECC (including use of a temporary haul road and associated culverts and bridges at watercourse crossings), OCS zone and ESBI may increase sediment supply to watercourses, which could impact on turbidity levels and oxygenation within the water body. There would also be increased risk of contaminant supply to water bodies, from accidental spillage or leakage of fuel oils or lubricants from construction vehicles. This has the potential to impact on physico-chemistry.	In
		Operation The area of each river catchment occupied by permanent infrastructure is very small, with a maximum of 0.21km^2 for the High Hunsley to Woodmansey Area catchment (1.37% of the catchment area). The proportion of all other river and canal water bodies that would be affected by the installation of permanent infrastructure is significantly less than 1% (average 0.06%). As assessed in **Volume 1**, **Chapter 21 Water Resources and Flood Risk**, impact magnitude for operational activities associated with the accidental release of contaminants to surface and groundwater, and changes to surface and groundwater flows and flood risk, is negligible in all catchments except High Hunsley to Woodmansey Area where it is low, and significance of effect is no worse than minor adverse. Due to the very small area of each catchment that could be affected by operational activities, changes to the temperature, pH, oxygenation, salinity or nutrient concentrations any river or canal water body are not anticipated.	Out
	Could the activity introduce dangerous chemicals into the water body?	**Construction** Construction machinery in or adjacent to water bodies has the potential to accidentally release lubricants, fuels and oils into a surface water body. This could also be caused by spillage, leakage and in-wash from vehicle storage areas following rainfall, accidental release of foul waters (e.g. from welfare facilities) and construction materials, such as concrete and inert drilling fluids from trenchless crossings.	In
		Operation The area of each river catchment occupied by permanent infrastructure is very small, with a maximum of 0.21km^2 for the High Hunsley to Woodmansey Area catchment (1.37% of the catchment area). The proportion of all other river and canal water bodies that would be affected by the installation of permanent infrastructure is significantly less than 1% (average 0.06%). As assessed in **Volume 1, Chapter 21 Water Resources and Flood Risk**, impact magnitude for operational activities associated with the accidental release of contaminants to surface and groundwater is negligible in all catchments except High Hunsley to Woodmansey Area where it is low, and significance of effect is no worse than minor adverse.	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
		A Battery Safety Management Plan (Commitment ID CO79, **Volume 2, Appendix 6.3 Commitments Register**) will be developed for the Project. The management plan will include specific measures to contain firewater with appropriate layers of protection. This will prevent the contamination of surface waters from firewater. Specific measures in the Battery Safety Management Plan will be identified through the design process. Best practice measures (CIRIA, 2014) may include: • All potential sources of chemical pollution stored within an internal secondary containment bund. • The bund would be epoxy coated to withstand chemical degradation and would not be connected to foul or surface drainage and would be permanently sealed. • Quarterly preventative maintenance checks would be instigated on site and repairs carried out on the bund if issues are found. • This bund would be designed to contain at least 110% of the entire pollutant source. • In addition, external tertiary containment bunds would be constructed around the perimeter boundary to contain firefighting water and surface water runoff. • An emergency contract would be taken out with an appropriate water management service to provide a tankering facility on site to pump out accumulated firefighting water and / or rainwater from within the secondary or tertiary containment bunds. Due to the very small area of each catchment that could be affected by operational activities, changes to the temperature, pH, oxygenation, salinity or nutrient concentrations any river or canal water body are not anticipated.	
Biology	Could the activity change the hydromorphology and / or physico-chemistry of the water body, or lead to the direct loss or modification of habitats for aquatic plants?	**Construction** Impacts from ground disturbance and land use change at the landfall, along the onshore ECC (including use of a temporary haul road and associated culverts and bridges at watercourse crossings), OCS zone and ESBI could increase the supply of fine sediment to river water bodies. This could smother bed habitats and reduce light penetration. This could also lead to the loss or modification of aquatic flora communities. Changes to physico-chemistry from onshore construction activities could also lead to loss or modification of habitats for aquatic plants.	In
		Operation The area of each river catchment occupied by permanent infrastructure is very small, with a maximum of 0.21km^2 for the High Hunsley to Woodmansey Area catchment (1.37% of the catchment area). The proportion of all other river and canal water bodies that would be affected by the installation of permanent infrastructure is significantly less than 1% (average 0.06%). As assessed in **Volume 1, Chapter 21 Water Resources and Flood Risk**, impact magnitude for operational activities associated with the accidental release of contaminants to surface and groundwater, and changes to surface and groundwater flows and flood risk, is negligible in all catchments except High Hunsley to Woodmansey Area where it is low, and effect significance of effect no worse than minor adverse. Due to the very small area of each catchment that could be affected by operational activities, changes to the hydromorphology and/or physico-chemistry of any river or canal water body, or the direct loss or modification of habitats for aquatic plants in any river or canal water body are not anticipated.	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
	Could the activity change the hydromorphology and / or physico-chemistry of the water body, or lead to the direct loss or modification of habitats for aquatic invertebrates?	**Construction** Impacts from ground disturbance and land use change at the landfall, along the onshore ECC (including use of a temporary haul road and associated culverts and bridges at watercourse crossings), OCS zone and ESBI could increase the supply of fine sediment to river water bodies. This could smother bed habitats and reduce light penetration. This could lead to the loss or modification of habitats which support benthic invertebrates. Changes to physico-chemistry from onshore construction activities could also lead to loss or modification of aquatic invertebrate habitat.	In
		Operation The area of each river catchment occupied by permanent infrastructure is very small, with a maximum of 0.21km^2 for the High Hunsley to Woodmansey Area catchment (1.37% of the catchment area). The proportion of all other river and canal water bodies that would be affected by the installation of permanent infrastructure is significantly less than 1% (average 0.06%). As assessed in **Volume 1, Chapter 21 Water Resources and Flood Risk**, impact magnitude for operational activities associated with the accidental release of contaminants to surface and groundwater, and changes to surface and groundwater flows and flood risk, is negligible in all catchments except High Hunsley to Woodmansey Area where it is low, and effect significance of effect no worse than minor adverse. Due to the very small area of each catchment that could be affected by operational activities, changes to the hydromorphology and / or physico-chemistry of any river or canal water body, or the direct loss or modification of habitats for aquatic invertebrates in any river or canal water body are not anticipated.	Out
	Could the activity change the hydromorphology and / or physico-chemistry of the water body, or lead to the direct loss or modification of shelter, feeding and spawning habitats for fish?	**Construction** Increased turbidity due to increased fine sediment loads from onshore construction activities could alter niche habitats and lead to the loss or modification of shelter, feeding and spawning habitats for fish. Culverts used at temporary crossings would also affect fish habitats by disturbing the channel bed and impounding sediment if not set at the correct level. Furthermore, potential changes to physico-chemistry could also reduce the capacity of the water body to support feeding and spawning fish.	In
		Operation The area of each river catchment occupied by permanent infrastructure is very small, with a maximum of 0.21km^2 for the High Hunsley to Woodmansey Area catchment (1.37% of the catchment area). The proportion of all other river and canal water bodies that would be affected by the installation of permanent infrastructure is significantly less than 1% (average 0.06%). As assessed in **Volume 1, Chapter 21 Water Resources and Flood Risk**, impact magnitude for operational activities associated with the accidental release of contaminants to surface and groundwater, and changes to surface and groundwater flows and flood risk, is negligible in all catchments except High Hunsley to Woodmansey Area where it is low, and effect significance of effect no worse than minor adverse. Due to the very small area of each catchment that could be affected by operational activities, changes to hydromorphology and / or physico-chemistry of the any river or canal water body, or the direct loss or modification of shelter, feeding and spawning habitats for fish in any river or canal water body are not anticipated.	Out
	Could the activity introduce invasive non-native species (INNS) to the water body?	**Construction and operation**	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
		Construction and any planned or unplanned maintenance activities have the potential to contribute to the spread of INNS if materials and equipment used in the process have not been properly cleaned after use at a previous location that may have had invasive species present. However, good practice measures would be employed to ensure all equipment is cleaned and checked before use. Measures to prevent the transfer and spread of INNS will be outlined within the Ecological Management Plan (EcoMP) (Commitment ID CO81, **Volume 2, Appendix 6.3 Commitments Register**).	

