MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Environmental Statement

Volume 2, Annex 2.2: Water Framework Directive coastal waters assessment

September 2024
Rev: ES Issue

MOR001-FLO-CON-ENV-RPT-0034
MRCNS-J3303-RPS-10005

PINS Reference: EN020028
APFP Regulations: 5(2)(a)
Document reference: F2.2.2

Document status					
Version	Purpose of document	Approved by	Date	Approved by	Date
ES	For issue	AS	September 2024	IM	September 2024

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Glossary

Term	Meaning
Activity	In the context of this WFD coastal waters assessment this includes the installation, operation and maintenance, and decommissioning of offshore export cables through the intertidal and subtidal zones, seaward to 1 nm from MHWS.
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Limited (Morecambe OWL).
Development Consent Order	An order made under the Planning Act 2008, as amended, granting development consent.
Environmental Impact Assessment	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
Export cable corridor	The specific corridor of seabed (seaward of Mean High Water Springs) and land (landward of Mean High Water Springs) from the Generation Assets to the National Grid Penwortham substation.
Footprint	The area of habitat potentially affected by the activity, which may also comprise a temperature or sediment plume.
Generation Assets	The generation assets associated with the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm include the offshore wind turbines, inter-array cables, offshore substation platforms and platform link (interconnector) cables to connect offshore substations.
Intertidal Infrastructure Area	The temporary and permanent areas between MLWS and MHWS.
Landfall	The area in which the offshore export cables make landfall (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Lytham St. Annes between Mean Low Water Springs and the transition joint bays inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Marine licence	The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities. Section 149A of the Planning Act 2008 allows an applicant for a Development Consent Order to apply for 'deemed marine licences' as part of the Development Consent Order process.
Maximum design scenario	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the Transmission Assets.
Morecambe Offshore Windfarm: Generation Assets	The offshore generation assets and associated activities for the Morecambe Offshore Windfarm.
Morecambe Offshore Windfarm Transmission Assets	The offshore export cables, landfall and onshore infrastructure required to connect the Morecambe Offshore Windfarm to the National Grid.

Term	Meaning
Morecambe OWL	Morecambe Offshore Windfarm Limited is a joint venture between Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company) (Cobra) and Flotation Energy Ltd.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore and onshore infrastructure connecting the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm to the national grid. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker compounds. Also referred to in this report as the Transmission Assets, for ease of reading.
Morgan Offshore Wind Project: Generation Assets	The offshore generation assets and associated activities for the Morgan Offshore Wind Project.
Morgan Offshore Wind Project Transmission Assets	The offshore export cables, landfall and onshore infrastructure required to connect the Morgan Offshore Wind Project to the National Grid.
Morgan OWL	Morgan Offshore Wind Limited is a joint venture between bp Alternative Energy investments Ltd. and Energie Baden-Württemberg AG (EnBW).
National Site Network	Following the UK's exit from the European Union, Special Areas of Conservation and Special Protection Areas (SPAs) in the UK no longer form part of the EU's Natura 2000 ecological network. The 2019 (EU Exit) Regulations have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK, including existing Special Areas of Conservation and SPAs as well as new Special Areas of Conservation and SPAs designated under these Regulations.
Offshore export cables	The cables which would bring electricity from the Generation Assets to the landfall.
Offshore export cable corridor	The corridor within which the offshore export cables will be located.
Offshore Permanent Infrastructure Area	The area within the Transmission Assets Offshore Order Limits (up to MLWS) where the permanent offshore electrical infrastructure (i.e. offshore export cables) will be located.
Offshore Order Limits	See Transmission Assets Order Limits: Offshore (below).
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substations.
Onshore export cable corridor	The corridor within which the onshore export cables will be located.
Quality element	Generic descriptor for ecological and physical receptors with the potential to be impacted by activities in the marine environment. These provide the basis on which the status of WFD water bodies is classified.
Transmission Assets	See Morgan and Morecambe Offshore Wind Farms: Transmission Assets (above).

Term	Meaning
Transmission Assets Order Limits: Offshore	The area within which all components of the Transmission Assets seaward of Mean Low Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning. Also referred to in this report as the Offshore Order Limits, for ease of reading.
WFD coastal waters assessment study area	Defined as the area within a 2 km buffer zone of the Transmission Assets Order Limits and Intertidal Infrastructure Area, seaward to 1 nm from MHWS.

Acronyms

Acronym	Meaning
AEoI	Adverse Effect on Integrity
Cefas	Centre for Environment, Fisheries and Aquaculture Science
Defra	Department for Environment, Food and Rural Affairs
DO	Dissolved Oxygen
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EQSD	Environmental Quality Standards Directive
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HRA	Habitats Regulations Assessment
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
MCZ	Marine Conservation Zone
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
NSA	Nutrient Sensitive Area
NVZ	Nitrate Vulnerable Zones
OSPAR	Oslo and Paris Conventions
RBMP	River Basin Management Plan
SPA	Special Protection Area
SSC	Suspended Sediment Concentration
SSSI	Site of Special Scientific Interest

Acronym	Meaning
TJB	Transition Joint Bay
UK	United Kingdom
UV	Ultraviolet Light
WFD	Water Framework Directive
ZOI	Zone of Influence

Units

Unit	Description
%	Percentage
km	Kilometre
km^2	Square kilometres
m	Metre
mm	Millimetre
m^2	Square metres
nm	Nautical mile
µm	Micrometre

1 Water Framework Directive coastal waters assessment

1.1 Introduction

1.1.1.1 This document forms Annex 2.2 of Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (ES) prepared for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. The ES presents the findings of the Environmental Impact Assessment (EIA) process for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (hereafter referred to as the Transmission Assets), as illustrated in **Figure 1.1**.

1.1.1.2 This document provides the Water Framework Directive (Council Directive 2000/60/EC establishing a framework for community action in the field of water policy) (WFD) compliance assessment for the Transmission Assets against the objectives for the relevant WFD water bodies (see **section 1.5.2**). It describes the current baseline conditions and provides a WFD screening, scoping and assessment of potential effects and changes due to the installation and presence of the Transmission Assets.

1.1.1.3 The WFD was adopted by the European Commission in December 2000 and was transposed into law in England and Wales by The Water Environment Water Framework Directive) (England and Wales) Regulations 2017 (the 2017 Regulations). The WFD is retained EU legislation and is applicable in England and Wales as set out in sections 2 and 3 of the European Union (Withdrawal) Act 2018 and the Floods and Water (Amendment etc.) (EU Exit) Regulations 2019.

1.1.1.4 The WFD applies to all water bodies, including those that are both natural and man-made. Under the WFD, coastal waters, estuaries, rivers, man-made docks and canals are divided into a series of water bodies, and within each water body, the WFD sets ecological and chemical objectives.

1.1.1.5 Whilst EIA is an efficient mechanism to gather the relevant information for WFD compliance assessment, it needs to be interpreted specifically in relation to the WFD objectives. According to the '*Clearing the Waters for All*' guidance (Environment Agency, 2023a), impacts on biology, chemistry and hydromorphology need to be considered in relation to WFD status classes and reported under a specific WFD section in any ES or report produced, or in a separate WFD compliance report. Therefore, this WFD coastal waters assessment has been undertaken to assess the potential impact during the construction, operation and maintenance, and decommissioning phases of the Transmission Assets on WFD transitional and coastal receptors seaward of Mean High Water Springs (MHWS), out to 1 nm, as advised in '*Clearing the Waters for All*'.

1.1.1.6 WFD compliance of onshore infrastructure has been assessed and presented as part of Volume 3, Chapter 2: Hydrology and flood risk of the ES and Volume 3, Annex 2.1: Water Framework Directive surface water and groundwater assessment of the ES.

1.1.1.7 This WFD coastal waters assessment considers the different activities associated with the Transmission Assets in the context of the environmental objectives of any affected WFD coastal and transitional water body. The compliance assessment also provides the opportunity to inform the detailed design of the Transmission Assets to avoid, minimise, mitigate or compensate for the risks to the environmental objectives of WFD coastal water receptors (see **section 1.4.3**) where the risk assessment determines that the activities have the potential to:

- cause a surface water body to deteriorate from one WFD status class to another or cause significant localised impacts that could contribute to this happening; and
- prevent or undermine action to get surface water bodies to good status (e.g. compromise the programme of measures put in place to achieve the ultimate water body objective).

1.1.1.8 The '*Clearing the Waters for All*' guidance, the Planning Inspectorate 'Advice Note 18: Water Framework Directive' (Planning Inspectorate, 2017) and the relevant chapters of the Transmission Assets ES, are used to inform the screening, scoping and assessment of the potential for the Transmission Assets to have a non-temporary effect on WFD parameters at the water body level.

1.1.1.9 Temporary effects of the Transmission Assets are also included for assessment although it is noted in the '*Clearing the Waters for All*' guidance that these are not considered to constitute a deterioration in WFD status.

1.1.1.10 Information to inform the WFD coastal waters assessment within the WFD coastal waters assessment study area (see **section 1.3**) was collected through a detailed desktop review of existing studies and datasets, summarised in **section 1.1.3**.

1.1.1.11 Characterisation of the existing baseline has been undertaken on the basis of the information detailed within the following chapters of the Transmission Assets ES.

- Volume 1, Chapter 3: Project description of the ES.
- Volume 2, Chapter 1: Physical processes of the ES.
- Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES.
- Volume 2, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the ES.
- Volume 2, Chapter 3: Fish and shellfish ecology of the ES.
- Volume 2, Annex 3.1: Fish and shellfish ecology technical report of the ES.

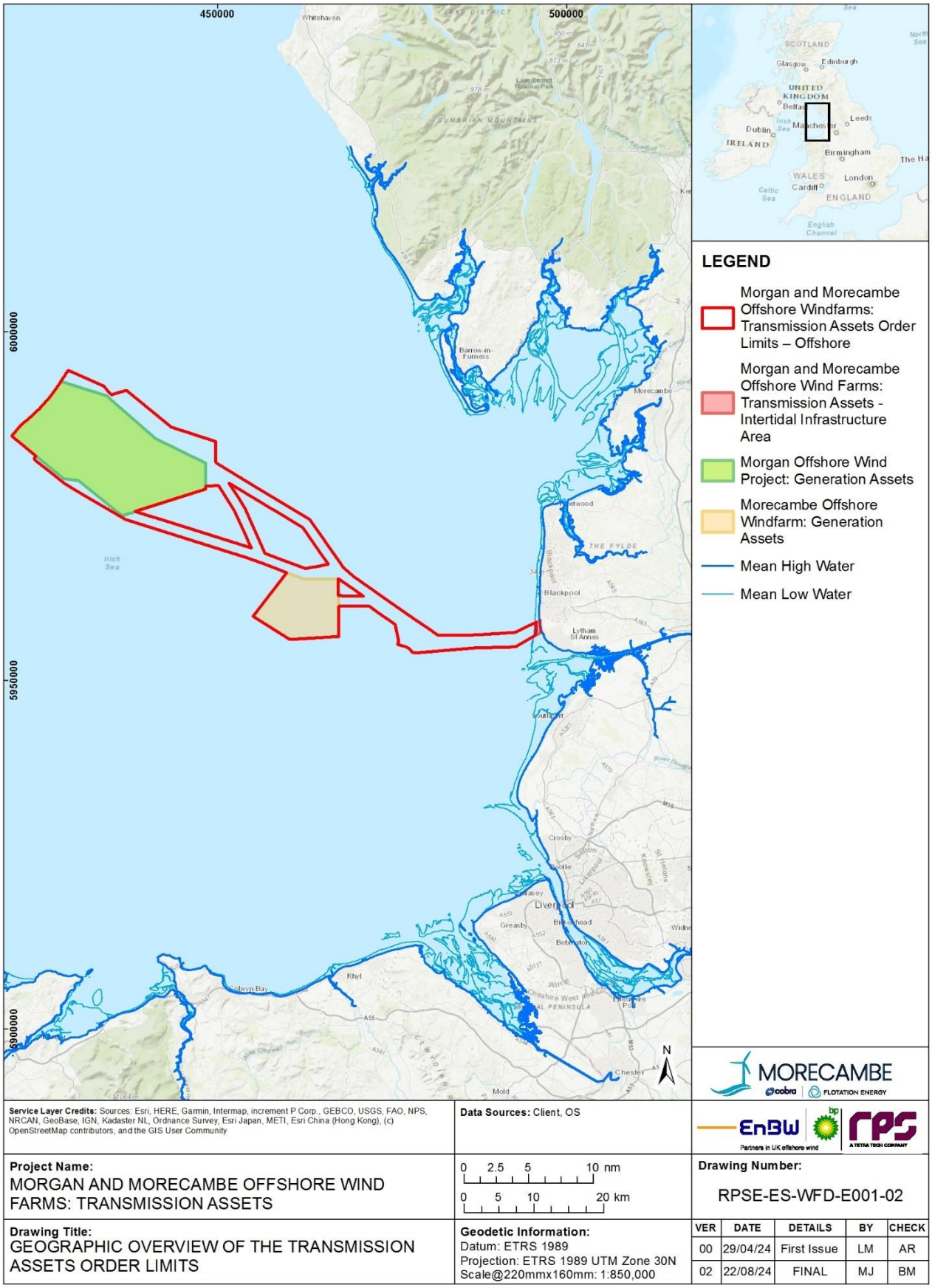

Figure 1.1: Geographic overview of the Transmission Assets Order Limits

1.1.2 Consultation

1.1.2.1 A summary of the key items raised specific to WFD coastal waters assessment is presented in **Table 1.1**, together with how these have been considered in the production of this annex. It should however be noted that formal responses are provided for all consultation responses received and can be accessed in the Consultation Report (document reference E1).

