MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Environmental Statement

Volume 3, Annex 2.1: Water Framework Directive surface water and groundwater assessment

September 2024
Rev: ES Issue

MOR001-FLO-CON-ENV-ASS-0001
MRCNS-J3303-RPS-10125

PINS Reference: EN020028
APFP Regulations: 5(2)(a)
Document reference: F3.2.1

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
400 kV grid connection cables	Cables that will connect the proposed onshore substations to the existing National Grid Penwortham substation.
400 kV grid connection cable corridor	The corridor within which the 400 kV grid connection cables will be located.
Catchments	An area that serves a watercourse with rainwater. Every part of land where the rainfall drains to a single watercourse is in the same catchment.
Commitment	This term is used interchangeably with mitigation and enhancement measures. The purpose of commitments is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects. Primary and tertiary commitments are taken into account and embedded within the assessment set out in the ES.
Diffuse sources	Non-point sources primarily associated with runoff and other discharges related to different land uses such as agriculture and forestry, from septic tanks associated with rural dwellings and from the land spreading of industrial, municipal and agricultural wastes.
Direct pipe	A cable installation technique which involves the use of a mini (or micro) tunnel boring machine and a hydraulic (or other) thruster rig to directly install a steel pipe between two points..
Discharge consents	Consent granted by the Environment Agency to discharge into watercourses, subject to conditions.
Drainage Board	Drainage Boards are an integral part of water level management in the UK. Each Drainage Board is a local public authority established in areas of special drainage need in England and Wales. They have permissive powers to manage water levels within their respective drainage districts. They undertake works to reduce flood risk to people and property and manage water levels to meet local needs.
Ecological potential	Ecological potential in artificial and heavily modified water bodies is determined by an assessment of whether measures are properly in place to mitigate the impacts of any modification on the ecology of the water body.
EIA Scoping Report	A report setting out the proposed scope of the Environmental Impact Assessment process. The Transmission Assets Scoping Report was submitted to The Planning Inspectorate (on behalf of the Secretary of State) for the Morgan and Morecambe Offshore Windfarms Transmission Assets in October 2022.
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 Objective	Objective setting considered waters that require protection from deterioration as well as waters that require restoration and the timescales needed for recovery.
Environmental Quality Ratio	Measure of the deviation of biological elements from undisturbed or reference conditions.

Term	Meaning
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
Groundwater	All water which is below the surface of the ground in the saturated zone and in direct contact with the ground or subsoil.
Heavily Modified Water Body	A body of surface water which, as a result of physical alterations by human activity, is substantially changed in character, as designated in accordance with the provisions of Annex II of the Water Framework Directive (WFD).
Hydromorphology	A study of the quantity and dynamics of water flow within a water body that has variations in its width, depth, structure and substrate of bed and riparian zone.
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 bay inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Lead Local Flood Authority (LLFA)	LLFAs are county councils and unitary authorities that lead in managing local flood risks (i.e. risks of flooding from surface water, ground water and ordinary (smaller) watercourses).
Main river	The term used to describe a watercourse designated as a main river under the Water Resources Act 1991 and shown on the Main River Map. These are usually larger rivers or streams and are managed by the Environment Agency.
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.
Mean High Water Springs	The height of mean high water during spring tides in a year.
Mean Low Water Springs	The height of mean low water during spring tides in a year.
Micro-tunnel	A tunnelling technique involving the use of a hydraulic (or other) jacking rig and a mini (or micro) tunnel boring machine to install a concrete tunnel between two points.
Minor watercourse	The term used to describe a water course owned and operated by a local Drainage Board, a Lead Local Flood Authority or a private land owner.
Mitigation measures	This term is used interchangeably with Commitments. The purpose of such measures is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects.
Morecambe Offshore Windfarm: Generation Assets	The offshore generation assets and associated activities for the Morecambe Offshore Windfarm: Generation Assets.
Morecambe Offshore Windfarm: Transmission Assets	The offshore export cables, landfall and onshore infrastructure required to connect the Morecambe Offshore Windfarm to the National Grid.
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.