21.4.4.2 Coastal Water Bodies

Table 21.4-3 Scoping Assessment for Coastal Water Bodies Screened Into the Assessment

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
Hydromorphology	Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status?	**Construction** and **operation** The Yorkshire South coastal water body is at Moderate ecological potential. No further coastal water bodies were screened in to the assessment.	Out
	Could significantly impact the hydromorphology of any water body?	**Construction** As described in **Volume 1, Chapter 8 Marine Physical Processes**, the worst-case export cable laying technique is cable plough with all the sediment released in the bottom layer. For sand wave levelling, the worst-case scenario assumes that sediment would be dredged and returned to the water column at the sea surface as overflow from a dredger vessel. This process would cause local and short-term increases in suspended sediment concentrations both at the point of dredging at the seabed and at the point of its discharge back into the water column. The scale of this impact would be relatively localised for coarser sediments (due to immediate settling out) and larger scale for finer sediments. Although there may be some impacts on suspended sediment concentrations, impacts would be short-term and temporary and unlikely to adversely affect the hydromorphology of the wider Yorkshire South coastal water body, which measures 163.3km^2. The landfall trenchless crossing exit point would also require excavation of the exit pits to install the trenchless crossing ducts on the seaward side of the landfall. Upon completion of duct installation, the exit pits would be filled in to reinstate the intertidal zone close to its original morphology. This activity would result in some localised and short-term disturbance to the beach and nearshore zone, but there would be no long-term effect on sediment transport processes.	Out
		Operation There is the potential that burial of the export cables would not practicably be achievable within the entire area of the of the coastal water body crossed by the Project. The locations where cable protection measures are most likely to be required are cable crossings and in areas of seabed characterised by exposed bedrock. Cable protection may take the form of rock placement, concrete mattresses, rock bags, and flow dissipation devices	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
		As described in **Volume 1, Chapter 8 Marine Physical Processes**, in areas of active sediment transport, any linear protrusion on the seabed may interrupt bedload sediment transport processes. This is most likely in the nearshore zone landward of the closure depth, which is the seaward limit that marks the effective boundary of wave-driven sediment transport. As described in **Volume 1, Chapter 8 Marine Physical Processes**, local data have been used to calculate the closure depth as 860m offshore. The magnitude of wave driven transport would decrease with distance offshore within the closure depth; the most active zone for wave-driven sediment transport along the Holderness coast is the intertidal zone. As described in **Volume 1, Chapter 8 Marine Physical Processes**, a study at Easington along south Holderness (HR Wallingford (2011) shows that most of the longshore transport from wave breaking occurs close to the shoreline, within approximately 250m of the cliff line. Seaward of this, the wave-driven sediment transport is effectively zero. Given the similar shore profile gradients at the landfall the conclusion is that the active zone at the landfall is similar in width to that at Easington. Hence, sediment transport driven by waves seaward of 250m from the cliffs at the landfall is very low (although still within the closure depth) and there will be no effect on these processes by the presence of the cable protection structures. This is because any export cables across the most active zone of wave-driven sediment transport will be buried and will have no effect on sedimentary processes.	
	Is in a water body that is heavily modified for the same use as your activity?	**Construction** and **operation** No – the designated uses for the heavily modified water body are coast protection, flood protection, and navigation, ports and harbours.	Out
Physico-chemistry and chemistry	Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)?	**Construction** There would be an increase in suspended sediment concentrations because of export cable installation and excavations associated with the intertidal / subtidal exit pits. These activities could increase turbidity and alter oxygen and nutrient levels. Although these processes would cause localised and short-term increases in suspended sediment, the scale of this impact would be relatively localised for coarser sediments (due to immediate settling out) and larger scale for finer sediments. Suspended sediments in the water column are expected to return to baseline conditions within days after completion of installation due to dispersion and dilution. Trenchless installation activity would result in some localised and short-term disturbance to the beach and nearshore zone, but in terms of the wider coastal water body, which measures 163.3km^2, there would be no long-term effects on water clarity, temperature, salinity, oxygen levels, nutrient concentrations or microbial patterns continuously for longer than a spring neap tidal cycle (c.14 days).	Out
		Operation Impacts on water quality from the presence of unburied cable protection are not anticipated.	Out
	Is in a water body with a phytoplankton status of moderate, poor or bad?	**Construction** and **operation** Phytoplankton status is High.	Out
	Is in a water body with a history of harmful algae?	**Construction** and **operation** Harmful algae are not monitored by the Environment Agency in this water body.	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
	Could introduce chemicals that are on the Environmental Quality Standards Directive (EQSD) list?	**Construction** and **operation** No chemicals would be directly released from potential works associated with the Project. Best practice measures would be used to reduce the likelihood of spillages during construction and operation / maintenance.	Out
	The activity could disturb sediment with contaminants above Cefas Action Level 1?	**Construction** and **operation** As described in **Volume 1, Chapter 9 Marine Sediment and Water Quality** of the PEIR, offshore sediment chemical composition is informed by the site-specific surveys undertaken across the Offshore Development Area in 2023 and 2024. The results show that there are no exceedances of Cefas AL1/TEL by any of the samples from within the Offshore Development Area.	Out
Biology	Is the footprint of the activity 0.5 km^2 or larger?	The Offshore Development Area within the coastal water body is 6.3km^2. However, this is the area within which offshore infrastructure would be sited. The worst-case scenario during construction is the indicative width of disturbance from jetting, jet assisted ploughing or mechanical trenching, which is 15m, in addition to the area for intertidal works (including emergency beach access). This equates to an area of disturbance of 0.11km^2.	Out
	Is the area of activity greater than 1% or more of the water body's area?	**Construction** The Yorkshire South coastal water body covers an area of 163.3km^2. The area affected by construction (0.11km^2) equates to 0.07% of the water body's area.	Out
		Operation The Yorkshire South coastal water body covers an area of 163.3km^2. The maximum area that could be affected by cable protection is 0.02km^2 – assuming protection of 10m width is required within the boundaries of the coastal water body. This equates to 0.012% of the water body's area.	Out
	Within 500 m of any higher sensitivity habitat?	**Construction** and **operation** The Offshore Development Area is not located within 500m of a coastal higher sensitivity habitat. The nearest higher sensitivity habitat (subtidal kelp beds) is 9.7km north of the Offshore Development Area at Bridlington.	Out
	Could affect 1% or more of any lower sensitivity habitat?	**Construction** Only one lower sensitivity habitat is likely to be affected by offshore construction activities (subtidal soft sediments). Subtidal soft sediments characterise nearly all of water body's area and the maximum area affected by construction activities equates to 0.07% of the lower sensitivity habitat. There are also several small, discontinuous areas of intertidal soft sediment crossed by the Offshore Development Area, which are located on the beach between MHWS and MLWS. This area will be avoided through the use of trenchless installation techniques at the landfall (Commitment ID CO23, **Volume 2, Appendix 6.3 Commitments Register**), and the exits pits will be located sub-tidally 5 to 10m below LAT.	Out
		Operation	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
		The maximum area of the subtidal soft sediments lower sensitivity habitat that would be affected by unburied cable protection – assuming protection of 10m width is required for the width of the coastal water body, which is unlikely, is 0.012%.	
	Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary?	**Construction** and **operation** The Offshore Development Area is not located close to an estuary. The closest estuary (entrance to the Humber estuary) is approximately 45km to the south.	Out
	Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)?	**Construction** As described in **Volume 1, Chapter 11 Fish and Shellfish Ecology**, all construction impacts have a magnitude of low and effect significance of minor adverse; no additional mitigation is required. Given the very small area of disturbance with the coastal water body (worst case of 0.11km^2) impacts on normal fish behaviour are not anticipated.	Out
		Operation As described in **Volume 1, Chapter 11 Fish and Shellfish Ecology**, all operational impacts have an impact of negligible to low, and effect significance of minor adverse; no additional mitigation is required. Given the very small area of cable protection that could be present in the coastal water body (0.012km^2), and likely small-scale and infrequent nature of any emergency cable repairs within the coastal water body, impacts on normal fish behaviour are not anticipated.	Out
	Could cause entrainment or impingement of fish?	**Construction** and **operation** The Offshore Development Area is not located close to an estuary. The closest estuary (entrance to the Humber Estuary) is approximately 46km to the south.	Out
	Could introduce or spread INNS?	**Construction** and **operation** Construction and any planned or unplanned maintenance activities have the potential to contribute to the spread of INNS if materials and equipment used in the process have not been properly cleaned after use at a previous location that may have had invasive species present. However, good practice measures would be employed to ensure all equipment is cleaned and checked before use. Measures to prevent the transfer and spread of INNS will be outlined within the Ecological Management Plan (EcoMP) (Commitment ID CO81, **Volume 2, Appendix 6.3 Commitments Register**).	Out

21.4.4.3 Groundwater Body

Table 21.4-4 Scoping Assessment for Groundwater Bodies Screened into the Assessment