Table 1.1: Summary of key consultation comments raised during consultation activities undertaken for the Transmission Assets relevant to WFD coastal waters assessment

Date	Consultee and type of response	Comments raised	How and where considered
December 2022	Environment Agency – Scoping Opinion	**Terrestrial ecology (intertidal and onshore)** We agree with scope for Marine Conservation Zone (MCZ) and WFD.	Noted. Scope for WFD assessment, as described in the EIA Scoping Report, has been adhered to.
December 2022	Natural England – Scoping Opinion	**Water Quality** Increases in suspended sediment concentrations (SSC) during construction and operation (e.g. future dredging works) have the potential to smother sensitive habitats. The ES should include information on the sediment quality and potential for any effects on water quality through suspension of contaminated sediments. The EIA should also consider whether increased SSC resulting are likely to impact upon the interest features and supporting habitats of the designated sites. The ES should consider whether there will be an increase in the pollution risk as a result of the construction or operation of the development.	Potential effects of SSC have been considered in the water quality sections for all relevant water bodies as part of the scoping stage, presented in **Table 1.17** and **Table 1.26** and in **section 1.6.2**. The potential for an increased risk of water pollution have been considered in **Table 1.18, Table 1.19, Table 1.27** and **Table 1.28**.
November 2023	Environment Agency (National Infrastructure Team) – Section 42 Consultation	The Environment Agency were satisfied with the conclusions of this WFD assessment, noting it will need to be updated following any changes in design of both temporary and permanent works. WFD mitigation may be needed following any changes in sediment transport and reduced sediment supply to the adjacent Site of Special Scientific Interest (SSSI) Lytham sand dune system as a result of the proposed	The project design has been reviewed for changes that may affect the WFD assessment since the Preliminary Environmental Information Report (PEIR)Relevant changes have been identified and incorporated into water body-specific scoping (sections **1.5.3** and **1.5.4**), with no increase

Date	Consultee and type of response	Comments raised	How and where considered
		scheme. This also applies to any significant hydromorphic changes upon the sea bed topography.	in impacts and no change to the assessment outcome (**section 1.6**). Assessments presented in Volume 2, Chapter 1: Physical processes of the ES indicate no significant changes in sediment transport that would reduce sediment supply to Lytham St Annes Dunes SSSI. Similarly, no significant changes are anticipated to hydromorphology or seabed topography that would jeopardise the status of relevant WFD waterbodies. No WFD mitigation, beyond that already committed (see **Table 1.5** and Volume 1, Annex 5.3: Commitments register of the ES) is recommended.

1.1.3 Data sources, policy and guidance

1.1.3.1 Information on WFD coastal waters assessment within the WFD coastal waters assessment study area was collected through a detailed desktop review of existing studies and, datasets and is informed by guidance. These information sources are summarised at **Table 1.2** below.

Table 1.2: Summary of key data sources and guidance

Title	Source	Year	Author
2024 Bathing Water Profile for Blackpool South	Environment Agency Bathing Water Quality tool (Environment Agency, 2024a)	2024	Environment Agency
2024 Bathing Water Profile for St Annes	Environment Agency Bathing Water Quality tool (Environment Agency, 2024b)	2024	Environment Agency
2024 Bathing Water Profile for St Annes North	Environment Agency Bathing Water Quality tool (Environment Agency, 2024c)	2024	Environment Agency
Magic Map Application	Department for Environment, Food and Rural Affairs (Defra) Magic mapping tool (Defra, 2024)	2024	Defra
Ribble Estuary Cockle Beds	North Western IFCA Cockle Fisheries (North Western IFCA, 2024a)	2024	North Western IFCA

Title	Source	Year	Author
Ribble Estuary Mussel Beds	North Western IFCA Mussel Fisheries (North Western IFCA, 2024b)	2024	North Western IFCA
Clearing the Waters for All	Water Framework Assessment Guidance: estuarine and coastal waters (Environment Agency, 2023a)	2023	Environment Agency
Water body summary table	WFD water body summary table (2023 update) MS Excel Spreadsheet (Environment Agency, 2023b)	2023	Environment Agency
Overarching National Policy Statement for Energy (EN-1)	Planning guidance for developers of nationally significant energy infrastructure projects (Department for Energy Security & Net Zero, 2023)	2023	Department for Energy Security & Net Zero
Ribble *C. edule*	Centre for Environment, Fisheries and Aquaculture Science (Cefas) Classification zone maps (Cefas, 2023)	2023	Cefas
Ribble Mytilus spp	Cefas Classification zone maps (Cefas, 2022)	2022	Cefas
North West river basin district river basin management plan	North West river basin district river basin management plan: updated 2022 (Environment Agency 2022a)	2022	Environment Agency
North West TraC Management Catchment	Environment Agency Catchment Data Explorer (Environment Agency, 2022b)	2022	Environment Agency
Mersey Mouth Water Body	Environment Agency Catchment Data Explorer (Environment Agency, 2022c)	2022	Environment Agency
RIBBLE Water Body	Environment Agency Catchment Data Explorer (Environment Agency, 2022d)	2022	Environment Agency
Draft river basin management plan: maps	Environment Agency mapping tool (Environment Agency, 2021)	2021	Environment Agency
Liverpool Bay/Bae Lerpŵl Special Protection Area (SPA)	Natura 2000 – Standard Data Form: Liverpool Bay/Bae Lerpŵl (UK9020294) (Joint Nature Conservation Committee (JNCC), 2017)	2017	JNCC
Advice Note Eighteen: The Water Framework Directive	Planning Inspectorate Advice Note Eighteen, Published June 2017 (version 1) (Planning Inspectorate, 2017)	2017	Planning Inspectorate
Ribble and Alt Estuaries SPA	Natura 2000 – Standard Data Form: Ribble and Alt Estuaries (UK9005103) (JNCC, 2015)	2015	JNCC
Ribble and Alt Estuaries Ramsar Site	Ramsar Information Sheet (RIS) for Ribble and Alt Estuaries (JNCC, 2005)	2005	JNCC

National Policy Statements

1.1.3.2 There are currently six energy National Policy Statements (NPSs), one of which contains policy relevant to WFD assessment: Overarching National Policy Statement for Energy (EN-1), which sets out the United Kingdoms (UK) Government's policy for the delivery of major energy infrastructure (Department for Energy Security & Net Zero, 2023). A summary of the NPS

provisions relevant to the WFD coastal waters assessment is presented in Table 1.3.

Table 1.3: Summary of the NPS EN-1 policies relevant to the WFD coastal waters assessment

Summary of NPS provision	How and where considered in the WFD coastal waters assessment
[Paragraph 5.16.2] "During the construction, operation, and decommissioning phases, development can lead to increased demand for water, involve discharges to water, and cause adverse ecological effects resulting from physical modifications to the water environment. There may also be an increased risk of spills and leaks of pollutants to the water environment. These effects could lead to adverse impacts on health or on protected species and habitats (see Section 4.3) and could result in surface waters, groundwaters or protected areas failing to meet environmental objectives established under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and the Marine Strategy Regulations 2010." [Paragraph 5.16.7] "The ES should in particular describe…any impacts of the proposed project on water bodies or protected areas (including shellfish protected areas) under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and source protection zones (SPZs) around potable groundwater abstractions…"	Section **1.5** considers the potential impact of the construction, operation, and decommissioning phases of the Transmission Assets upon the six quality elements on which the status of WFD water bodies is classified. • Hydromorphology. • Biology – habitats. • Biology – Fish. • Water quality. • Protected areas. • Invasive non-native species. These quality elements are considered for the Mersey Mouth water body in section **1.5.3** and for the Ribble water body in section **1.5.4**. In cases where the potential impact of the Transmission Assets is expected to exceed the threshold given in the '*Clearing the Waters for All*' guidance, or in cases for which observations (e.g. sediment contaminant) or classifications (e.g. phytoplankton status) meet or exceed these thresholds, the respective quality element has been taken forward for assessment in section **1.6**.

UK Marine Policy Statement

1.1.3.3 The UK Marine Policy Statement (MPS) outlines some of the legislative provisions that Marine Plans need to take into account, which includes the WFD. No additional requirements relevant to WFD assessment are stipulated within the UK MPS.

North West Inshore and North West Offshore Marine Plan

1.1.3.4 The North West Marine Plan states that With the exception of the derogations identified in Section 17 and 19 of the 2017 Regulations there should be no residual adverse impacts on inshore water bodies. No additional requirements relevant to WFD assessment are stipulated within the North West Marine Plan.

1.2 Project description

1.2.1 Overview

1.2.1.1 Morgan Offshore Wind Limited (OWL) and Morecambe OWL (hereafter referred to collectively as 'the Applicants') are proposing to develop the Transmission Assets, as illustrated in **Figure 1.1**. The purpose of the Transmission Assets is to connect the Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets (referred to collectively as the 'Generation Assets') to the National Grid.

1.2.1.2 The maximum design scenario for the Transmission Assets offshore export cable corridor is presented in **Table 1.4**. For the purposes of the WFD Coastal Waters Assessment, which applies seaward of MHWS up to 1 nm from the coast, the relevant section of the offshore export cables considered here is that which lies out to 1 nm (~1,852 m) seaward from MHWS. Although the Transmission Assets offshore export cable corridor has been identified, the exact position of the offshore export cables within the export cable corridor will be determined based upon geophysical and geotechnical survey information.

1.2.1.3 The maximum distance between MHWS and Mean Low Water Springs (MLWS) within the WFD coastal waters assessment study area (as defined in section **1.3**) was calculated as 1,069 m, while the minimum distance was calculated as 645 m. The maximum design scenario is therefore based upon the greatest distance of subtidal trenching, which would be required for the shortest intertidal distance.

Table 1.4: Maximum design scenario for installation of offshore export cables out to 1 nm from MHWS (i.e. within WFD coastal assessment study area)

Parameter	Maximum Design Scenario
Maximum number of offshore export circuits	6
Offshore export cable length, per circuit out to 1 nm	1,852 m
Maximum total offshore export cable length out to 1 nm (6 cables)	11,112 m
Maximum cable diameter	350 mm
Intertidal	
Maximum length of intertidal	1,069 m
Minimum length of intertidal	645 m
Cable installation methodologies – between MWHS and MLWS (intertidal)	Open cut trenching, trenchless installation, marinised trencher
Maximum distance of trenchless cable installation from direct pipe entry pit (at Blackpool Airport) to exit pit (above MLWS)	1,500 m
Dimensions of trenchless cable installation exit pits	15 m x 5 m
Footprint of trenchless cable installation exit pits	75 m^2
Dimensions of trenchless cable installation exit pits and working areas (20 m buffer)	35 m x 25 m

Parameter	Maximum Design Scenario
Footprint of trenchless cable installation exit pits and working areas	875 m^2
Maximum length of intertidal open-trench installation (m)	300 m
Minimum length of intertidal trenchless installation (assuming maximum length of intertidal open-trench installation)	345 m
Maximum depth of trench	3 m
Maximum width of trench	10 m
Maximum width of seabed disturbed by cable installation (per cable)	50 m
Maximum area of intertidal seabed disturbance	**90,000 m^2**
Subtidal	
Cable installation methodologies – seaward of MLWS (subtidal)	Trenching, plough, pre-lay plough, jetting, mechanical cutting
Maximum distance of trenching in subtidal zone	1,207 m
Target cable burial depth	1 m
Minimum cable burial depth	0.5 m
Maximum cable burial depth	3 m
Maximum width of subtidal seabed disturbed by cable installation (per cable)	60 m (sandwave clearance) 20 m (boulder and debris clearance) 20 m (cable installation tool)
Maximum area of subtidal seabed disturbed by cable installation tool	144,840 m^2
Maximum percentage of export cables requiring sandwave clearance	9%
Maximum percentage of export cables **not** requiring sandwave clearance	91%
Maximum area of seabed requiring sandwave clearance	39,107 m^2
Maximum area of seabed **not** requiring sandwave clearance	131,804 m^2
Maximum area of subtidal seabed disturbance	**170,911 m^2**
Cable protection	
Maximum width of cable protection	10 m
Maximum percentage of subtidal cable requiring protection	10%
Maximum area of subtidal cable protection[1]	7,242 m^2
All footprints	
Total maximum seabed disturbance in WFD water body	**260,911 m^2**

[1] Note that the width of disturbance from exit pit working areas in the intertidal infrastructure area (35 m) is less than that for open trench installation (50 m), and the width of cable protection (10 m) is less than that from subtidal cable installation itself (20 m). To avoid double-counting, the total footprint therefore does not include exit pit working areas or cable protection.