Term	Meaning
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 Grid Penwortham substation	The existing National Grid substation at Penwortham, Lancashire.
National Policy Statement(s)	The current national policy statements published by the Department for Energy Security and Net Zero in 2023 and adopted in 2024.
National site network	Special Protection Areas, Special Areas of Conservation or Ramsar sites contribute to the national site network.
Onshore export cables	The cables which would bring electricity from the Generation Assets to the landfall.
Onshore export cable corridor	The corridor within which the onshore export cables will be located.
Onshore Infrastructure Area	The area within the Transmission Assets Order Limits landward of Mean High Water Springs. Comprising the offshore export cables from Mean High Water Springs to the transition joint bays, onshore export cables, onshore substations and 400 kV grid connection cables, and associated temporary and permanent infrastructure including temporary and permanent compound areas and accesses. Those parts of the Transmission Assets Order Limits proposed only for ecological mitigation/biodiversity benefit are excluded from this area.
Onshore substations	The onshore substations will include a substation for the Morgan Offshore Wind Project: Transmission Assets and a substation for the Morecambe Offshore Windfarm: Transmission Assets. These will each comprise a compound containing the electrical components for transforming the power supplied from the generation assets to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid.
Onshore Order Limits	See Transmission Assets Order Limits: Onshore (below).
Ordinary Watercourse	Watercourses (such as a river, stream, ditch, cut, sluice, dyke or non-public sewer) that are not designated a Main River under the Water Resources Act (1991). Responsibility for management lies with the Lead Local Flood Authority, or Internal Drainage Board or some watercourses where there is an Internal Drainage District.

Term	Meaning
Preliminary Scoping	Identifying links between the proposed activity and every quality element of the status classification that could be affected. It is also necessary at this stage to consider activities and how they affect the morphological mitigation measures for those waterbodies, where applicable.
Programme of Measures	Those actions, defined in detail, which are required to achieve the environmental objectives of the Directive within a river basin district.
Quality Element	Biological, hydromorphological, physico-chemical and chemical elements that contribute to the WFD status classification.
Ramsar sites	Wetlands of international importance that have been designated under the criteria of the Ramsar Convention. In combination with Special Protection Areas and Special Areas of Conservation, these sites contribute to the national site network.
River Basin District	Administrative area for coordinated water management, composed of multiple river basins (or catchments).
River Basin Management Plan	The purpose of a river basin management plan is to provide a framework for protecting and enhancing the benefits provided by the water environment.
Special Areas of Conservation	A site designation specified in the Conservation of Habitats and Species Regulations 2017. Each site is designated for one or more of the habitats and species listed in the Regulations. The legislation requires a management plan to be prepared and implemented for each SAC to ensure the favourable conservation status of the habitats or species for which it was designated. In combination with Special Protection Areas and Ramsar sites, these sites contribute to the national site network.
Special Protection Areas	A site designation specified in the Conservation of Habitats and Species Regulations 2017, classified for rare and vulnerable birds, and for regularly occurring migratory species. Special Protection Areas contribute to the national site network.
Study area	This is an area which is defined for each environmental topic which includes the Transmission Assets Order Limits as well as potential spatial and temporal considerations of the impacts on relevant receptors. The study area for each topic is intended to cover the area within which an impact can be reasonably expected.
Transmission Assets Order Limits: Onshore	The area within which all components of the Transmission Assets landward of Mean High Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds). Also referred to in this report as the Onshore Order Limits, for ease of reading.
Water Framework Directive	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. The Water Framework Directive promotes water management through river basin planning. It covers inland surface waters, estuarine waters, coastal waters and groundwater.
Zone of Influence	Water bodies that are within, intersect or which are hydrologically connected to the Transmission Assets Order Limits.

Acronyms

Acronym	Meaning
CoCP	Code of Construction Practice
DO	Dissolved oxygen
EA	Environment Agency
EIA	Environmental Impact Assessment
EQS	Environmental Quality Standard
EQSD	Environmental Quality Standards Directive
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HMWB	Heavily Modified Water Body
INNS	Invasive Non-native Species
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MTBM	Micro-tunnel boring machine
NPS	National Policy Statement
NRW	Natural Resources Wales
NVZ	Nitrate Vulnerable Zone
PBDE	Polybrominated diphenyl ether
PRoW	Project Right of Way
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SoS	Secretary of State
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SWMI	Significant Water Management Issues
uPBT	Ubiquitous, persistent, bioaccumulative and toxic
WFD	Water Framework Directive
ZOI	Zone of Influence

Units

Unit	Description
%	Percentage
km^2	Kilometres Squared
m^2	Square Metres
m	Metre
km	Kilometre
kV	Kilovolt

1 Water Framework Directive surface water and groundwater assessment

1.1 Introduction

1.1.1 Purpose of this report

1.1.1.1 This document forms Volume 3, Annex 2.1: Water Framework Directive surface water and groundwater assessment of the Environmental Statement (ES) prepared for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (referred to hereafter as 'the Transmission Assets'). The ES presents the findings of the Environmental Impact Assessment (EIA) process for the Transmission Assets.