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
Groundwater quantity	Will the activity change groundwater levels or affect Groundwater Dependent Terrestrial Ecosystems (GWDTEs) or dependent surface water features?	**Construction** Abstraction of up to 20m^3 per day may be required at the landfall area and up to 70m^3 per day at the OCS zone. However, the landfall area is 16 km away from Pulfin Bog Site of Special Scientific Interest (SSSI) and 20 km away from Bryan Mills Field SSSI (both designated GWDTEs). In addition, Pulfin Bog is 7km away from the OCS zone (assuming the closer Zone 4 is selected for the OCS zone), and Bryan Mills Field is 11km away from OCS Zone 4. Temporary, small-scale dewatering of superficial deposits (to 1.2m depth) may also be required along the onshore ECC associated with export cable installation. At its closest an onshore ECC access road would be 50m away from Bryan Mills Field SSSI (100m away from the main corridor) and 1.5km away from Pulfin Bog. Bryan Mills Field SSSI is relatively close to the onshore ECC. As described in **Volume 1, Chapter 21 Water Resources and Flood Risk** (**Section 21.6.2.6**) the designated site is spring-fed and comprises a tall fen community which occupies the centre of a small ungrazed field. The fen area has developed over a complex of spring heads (sourced from the underlying chalk aquifer) which create small areas of surface water (Natural England, 2022). Superficial deposits around the SSSI and adjacent onshore ECC are glacial till (BGS, 2024a), which is generally clay rich. There are no boreholes through the clay deposits close to the SSSI. Two boreholes located 400m north of the SSSI through an area of sand and gravel (BGS, 2024b, 2024c) show an underlying 4m thick layer clay. This is likely to be the till that characterises the wider area. These deposits are likely to form an aquiclude of low permeability. As trenching for the onshore ECC will be shallow (1.2m) and through these deposits, impacts on the underlying chalk aquifer are unlikely. The chalk bedrock is located a depth of approximately 12m in this area. It is considered unlikely that temporary abstraction at the landfall area and OCS zone would be of significant enough volume to affect the GWDTEs at distances of 7 to 20km away. Trenching to install the onshore export cables would be shallow (to 1.2m depth) through superficial deposits and dewatering would be highly localised. In addition, any abstraction would be agreed with the Environment Agency and would comply with conditions associated with any abstraction licenses that may be required. Impacts on the GWDTEs are not anticipated.	Out
		Operation The presence of the buried onshore export cables is not anticipated to have impacts on Bryan Mills Field SSSI and Pulfin Bog SSSI. Although there may be localised changes to flow paths and directions of groundwater in the vicinity of buried / near surface infrastructure, these would be small-scale and unlikely to impact GWDTEs or dependent surface water features. Any localised dewatering needed for unplanned emergency repairs would be highly localised and infrequent and is considered unlikely to significantly affect Bryan Mills Field SSSI or Pulfin Bog SSSI.	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
	Will the level of proposed groundwater abstraction exceed recharge at a water body scale?	**Construction** Temporary abstraction of groundwater of up to 20m^3 per day at the landfall area and up to 70m^3 per day at the OCS zone would be required during construction. Abstraction conditions associated with abstraction licenses that may be required would be agreed with the Environment Agency as part of the consenting process. The volumes of water that would be temporarily required are unlikely to significantly alter the movement or level of groundwater in the wider Hull and East Riding Chalk groundwater body (which measures 1,967km^2) or affect gross patterns of groundwater flow.	Out
		Operation Abstraction at the OCS zone may be required during operation of the Project. Although an abstraction volume of up to 70 m^3 per day is included as a worst-case scenario, the OCS will be unstaffed and day-to-day water use will be minimal (e.g. general water supply – toilet, taps, hoses). Operational water use would also include emergency storage fighting non-electrical fires, although it is anticipated that emergency stores would only be replenished very infrequently. It is considered unlikely that minor operational abstraction at the OCS zone would affect recharge at the water body scale. Any abstraction for dewatering associated with emergency repairs to the export cables would be highly localised and infrequent and unlikely to affect recharge at the water body scale.	Out
	Could the activity lead to an additional surface water body that will become noncompliant and lead to failure of the dependent surface water test	**Construction** Groundwater abstraction of up to 70m^3 per day at the OCS zone has the potential to temporarily impact surface water bodies in the High Hunsley to Woodmansey Area catchment (OCS Zone 4) and Beverley and Barmston Drain catchment (OCS Zone 8), depending on which OCS zone is selected. The landfall is located in an area of onshore coastal catchment, but groundwater abstraction of up to 20m^3 per day could potentially affect adjacent surface water bodies.	In
		Operation Abstraction at the OCS zone may be required during operation of the Project. Although an abstraction volume of up to 70 m^3 per day is included as a worst-case scenario, the OCS will be unstaffed and day-to-day water use will be minimal (e.g. general water supply – toilet, taps, hoses). Operational water use would also include emergency storage fighting non-electrical fires, although it is anticipated that emergency stores would only be replenished very infrequently It is considered unlikely that minor operational abstraction at the OCS zone would affect surface water bodies. Any abstraction for dewatering associated with emergency repairs to the export cables would be highly localised and infrequent and unlikely to surface water bodies.	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
	Could the activity result in additional abstraction that will exceed any groundwater body scale headroom between the fully licensed quantity and the limit imposed by the total recharge?	**Construction** Temporary abstraction of groundwater of up to 20m^3 per day at the landfall area and up to 70m^3 per day at the OCS zone would potentially be required during construction. Appropriate conditions to be applied to any abstraction licenses that may be required to prevent adverse impacts would be agreed with the Environment Agency as part of the consenting process. The volumes of water that would be temporarily required would be unlikely to significantly alter the movement or level of groundwater in the wider Hull and East Riding Chalk groundwater body (which measures 1967km^2) or affect gross patterns of groundwater flow. Impacts on groundwater body scale headroom and recharge are not anticipated.	Out
		Operation Abstraction at the OCS zone may be required during operation of the Project. Although an abstraction volume of up to 70 m^3 per day is included as a worst-case scenario, the OCS will be unstaffed and day-to-day water use will be minimal (e.g. general water supply – toilet, taps, hoses). Operational water use would also include emergency storage fighting non-electrical fires, although it is anticipated that emergency stores would only be replenished very infrequently. It is considered unlikely that minor operational abstraction at the OCS zone would affect total recharge. Any abstraction for dewatering associated with emergency repairs to the export cables would be highly localised and infrequent and unlikely to affect total recharge of the wider groundwater body, which measures 1,967km^2).	Out
Groundwater quality	Will the activities have the potential to result in or exacerbate widespread diffuse pollution at a water body scale?	**Construction** Should pollution during construction accidently occur (e.g. spill, leakage or breakout), this would be limited to a very small proportion of the groundwater body, which measures 1,967.3km^2, and would not have an impact on diffuse pollution at the water body scale. Best practice embedded mitigation measures secured in a Code of Construction Practice (Commitment ID CO39, **Volume 2, Appendix 6.3 Commitments Register**), Drilling Fluid Breakout Management Plan (Commitment ID CO38) and Pollution Prevention Plan (Commitment ID CO40) would minimise the likelihood of an accidental release and put in place procedures for an effective response to any pollution event that could have an impact on groundwater resources.	Out
		Operation During operation, best practice mitigation measures would be sufficient to manage the use of potential pollutants associated with small-scale and infrequent maintenance activities. At the ESBI, a Battery Safety Management Plan (Commitment ID CO79**, Volume 2, Appendix 6.3 Commitments Register**) will be developed for the Project. As described in **Table 21.4-2** (scoping assessment for river and canal water bodies) the management plan will include specific measures to contain firewater with appropriate layers of protection and prevent the contamination of groundwater.	Out
	Will the activities have the potential to result in pollution of GWDTEs or cause deterioration in the quality of a drinking water abstraction?	**Construction** Bryan Mills Field SSSI and Pulfin Bog SSSI (designated GWDTEs) are located 0.05km and 1.1km away from the Onshore Development Area. There are three groundwater abstractions located within 100m of the Onshore Development Area.	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
		As described in **Volume 1, Chapter 21 Water Resources and Flood Risk** of the PEIR, one trenched crossings would be required in the Bryan Mills Beck Source to Bryan Mills Farm catchment, which could introduce pollutants close to Bryan Mills Field SSSI if an accidental spill occurs. The SSSI is located 2.4 km away from the closest trenched crossing; the closest deeper trenchless crossing would be 150m away. The closest trenchless watercourse crossings to Pulfin Bog SSSI is 1.14km; the closest trenched crossings is 2.2km away. Best practice embedded mitigation measures secured in a Code of Construction Practice (CoCP) (Commitment ID CO39, **Volume 2, Appendix 6.3 Commitments Register**), Drilling Fluid Breakout Management Plan (Commitment ID CO38) and Pollution Prevention Plan (Commitment ID CO40) would minimise the likelihood of an accidental release and put in place procedures for an effective response to any pollution event. Impacts on the GWDTEs and drinking water abstractions are not anticipated.	
		Operation Once the Project is operational, impacts on the GWDTEs at Bryan Mills Field SSSI, Pulfin Bog SSSI, and groundwater abstractions for drinking water, are not anticipated. Any emergency repairs along the onshore ECC would be highly localised and infrequent, and best practice pollution prevention measures would be sufficient to prevent impacts. At the ESBI, a Battery Safety Management Plan (Commitment ID CO79, **Volume 2, Appendix 6.3 Commitments Register**) will be developed for the Project. The management plan will include specific measures to contain firewater with appropriate layers of protection and prevent the contamination of groundwater.	Out
	Could the activities have the potential to result in increasing trends in pollutant concentrations or reduce the ability of the water body being able to reverse significant trends in groundwater pollutants?	**Construction** Installation of the onshore export cables from open cut trench excavations and HDD could potentially introduce contaminants into groundwater. Should pollution during construction accidently occur (e.g. spill, leakage or breakout), this would be limited to a very small proportion of the groundwater body, which measures 1,967.3km^2, and would likely be very small-scale and localised. In addition, best practice mitigation measures (Pollution Prevention Plan and Drilling Fluid Breakout Management Plan, Commitment ID CO40 and CO38 respectively (**Volume 2, Appendix 6.3 Commitments Registe**r)), secured in a CoCP (Commitment ID CO39) would minimise the likelihood of an accidental release and put in place procedures for an effective response to any pollution event that could have an impact on groundwater resources. With appropriate mitigation in place, it is considered unlikely that construction activities would lead to increasing pollutant trends or reduce the water body's ability to reverse significant trends in groundwater pollution.	Out
		Operation During operation, best practice mitigation measures would be sufficient to manage the use of potential pollutants associated with small-scale and infrequent maintenance activities. At the ESBI, a Battery Safety Management Plan (Commitment ID CO79, **Volume 2, Appendix 6.3 Commitments Register**) will be developed for the Project. The management plan will include specific measures to contain firewater with appropriate layers of protection and prevent the contamination of groundwater.	Out

Parameter	Scoping Question	Scoping Assessment	Scoping Decision
	Will the activity lead to saline intrusion?	**Construction** Although there could be some very localised increases in salinity in the vicinity of the landfall trenchless crossing technique bore, these would be highly localised and temporary. As the landfall entry point is above MHWS, the head difference would also limit any minor changes in salinity. There may also be the requirement for minor groundwater abstraction at the landfall zone during construction (up to 20 m^3 per day). The abstraction would be temporary during construction and the low volume required is considered unlikely to cause significant drawdown in the underlying aquifer and thus promote saline intrusion into the groundwater body. In addition, the Project will comply with the conditions of any abstraction licenses that may be required.	Out
		Operation Once the Project is operational there would be no mechanism whereby saline intrusion could occur into the underlying groundwater body / aquifer.	Out

21.4.4.4 Impacts on River Basin District Management Plan Mitigation Measures

39. The Environment Agency have identified mitigation measures that are required to achieve GEP in the Yorkshire South coastal water body (**Table 21.4-5**). For the Yorkshire South water body, only measures not in place (yet to be implemented) have been identified, as opposed to measures classed as in place (i.e. they have already been implemented).