1.2.1.4 The Transmission Assets project design requires flexibility in type, location, depth of burial and protection measures for the offshore export cables to ensure that anticipated physical and technical constraints and changes in available technology can be accommodated within the Transmission Assets design.

1.2.2 Construction

Offshore export cable installation

1.2.2.1 Offshore export cables are used for the transfer of power from the Generation Assets to the landfall site. Up to six offshore export cables will be required as follows:

- Up to four cables for the Morgan Offshore Wind Project: Transmission Assets.
- Up to two cables for the Morecambe Offshore Windfarm: Transmission Assets.

1.2.2.2 A co-ordinated export cable corridor is anticipated for the offshore export cables, which will be located within the Offshore Infrastructure Area (the area within which the offshore export cables will be located).

1.2.2.3 Before offshore export cable installation can be undertaken in the subtidal zone, seabed preparation works may be required to remove obstacles that may prevent offshore export cables from being buried to the target depth. Preparation works include removal of boulders and clearance of sandwaves and similar bedforms to provide a clear path along which cable burial and installation equipment can move.

1.2.2.4 Methods being considered for installation of the offshore export cables in the subtidal zone include trenching, ploughing, jetting and mechanical cutting. Cable installation via pre-lay plough (see Volume 1, Chapter 3: Project description and the Outline Cable Specification and Installation Plan (CSIP) (document reference J15), plough, trenching and jetting involves creating a trench within which the cable is laid, and the trench or ploughed area is backfilled.

1.2.2.5 Offshore export cables would come onshore at the landfall site, which will be located on the coast of north west England near Lytham St Annes, Lancashire. The landfall refers to the area where the offshore export cables come ashore (i.e., make landfall) and are jointed to the onshore export cables via the Transition Joint Bays (TJB). TJBs are underground concrete structures accessed via an inspection cover at ground level and would be located at or near Blackpool Airport.

1.2.2.6 Works between the TJBs at Blackpool airport and the intertidal infrastructure area at Lytham St Annes will be undertaken by direct pipe installation. Direct pipe is a hybrid method between micro-tunnelling and Horizontal Direction Drilling (HDD) that allows for installation under sensitive features. The offshore export cable would then be pulled above MLWS and through the direct duct to be jointed to the onshore export cables within the TJBs.

1.2.2.7 Following the pull in of the offshore export cable(s), the cables would be buried above MLWS via open cut trenching and marinised trencher. Open cut trenching in the intertidal zone would be undertaken between direct pipe exit pits and MLWS to a maximum distance of 300 m, after which a marinised trencher would be utilised.

1.2.3 Operation and maintenance

1.2.3.1 Routine inspections of offshore export cables will be undertaken to ensure the cables are buried to an adequate depth and not exposed. The integrity of the cables and cable protection systems will also be checked on a regular basis, as required. Inspection of the intertidal zone is expected to take place, on foot, on an annual basis, by a maximum of two persons. Maintenance works to rebury/replace and carry out repair works on offshore export cables, should this be required, are presented in Volume 1, Chapter 3: Project description of the ES.

1.2.4 Decommissioning

1.2.4.1 During decommissioning, it is expected that offshore export cables in the intertidal zone will be removed up to the TJBs. The cable ends will be cut, sealed and securely buried as a precautionary measure.

1.2.4.2 The decommissioning sequence will generally be the reverse of the construction sequence and involve similar types and numbers of equipment. The Energy Act 2004 requires that a decommissioning plan must be submitted to the Secretary of State for the Department for Energy Security and Net Zero (at the time of writing) prior to the construction of the Transmission Assets and is typically prepared post-consent.

1.2.4.3 The decommissioning plan and programme will be updated during the lifetime of the Transmission Assets to take account of changes in regulations, best practice and new technologies (see **Table 1.5**).

1.2.5 Measures adopted as part of the Transmission Assets (Commitments)

1.2.5.1 This section provides an overview of the relevant measures which are being adopted as part of the Transmission Assets, including Project Design Envelope commitments for the Transmission Assets (Volume 1, Chapter 3: Project description of the ES). The provision of the identified plans, as detailed below, will be secured in the draft Development Consent Order (or marine licences). These measures have been developed as part of the EIA process as embedded measures specified in the relevant technical topics of the EIA (as set out in **section 1.1.1.11**) and include those measures summarised in **Table 1.5** (see Volume 1, Annex 5.3: Commitments register of the ES).

Table 1.5: Measures (commitments) adopted as part of the Transmission Assets

Commitment number	Measure adopted	How the measure will be secured
CoT45	The Outline Offshore Cable Specification and Installation Plan (CSIP) for the Fylde MCZ includes: details of cable burial depths, cable protection, and cable monitoring. The Outline CSIP also includes an Outline Cable Burial Risk Assessment (CBRA). Detailed CSIP(s) and CBRA(s) will be prepared by the Applicants covering the full extent of their respective offshore export cable corridors. Detailed CSIPs will be developed in accordance with the Outline CSIP and will ensure safe navigation is not compromised including consideration of under keel clearance. No more than 5% reduction in water depth (referenced to Chart Datum) will occur at any point on the offshore export cable corridor route without prior written approval from the MCA.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(e) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Wind Farm Transmission Assets), Part 2 - Condition 18(1)(e) (Pre-construction plans and documentation).
CoT49	Construction Method Statement(s) (CMSs) including Offshore Cable Specification and Installation Plan(s), will be produced and implemented prior to construction. These will contain: - details of cable installation and methodology; and - details of foundation installation methodology covering scour protection and the deposition of material arising from drilling, dredging, and/or sandwave clearance.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(e) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Wind Farm Transmission Assets), Part 2 - Condition 18(1)(e) (Pre-construction plans and documentation).
CoT54	An Outline Offshore Cable Specification and Installation Plan (CSIP) (document reference J15) will include for cable burial to be the preferred option for cable protection, where practicable. Detailed CSIP(s) will be developed in accordance with the Outline CSIP (document reference J15).	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(e) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Wind Farm Transmission Assets), Part 2 - Condition 18(1)(e) (Pre-

Commitment number	Measure adopted	How the measure will be secured
		construction plans and documentation).
CoT55	Offshore Decommissioning Programme will be developed prior to decommissioning and will include information on the consideration of recycling of materials, where practicable, and if opportunities are available.	DCO Schedules 2A & 2B, Requirement 21 (Offshore decommissioning).
CoT65	Offshore Environmental Management Plan(s) (EMPs) will be developed and will include details of: – a marine pollution contingency plan to address the risks, methods and procedures to deal with any spills and collision incidents during construction and operation of the authorised scheme for activities carried out below MHWS; – a chemical risk review to include information regarding how and when chemicals are to be used, stored and transported in accordance with recognised best practice guidance; – waste management and disposal arrangements; – the appointment and responsibilities of a fisheries liaison officer; – a fisheries liaison and coexistence plan (which accords with the outline fisheries liaison and co-existence plan) to ensure relevant fishing fleets are notified of commencement of licensed activities pursuant to condition and to address the interaction of the licensed activities with fishing activities; – measures to minimise disturbance to marine mammals and rafting birds from vessels; and – a Marine Biosecurity Plan that includes measures to minimise the potential spread of invasive non-native species, including adherence to IMO ballast water management guidelines.	DCO Schedules 14 & 15, Part 2- Condition18(1)(f) (Pre-construction plans and documentation).
CoT 114	All permanent infrastructure located between Mean Low Water Springs (MLWS) and Mean High Water Springs (MHWS) will be buried to a target depth of 3 metres, subject to further pre-construction surveys to be reported within Detailed Cable Burial Risk Assessments (CBRAs). An Outline CBRA (document reference J14) has been prepared and submitted with the application for development consent.	DCO Schedules 14 & 15, Part 2- Condition 18(e)(i)(bb) (Pre-construction plans and documentation).

1.3 WFD coastal waters assessment study area and Zone of influence

1.3.1.1 The WFD coastal waters assessment study area is based on the requirements set out in the *'Clearing the Waters for All*' guidance and the defined Zone of Influence (ZOI).

1.3.1.2 The ZOI is defined as the geographical extent of an impact from activities associated with the Transmission Assets on a receptor. Following the '*Clearing the Waters for All*' guidance, the ZOI is considered to be within

2 km of the activity (defined in paragraph **1.4.1.2**) being assessed. This distance is based upon the requirement for protected areas within 2 km of an activity being scoped in for assessment (Environment Agency, 2023a).

1.3.1.3 Similarly, the Marine Management Organisation (MMO) 'Marine Conservation Zones and Marine Licensing' guidance (MMO, 2013) on MCZ assessment recommends the use of a risk-based approach to determine the "nearness" of an activity to protected areas. This includes applying an appropriate buffer zone to the features under consideration, as well as a consideration of risks for activities at greater distances.

1.3.1.4 A 2 km buffer zone (the ZOI) has therefore been applied either side of the Transmission Assets. As discussed in **section 1.1**, '*Clearing the Waters for All guidance*' states that the WFD coastal waters assessment should apply seaward of MHWS out to 1 nm.

1.3.1.5 The WFD coastal waters assessment study area is therefore defined as the area of the Transmission Assets Offshore Order Limits and intertidal infrastructure area, with a 2 km buffer zone (i.e. the ZOI), seaward to 1 nm from MHWS, as illustrated in **Figure 1.2**.