1.1.1.2 This document forms an assessment of the Transmission Assets compliance with Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy (Water Framework Directive (WFD)). Specifically, this document considers the potential impact of the Transmission Assets landward of Mean High Water Springs (MHWS) during the construction, operation and maintenance, and decommissioning. Reference should also be made to Volume 2, Annex 2.2: Water Framework Directive coastal waters assessment of the ES to assess the potential impact of the Transmission Assets (submerged offshore infrastructure) on WFD transitional and coastal receptors out to one nautical mile.

1.1.1.3 This annex comprises a WFD assessment to demonstrate that the nature and anticipated magnitude of the effects of the Transmission Assets will not compromise the environmental objectives of any affected WFD surface water and groundwater bodies within the Zone of Influence (ZOI) (see **section 1.3.3** for more detail). The WFD assessment also provides the opportunity to inform the detailed design of the Transmission Assets to avoid, minimise, mitigate, or compensate for the risks to WFD surface water and groundwater receptors where the risk assessment determined that the activities have the potential to:

- cause a surface water body or groundwater body to deteriorate from one WFD status class to another or cause significant localised impacts that could contribute to this happening;
- prevent or undermine action to get surface water and groundwater bodies to good status (e.g., compromise the programme of measures put in place to achieve the ultimate water body objective);
- prevent the achievement of the objectives and standards for water dependent protected areas;
- prevent the reversal of any significant and sustained upward trends in pollutant concentrations in groundwater;
- result in discharges, emissions and losses of priority hazardous substances into surface waters; and

- impact on the progressive reduction of the pollution of groundwater.

1.1.2 Legislation, policy and guidance

Legislation

1.1.2.1 The WFD (Council Directive 2000/60/EC establishing a framework for community action in the field of water policy) was adopted by the European Commission in December 2000. The WFD was transposed into law in England and Wales by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (hereafter referred to as 'the 2017 WFD Regulations'). The WFD is retained EU legislation and is still 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.

1.1.2.2 The 2017 WFD Regulations require the Secretary of State (SoS), Welsh Ministers, the Environment Agency (EA) and Natural Resources Wales (NRW) to exercise their 'relevant functions' so as to secure compliance with the WFD (Regulation 3). Under the regulations the SoS, the Welsh Ministers, EA, NRW, and all public bodies have a specific duty to have regard to the relevant River Basin Management Plan (RBMP), and any supplementary plans made under it, when exercising their functions. 'Having regard to' RBMP's includes taking account of and considering the environmental objectives and summary of measures contained within the plan when exercising any functions and the effects of those functions on the objectives and measures within the plan (Planning Inspectorate, 2018). In carrying out their functions for the third planning period 2021 to 2027 the Environment Agency are responsible for the preparation and updating of RBMPs. The relevant RBMP for the Transmission assets is the North Western RBMP.

1.1.2.3 Regulation 5(2) (l) (iii) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) (the APFP Regulations) requires each Applicant (where applicable) to provide with their application 'a plan with accompanying information identifying water bodies in a river basin management plan, together with an assessment of any effects on such bodies likely to be caused by the proposed development'.

Planning policy context

1.1.2.4 The Transmission Assets will be located in English offshore waters (beyond 12 nautical miles (nm) from the English coast) and inshore waters, with the onshore infrastructure located wholly within England. As set out in Volume 1, Chapter 1: Introduction of this ES, the Secretary of State for the Department for Business, Energy and Industrial Strategy (BEIS) (the department which preceded the Department for Energy Security and Net Zero) has directed that the Transmission Assets are to be treated as development for which development consent is required under the Planning Act 2008, as amended. As such, there is a requirement to submit an application for a DCO to the Planning Inspectorate to be decided by the SoS for the Department for Energy Security and Net Zero. As required under Regulation 5(2) (l) (iii) of the APFP Regulations it is essential that any WFD assessment is conducted

thoroughly and is easily identified amongst the application documents, together with any relevant plans.