40. Measures are intended to address physical modification pressures associated with coast protection, flood protection, navigation, ports and harbours (i.e. the uses for which the water body is designated heavily modified).

41. As assessed in **Table 21.4-3**, construction activities could lead to temporary and short-term increases in suspended sediment concentrations, but there would be no long-term effect on sediment transport processes. This means construction activities will not affect mitigation measures focused on sediment management measures for navigation, ports and harbours.

42. For mitigation measured aimed at the retention and creation of habitats and associated species, as assessed in **Volume 1, Chapter 10 Benthic and Intertidal Ecology** of the PEIR for impact BEN-C-01 (Temporary Habitat Loss / Physical Disturbance) due to the temporary, episodic and relatively localised nature of the impact, recoverability of the receptors and extent of the receptors across the wider region, temporary physical disturbance is considered to be of negligible magnitude and effect significance negligible to minor adverse.

43. The Shoreline Management Plan policy for the stretch of coast at the landfall (Policy Unit C: Wilsthorpe to Atwick) is 'No Active Intervention' over the short term (present day to 2025), medium term (2025 to 2055) and long term (2055 to 2105) (Scott Wilson, 2010). The National Coastal Erosion Risk Mapping (NCERM) identifies this frontage as natural defence and erodible. Therefore there is no current coastal protection measures at the landfall location which could be affected by the Project.

44. Overall, it is not anticipated that the Project will impact measures to mitigate the effects of coast protection, flood protection and navigation, ports and harbours.

Table 21.4-5 Measures Identified in the RMBP for the Yorkshire South Water Body

Mitigation measures	Heavily Modified Designation Use			
	Coast protection	Flood protection	Navigation, ports and harbours	Potential impacts
Remove obsolete structure(s)	✓	✓	✗	✗
Remove or soften hard bank engineering	✓	✓	✗	✗
Preserve or restore habitats	✓	✓	✗	✗
Implement bank rehabilitation	✓	✓	✗	✗
Implement changes to locks etc.	✓	✓	✗	✗
Manage realignment of flood defences	✓	✓	✗	✗
Enhance existing structures to improve ecology	✓	✓	✗	✗
Dredge disposal site selection	✓	✓	✗	✗
Remove and prevent further dispersal of invasive non-native species	✓	✓	✗	✗
Retain habitats	✓	✓	✗	✗
Create habitat	✓	✓	✗	✗
Modify channel to allow increased natural processes	✗	✗	✓	✗
Manipulate flow to restore or enhance suitable flows	✗	✗	✓	✗
Implement sediment management plan	✗	✗	✓	✗
Reduce sediment resuspension	✗	✗	✓	✗

Mitigation measures	Heavily Modified Designation Use			
	Coast protection	Flood protection	Navigation, ports and harbours	Potential impacts
Implement sediment management regime	✖	✖	✓	✖
Improve vessel management	✖	✖	✓	✖

21.4.4.5 Impacts on Protected Areas

45. The Environment Agency's '*Clearing the Waters for All*' guidance (Environment Agency, 2023a) recommends further assessment of potential impacts on any water-dependent protected areas that are within 2km of a proposed new project activity. This 2km zone of influence has therefore been adopted across all water bodies scoped into the assessment **Table 21.4-6**.

46. The majority of freshwater water bodies have protected areas associated with Nitrate Vulnerable Zones (NVZs). Two water bodies have Drinking Water Protected Area (DWPA) and Drinking Water Safeguarding Zone (DWSZ) protected areas and the Yorkshire South coastal water body also has SPA and bathing water protected areas within 2km of the Offshore Development Area. The Greater Wash SPA is also associated with the Hull and East Riding Chalk groundwater body.

21.4.4.6 Nitrate Vulnerable Zones

47. The Onshore Development Area passes through the following NVZs, as indicated in **Table 21.4-6**:

- River Hull from Arram Beck to Humber NVZ (S254);
- Barmston Sea Drain from Skipsea Drain to N Sea NVZ (S259);
- Holderness Drain from Foredyke Stream to Humber NVZ (S251); and
- Yorkshire Chalk (G106).

48. Potential impacts on NVZs could arise from foul drainage at the OCS zone. Permanent arrangements for foul drainage at the OCS zone have not been finalised, but this could include connection to a mains sewer or septic tank. The OCS zone would be unstaffed and would require infrequent visits. Any foul waters from the site would be minimal and unlikely to affect NVZs. During construction, foul drainage from temporary welfare facilities would be tankered off-site for treatment, preventing impacts to NVZs.

49. The construction and operation activities are therefore unlikely to significantly affect nitrate levels. Impacts on NVZs are scoped out of the assessment.

21.4.4.7 Bathing Waters

50. Skipsea bathing waters are located within the Offshore Development Area. Overall bathing water quality for the last three years (Defra, 2024) is: unassessed (2024); good (2023) and excellent (2022). Bathing waters in England are monitored for *Escherichia coli* and intestinal enterococci, which are associated with sewage or agricultural inputs. The Project therefore has no pathway for effect on monitored bathing water quality.

51. General impacts on coastal water quality could potentially occur related to the accidental spillage of pollutants from offshore construction activities. A spill or leak could also occur in the onshore coastal catchment and transfer to the intertidal (bathing) zone. Embedded mitigation set out in the Pollution Prevention Plan (Commitment ID CO40, **Volume 2, Appendix 6.3 Commitments Register**) will be in place and secured in the CoCP. The Pollution Prevention Plan would limit the potential for accidental spills and leaks and put in place procedures for an effective response to any pollution event.

52. Impacts on bathing waters are not anticipated and are scoped out of the assessment.

21.4.4.8 Drinking Water Protected Area and Drinking Water Safeguarding Zone

53. Tophill Low DWSZ (surface water) and the River Hull from West Beck to Arram Beck DWPA (surface water) are at risk due to elevated levels of two substances: metaldehyde and nitrate (Environment Agency, 2021). Metaldehyde is a pesticide and there is no pathway for effect from the Project. Nitrates are mainly sourced from sewage and agriculture. The only potential pathway for effect on nitrates would be from permanent welfare facilities at the OCS zone. The OCS zone would be unstaffed and would require infrequent visits. Any foul waters from the site would be minimal and unlikely to affect the protected areas. During construction, foul drainage from temporary welfare facilities would be tankered off-site for treatment, preventing impacts to the DWSZ.

54. Cottingham and Dunswell DWSZ (groundwater) is also at risk due to nitrates (Environment Agency, 2020). As described above, there is very limited potential for foul water from the Project to affect the water resources and therefore impacts are considered unlikely.

55. In addition, all groundwater bodies in England are designated as DWPAs. This designation aims to protect groundwater from over-abstraction and to prevent deterioration in groundwater quality that could increase the treatment of drinking water. As assessed in **Table 21.4-4**, impacts on the groundwater body are not anticipated. Best practice mitigation measures (Pollution Prevention Plan (Commitment ID CO40, **Volume 2, Appendix 6.3 Commitments Register**); Drilling Fluid Breakout Management Plan (Commitment ID CO38)), secured in the CoCP would minimise the likelihood of an accidental release and put in place procedures for an effective response to any pollution event that could have an impact on groundwater resources. As described in **Table 21.4-4** some groundwater abstraction may be required during construction. The Project will comply with any abstraction and discharge licences that may be required.

56. DWPAs and DWSZs are therefore scoped out of the assessment.

21.4.4.9 Greater Wash Special Protection Area

57. The Greater Wash SPA was screened into the Habitats Regulations Assessment (HRA) screening addendum due to the potential impacts on the following designated features:

- Little tern, breeding;
- Common tern, breeding;
- Sandwich tern, breeding;
- Little gull, breeding and non-breeding;
- Common scoter, non-breeding; and
- Red-throated diver, non-breeding.

58. The **Report to Inform Appropriate Assessment (RIAA)** (document reference 5.3) concludes that:

- There is no potential for the Project to have an Adverse Effect on Site Integrity (AEoSI) for the Greater Wash SPA through disturbance and displacement or indirect impacts on habitats or prey during construction, either alone or in-combination with other plans and projects.
- There is in summary no potential for the Project to have an AEoSI for the Greater Wash SPA through disturbance and displacement or indirect impacts on habitats or prey during the O&M phase, either alone or in-combination with other plans and projects.
- There is no potential for the Project to have an AEoSI for the Greater Wash SPA through disturbance and displacement or indirect impacts on habitats or prey during decommissioning, either alone or in-combination with other plans and projects.