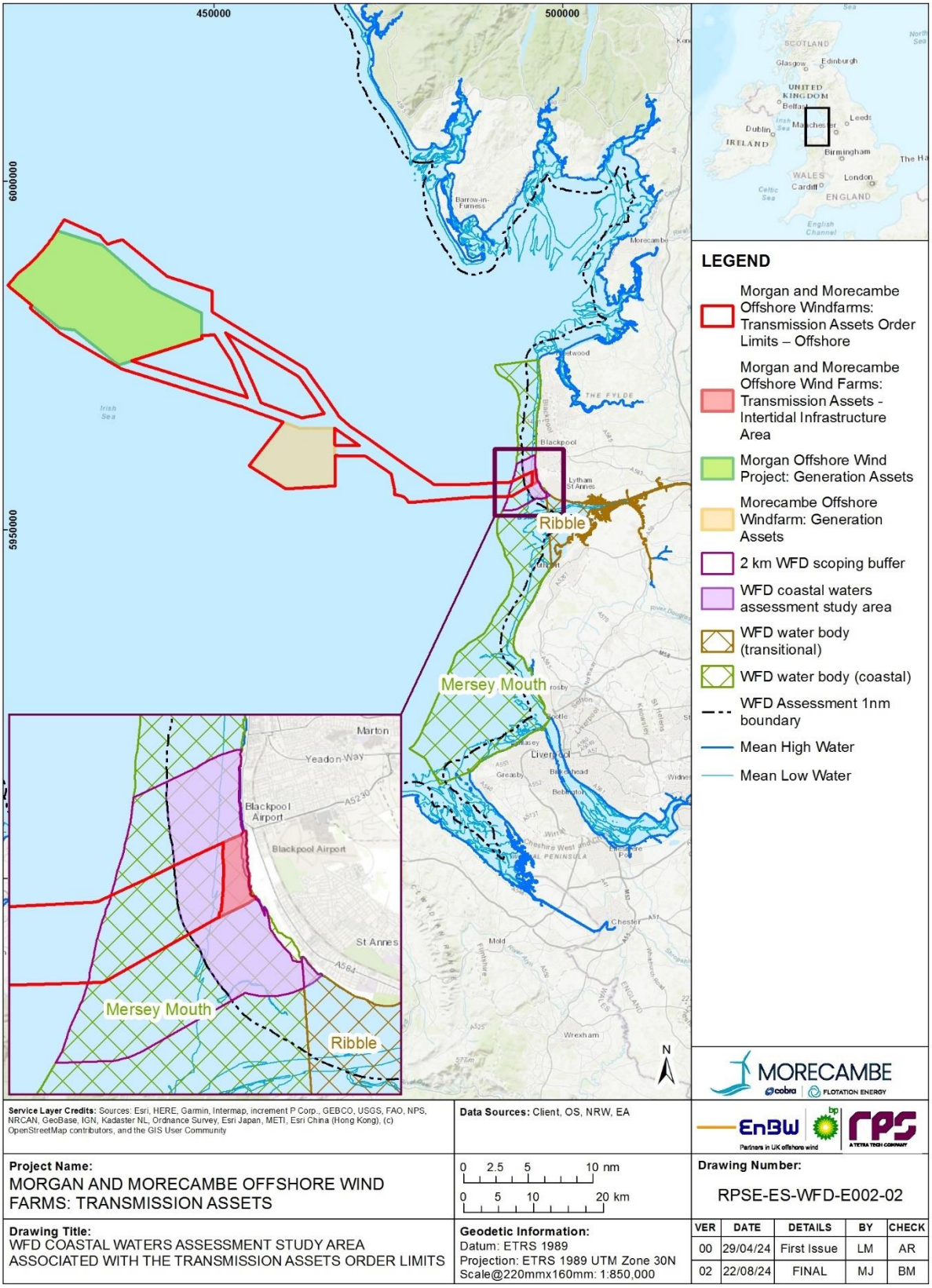

Figure 1.2: WFD coastal waters assessment study area associated with the Transmission Assets Order Limits

1.4 Methodology

1.4.1 Introduction

1.4.1.1 The *'Clearing the Waters for All*' guidance stipulates that the footprint of an activity should be considered when assessing its potential impact upon WFD water bodies and protected areas (as defined in **section 1.4.3**).

1.4.1.2 In the context of this WFD coastal waters assessment, 'activity' refers to the following features of the Transmission Assets, described in **section 1.2**, that are proposed to occur within the WFD coastal waters assessment study area.

- The installation, operation and maintenance, and decommissioning of up to six offshore export cables through the intertidal zone via open-cut trenching and direct pipe installation (i.e. trenchless installation).
- The installation, operation and maintenance, and decommissioning of up to six offshore export cables in the subtidal zone, seaward to 1 nm from MHWS, via open-cut trenching.

1.4.1.3 In the context of this WFD coastal waters assessment, 'footprint' refers to the area of habitat potentially affected by the activity, which may also comprise a temperature or sediment plume, and for a dredging activity, a footprint is defined as 1.5 times the dredge area (Environment Agency, 2023a). However, dredging is not anticipated to be required within the WFD coastal waters assessment study area, nor is the activity expected to produce a temperature or sediment plume. The footprint is therefore defined as the area of habitat directly affected by the activity, as detailed in **Table 1.4**.

1.4.2 Screening

1.4.2.1 According to the '*Clearing the Waters for All*' guidance, the aim of screening is to ensure that only those activities that may cause deterioration or prevent a water body from meeting its objectives are taken forward for assessment. Screening excludes any activities that do not need to go through the scoping or impact assessment stages. Activities which can be excluded from scoping include those which are considered to be low risk, such as:

- a self-service marine licence activity (MMO, 2018) or an accelerated marine licence activity that meets specific conditions, namely dredging (MMO, 2017);
- maintaining pumps at pumping stations;
- removing blockages or obstacles like litter or debris within 10 m of an existing structure to maintain flow;
- replacing or removing existing pipes, cables or services crossing over a water body, but not including any new structure or supports, or new bed or bank reinforcement; and
- 'over water' replacement or repairs to, for example bridge, pier and jetty surfaces, so long as bank or bed disturbance is minimised.

1.4.2.2 The Transmission Assets is not a fast-track or accelerated marine licence activity and does not fall into any of the categories of activities where scoping is not required. Therefore, the Transmission Assets should proceed to the scoping stage.

1.4.3 Scoping Methodology

1.4.3.1 The aim of the scoping stage is to identify elements (receptors) within water bodies which may be impacted as a result of the Transmission Assets. Any identified receptors, both chemical and ecological, will then be taken forward for a detailed impact assessment (**section 1.6**). A scoping assessment will be undertaken for each water body potentially affected by the Transmission Assets, as presented in **Table 1.8**. Where robust justification can be provided, impacts on water bodies will be scoped out from further consideration.

1.4.3.2 The receptors, as specified in the '*Clearing the Waters for All*' guidance, are:

- hydromorphology;
- biology – habitats;
- biology – fish;
- water quality;
- protected areas; and
- Invasive Non-Native Species (INNS).

1.4.3.3 The '*Clearing the Waters for All*' guidance provides specific criteria for each of the receptors listed above to determine if an assessment of impacts is required and recommends the use of a scoping template as part of the WFD assessment process. These criteria are considered for each receptor in **section 1.5** of this annex, using the recommended scoping template (Environment Agency, 2016a).

1.4.3.4 The current status of water bodies is detailed within River Basin Management Plans (RBMPs) and supporting appendices. Each RBMP includes the work undertaken over the preceding five years, and the plans/objectives for the next six years following publication. The aim of the WFD is to maintain and improve surface waters (which includes coastal and transitional waters) and water bodies seaward to 1 nm. Therefore, the focus of this WFD coastal waters assessment is on those elements of the Transmission Assets from MHWS seaward to 1 nm.

Hydromorphology

1.4.3.5 Hydromorphology, for the purposes of this assessment, is defined as the physical characteristics of the water body including the size, shape and structure of sediment and the flow and quantity of water and sediment.

Biology – habitats

1.4.3.6 Biological habitats (those designated in '*Clearing the Waters for All*' both as higher or lower sensitivity habitats[2], summarised in **Table 1.6**) have been scoped in if the footprint (including sediment plumes and dredging areas) of activities is:

- 0.5 km^2 or greater (within the relevant WFD water body); **or**
- 1% or more of the water body's area; **or**
- within 500 m of any higher sensitivity habitat; **or**
- 1% or more of any lower sensitivity habitat.

1.4.3.7 Note that impact assessment for biological habitats would be required if *any* of these criteria are met.

Table 1.6: Sensitivity of WFD biological habitats to human pressures

Higher sensitivity habitats	Lower sensitivity habitats
Chalk reef	Cobbles, gravel and shingle
Clam, cockle and oyster beds	Intertidal soft sediments like sand and mud
Intertidal seagrass	Rocky shore
Maerl	Subtidal boulder fields
Mussel beds, including blue and horse mussel	Subtidal rocky reef
Polychaete reef	Subtidal soft sediments like sand and mud
Saltmarsh	-
Subtidal kelp beds	
Subtidal seagrass	

Biology – fish

1.4.3.8 The following impacts on fish are scoped in if:

- the activity is in an estuary and could affect the fish in the estuary; **or**
- the activity could delay or prevent fish from entering the estuary; **or**
- the activity could affect fish migrating through the estuary to freshwater; **or**
- fish could become entrained (for example being drawn into mechanical plant like cooling systems or tidal turbines); **or**
- impingement could occur (for example fish becoming trapped against debris screens).

[2] Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures. Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.

Water quality

1.4.3.9 The impacts resulting from the proposed activities on water quality are scoped in based on:

- whether it could affect water clarity, temperature, salinity, oxygen levels, nutrients, or microbial patterns continuously for longer than a spring/neap tidal cycle; **or**
- whether it is in a water body/water bodies with a phytoplankton status of moderate, poor or bad; **or**
- whether the water body/water bodies have a history of harmful algae.

1.4.3.10 The water quality assessment assesses the potential for the release of chemicals (on the Environmental Quality Standards Directive (2008/105/EC) (EQSD) list) and sediment bound contaminants (above Cefas Action Level 1) as a result of the proposed activities.

Protected areas

1.4.3.11 The WFD coastal waters assessment study area for the impact of activities on WFD protected areas, following the '*Clearing the Waters for All*' guidance, is considered to be within 2 km of the activity being assessed. This approach has been adopted for this WFD coastal waters assessment, and any protected areas within 2 km of the activity are scoped in for a detailed impact assessment. For the purposes of this assessment, protected areas are defined as:

- Special Areas of Conservation;
- SPA;
- shellfish waters;
- bathing waters;
- Nutrient Sensitive Areas (NSA) (under the Urban Waste Water Treatment Directive (91/271/EEC));
- Nitrate Vulnerable Zones (NVZ) - polluted or sensitive; and
- Drinking Water Protected Areas (Surface and Ground).

Invasive non-native species

1.4.3.12 The impacts resulting from an activity should be scoped in for assessment if it has the potential to introduce or spread INNS.

1.4.4 Impact Assessment Methodology

1.4.4.1 Following the scoping stage, if it was determined that the impact assessment stage was required (as per the '*Clearing the Water for All*' guidance), an impact assessment was undertaken for each receptor identified as being at risk from the activity (**paragraph 1.4.3.2**). The impact assessment considered what pressures the activity could create on the receptors

identified. The key aim of the impact assessment was to determine whether there was potential for deterioration in the status of a water body receptor, or any element within a water body.

1.4.4.2 Deterioration is defined as when the status (ecological or chemical) of a quality element reduces by one class, for example, ecological quality elements move from 'good' to 'moderate' status. If a quality element is already at the lowest status (’bad’), then any reduction in its condition also counts as deterioration. Where relevant, designed-in measures were included to avoid or minimise risks of deterioration (**section 1.2.5** and **Table 1.5**).

1.4.4.3 Temporary effects due to short-duration activities such as maintenance are not considered, in the ‘*Clearing the Waters for All*’ guidance, to cause deterioration if the water body would recover in a short time without any restoration measures. However, it was noted that works that are temporary in nature may have longer term effects on aspects such as ecology. This assessment focussed upon identifying effects that may lead to non-temporary deterioration, which is defined here as occurring over a period of time that is greater than the recommended monitoring period interval as stated by the WFD and summarised in **Table 1.7**.

Table 1.7: Recommended monitoring period for WFD quality elements, adapted from Annex V, Section 1.3.4 of the WFD

Quality element	Monitoring period	
	Transitional water bodies	Coastal water bodies
Biological		
Phytoplankton	6 months	6 months
Other aquatic flora	3 years	3 years
Macro-invertebrates	3 years	3 years
Fish	3 years	n/a
Hydromorphological		
Morphology	6 years	6 years
Physico-chemical		
Thermal conditions	3 months	3 months
Oxygenation	3 months	3 months
Salinity	3 months	n/a
Nutrient status	3 months	3 months
Other pollutants	3 months	3 months
Priority substances	1 month	1 month

1.4.4.4 The ‘*Clearing the Waters for All*’ guidance, stipulates that if the activity could cause deterioration or hinder the achievement of the water body's objective (or potential), either of the quality element or supporting habitat, an

explanation must be provided on how this deterioration could occur, including consideration of whether the impact is:

- direct and immediate: it will happen at the same time and place as the activity; or
- indirect: it will happen later or further away, including in other linked water bodies.

1.4.4.5 Where the activity may cause deterioration, alternatives should be considered to minimise the impact, including changes to the materials or substances used, the size, scale or timing of the activity or methods of working and/or how equipment or services are used.

1.4.4.6 In addition to assessing the potential for deterioration of the current status of a water body, the impact assessment must consider the risk of jeopardising 'good status'. Every water body has a target status that it is expected to achieve, with an expected date by when this should be achieved, as set out in the RBMPs.

1.4.4.7 Where the status of a water body or quality element is less than 'good', the impact assessment should consider whether the activity may jeopardise the water body achieving 'good status' in the future. These may include activities which reduce the effectiveness of improvement activities taking place or prevent improvement activities taking place in the future. Details of these activities or measures are set out in the RBMPs.