National Policy Statements

1.1.2.5 There are currently six energy National Policy Statements (NPSs), last updated in November 2023 and came into force on the 17th January 2024, three of which contain policy relevant to offshore wind development and the Transmission Assets, specifically:

- Overarching NPS for Energy (NPS EN-1) which sets out the UK Government's policy for the delivery of major energy infrastructure (Department for Energy Security & Net Zero, 2023a);
- NPS for Renewable Energy Infrastructure (NPS EN-3) (Department for Energy Security & Net Zero, 2023b);
- NPS for Electricity Networks Infrastructure (NPS EN-5) (Department for Energy Security & Net Zero, 2023c).

1.1.2.6 NPS EN-1 and NPS EN-3 include guidance on what matters are to be considered in water quality and resources. These are summarised in **Table 1.1** and **Table 1.2** below.

1.1.2.7 NPS EN-5 includes guidance on what matters are to be considered in the onshore assessment of electrical networks. These are summarised in **Table 1.3**.

Table 1.1: Summary of the NPS EN-1 provisions relevant to WFD Assessment

Summary of NPS EN-1 provision	How and where considered in the Environmental Statement
Where the project is likely to have effects on the water environment, the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment, and how this might change due to the impact of climate change on rainfall patterns and consequently water availability across the water environment, as part of the Environmental Statement or equivalent. [Paragraph 5.16.3 of NPS EN-1].	The baseline environment (see **section 1.4**) is described for the WFD water bodies within the WFD study area (the WFD study area is defined in **paragraph 1.3.3**). An assessment of the impacts on water quality, resources and physical characteristics is provided in **section 1.6.** The assessment of flood risk, taking into account increases in rainfall rates due to climate change, has been addressed in Volume 3, Chapter 2: Hydrology and flood risk of the ES, ensuring the drainage design is able to accommodate increasing volumes of surface water runoff associated with the effects of climate change..

Summary of NPS EN-1 provision	How and where considered in the Environmental Statement
The Environmental Statement should in particular describe: • The existing quality of waters affected by the proposed project and the impacts of the proposed project on water quality, noting any relevant existing discharges, proposed new discharges and proposed changes to discharges • Existing water resources affected by the proposed project and the impacts of the proposed project on water resources, noting any relevant existing abstraction rates, proposed new abstraction rates and proposed changes to abstraction rates (including any impact on or use of mains supplies and reference to Abstraction Licensing Strategies) and also demonstrate how proposals minimise the use of water resources and water consumption in the first instance • Existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project and any impact of physical modifications to these characteristics • 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 • How climate change could impact any of the above in the future • Any cumulative effects [Paragraph 5.16.7 of NPS EN-1].	This WFD Assessment has been undertaken in accordance with the Planning Inspectorate Advice Note 18: The Water Framework Directive. The assessment considers the potential impact of the Transmission Assets landward of MHWS during the construction, operations and maintenance, and decommissioning phases as outlined in **Section 1.6** of this annex. The assessment and the proposed measures adopted as part of the Transmission Assets have taken into account the requirements of the North Western RBMP, within which the Transmission Assets are located, and WFD to ensure all potential impacts on the water environment are mitigated to within acceptable levels including drinking water protected areas associated with public and private abstractions. Environment Agency, Fylde Council, Blackpool Council, South Ribble Borough Council and Preston City Council (and Lancashire County Council at the County level) have been consulted during the preparation of the WFD assessment. Consultation responses relevant to the WFD assessment are detailed in **Table 1.4**. The impact on Hydromorphological supporting conditions to the biological elements of ecological status have been considered in the WFD Assessment **section 1.6**. The WFD Assessment has undertaken an assessment of the water bodies and associated protected areas including designated shellfish waters and drinking water protected areas in **section 1.6**. Impacts to peak river flow, peak rainfall intensity and sea level rise as a result of climate change has been described and taken into account within Volume 3, Annex 2.3: Flood Risk Assessment of the ES. Where appropriate, mitigation measures have been applied.. A cumulative impact assessment of the water environment has been undertaken in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES and Chapter 2: Hydrology and flood risk of the ES. The in-combination effects and inter-related effects of climate change on the water environment and on ecology are assessed in Volume 4, Chapter 1: Climate change of the ES, which concludes that these effects are not significant as climate resilience has been considered in the mitigation strategy.