Table 21.4-6 Water Dependent Protected Areas Within 2 km of the Project

Water body	Protected area									
	Barmston Sea Drain from Skipsea Drain to N Sea NVZ	River Hull from Arram Beck to Humber NVZ	Yorkshire Chalk NVZ	Holderness Drain from Fordyke Stream to Humber NVZ	River Hull from West Beck to Arram Beck DWPA (surface water)	Hull and East Riding Chalk DWPA (groundwater)	Cottingham and Dunswell DWSZ (groundwater)	Tophill Low DWSZ (surface water)	Greater Wash SPA	Skipsea Bathing Water
Barmston Sea Drain / Skipsea Drain to Conf	✓	✓								
Old Howe / Frodingham Beck to R Hull		✓	✓							
Foredyke Stream Lower to Holderness Dr				✓						
Mickley Dike Catchment		✓								
Hull from West Beck to Arram Beck		✓	✓		✓	✓	✓	✓		
Hull from Arram Beck to Humber		✓	✓							
Holderness Drain Source to Foredyke Stream		✓		✓						
Beverley and Barmston Drain		✓	✓							
Bryan Mills Beck Source to Bryan Mills Farm		✓	✓							
Scorborough Beck		✓	✓							
Ella Dyke		✓	✓							
High Hunsley to Arram Area		✓	✓							
High Hunsley to Woodmansey Area		✓	✓							
Leven Canal		✓		✓						

Water body	Protected area									
	Barmston Sea Drain from Skipsea Drain to N Sea NVZ	River Hull from Arram Beck to Humber NVZ	Yorkshire Chalk NVZ	Holderness Drain from Fordyke Stream to Humber NVZ	River Hull from West Beck to Arram Beck DWPA (surface water)	Hull and East Riding Chalk DWPA (groundwater)	Cottingham and Dunswell DWSZ (groundwater)	Tophill Low DWSZ (surface water)	Greater Wash SPA	Skipsea Bathing Water
Yorkshire South									✓	✓
Hull and East Riding Chalk		✓	✓	✓		✓	✓		✓	

21.4.4.10 Scoping Summary

59. Stage 2 scoping has established that construction activities associated with the Project in the following water bodies should be taken forward to Stage 3 Detailed Compliance Assessment:

- River and canal water bodies:
  - Barmston Sea Drain / Skipsea Drain to Conf (GB104026077770);
  - Old Howe / Frodingham Beck to R Hull (GB104026067021);
  - Foredyke Stream Lower to Holderness Dr (GB104026066910);
  - Mickley Dike Catchment (GB104026066990);
  - Hull from West Beck to Arram Beck (GB104026067000);
  - Holderness Drain Source to Foredyke Stream (GB104026066950);
  - Beverley and Barmston Drain (GB104026067211);
  - Bryan Mills Beck Source to Bryan Mills Farm (GB104026066960);
  - Scorborough Beck (GB104026066901);
  - Ella Dyke (GB104026066941);
  - High Hunsley to Arram Area (GB104026066841);
  - High Hunsley to Woodmansey Area (GB104026066820); and
  - Leven Canal (GB70410003).

60. All quality elements (hydromorphology, physico-chemistry and biology) are scoped in for river and canal water bodies during construction.

61. The Hull and East Riding Chalk (GB40401G700700) groundwater body has been scoped in for further assessment for the groundwater quantity element and potential effects on surface water bodies.

62. All operational activities have been scoped out.

63. Impacts of water body mitigation measures not yet in place and the majority of protected areas are scoped out.

64. The Greater Wash SPA has been scoped into the assessment because the designated site has been screened into the HRA screening addendum due to potential impacts on a range of designated features (bird species). The Greater Wash SPA is not considered further in this assessment because the results of the RIAA are not yet available. The findings of the RIAA will be included in the ES and the scoping assessment for the SPA will be revised based on the findings.

21.4.5 Detailed Compliance Assessment

65. This section presents the results of the impact assessment undertaken on the water bodies identified in **Section 21.4.3** of this report, using the method outlined in **Section 21.4.2**. This assessment determines whether elements of the Project brought forward from Stage 2 would cause deterioration of water bodies, and whether such deterioration would have a significant non-temporary effect on the status of one or more quality elements at a water body level.

21.4.5.1 River and Canal Water Bodies

21.4.5.1.1 Hydromorphology

66. There is the potential for construction activities to alter surface water flows entering river water bodies. An increase in areas of hard-standing land use associated with the haul road, OCS Report to Inform Appropriate Assessment / ESBI and temporary compound areas, could change flow conveyance pathways. This could result in localised changes to the volume, energy or distribution of flows of the identified water bodies. Such an increase in surface runoff could potentially increase local bed and bank scour.

67. Greater levels of fine sediment could be released directly into watercourses, predominantly from ground disturbance and vegetation cover removal associated with construction. This could result in increased sediment deposition and smothering of existing substrates. However, with the exception of Bealey's Beck, all water bodies surveyed during the **Fluvial Geomorphology Baseline Survey** (**Appendix 21.2**) are low energy (depositional), environments and bed substrates are typically fine (silts and clays). Most channels are artificial and typically have strongly trapezoidal cross sections due to channel management – freshly dredged material was visible on the adjacent banks of most watercourses at the time of the survey. This means that baseline disturbance and fine sediment supply are likely to be high in most catchments.

68. Bealey's Beck, which will be crossed using a trenchless crossing technique, is a more dynamic / natural watercourse with clear evidence of natural processes and landforms (e.g. pool-riffle sequences; active bank erosion; in-channel large wood) (**Appendix 21.2 Fluvial Geomorphology Baseline Survey**). The depth of the crossing below channel bed will be finalised in the ES to reflect potential geomorphological risks of incision and scour exposing the cables. Bealey's Beck will also be crossed using trenchless crossing techniques. This will avoid disturbance to the channel, which is also a local wildlife site (Bealey's Beck Lockington).

69. There is potential for indirect impacts upon the hydrological regime and morphological condition of water bodies from the use of multiple trenched crossings and culverts on ordinary watercourses which drain into the main water body. A large number of trenched crossings in water body catchments could alter flow regimes, disrupt coarse sediment transport patterns and increase the input of fine sediment into water bodies, impacting upon its morphological condition.

70. The Project will use trenchless methods to cross Main Rivers (Commitment ID CO32, **Volume 2, Appendix 6.3 Commitments Register**) and most ordinary watercourses (**Table 21.4-7**). Main Rivers and ordinary watercourses crossed in this way will not be directly disturbed by installation of the export cables.

71. As a worst-case scenario, it is assumed that temporary culverts may be used on ordinary watercourses to allow the haul road to continue. As shown in **Table 21.4-7** there are a low number of trenched crossings required within each water body catchment, with a maximum of five in the Holderness Drain Source to Foredyke Stream catchment; there would be and two in the onshore coastal catchment that drains to the Yorkshire South coastal water body. This means that impacts on hydromorphology from trenching would have a limited spatial scale and any impacts would be temporary (i.e. only during construction).

72. In addition, temporary haul road crossings may also be required at other locations (i.e. at trenchless crossings where stop ends are not implemented). The impact of temporary haul road crossings at these locations would be lower than at trenched crossings because the installation of temporary haul road crossing structures is a lot less intrusive than open cut trenching works. Potential impacts at temporary crossings would be mitigated by Commitment ID CO35 (**Table 21.4-8**). This means that impacts on hydromorphology from temporary haul road crossings are not anticipated.

Table 21.4-7 Watercourse Crossings in River and Canal Water Bodies

Catchment	Sensitivity	Trenchless Crossings (Cable Duct Installation)			Trenched Crossings (Cable Duct Installation Including Temporary Haul Road Crossing)	Magnitude of Impact With Embedded Mitigation
		Main River	Ordinary Watercourse	With Temporary Haul Road Crossing		
Barmston Sea Drain from Skipsea Drain to N Sea	High	0	0	0	0	No impact
Barmston Sea Drain / Skipsea Drain to Conf	High	0	3	3	3	Low
Old Howe / Frodingham Beck to R Hull	Medium	0	4	4	2	Low
Foredyke Stream Lower to Holderness Dr	Low	0	0	0	0	No impact
Mickley Dike Catchment	Medium	1	18	18	2	Low
Hull from West Beck to Arram Beck	High	1	1	0	0	No impact
Holderness Drain Source to Foredyke Stream	Low	2	22	21	5	Low
Beverley and Barmston Drain	Low	1	18	13	0	Low
Bryan Mills Beck Source to Bryan Mills Farm	High	1	2	3	1	Low

Catchment	Sensitivity	Trenchless Crossings (Cable Duct Installation)			Trenched Crossings (Cable Duct Installation Including Temporary Haul Road Crossing)	Magnitude of Impact With Embedded Mitigation
		Main River	Ordinary Watercourse	With Temporary Haul Road Crossing		
Scorborough Beck	Low	1	6	6	0	Low
Ella Dyke	Low	0	0	0	0	No impact
High Hunsley to Arram Area	Low	0	3	3	1	Low
High Hunsley to Woodmansey Area	Low	0	0	0	0	No impact
Leven Canal	High	0	0	0	0	No impact
Onshore coastal catchment	High	0	2	2	2	Low

73. In addition, embedded control measures will be in place **Table 21.4-8** to limit impacts on hydromorphology. As well as the measures listed in **Table 21.4-8**, the following control measures will be secured in the CoCP (Commitment ID CO39, **Volume 2, Appendix 6.3 Commitments Register**) as part of a Watercourse Crossing Method Statement (Commitment ID CO35) and Soil Management Plan (Commitment ID CO46) to reduce impacts on hydromorphology. Further information is provided in the draft version of the **Outline CoCP** (document reference 8.9) provided with the PEIR.