1.5 Scoping

1.5.1 Overview

1.5.1.1 The following sections detail the findings of the Scoping stage of the WFD coastal waters Assessment. As per the '*Clearing the Waters for All*' guidance, this Scoping stage adopts the structure outlined in the Environment Agency WFD scoping template (Environment Agency, 2016a). The potential risks of the activity to each of the key receptor groups are considered in the sections below.

1.5.1.2 Taking into consideration the WFD coastal waters assessment study area, as described in **section 1.3**, two water bodies have the potential to be impacted as illustrated in **Figure 1.2** and detailed in **Table 1.8**. Further details on these water bodies are presented in **section 1.5.2** and **Table 1.9** of this document.

Table 1.8: Water bodies screened into the WFD coastal waters assessment.

Water body name	Type	Reason for including in scoping
Mersey Mouth (GB641211630001)	Coastal	Proposed route for offshore export cable corridor overlaps with this water body.
Ribble (GB531207112400)	Transitional	Proposed route for offshore export cable corridor is less than 2 km from this water body.

1.5.2 Status of the potentially affected WFD water bodies

1.5.2.1 The WFD coastal waters assessment study area (as illustrated in **Figure 1.2**) overlaps with the Mersey Mouth water body (GB641211630001) and the Ribble water body (GB531207112400). These water bodies are therefore screened in for their potential to be affected by the activity (cable installation). **Table 1.9** summarises the statuses of the screened-in water bodies as reported by the Environment Agency (2022c, 2022d, 2023b), **Table 1.10** presents the qualifying features of relevant National Site Network sites and shellfish waters, and overlap with the screened-in water bodies, and **Table 1.11** summarises the status of the bathing waters relevant to this WFD coastal waters assessment. The protected areas relevant to this WFD coastal waters assessment are illustrated in **Figure 1.3**.

Table 1.9: Status of WFD water bodies screened in for potential impact from the activity (cable installation)

Parameter	Mersey Mouth	Ribble
WFD water body ID	GB641211630001	GB531207112400
River basin district	North West	North West
Water body type	Coastal	Transitional
Year of assessment	2022	2022
Water body area (km^2)	420.52	45.28
Current overall status	Moderate	Bad
Current ecological status	Moderate	Bad
Current chemical status	Fail	Fail
Target water body status	Good	Good
Deadline for target status	2027	2027
Hydromorphology status	Not assessed	Supports good
Is the water body heavily modified	Yes	Yes
Reason for designation as heavily modified	Coastal protection; Navigation, ports and harbours	Flood protection
WFD phytoplankton classification	Moderate	Bad
History of harmful algae	Not Monitored	No
Dissolved inorganic nitrogen	Moderate	Moderate

Table 1.10: Qualifying features of SPAs and shellfish water within the WFD coastal waters assessment study area, and overlap with WFD water bodies

Site	Primary qualifying features/relevant species	Water body overlap	
		Mersey Mouth	Ribble
Liverpool Bay/Bae Lerpŵl SPA (UK9020294)	• Red-throated diver *Gavia stellata.* • Little gull *Larus minutus.* • Common scoter *Melanitta nigra.* • Little tern *Sterna albifrons.* • Common tern *Sterna hirundo.* • Waterbird assemblage.	Yes	Yes
Ribble and Alt Estuaries SPA (UK9005103)	• Pintail *Anas acuta.* • Teal *Anas crecca.* • Eurasian wigeon *Anas Penelope.* • Pink-footed goose *Anser brachyrhynchus.* • Greater scaup *Aythya marila.* • Sanderling *Calidris alba.* • Dunlin *Calidris alpina alpina.* • Knot *Calidris canutus.* • Ringed plover *Charadrius hiaticula.* • Bewick's swan *Cygnus columbianus bewickii.* • Whooper swan *Cygnus cygnus.* • Eurasian oystercatcher *Haematopus ostralegus.* • Little gull *Larus fuscus.* • Black-headed gull *Larus ridibundus.* • Bar-tailed godwit *Limosa lapponica.* • Black-tailed godwit *Limosa limosa islandica.* • Common scoter *Melanitta nigra.* • Eurasian curlew *Numenius arquata.* • Eurasian whimbrel *Numenius phaeopus.* • Cormorant *Phalacrocorax carbo.* • Ruff *Philomachus pugnax.* • Golden plover *Pluvialis apricaria.* • Grey plover *Pluvialis squatarola.* • Common tern *Sterna hirundo.* • Shelduck *Tadorna tadorna.* • Redshank *Tringa tetanus.* • Lapwing *Vanellus vanellus.* • Seabird assemblage. • Waterbird assemblage.	Yes	Yes
Ribble shellfish water	• Mussel *Mytilus* spp. • Cockle *Cerastoderma edule*.	Yes	Yes

Table 1.11: Information and status of identified bathing waters relevant to this WFD coastal waters assessment

Parameter	Blackpool South	St Annes North	St Annes
Identifier	UK42100	UK41900	UK41800
Local authority	Blackpool	Fylde	Fylde
Year of designation	1988	1988	1988
Distance from activity (km)	1.97	0.23	1.59
2023 Classification	Sufficient	Poor	Sufficient
2022 Classification	Sufficient	Sufficient	Sufficient
2021 Classification	Good	Sufficient	Good
2020 Classification	No classification available[1]		
2019 Classification	Good	Sufficient	Good
2018 Classification	Good	Good	Good

[1] Consistency in monitoring of bathing water quality in 2020 was impacted by covid-19 restrictions.

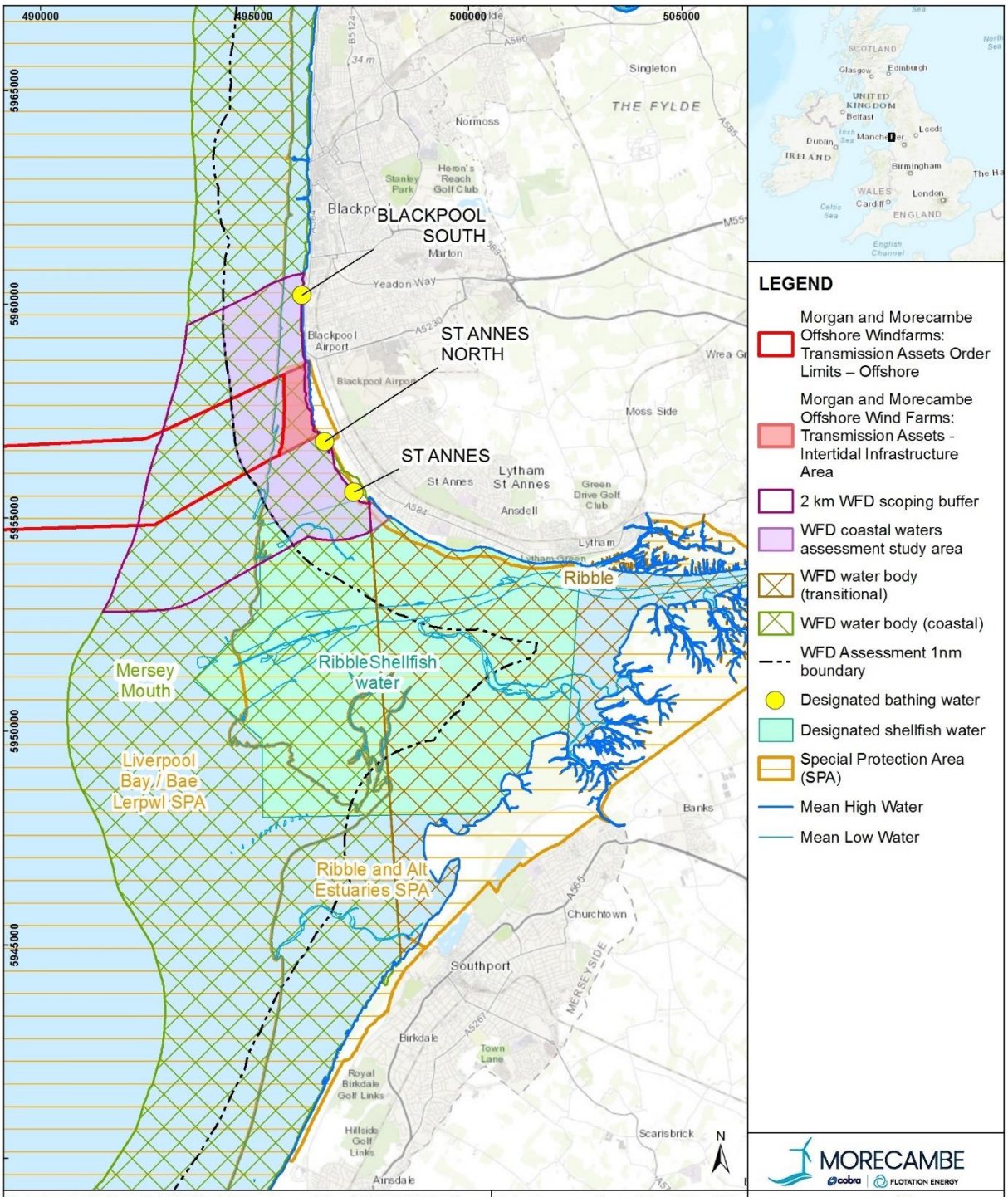

Figure 1.3: WFD protected areas located within the WFD coastal waters assessment study area for the Transmission Assets

1.5.3 Mersey Mouth water body

Hydromorphology

1.5.3.1 Hydromorphology influences the health of aquatic habitats and ecosystems. Changes to hydromorphology can drive fragmentation and loss of habitat, changes in the flow regime and disturbance of natural dynamics of sediment transport. Water bodies at 'high' hydromorphological status may therefore be more sensitive to human pressures, with potential for subsequent effects to overall ecological status. **Table 1.12** provides the specific risk information for hydromorphology receptors.

Table 1.12: Specific risk information for hydromorphology receptors in the Mersey Mouth water body

Consideration	Key risks and justification	Scoped into assessment?
Activity could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status.	The hydromorphology status of the Mersey Mouth water body is classified as 'not assessed', having been classified in 2019 as 'supports good' (meaning that the water body cannot be classified as 'high' status due to heavy modification, but would otherwise support a status of 'good'). The hydromorphology status of the Mersey Mouth water body is therefore not at high status.	No: impact assessment not required.
Activity could significantly impact the hydromorphology of any water body.	The EIA presented within Volume 2, Chapter1: Physical processes of the ES indicates that the sediment transport regime and hydromorphology of the Mersey Mouth water body would not be significantly impacted by the proposed activity (cable installation). Effects of all cable installation activities will be temporary and reversible and would be highly localised.	No: impact assessment not required.
Activity is in a water body that is heavily modified for the same use as the activity.	The Mersey Mouth water body has been designated as a heavily modified water body for coastal protection and navigation, ports and harbours. This designation (coastal protection and navigation, ports and harbours) is not for the same use as the activity (cable installation).	No: impact assessment not required.

Biology – habitats

1.5.3.2 The Environment Agency scoping template (Environment Agency, 2016a) provides a list of habitats which have a sensitivity to human pressures; split into higher and lower sensitivities. **Table 1.13** is a reproduction of the list of sensitive habitats from the scoping template and **Table 1.15** presents the specific risk information for biology habitat receptors.

Table 1.13: Occurrence of 'higher sensitivity habitats' within the Mersey Mouth water body

Habitat[13]	Area within Mersey Mouth water body (km^2)[4]	Area within 500 m of activity footprint (km^2)
Chalk reef	-	-
Clam, cockle and oyster beds	-	-
Intertidal seagrass	-	-
Maerl	-	-
Mussel beds, including blue and horse mussel	0.023	0.00
Polychaete reef	0.003	0.00
Saltmarsh	-	-
Subtidal kelp beds	-	-
Subtidal seagrass	-	-

Table 1.14: Occurrence of 'lower sensitivity habitats' within the Mersey Mouth water body

Habitat[1]	Area within Mersey Mouth water body (km^2)[2]
Cobbles, gravel and shingle	-
Intertidal soft sediments like sand and mud	376.49
Rocky shore	1.63
Subtidal boulder fields	-
Subtidal rocky reef	28.98
Subtidal soft sediments like sand and mud	265.74

Table 1.15: Specific risk information for biological habitat receptors in the Mersey Mouth water body

Consideration	Key risks and justification	Scoped into assessment?
Footprint is 0.5 km^2 or larger	For six cables, the anticipated disturbance width would be: • 50 m per cable in the intertidal zone; and • 20 m per cable (incorporating a 3 m wide trench) in the subtidal zone.	No: impact assessment not required.

[3] Habitats present within the WFD coastal waters assessment study area are highlighted in bold text.

[4] Habitat areas taken from Environment Agency water body summary table (Environment Agency, 2023b). Dashes indicate that habitat is not present in water body.

Consideration	Key risks and justification	Scoped into assessment?
	The maximum assessment length of 1,852 m (i.e. 1 nm), per cable, would be split between the intertidal zone and subtidal zone as: • 300 m in intertidal zone; • 345 m trenchless installation (no disturbance); and • 1,207 m in subtidal zone. The maximum footprint would therefore be as follows: Intertidal zone: 6 x 50 m x 300 m = 90,000 m^2 = 0.090 km^2 Subtidal sandwave clearance: 6 x 60 m x 1,207 m x 9% = 39,107 m = 0.039 km^2 Subtidal installation: 6 x 20 m x 1,207 m x 91% = 131,804 m^2 = 0.132 km^2 Total maximum disturbance: 0.090 km^2 + 0.039 km^2 + 0.132 km^2= **0.261 km^2** The estimated maximum footprint of the activity (cable installation) is not expected to exceed 0.5 km^2.	
Footprint is 1% or more of the water body's area.	Mersey Mouth water body area = **420.52 km^2** Maximum footprint = **0.261 km^2** Footprint as percentage of Mersey Mouth water body = **0.06%** The estimated maximum footprint of the activity (cable installation) would not exceed 1% of the area of the Mersey Mouth water body.	No: impact assessment not required.
Footprint is within 500 m of any higher sensitivity habitat.	No higher sensitivity habitat types occur within 500 m of the activity footprint.	No: impact assessment not required.
Footprint is 1% or more of any lower sensitivity habitat.	For lower sensitivity habitats that are present within the Mersey Mouth water body: Area of 'Intertidal soft sediment' = **376.49 km^2** Intertidal footprint as percentage of 'Intertidal soft sediment' = **0.07%** Area of 'Rocky shore' = **1.63 km^2** Total footprint as percentage of 'Rocky shore' = **16.01%** Area of 'Subtidal rocky reef' = **28.98 km^2** Subtidal footprint as percentage of 'Subtidal rocky reef'= **0.90%** Area of 'Subtidal soft sediments like sand and mud' = **265.74 km^2** Subtidal footprint as percentage of 'Subtidal soft sediments like sand and mud' = **0.10%**. The estimated maximum footprint of the activity (cable installation) would not exceed 1% of any lower sensitivity habitat.	Although the footprint represents more than 1% of 'Rocky shore' habitat, site-specific surveys identified only soft sediments at the landfall site. No: impact assessment not required.

Biology – fish

1.5.3.3 The '*Clearing the Waters for All*' scoping template provides a list of criteria which may impact fish species within relevant water bodies. **Table 1.16** presents the specific risk information for biology fish receptors.

Table 1.16: Specific risk information for fish receptors in the Mersey Mouth water body

Consideration	Key risks and justification	Scoped into assessment?
Activity 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.	The activity (cable installation) is not located within an estuary and is not likely to delay or prevent fish from entering or migrating through the Mersey Mouth water body. The assessment presented in Volume 2, Chapter 3: Fish and shellfish ecology of the ES predicted that installation, operation and maintenance, or decommissioning of the offshore export cables would not significantly affect fish and shellfish populations, in particular migration of diadromous fish species migrating to/from estuarine habitats.	No: Impact assessment not required.
Activity 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).	The installation, operation and maintenance or decommissioning of the offshore export cables will not cause a change in depth or flow and will not create a physical barrier. The activity (cable installation) does not include a discharge pipe or outfall, and therefore no chemicals will be released into the marine environment that could cause a chemical change. Some noise is expected to be generated should intertidal cable installation be conducted via trenchless technologies (namely direct pipe installation), but the magnitude is not likely to constitute an impact upon normal fish behaviour. The assessment presented in Volume 2, Chapter 3: Fish and shellfish ecology of the ES indicated that installation, operation and maintenance or decommissioning of the offshore export cables would not significantly affect fish and shellfish movement, migration or spawning within this WFD water body.	No: Impact assessment not required.
Activity could cause entrainment or impingement of fish.	The activity (cable installation) does not include any mechanical systems that could cause fish to become entrained, and no surfaces or screens against which fish could become impinged.	No: Impact assessment not required.

Water quality

1.5.3.4 The risk to water quality is split between specific risks to water quality in relation to phytoplankton and harmful algae (**Table 1.17**), those in relation to the use or release of chemicals (**Table 1.18**) and those risks in relation to the mixing zone (**Table 1.19**).

Table 1.17: Specific risk information for water quality receptors in the Mersey Mouth water body in relation to phytoplankton and harmful algae

Consideration	Key risks and justification	Scoped into assessment?
Activity could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days).	The resuspension of sediments into the water column would result in a short-term increase in SSC and reduction of clarity as a result of cable installation. The methods used for installation would affect the amount of sediment displaced, but the impacts are anticipated to be localised and short lived, with SSC returning to pre-installation levels within a couple of days. SSC would not disperse to a significant level outside the footprint of the activities. A full assessment of sediment displacement is presented in Volume 2, Chapter 1: Physical processes of the ES, wherein no significant effect was identified. Resistive heating of power cables has the potential to increase the temperature of the surrounding sediment. Any temperature increase is expected to be minimal and highly localised to the cable. Since all cables within the Mersey Mouth water body will be buried, there would therefore be no effect pathway between cable temperature and the water quality receptor. Moreover, due to natural fluctuations in temperature throughout the year, benthic subtidal and intertidal receptors are expected to be tolerant to small temperature increases. The impact of minor increases in temperature to benthic ecology receptors has therefore been assessed as negligible for all receptors (Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES).	No: impact assessment not required.
Activity is in a water body with a phytoplankton status of moderate, poor or bad.	This water body was assigned a phytoplankton status of moderate in the most recent Classification Cycle (Cycle 3: 2021) (Environment Agency, 2022c).	**Yes: Requires impact assessment.**
Activity is in a water body with a history of harmful algae.	The Mersey Mouth water body is not monitored for harmful algae (Environment Agency, 2022e). As such, this has been screened in for assessment on a precautionary basis.	**Yes: Requires impact assessment.**

Table 1.18: Specific risk information for water quality receptors in the Mersey Mouth water body in relation to the use or release of chemicals

Consideration	Key risks and justification	Scoped into assessment?
Activity uses or releases chemicals on the EQSD list.	This activity (cable installation) does not involve the release of any chemicals, including those on the EQSD list. Cofferdams may be used to minimise the potential risk of accidental release of contaminants into the environment, along with implementation of an approved EMP (CoT65, see **Table 1.5**) during the construction, and operation and maintenance phases (see **section 1.2.5**). No deterioration of the status of water quality receptors designated under the WFD is therefore anticipated.	No: impact assessment not required.
Activity disturbs sediment with contaminants above Cefas Action Level 1.	Sediment sampling has been conducted throughout the Transmission Assets offshore export cable corridor, including within the Mersey Mouth water body and WFD coastal waters assessment study area. No sediment contamination was observed above Cefas Action Level 1 in samples taken within the Mersey Mouth water body, or within the WFD coastal waters assessment study area. Full details of sediment sampling are presented in Volume 2, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the ES.	No: impact assessment not required.

Table 1.19: Specific risk information for water quality receptors in the Mersey Mouth water body in relation to mixing zones

Consideration	Key risks and justification	Scoped into assessment?
Activity has a mixing zone (such as a discharge pipeline or outfall) and the chemicals released are on the EQSD list.	The activity (cable installation) does not include a mixing zone such as a discharge pipe or outfall, and therefore no chemicals will be released into the marine environment.	No: Impact assessment not required.

Protected areas

1.5.3.5 This WFD assessment considers if WFD protected areas, as defined in **paragraph 1.4.3.11** are at risk from the proposed activity (cable installation). Six WFD protected areas overlap with the WFD coastal waters assessment study area: Liverpool Bay/Bae Lerpŵl SPA, Ribble and Alt Estuaries SPA, Ribble shellfish water, Blackpool South bathing water, St Annes bathing water, St Annes North bathing water. Details of the qualifying features of the SPAs and shellfish water are summarised in **Table 1.10**, and detail of the status of the bathing waters is presented in **Table 1.11.**

1.5.3.6 **Table 1.20** outlines the potential risks for these protected areas.

Table 1.20: Specific risk information for WFD protected areas coinciding with the Mersey Mouth water body

Consideration	Key risks and justification	Scoped into assessment?
Activity is within 2 km of any WFD protected area.	Six WFD protected areas that occur within or overlap with the Mersey Mouth water body are located within 2 km of the activity (cable installation). • Liverpool Bay/Bae Lerpŵl SPA. • Ribble and Alt Estuaries SPA. • Ribble shellfish water. • Blackpool South bathing water. • St Annes bathing water. • St Annes North bathing water. No NSAs (under the Urban Waste Water Treatment Directive), NVZs (polluted or sensitive) or Drinking Water Protected Areas (Surface and Ground) are located within 2 km of the activity (cable installation).	**Yes: Requires impact assessment.**

Invasive non-native species

1.5.3.7 **Table 1.21** outlines the risk of the introduction of INNS.

Table 1.21: Specific risk information for INNS in the Mersey Mouth water body

Consideration	Key risks and justification	Scoped into assessment?
Activity could introduce or spread INNS.	There is little evidence of adverse effects on fish and shellfish receptors resulting from colonisation of infrastructure associated with offshore wind farms by INNS, and the risk of introduction and spread of INNS to benthic ecology receptors has been assessed as minor (Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES). Furthermore, an Offshore Environmental Management Plan (to include INNS) will be adopted and implemented to manage and reduce the risk of potential introduction and spread of INNS so far as reasonably practicable.	No: impact assessment not required.

1.5.4 Ribble transitional water body

Hydromorphology

1.5.4.1 Hydromorphology influences the health of aquatic habitats and ecosystems. Changes to hydromorphology can drive fragmentation and loss of habitat, changes in the flow regime and disturbance of natural dynamics of sediment transport. Water bodies at 'high' hydromorphological status may therefore be more sensitive to human pressures, with potential for subsequent effects to overall ecological status. **Table 1.22** provides the specific risk information for hydromorphology receptors.

Table 1.22: Specific risk information for hydromorphology receptors in the Ribble water body

Consideration	Key risks and justification	Scoped into assessment?
Activity could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status.	The hydromorphology status of the Ribble water body is classified as 'supports good' and is therefore not at high status.	No: impact assessment not required.
Activity could significantly impact the hydromorphology of any water body.	The EIA presented within Volume 2, Chapter 1: Physical processes of the ES indicates that the sediment transport regime and hydromorphology of the Ribble would not be significantly impacted by the proposed activity (cable installation). Effects of all cable installation activities will be temporary and reversible and would be highly localised.	No: impact assessment not required.
Activity is in a water body that is heavily modified for the same use as the activity.	The Ribble water body has been designated as a heavily modified water body for flood protection. This designation is not for the same use as the activity (cable installation).	No: impact assessment not required.

Biology – habitats

1.5.4.2 The Environment Agency scoping template provides a list of habitats which have a sensitivity to human pressures; split into higher and lower sensitivities. **Table 1.23** is a reproduction of the list of sensitive habitats from the scoping template and **Table 1.24** presents the specific risk information for biology habitat receptors.

Table 1.23: Habitat sensitivity to human pressures

Habitat[1]	Area within Ribble water body (km^2)[2]	Area within 500 m of activity footprint (km^2)
Higher sensitivity habitats		
Chalk reef	-	-
Clam, cockle and oyster beds	-	-
Intertidal seagrass	-	-
Maerl	-	-
Mussel beds, including blue and horse mussel	-	-
Polychaete reef	-	-
Saltmarsh	24.18	0.00
Subtidal kelp beds	-	-
Subtidal seagrass	-	-
Lower sensitivity habitats		

Habitat[1]	Area within Ribble water body (km²)[2]	Area within 500 m of activity footprint (km²)
Cobbles, gravel and shingle	-	n/a
Intertidal soft sediments like sand and mud	55.20	n/a
Rocky shore	-	n/a
Subtidal boulder fields	-	n/a
Subtidal rocky reef	-	n/a
Subtidal soft sediments like sand and mud	-	n/a

[1] Habitats present within the WFD coastal waters assessment study area are highlighted in bold text. Dashes indicate that habitat has not been recorded within the water body. Cells containing 'n/a' indicate that the threshold is not relevant to the corresponding habitat.