74. Measures to be included within the Watercourse Crossing Method Statement:

- The duration that temporary dams are in place will be kept to a minimum;
- Flumes, pumps or diversion channels will be adequately sized to ensure that flows downstream are maintained whilst minimising upstream impoundment, accounting for climate change allowances;
- A sediment / siltation trap will be installed upstream of any temporary dams. Excess sediment will be moved before or as the temporary dams are removed to stop mobilisation downstream once works are complete;
- A sediment / siltation trap will also be installed downstream of the temporary dam to capture any sediment that is overpumped. For lower flows, hay bales or similar may be used;
- Weather forecast and any flood alert / warning will be reviewed to ensure works are not undertaken during flood events, and works during very wet weather conditions will be avoided;
- Scour protection measures will be implemented to protect the riverbed downstream of the dam from high energy flow at the outlets of flumes and pumps;
- If a diversion channel is required, geotextiles or similar techniques will be used to line the channel and prevent sediment from entering the watercourse;
- Vegetation will not be removed from the banks, unless necessary to undertake the works, in which case removal will be restricted to the smallest practicable footprint; and
- Channel bed and banks will be appropriately reinstated (e.g. by replacing resectioned banks with more natural profiles that are typical of the natural geomorphology of the watercourse).

75. Measures to be included in the Soil Management Plan:

- Adherence to the soil handling, storage and reinstatement measures outlined in Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009)
- Consideration of weather conditions where it is appropriate to work for each soil type, e.g. not working in an area of poorly draining soils following a period of heavy rain;
- Storing soils appropriately by;
  - Storing topsoil adjacent to where it is stripped, wherever practicable;
  - Storing excavated subsoil separately from topsoil, with sufficient separation to ensure segregation;
  - Cordoning off stockpile areas, if required, with secure fencing to prevent any disturbance or contamination by other construction activities;
  - Seal soil stockpiles to prevent water ingress and erosion / washout of materials into the surrounding environment;
  - If the soils are to be stockpiled for more than six months, the surface of the stockpiles will be seeded with grass / clover mix or covered to minimise soil loss and fix nutrients; and
  - Minimising the duration of soil storage in stockpiles where practicable.
- Monitoring weather conditions on site and undertake works as and when appropriate for the soil type (e.g. not working in an area of poorly draining soils following a period of heavy rain, limited mechanised soil handling in areas where soils are highly vulnerable to compaction during wet weather);

- Soils should be handled in the driest conditions as practicable;
- Handling of soils according to their characteristics;
- Undertaking field testing of soil moisture and consistency prior to the commencement of works to ensure suitability for handling where required;
- Restricting movements of heavy plant and equipment and vehicles to specified routes to avoid compaction and damage to the soil resource;
- Minimising the footprint of excavation works as much as reasonably practicable;
- Implementing appropriate working practices to limit the risk for the spread of animal and plant diseases (further details on the control of invasive non-native species and biosecurity measures will be provided in the Outline EcoMP (Commitment ID CO81) to be prepared at ES stage for the DCO application);
- Installation of temporary land drainage channels in the working area to reduce the potential for wet areas to form during construction, thereby reducing adverse effects on soil structure and fertility;
- Ensuring effective land drainage systems are used during construction; and
- Implementing appropriate soil reinstatement methodology.

76. As assessed in **Volume 1, Chapter 21 Water Resources and Flood Risk**, with these embedded control measures in place the impact magnitude for pressures that could affect hydromorphology (i.e. direct disturbance of surface water bodies (Impact ID: WRF-C-01); increased sediment supply (impact ID WRF-C-02); changes to surface and groundwater flows and flood risk (impact ID WRF-C-04)) is either 'no impact' (no trenched crossings or temporary crossings), negligible or low. Effect significance for the impacts listed above would be either 'no change' where no trenched crossings are required, negligible or minor adverse (depending on catchment sensitivity).

77. With embedded control measures applied, the construction activities activity would not result in a deterioration in the hydromorphology quality element or water body status or prevent status objectives being achieved in the future.

Table 21.4-8 Hydromorphology Control Measures

Commitment ID	Proposed embedded control measures	How the embedded control measures will be secured	Relevance to water resources and flood risk assessment
Hydromorphology control measures			
CO32	Installation of cable ducts at crossings of Environment Agency Main Rivers will be undertaken using trenchless installation techniques. Installation of cable ducts at crossings of Beverley and North Holderness Internal Drainage Board (IDB) maintained drains will be undertaken using trenchless installation techniques unless agreed otherwise.	Development Consent Order (DCO) Requirement (CoCP)	Mitigation to avoid the direct disturbance of surface water bodies.
CO33	At trenchless crossings of Environment Agency Main Rivers, crossing entry and exit points will be located at least 20m from the bank of the Main River or the nearest landward toe of any associated flood defence structure. At trenchless crossings of Internal Drainage Board maintained drains and where trenchless techniques are proposed for other ordinary watercourses, crossing entry and exit points will be located at least 9m from the bank of the drain or watercourse.	DCO Requirement (CoCP)	Mitigation to avoid the direct disturbance of surface water bodies.
CO35	A Watercourse Crossing Method Statement (WCMS) will be provided as part of the Code of Construction Practice (CoCP). The WCMS will be developed in accordance with the Outline CoCP and will include details of the crossing technique and construction methodology to be undertaken at each crossing and associated environmental mitigation measures. Where open cut trenching is proposed for ordinary watercourses, temporary measures to maintain the flow of water and mitigate adverse effects on the watercourse and flood risk will be implemented during construction.	DCO Requirement (CoCP)	Mitigation to avoid the direct disturbance of surface water bodies and causing changes to surface and groundwater flows and flood risk.

Commitment ID	Proposed embedded control measures	How the embedded control measures will be secured	Relevance to water resources and flood risk assessment
Hydromorphology control measures			
	Where the Environment Agency's Main Rivers are to be crossed by temporary haul roads, bailey or similar clear span bridges will be used. For other watercourses, temporary culverts with an overlying haul road will be used where existing access is not available and where temporary bridges are not practicable. Temporary culverts will be adequately sized to avoid impounding flows (including appropriate climate change allowances), and the invert set below the bed level to allow bedload transport.		
CO36	Onshore export cables will be installed at a minimum depth of 2m (to the top of the duct / cable or otherwise) below the channel bed of watercourses, including the landward toe of any associated flood defences. The final depth at each watercourse crossing will be dependent on local geology and geomorphology risks and will take into consideration anticipated climate change-related changes in fluvial flows and erosion that may occur over time. Crossing-specific vertical clearance depth will be agreed with the relevant authorities through the Watercourse Crossing Method Statement (WCMS).	DCO Requirement (CoCP)	Mitigation to avoid the direct disturbance of surface water bodies.

Commitment ID	Proposed embedded control measures	How the embedded control measures will be secured	Relevance to water resources and flood risk assessment
Hydromorphology control measures			
CO37	With the exception of watercourse crossings, onshore export cable installation works will be located at a minimum of 6m from the outside edge of any pipe which is forming a culverted Internal Drainage Board (IDB) maintained drain where practicable. Where works are required within 6m, this will be agreed with the Beverley and North Holderness IDB prior to the commencement of the relevant works to ensure access to the IDB's assets is maintained during construction.	DCO Requirement (CoCP)	Mitigation to avoid the direct disturbance of surface water bodies.
CO39	A Code of Construction Practice (CoCP) will be provided in accordance with the Outline CoCP. The CoCP will enable effective planning, monitoring and management of onshore construction works to mitigate potential impacts on the environment and communities and ensure compliance with the latest relevant regulatory requirements and best practice.	DCO Requirement (CoCP)	The CoCP secures best practice mitigation measures to that will limit impacts on surface and groundwaters.
CO43	A Construction Surface Water Drainage Plan will be provided as part of the Code of Construction Practice (CoCP) and will be developed in accordance with the Outline CoCP. The Construction Surface Water Drainage Plan will detail measures to minimise water within the temporary works area, to ensure the required ongoing drainage of surrounding land (including appropriate climate change allowances) and that the existing land drainage system is not adversely compromised by construction works.	DCO Requirement (CoCP)	The Construction Surface Water Drainage Plan includes measures to manage surface water during construction, which will limit and reduce any potential flood risk impacts.

Commitment ID	Proposed embedded control measures	How the embedded control measures will be secured	Relevance to water resources and flood risk assessment
Hydromorphology control measures			
	Site-specific construction drainage measures and post-construction drainage reinstatement and maintenance requirements will be detailed in the Construction Surface Water Drainage Plan based on land drainage survey undertaken by a suitably qualified expert prior to construction and in consultation with landowners.		
CO46	A Soil Management Plan (SMP) will be provided as part of the Code of Construction Practice (CoCP). The SMP will be developed in accordance with the Outline CoCP and will detail the soil stripping, excavation, storage, reinstatement, cropping and aftercare measures to safeguard soil resources and drainage during the construction works. The SMP will be informed by Agricultural Land Classification (ALC) and soil condition surveys which will be undertaken post-consent and prior to construction.	DCO Requirement (CoCP)	The Soil Management Plan includes measures to limit impacts associated with exposed ground and soil erosion, which could transfer to nearby watercourses.