[2] Habitat areas taken from Environment Agency water body summary table (Environment Agency, 2023b).

Table 1.24: Specific risk information for biological habitat receptors in the Ribble water body

Consideration	Key risks and justification	Scoped into assessment?
Footprint is 0.5 km² or larger.	The maximum footprint of the activity (cable installation) is estimated to be 0.521 km² (full calculations for the footprint are presented in **Table 1.15)**. The estimated maximum footprint of the activity (cable installation) is expected to exceed 0.5 km², however no works are planned to occur within the Ribble water body, so there would be no spatial overlap with the footprint of the activity.	No: impact assessment not required.
Footprint is 1% or more of the water body's area.	Ribble water body area = **45.28 km²** Maximum footprint = **0.521 km²** Footprint as percentage of Ribble water body = **1.15%** The estimated maximum footprint of the activity (cable installation) would exceed 1% of the area of the Ribble water body. However, there would be no spatial overlap with the footprint of the activity (cable installation) and the Ribble water body.	No: impact assessment not required.
Footprint is within 500 m of any higher sensitivity habitat.	The Ribble water body is located approximately 2 km from the activity (cable installation), and as such no higher sensitivity habitats that occur within this water body are within 500 m of the footprint.	No: impact assessment not required.
Footprint is 1% or more of any lower sensitivity habitat.	For lower sensitivity habitats that are present within the Ribble water body: Area of 'Intertidal soft sediment' = **55.20 km²** Footprint as percentage of 'Intertidal soft sediment' = **0.85%** However, there would be no spatial overlap with the footprint of the activity (cable installation) and the Ribble water body.	No: impact assessment not required.

Biology – fish

1.5.4.3 The '*Clearing the Waters for All*' scoping template provides a list of criteria which may impact fish species within relevant water bodies. **Table 1.25** presents the specific risk information for biology fish receptors.

Table 1.25: Specific risk information for fish receptors in the Ribble water body

Consideration	Key risks and justification	Scoped into assessment?
Activity 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.	The activity (cable installation) is not located within an estuary and is not likely to delay or prevent fish from entering or migrating through the Ribble water body. The assessment presented in Volume 2, Chapter 3: Fish and shellfish ecology of the ES predicted that installation, operation and maintenance, or decommissioning of the offshore export cables would not significantly affect fish and shellfish populations, in particular migration of diadromous fish species migrating to/from estuarine habitats.	No: Impact assessment not required.
Activity 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).	The installation, operation and maintenance or decommissioning of the offshore export cables will not cause a change in depth or flow and will not create a physical barrier. The activity (cable installation) does not include a discharge pipe or outfall, and therefore no chemicals will be released into the marine environment that could cause a chemical change. Some noise is expected to be generated should intertidal cable installation be conducted via direct pipe installation, but the magnitude is not likely to constitute an impact upon normal fish behaviour. The assessment presented in Volume 2, Chapter 3: Fish and shellfish ecology of the ES indicates that installation, operation and maintenance or decommissioning of the offshore export cables would not significantly affect fish and shellfish movement, migration or spawning within this WFD water body.	No: Impact assessment not required.
Activity could cause entrainment or impingement of fish.	The activity (cable installation) does not include any mechanical systems that could cause fish to become entrained, and no surfaces or screens against which fish could become impinged.	No: Impact assessment not required.

Water quality

1.5.4.4 The risk to water quality is split between specific risks to water quality in relation to phytoplankton and harmful algae (**Table 1.26**), those in relation to the use or release of chemicals (**Table 1.27**) and those risks in the mixing zone (**Table 1.28**).

Table 1.26: Specific risk information for water quality receptors in the Ribble water body in relation to phytoplankton and harmful algae

Consideration	Key risks and justification	Scoped into assessment?
Activity could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days).	The resuspension of sediments into the water column would result in a short-term increase in SSC and reduction of clarity as a result of cable installation. The methods used for installation would affect the amount of sediment displaced, but the impacts are anticipated to be localised and short lived, with SSC returning to pre-installation levels within a couple of days. SSC would not disperse to a significant level outside the footprint of the activities and is not expected to overlap with the Ribble water body. Resistive heating of power cables has the potential to increase the temperature of the surrounding sediment, however, since the offshore export cable route is not planned to overlap with the Ribble water body, no cable-induced temperature change would occur here.	No: impact assessment not required.
Activity is in a water body with a phytoplankton status of moderate, poor or bad.	This water body was assigned a phytoplankton status of bad in the most recent Classification Cycle (Cycle 3: 2021).	**Yes: impact assessment required.**
Activity is in a water body with a history of harmful algae.	The Ribble water body does not have a history of harmful algae (Environment Agency, 2022d).	No: impact assessment not required.

Table 1.27: Specific risk information for water quality receptors in the Ribble water body in relation to the use or release of chemicals

Consideration	Key risks and justification	Scoped into assessment?
Activity uses or releases chemicals on the EQSD list.	This activity (cable installation) does not involve the release of chemicals, including those on the EQSD list. No deterioration of the status of any water quality receptors is therefore anticipated.	No: impact assessment not required.
Activity disturbs sediment with contaminants above Cefas Action Level 1.	The activity (cable installation) is planned to occur outside the Ribble water body, and as such no sediment would be disturbed within the WFD coastal waters assessment study area. Moreover, as described in **Table 1.18**, no sediment contamination was observed above Cefas Action Level 1 in samples taken within the Mersey Mouth water body, or within the WFD coastal waters assessment study area. Full details of sediment sampling are presented in Volume 2, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the ES.	No: impact assessment not required.

Table 1.28: Specific risk information for water quality receptors in the Ribble water body in relation to mixing zones

Consideration	Key risks and justification	Scoped into assessment?
Activity has a mixing zone (such as a discharge pipeline or outfall) and the chemicals released are on the EQSD list.	The activity (cable installation) does not include a discharge pipe or outfall, and therefore no chemicals will be released into the marine environment.	No: Impact assessment not required.

Protected areas

1.5.4.5 This WFD assessment considers if WFD protected areas, as defined in **paragraph 1.4.3.11** are at risk from the proposed activity (cable installation). Two WFD protected areas overlap with the WFD coastal waters assessment study area: Ribble and Alt Estuaries SPA and Ribble shellfish water. The location of these protected areas in relation to the Ribble water body are illustrated in **Figure 1.3** and details of the qualifying features of these protected areas are summarised in **Table 1.10**. **Table 1.29** outlines the potential risks for these protected areas.

Table 1.29: Specific risk information for WFD protected areas coinciding with the Ribble water body

Consideration	Key risks and justification	Scoped into assessment?
Activity is within 2 km of any WFD protected area.	Two WFD protected areas that occur within or overlap with the Ribble water body are located within 2 km of the activity (cable installation). • Ribble and Alt Estuaries SPA. • Ribble shellfish water. No bathing waters are located within the Ribble water body, and no Nutrient Sensitive Areas (under the Urban Waste Water Treatment Directive), Nitrate Vulnerable Zones (polluted or sensitive) or Drinking Water Protected Areas (Surface and Ground) that occur within or overlap with the Ribble water body are located within 2 km of the activity (cable installation).	**Yes: Requires impact assessment.**

Invasive non-native species

1.5.4.6 **Table 1.30** outlines the risk of the introduction of INNS.

Table 1.30: Specific risk information for INNS in the Ribble water body

Consideration	Key risks and justification	Scoped into assessment?
Activity could introduce or spread INNS.	There is little evidence of adverse effects on fish and shellfish receptors resulting from colonisation of infrastructure associated with offshore wind farms by INNS, and the risk of introduction and spread of INNS to benthic ecology receptors has been assessed as minor (Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES). Furthermore, an Offshore Environmental Management Plan (CoT65, see Table 1.5), to include INNS, will be adopted and implemented to manage and reduce the risk of potential introduction and spread of INNS so far as reasonably practicable.	No: impact assessment not required.

1.5.5 Summary of scoping

1.5.5.1 **Table 1.31** presents a summary of the WFD scoping for the Mersey Mouth and Ribble water bodies.

Table 1.31: Summary of scoping for WFD receptors in the Mersey Mouth and Ribble water bodies

WFD receptor	Potential risk?	Reason/features affected	Risk(s) for impact assessment
Mersey Mouth water body			
Hydromorphology	No	n/a	n/a
Biology: habitats	No	The footprint of the activity (cable installation) is expected to be approximately 0.261 km^2. Although this does not exceed the 0.5 km threshold for assessment, the assessment has been retained from PEIR as a precautionary approach.	n/a
Biology: fish	No	n/a	n/a
Water quality	Yes	The Mersey Mouth water body was assigned a phytoplankton status of moderate in Classification Cycle 3, 2021. The Mersey Mouth water body is not monitored for harmful algae	Is within a water body with a phytoplankton status of moderate, poor or bad. Activity is in a water body with a history of harmful algae.
Protected areas	Yes	Liverpool Bay/Bae Lerpŵl SPA Ribble and Alt Estuaries SPA Ribble shellfish water Blackpool South bathing water St Annes bathing water St Annes North bathing water.	Within 2 km of any WFD protected area.

WFD receptor	Potential risk?	Reason/features affected	Risk(s) for impact assessment
INNS	No	n/a	n/a
Ribble water body			
Hydromorphology	No	n/a	n/a
Biology – habitats	No	n/a	n/a
Biology – fish	No	n/a	n/a
Water quality	Yes	The Ribble water body was assigned a phytoplankton status of bad in Classification Cycle 3, 2021.	Is within a water body with a phytoplankton status of moderate, poor or bad.
Protected areas	Yes	Ribble and Alt Estuaries SPA Ribble shellfish water	Within 2 km of any WFD protected area.
INNS	No	n/a	n/a

1.6 Impact assessment

1.6.1.0 Based on the WFD scoping for the Mersey Mouth and Ribble water bodies presented in **sections 1.5.3** and **1.5.4**, the receptors scoped in for assessment are summarised in **Table 1.32** and assessed in sections **1.6.1** to **1.6.3**.

Table 1.32: Summary of WFD receptors scoped in or out for assessment, for each of the Mersey Mouth and Ribble water bodies

WFD receptor	Scoped in for assessment?	
	Mersey Mouth	Ribble
Hydromorphology	No	No
Biology – habitats	**Yes**	No
Biology – fish	No	No
Water quality	**Yes**	**Yes**
Protected areas	**Yes**	**Yes**
INNS	No	No

1.6.1 Biology – habitats

Mersey Mouth Water Body

1.6.1.1 The seabed disturbance arising from installation of up to six offshore export cables in intertidal and subtidal habitat via open-cut trenching is expected to be a maximum of 0.261 km^2 which does not exceed the 0.50 km^2 threshold set by the '*Clearing the Waters for All*' guidance. However, the potential impact to the 'Biology – habitats' receptor has been retained for assessment as it was included at PEIR.

1.6.1.2 The WFD habitats present in the Mersey Mouth water body are predominantly classified as lower sensitivity habitats (**Table 1.13**), namely 'Intertidal soft sediments like sand and mud' (376.49 km^2), 'Rocky shore' (1.63 km^2), 'Subtidal rocky reef' (28.98 km^2) and 'Subtidal soft sediments like sand and mud' (265.74 km^2) (Environment Agency, 2023b). Some areas of higher sensitivity are also present within the Mersey Mouth water body, specifically 'Mussel beds, including blue and horse mussel' (0.023 km^2) and 'Polychaete reef' (0.003 km^2) (Environment Agency, 2023b).

1.6.1.3 However, site-specific surveys of intertidal biotopes within the offshore export cable corridor identified only habitats classified as 'Intertidal soft sediments like sand and mud', and Particle Size Analysis of nearshore subtidal sediments indicated a preponderance of fine-grained and muddy material (see Volume 2, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the ES). The WFD habitats present within the WFD coastal waters assessment study area would therefore all be considered 'Intertidal soft sediments like sand and mud' or 'Subtidal soft sediments like sand and mud'.

1.6.1.4 Due to the fine-grained substrate across the WFD coastal waters assessment study area, these habitats are expected to return to their previous state after the cable installation process with infilling of sediment, within a couple of tidal cycles (see results of numerical modelling presented in Volume 2, Chapter 1: Physical processes of the ES), being driven by wave exposure and tidal currents.

1.6.1.5 The effect of seabed disturbance upon the benthic ecology of the intertidal and subtidal zone within the offshore export cable corridor (located entirely within the Mersey Mouth water body) is fully assessed in Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES. Intertidal and subtidal benthic communities in the Transmission Assets offshore export cable corridor were considered to be of relatively low diversity and were assigned an overall medium sensitivity to the impact of temporary habitat loss and disturbance associated with cable installation. This impact was assessed in Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES to be of minor adverse significance and the activity (cable installation) is not predicted to cause a deterioration in the status of the WFD 'Biology – habitats' element of the Mersey Mouth water body. The Transmission Assets are therefore considered, with respect to biological habitats, to be compliant with the requirements of the WFD.

1.6.2 Water quality

Mersey Mouth and Ribble water bodies

1.6.2.1 The offshore export cable corridor for the Transmission Assets crosses the Mersey Mouth coastal water body and lies approximately 2 km from the boundary of the Ribble transitional water body. Assessment of the potential for a deterioration in water quality within these water bodies is therefore required.

Phytoplankton status

1.6.2.2 Phytoplankton is not considered to be sensitive to the installation or operation and maintenance of cables, however this has been scoped in due to the Classification Cycle 3 'moderate' phytoplankton status of the Mersey Mouth water body (Environment Agency, 2022c) and 'bad' status of the Ribble water body (Environment Agency, 2022d). Since the Mersey Mouth water body is not monitored for harmful phytoplankton blooms (Environment Agency, 2022e), this quality element has also been scoped in as a precautionary measure.

1.6.2.3 Seabed disturbance and a short-term increase in SSC which has the potential to occur during the installation of the offshore export cables may cause sediment-borne nutrients to be released into the water column. When nutrient loading is high, phytoplankton blooms may occur, after which phytoplankton will die. Bacteria and other decomposer organisms then break down this organic matter, and dissolved oxygen (DO) levels may become reduced (NRW, 2023).

Harmful algae (phytoplankton blooms)

1.6.2.4 Phytoplankton blooms may also drive an increase in levels of marine algal biotoxins which are a determinant of suitability for the harvest from shellfish waters (see **section 1.6.3**).

1.6.2.5 No nutrients are anticipated to be released in significant concentrations from the seabed as a result of the activity (cable installation), beyond those expected in typical storm conditions. There are no outfalls or discharges associated with the Transmission Assets, so the activity (cable installation) is not expected to cause phytoplankton blooms or subsequent reduction in DO in the water column. As such neither the Mersey Mouth or Ribble water bodies are expected to be detrimentally affected by an increase in nutrient availability associated with the activity.

1.6.2.6 The construction, operation and maintenance, and decommissioning of the Transmission Assets offshore export cables is not predicted to cause a deterioration in the status of the Mersey Mouth or Ribble water bodies with respect to water quality. Any potential for an increase in SSC is expected to disperse rapidly at distances of hundreds of metres from cable installation works and phytoplankton is not expected to bloom in response to nutrient availability. The Transmission Assets are therefore considered, with respect to water quality, to be compliant with the requirements of the WFD.

1.6.3 Protected areas

Mersey Mouth and Ribble water bodies

1.6.3.1 Six WFD protected areas located in the Mersey Mouth water body overlap with the WFD coastal waters assessment study area.

- Liverpool Bay/Bae Lerpŵl SPA.
- Ribble and Alt Estuaries SPA.

- Ribble shellfish water.
- Blackpool South bathing water.
- St Annes bathing water.
- St Annes North bathing water.

1.6.3.2 Three WFD protected areas located in the Ribble water body overlap with the WFD coastal waters assessment study area, although these also coincide with the Mersey Mouth water body (paragraph **1.6.3.1**) and do not constitute additional WFD protected areas.

- Liverpool Bay/Bae Lerpŵl SPA.
- Ribble and Alt Estuaries SPA.
- Ribble shellfish water.

National Sites Network

1.6.3.3 A detailed assessment has been undertaken on all potentially affected SPAs (and other National Site Network sites) within the Transmission Assets Habitats Regulations Assessment (HRA) Stage 2 Information to Inform an Appropriate Assessment. This provides a summary of the screening results for Likely Significant Effects as identified within the HRA Stage 1 Screening Report, and for those sites screened in, a detailed assessment has been conducted to determine whether there will be any Adverse Effect on Integrity (AEoI) for the Transmission Assets alone or in-combination with other plans or projects. No AEoI has been identified for any of the SPAs identified in this WFD coastal waters assessment.

Shellfish waters

1.6.3.4 Phytoplankton blooms may be associated with an increase in levels of marine algal biotoxins in the flesh of shellfish harvested from designated shellfish waters, including those located in the Ribble shellfish water. As described in **paragraph 1.6.2.5**, phytoplankton abundance is not expected to be affected by the construction, operation and maintenance, or decommissioning of the Transmission Assets offshore export cables.

Bathing waters

1.6.3.5 The Blackpool South bathing water is located approximately 1.97 km to the north of the Transmission Assets offshore export cable corridor and received a status of ‘sufficient’ in 2023 (the most recent classification year), which was a deterioration in 2022 from its ‘good’ status in 2021, 2019 and 2018.

1.6.3.6 Several small surface water outfalls discharge close to Blackpool South bathing water, however no impact on bathing water quality from these outfalls has been identified (Environment Agency, 2024a). There are also multiple storm, emergency and surface water outfalls that discharge to the River Ribble and its estuary. Sewer overflows operating during periods of heavy rain, can result in reduced bathing water quality at Blackpool South.

1.6.3.7 The St Annes North bathing water is located approximately 0.23 km to the south east of the offshore export cable corridor, and received a status of 'poor' in 2023, which was a deterioration from its 'sufficient' status in 2022, 2021 and 2019, and a further a deterioration from 'good' in 2018. One disused outfall is located close to the bathing water and no operational outfalls exist nearby (Environment Agency, 2024b).

1.6.3.8 St Annes bathing water is located approximately 1.59 km to the south east of the offshore export cable corridor, and received a status of 'sufficient' in 2023 and 2022, which was a deterioration from 'good' in 2021, 2019 and 2018. Two disused outfalls are located close to the bathing water and no operational outfalls are present here (Environment Agency, 2024c).

1.6.3.9 The level of *Escherichia coli* and intestinal enterococci are a determinant of water quality at designated bathing waters, and the presence of live bacteria is strongly influenced by the amount of Ultraviolet light (UV) light penetrating the water column. Under lower UV scenarios, as occurs when SSC is high, survival of bacterium such as *E. coli* may increase (Bashwari *et al*., 2020).

1.6.3.10 Open cut trenching for cable installation may disturb sediment but works would occur during low water when the potential for sediment resuspension would be minimal. Furthermore, deposition of suspended sediment would occur during and immediately after cable installation, and SSC would reduce rapidly with distance from the cable installation site. Any increase in SSC (and potential bacterial contaminants) associated with cable installation would be temporary, intermittent and highly reversible and deterioration of bathing water quality is unlikely.

1.6.3.11 The construction, operation and maintenance, and decommissioning of the Transmission Assets offshore export cables is not predicted to cause a deterioration in the status of the Mersey Mouth or Ribble waterbodies with respect to WFD protected areas. It is therefore considered, in this respect, to be compliant with the requirements of the WFD.

1.7 Summary

1.7.1 Overview

1.7.1.1 Based on the WFD Scoping presented in **section 1.5** and the impact assessment presented in **section 1.6,** there is no potential for deterioration of the Mersey Mouth or the Ribble water bodies, nor the individual elements of these water bodies, arising from the installation, operation and maintenance, and decommissioning of up to six offshore export cables through the intertidal and subtidal zones (seaward to 1 nm from MHWS).

1.7.1.2 The WFD receptors 'hydromorphology', 'biology – fish', and 'INNS', for the relevant activities for the construction, operation and maintenance, and decommissioning of the Transmission Assets offshore export cables were scoped out of the assessment as they are below the thresholds set by the '*Clearing the Waters for All*' guidance.

1.7.1.3 The WFD receptors 'habitats – biology', 'water quality' and 'protected areas' were scoped in for assessment for the Mersey Mouth water body, with the latter two also scoped in for the Ribble water body.

1.7.2 Mersey Mouth water body

Biology - habitats

1.7.2.1 With respect to 'biology – habitats', the criterion which determines whether an assessment of effects is required was met within the WFD coastal waters assessment presented within the Transmission Assets for being "*0.5 km^2 or greater*", with all potential effects occurring only within the Mersey Mouth water body. Although the updated project design has a reduced footprint compared to that presented in the PEIR, this impact was taken forward for assessment for consistency.

1.7.2.2 The installation of offshore export cables may create seabed disturbance at a maximum of 0.261 km^2, with potential for lower sensitivity intertidal and subtidal soft sediments like sand and mud to be affected. The ecological habitats and benthic communities within these WFD habitats are expected to recover rapidly following cessation of works, and the impact of these activities does not represent a deterioration in the status of this WFD element for the Mersey Mouth water body.

Water quality

1.7.2.3 In the context of 'water quality', two criteria were met by the activity (cable installation) for scoping impacts into the assessment for the Mersey Mouth water body. The activity "*is in a water body with a phytoplankton status of moderate, poor or bad*", and a precautionary approach was also taken as the Mersey Mouth water body is not monitored for harmful algae so the activity being "*in a water body with a history of harmful algae*" could not be ruled out.

1.7.2.4 The installation, operation and maintenance, and decommissioning of up to six offshore export cables through the intertidal and subtidal zones (seaward to 1 nm from MHWS) for the Transmission Assets would not release nutrients into the water column. Similarly, sediment-borne nutrients were not expected to be made available to a greater degree by cable installation than would be expected from a typical storm event. Phytoplankton was therefore not expected to bloom in response to increased nutrient availability. The effects of the activity were not expected to represent a deterioration in the status of the WFD 'water quality' element of the Mersey Mouth water body.

Protected areas

1.7.2.5 The Transmission Assets offshore export cable corridor lies "*within 2 km of any WFD protected area*", as defined by the '*Clearing the Waters for All*' guidance: two SPAs, one shellfish water, and three bathing waters. The construction, operation and maintenance, and decommissioning of the Transmission Assets offshore export cables was not predicted to jeopardise the conservation objectives or statuses of the scoped-in WFD protected areas. The effects of the activity (cable installation) were therefore not

predicted to represent a deterioration in the status of the WFD 'protected areas' element of the Mersey Mouth water body.

1.7.3 Ribble water body

Water quality

1.7.3.1 For the 'water quality' receptor, one criterion was met by the activity (cable installation) for scoping impacts into the assessment for the Ribble water body. The activity "*is in a water body with a phytoplankton status of moderate, poor or bad*.

1.7.3.2 The installation, operation and maintenance, and decommissioning of offshore export cables through the intertidal and subtidal zones (seaward to 1 nm from MHWS) for the Transmission Assets would not release nutrients into the water column. Similarly, sediment-borne nutrients were not expected to be made available to a greater degree by cable installation than would be expected from a typical storm event. Phytoplankton was therefore not expected to bloom in response to increased nutrient availability. The effects of the activity were not expected to represent a deterioration in the status of the WFD 'water quality' element of the Ribble water body.

Protected areas

1.7.3.3 The installation, operation and maintenance, and decommissioning of up to six offshore export cables through the intertidal and subtidal zones (seaward to 1 nm from MHWS) for the Transmission Assets would occur "*within 2 km of any WFD protected area*", as defined by the '*Clearing the Waters for All*' guidance: two SPAs and one shellfish water.

1.7.3.4 The construction, operation and maintenance, and decommissioning of the Transmission Assets offshore export cables was not predicted to jeopardise the conservation objectives or statuses of the scoped-in WFD protected areas. The effects of the activity (cable installation) were therefore not predicted to represent a deterioration in the status of the WFD 'protected areas' element of the Ribble water body.

1.7.4 Conclusion

1.7.4.1 Based on the assessment of effects related to the activity (i.e. installation, operation and maintenance, and decommissioning of up to six offshore export cables through the intertidal and subtidal zones (seaward to 1 nm from MHWS) for the Transmission Assets), there is no potential for significant impacts on the 'habitats – biology', 'water quality' or 'protected areas' associated with the Mersey Mouth or Ribble water bodies.

1.7.4.2 It is therefore concluded that the activity will not significantly impact any element within these water bodies and the ability of these water bodies to achieve good status in the future is likely to be secure. The construction, operation and maintenance, and decommissioning of the Transmission Assets offshore export cables is therefore considered to be compliant with the requirements of the WFD.

1.8 References

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