21.4.5.1.2 Physico-Chemistry

78. Construction activities could result in accidental release of lubricants, oils and runoff into nearby water bodies, impacting upon surface water quality. This could occur accidentally from construction machinery (e.g. fuels and lubricants) and construction materials (e.g. concrete) located near water bodies. Vehicle and construction material storage areas could be an additional source of leaks and spills.

79. An increase in sediment supply from any disturbed soils in the Onshore Development Area during construction, could increase surface runoff into the river water bodies. Greater fine sediment in the water body could reduce light penetration and affect local oxygenation and temperature conditions.

80. Construction activities which disturb the ground, including excavations for cable trenching, could result in the remobilisation of contaminants that are already present in the soil. This could include in-situ contaminated land and nutrients such as nitrogen and phosphorus from nutrient-rich arable soils. The supply of nutrients to surface waters could result in adverse effects on water quality (including, in extreme cases, eutrophication) and aquatic plant, invertebrate and fish communities supported by surface waters.

81. During construction the presence of temporary culverts and use of open cut trenching methods across ordinary watercourses could increase conveyance of pollutants and fine sediment to the downstream water body, impacting on overall dissolved oxygen, pH and temperature.

82. As described for hydromorphology, the embedded control measures described in **Table 21.4-8** would be in place to mitigate any impacts from the direct disturbance of surface water bodies (Impact ID: WRF-C-01), increased sediment supply, changes to surface and groundwater flows and flood risk (WRF-C-02)). These measures will also mitigate potential impacts on physico-chemistry (e.g. by reducing sediment supply and disturbance of watercourses).

83. In addition, **Table 21.4-9** shows control measures that would reduce impacts form pollution associated with drilling fluids (Commitment ID CO38, **Volume 2, Appendix 6.3 Commitments Register**) and overarching pollution prevention (Commitment ID CO40). Further control measures secured in the Pollution Prevention Plan (Commitment ID CO40) and Drilling Fluid Breakout Management Plan (Commitment ID CO38) include:

- The PPP will be developed in accordance with the Environment Agency's Pollution Prevention Guidance (PPG) notes (including PPG01, PPG05, PPG06, PPG08, PPG21, PPG22) (although these have been revoked in England, they still provide a useful guide for best practice measures), CIRIA's C532 Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (2001), Defra's Pollution Prevention for Businesses (2016), CIRIA's C648 Control of Water Pollution from Linear Construction Projects (2006) and other latest available guidance.
- Concrete and cement mixing and washing areas will be located at least 10m away from the nearest watercourse. These areas will incorporate settlement and recirculation systems to allow water to be re-used. All washing out of equipment will take place in a contained area, and the water collected for disposal off-site;
- Storing all fuels, oils, lubricants and other chemicals in impermeable bunds with capacity of 110% of the capacity if the largest storage vessel located within the bund or 25% of the total capacity of the tanks in the bund (whichever is greatest), with any damaged containers being removed from site;

- Ensuring that spill kits are available on site at all times as well as sandbags and stop logs for deployment on the outlets from the site drainage system in case of emergency spillages;
- Potential contaminants will be stored under cover to prevent rainwater carrying pollutants away ;
- Potential contaminants will be stored in a safe place away from vehicles to prevent collisions;
- Provision of drilling fluid management system appropriate to the trenchless installation works being undertaken;
- Monitoring of drilling fluid properties, volume / flow and pressure during the works to quickly identify any losses should a breakout occur;
- A protocol for the reporting of potential breakout and stopping works; and
- Measures to contain and clean up the breakout (e.g. sandbags, pumps, lost circulation additive materials).

84. Further information on control measures are provided in the draft version of the Outline CoCP (document reference 8.9) provided with the PEIR.

85. As assessed in **Volume 1, Chapter 21 Water Resources and Flood Risk**, the impact magnitude for pressures that could affect hydromorphology (i.e. direct disturbance of surface water bodies (Impact ID: WRF-C-01); increased sediment supply (impact ID WRF-C-02); supply of contaminants (impact ID WRF-C-03) and changes to surface and groundwater flows and flood risk (impact ID WRF-C-04)) is either 'no change' (no trenched crossings or temporary crossings), negligible or low.

86. With embedded control measures applied, construction activities would not result in a deterioration in the physico-chemical quality element or water body status or prevent status objectives being achieved in the future.

Table 21.4-9 Physico-Chemistry Control Measures

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Water Resources and Flood Risk Assessment
Physico-chemistry mitigation			
CO38	A Drilling Fluid Breakout Management Plan will be provided as part of the Code of Construction Practice (CoCP). The Drilling Fluid Breakout Management Plan will be developed in accordance with the Outline CoCP and will detail mitigation measures to reduce the risk of fluid breakouts during trenchless installation works and a response plan should a fluid breakout occur.	DCO Requirement (CoCP)	The Drilling Fluid Breakout Management Plan will manage the risks of a breakout, which could pollute groundwaters or smother habitats at the surface.
CO40	A Pollution Prevention Plan (PPP) will be provided as part of the Code of Construction Practice (CoCP). The PPP will incorporate the latest relevant Environment Agency best practice guidelines for pollution prevention and detail how ground and surface waters will be protected from construction-related pollution. The PPP will include appropriate control measures for the use and storage of any fuels, oils and other chemicals during construction works.	DCO Requirement (CoCP)	The PPP includes best practice mitigation measures that would minimise the likelihood of an accidental release and put in place procedures for an effective response to any pollution event in the water environment.

21.4.5.1.3 Biology

87. Construction activities could impact on aquatic flora, benthic invertebrates and fish fauna based on potential impacts to the hydromorphology and physico-chemistry quality elements. Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen. Additionally, changes to physico-chemistry could lead to loss or modification of in-channel and riparian habitats. This disturbance would limit the communities of all three biological parameters.

88. During construction the presence of temporary culverts and use of open cut trenching methods across ordinary watercourses could increase the conveyance of pollutants and fine sediment to water bodies, impacting on species and habitat populations.

89. Given the proposed embedded control measures that would be implemented to prevent construction impacts to hydromorphology and physico-chemistry, described above, these measures would indirectly reduce impacts to biological quality elements, by preventing the direct disturbance of watercourses, and preventing contaminants and fine sediment reaching water bodies and causing a risk of deterioration.

90. As described for hydromorphology and physico-chemistry, the impact magnitude for pressures that could affect hydromorphology (i.e. direct disturbance of surface water bodies (Impact ID: WRF-C-01); increased sediment supply (impact ID WRF-C-02); supply of contaminants (impact ID WRF-C-03) and changes to surface and groundwater flows and flood risk (impact ID WRF-C-04)), and subsequently impact water body biology, is either ‘no change’ (no trenched crossings or temporary crossings), negligible or low, depending on catchment sensitivity.

91. With embedded control measures applied (**Table 21.4-8**; **Table 21.4-9**), construction activities would not result in a deterioration in the biological quality element or water body status or prevent status objectives being achieved in the future.

21.4.5.2 Groundwater Bodies (Groundwater Quantity)

92. Groundwater quantity has been scoped into the assessment due to potential impacts that groundwater abstraction of up to 20m^3 per day at the landfall zone and 70m^3 per day at the OCS zone could have on overlying surface water bodies. In addition, there may be the requirement for localised dewatering along the onshore ECC if shallow groundwater is encountered.

93. The main surface water catchments that could be affected would be at the landfall and OCS zone. The landfall is not located in a surface water body as it is part of the onshore coastal catchment. Abstracted water would be required for use with drilling muds associated with the trenchless installation at the landfall and other construction activities (e.g. dust suppression, wheel washing). As a result of abstraction, there could be some localised drawdown of the water table in the vicinity of the abstraction point, which could in theory extend to the adjacent Barmston Sea Drain / Skipsea Drain to Conf surface water catchment.

94. Superficial geology at the landfall zone is mostly glacial till (BGS, 2024), which is generally clay rich. Borehole data from a location close to the landfall zone at Skipsea Sands Caravan Park (**Table 21.4-10** shows that a thick layer of clay (7.5m) overlies layers of boulders and gravel. The thick (34.5m) underlying chalk (and associated aquifer) is encountered at a depth of 19.5m. Although the degree of connectivity between surface and groundwaters in the landfall is not known, it is likely that the thick layer of clay that caps the more permeable deposits acts as an aquiclude (very low permeability) and gives protection to the overlying surface waters.

Table 21.4-10 Borehole Data for Skipsea Sands Caravan Park[2]

Strata details	Thickness	Depth
Hardcore	0.3	0.3
Clay	7.5	7.8
Boulder	9.2	17.0
Gravel	2.5	19.5
Chalk	34.5	54.0

95. Similarly at the OCS Zone 4 (High Hunsley to Woodmansey Area catchment) and Zone 8 (Beverley and Barmston Drain) most of the superficial deposits are glacial till with smaller areas of head (slopes deposits sourced from the surrounding parent material (i.e. till) and alluvium (BGS, 2024). There are no accessible borehole records for the OCS zones, but it is likely there will be a thickness of clay-rick till overlying the chalk aquifer and protecting surface waters. At OCS Zone 8 there are no permanent watercourses, further limiting the potential for groundwater abstraction to affect the surface water body.

[2] BGS. 2024. Survey of Existing Boreholes: Skipsea Sands Caravan Park, Mill Lane, Skipsea (ID TA15NE14) (https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/18539144). Accessed 05/12/24.

96. Along the onshore ECC there may be the requirement for localised dewatering if groundwater is encountered. However, cable trench excavations will be shallow (1.2m depth) and any dewatering would be temporary, small-scale and unlikely to affect overlying surface water bodies, especially given the low permeability of the superficial glacial till deposits.

97. Embedded control measures would be in place to mitigate potential impacts (**Table 21.4-11**) associated with shallow excavations and a hydrogeological risk assessment.

98. In addition, any abstraction that is required during construction in the Onshore Development Area would also be regulated by the details any abstraction licences that may be required. Specific details of abstractions licences would be agreed with the Environment Agency post consent.

99. Given that construction works would be confined to a relatively small area (0,02%) of the extensive groundwater body (1,967.3km^2), and abstraction volumes would be relatively modest, impacts on overlying surface water bodies are not anticipated.

100. As assessed in **Volume 1, Chapter 21 Water Resources and Flood Risk**, the impact magnitude for pressures that could affect groundwater quantity (i.e. changes surface and groundwater flows and flood risk (Impact ID: WRF-C-04)) in the Hull and East Riding Chalk groundwater body is negligible and effect significance is minor adverse due to high sensitivity.

101. Due to the relatively modest level of abstraction that would be required, the nature of superficial deposits in the onshore development area, and embedded control measures that would be in places, construction activities would not result in a deterioration in groundwater quantity element status or groundwater body status or prevent status objectives being achieved in the future.

Table 21.4-11 Groundwater Control Measures

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Water Resources and Flood Risk Assessment
Groundwater mitigation			
CO41	To protect groundwater bodies, the depth of excavation works will be kept as shallow as possible in line with construction and operational requirements. The target burial depth of onshore export cables will be approximately 1.2m to the top of the installed cable ducts, except where trenchless installation techniques are used or where deeper burial depth would be required due to other restrictions such as interactions with surface and buried infrastructure and landowner requirements.	DCO Requirement (CoCP)	Minimises potential impacts on groundwater bodies.
CO42	A hydrogeological risk assessment, informed by ground investigations, will be undertaken at each trenchless crossing location, where earthworks / excavations are within 50m (or 250m dependent upon volume abstracted) of private potable groundwater abstractions and / or where construction works have potential to interact with Source Protection Zone (SPZ) 1 or 2 areas. A hydrogeological risk assessment will also be required for earthworks / excavations within influencing distance of abstractions whereby construction works may interrupt flow pathways due to activities such as dewatering. The hydrogeological risk assessment will be undertaken in accordance with the Environment Agency's Approach to Groundwater Protection.	DCO Requirement (CoCP)	Minimises potential impacts on groundwater bodies.

21.4.6 Assessment Summary

102. Results of the WER compliance assessment process are summarised in **Table 21.4-12**.

103. The implementation of outlined control measures during construction and O&M phases means there will be no activities that have the potential to cause non-temporary effects. Construction and operation activities will not prevent water body status objectives being achieved in the future. The Project is therefore considered to be compliant with WER requirements.

Table 21.4-12 Compliance Assessment Summary

Water body	Stage 2	Stage 3	Deterioration in status	Prevent of objectives being achieved
Barmston Sea Drain from Skipsea Drain to N Sea	✗	✗	✗	✗
Barmston Sea Drain / Skipsea Drain to Conf	✓	✓	✗	✗
Old Howe / Frodingham Beck to R Hull	✓	✓	✗	✗
Foredyke Stream Lower to Holderness Dr	✓	✓	✗	✗
Mickley Dike Catchment	✓	✓	✗	✗
Hull from West Beck to Arram Beck	✓	✓	✗	✗
Holderness Drain Source to Foredyke Stream	✓	✓	✗	✗
Beverley and Barmston Drain	✓	✓	✗	✗
Bryan Mills Beck Source to Bryan Mills Farm	✓	✓	✗	✗
Scorborough Beck	✓	✓	✗	✗
Ella Dyke	✓	✓	✗	✗
High Hunsley to Arram Area	✓	✓	✗	✗
High Hunsley to Woodmansey Area	✓	✓	✗	✗
Leven Canal	✓	✓	✗	✗
Yorkshire South	✓	✓	✗	✗
Humber Middle	✗	✗	✗	✗
Humber Lower	✗	✗	✗	✗
Hull and East Riding Chalk	✓	✓	✗	✗

References

British Geological Society (BGS) (2024a). Geology Viewer. Available online: https://geologyviewer.bgs.ac.uk/ [Accessed 10/12/24]

BGS (2024b). Borehole Records Adjustment Form TAN04NW: Bryan Mills, Lockington. Available online: https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/459357 [Accessed: 12/12/24.]

BGS (2024c). Record of Well (shaft or bore): Bryan Mills New Cottages, near Lockington. Available online: https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/459335 [Accessed: 12/12/24]

CIRIA (2001) C532 Control of water pollution from construction sites. Available online: https://www.ciria.org/CIRIA/productexcerpts/c532.aspx [Accessed: 01/11/24].

CIRIA (2014). C736 Containment systems for the prevention of pollution Secondary, tertiary and other measures for industrial and commercial premises. CIRIA, London.

Court of Justice of the European Union (2015). Judgment in Case C-461/13 Bund für Umwelt und Naturschutz Deutschland eV v Bundesrepublik Deutschland. Available online: https://curia.europa.eu/jcms/upload/docs/application/pdf/2015-07/cp150074en.pdf. [Accessed 01/11/24].

Defra (2016). Guidance: Pollution prevention for businesses. Available online: https://www.gov.uk/guidance/pollution-prevention-for-businesses [Accessed 15/11/24].

Defra. (2024). Bathing water quality compliance reports. Available online: https://www.gov.uk/government/publications/bathing-waters-in-england-compliance-reports [Accessed 26/11/24].

Defra/Environment Agency (2009). WFD Expert Assessment of Flood Management Impacts R&D Technical Report FD2609/TR. Available online: https://assets.publishing.service.gov.uk/media/602e8c1bd3bf7f72182e9981/_WFD_Expert_Assessment_of_Flood_Management_Impacts_Technical_report.pdf [Accessed 20/01/25].

Environment Agency (2016). Water Framework Directive risk assessment. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/522426/LIT_10445.pdf. [Accessed: 01/11/24].

Environment Agency (2020). Surface Water Safeguard Zone Action Plan Summary Cottingham and Dunswell (GB40401G700700).

Environment Agency (2021). Surface Water Safeguard Zone Action Plan: Tophill Low, SWSGZ6010.Environment Agency (2023a). Clearing the Waters for All: Water Framework Directive assessment – estuarine and coastal waters. Available online: https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters. [Accessed 01/11/24].

Environment Agency (2023b). Catchment Data Explorer. Available online: England | Catchment Data Explorer [Accessed 01/10/24].

Legislation.gov.uk. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. Available online: https://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksiod_20151623_en_auto.pdf [Accessed 20/01/25].

Natural England (2022). Brayn Mills Field SSSI Condition of Features. Available online: https://designatedsites.naturalengland.org.uk/SiteFeatureCondition.aspx?SiteCode=S1002030&SiteName=Bryan Mills Field SSSI [Accessed 02/12/24].

Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive. Available online: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive [Accessed 01/11/24].

Scott Wilson (2010). Flamborough Head to Gibraltar Point Shoreline Management Plan, Non-Technical Summary. Humber Estuary Coastal Authorities Group.

UKTAG. 2003. UK Technical Advisory Group on the Water Framework Directive Guidance on Morphological Alterations and the Pressures and Impacts Analyses. Available online: https://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Morphological%20alterations%20and%20the%20pressures%20and%20impact%20analyses_Draft_251103.pdf [Accessed 20/01/25].

UKTAG. 2011. Guidance on the Water Framework Directive: Defining and Reporting on Groundwater Bodies. Available online: https://www.wfduk.org/sites/default/files/Media/Assessing%20the%20status%20of%20the%20water%20environment/UKTAG%20Paper%2011b(i)%20-%20Guidance%20on%20Groundwater%20Chemical%20Classification_FINAL_2802121%20v2.pdf [Accessed 20/01/25].

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List of Acronyms

Acronym	Definition
AMWB	Artificial Modified Water Bodies
CoCP	Code of Construction Practice
DBD	Dogger Bank D
DCO	Development Consent Order
DWPA	Drinking Water Protected Areas
DWSZs	Drinking Water Safeguard Zones
ECC	Export Cable Corridor
ES	Environmental Statement
ESBI	Energy Storage and Balancing Infrastructure
EQSD	Environmental Quality Standards Directive
EU	European Union
GEP	Good Ecological Potential
GES	Good Ecological Status
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HDD	Horizontal Directional Drilling
HMWB	Heavily Modified Water Bodies
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternative Current
HVDC	High Voltage Direct Current
IDB	Internal Drainage Board
INNS	Invasive Non-Native Species
LAT	Lowest Astronomical Tide
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
NVZ	Nitrate Vulnerable Zone
OCoCP	Outline Code of Construction Practice
OCS	Onshore Converter Station
PAHs	Polycyclic aromatic hydrocarbons
PBDE	Polybrominated diphenyl ethers
PEIR	Preliminary Environmental Information Report
PFAS	Per - and polyfluoroalkyl substances
PFOS	Perfluorooctane sulfonate
PPP	Pollution Prevention Plan
RBD	River Basin District
RBMP	River Basin Management Plan
RIAA	Report to Inform Appropriate Assessment
RNAG	Reason for Not Achieving Good
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
TJB	Transition Joint Bay
WER	Water Environment Regulations
WFD	Water Framework Directive