Summary of NPS EN-1 provision	How and where considered in the Environmental Statement
The Secretary of State should be satisfied that a proposal has regard to current River Basin Management Plans and meets the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (including regulation 19). The specific objectives for particular river basins are set out in River Basin Management Plans. The Secretary of State must refuse development consent where a project is likely to cause deterioration of a water body or its failure to achieve good status or good potential, unless the requirements set out in Regulation 19 are met. A project may be approved in the absence of a qualifying Overriding Public Interest test only if there is sufficient certainty that it will not cause deterioration or compromise the achievement of good status or good potential. The Secretary of State should also consider the interactions of the proposed project with other plans such as Water Resources Management Plans and Shoreline Management Plans [Paragraph 5.16.12 – 5.6.15 of NPS EN-1].	This technical annex has considered the North Western River Basin Management Plan 2021-2027 and the WFD assessment has been undertaken to demonstrate that the Transmission Assets are compliant with the requirements of the WFD and the implementing legislation in England and Wales, i.e. Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The assessment and the proposed mitigation measures have taken into account the requirements of the RBMP, and in particular the environmental objectives of the water bodies affected, to ensure all potential impacts on the water environment are mitigated to within acceptable levels. Therefore the achievement of the environmental objectives of the water bodies within the WFD study area will not be compromised as a result of the project activities associated with the Transmission Assets (see **section 1.6**).
The Secretary of State should consider proposals to mitigate adverse effects on the water environment and any enhancement measures put forward by the applicant and whether appropriate requirements should be attached to any development consent and/or planning obligations are necessary [Paragraph 5.16.16 NPS EN-1].	This has been described and considered in **section 1.6** in the assessment of the Transmission Assets.
The Secretary of State should consider whether mitigation measures are needed over and above any which may form part of the project application. A construction management plan may help codify mitigation at that stage. The risk of impacts on the water environment can be reduced through careful design to facilitate adherence to good pollution control practice. For example, designated areas for storage and unloading, with appropriate drainage facilities, should be clearly marked. The impact on local water resources can be minimised through planning and design for the efficient use of water, including water recycling. If a development needs new water infrastructure, significant supplies or impacts other water supplies, the applicant should consult with the local water company and the EA or NRW [Paragraph 5.16.8 – 5.16.10 NPS EN-1].	Appropriate mitigation measures are set out in the Outline Code of Construction Practice (CoCP,document reference J1) which has been prepared as part of the DCO application. The detailed CoCP(s) will be supported via a series of management plans The CoCP will include measures to maintain and address: • flood protection and control measures; • drainage; • pollution prevention; • geology and ground conditions; • ecology and nature conservation (including protected species and invasive species); • historic environment; • soil management; • traffic and transport; • noise management measures; • air quality and dust management; • landscape and visual; and • bentonite breakout plan.

Table 1.2: Summary of NPS EN-3 policy on decision making relevant to WFD Assessment

Summary of NPS EN-3 provision	How and where considered in the Environmental Statement
In relation to the network connection: The applicant should assess the effects of the offshore transmission and any associated infrastructure on the marine, coastal and onshore environment [Paragraph 2.8.68 of NPS EN-3].	This technical report assesses (**section 1.5** and **section 1.6**) the WFD compliance and the potential environmental effects of the Transmission Assets Order Limits landward of the MHWS as they relate to surface and groundwater bodies. The assessment of the Transmission Assets on the downstream marine water body which could be indirectly affected by the project through hydrological pathways is also considered in this WFD assessment. Volume 2, Annex 2.2: WFD coastal waters assessment of the ES, includes an assessment of the impacts of the Transmission Assets seaward of the MHWS.
Assessment of environmental effects of transmission infrastructure and any proposed offshore or onshore substations should assess effects both alone and cumulatively with other existing and proposed infrastructure [Paragraph 2.8.72 of NPS EN-3].	Cumulative effects on onshore WFD compliance are considered in Volume 3, Chapter 2: Hydrology and flood risk of the ES.
In addition, applicants should have regard to the specific ecological and biodiversity considerations that pertain to proposed offshore renewable energy infrastructure developments, namely: • Fish • Intertidal and subtidal seabed habitats and species • Marine mammals • Birds • Wider ecosystem impacts and interactions and other relevant protected migratory species. [Paragraph 2.8.98 of NPS EN-3].	This technical report considers the impacts on the ecological status of the water bodies within the Landfall (from MHWS) and Onshore Infrastructure Area including the impacts on fish, invertebrates and other elements of ecological status, in addition to water dependent habitats and species (see **Section 1.6**). The impacts on marine mammals and birds are dealt with in Volume 2, Chapter 4: Marine Mammals and Volume 2, Chapter 5: Offshore ornithology.

Table 1.3: Summary of the NPS EN-5 provisions relevant to WFD Assessment

Summary of NPS EN-5 provision	How and where considered in the Environmental Statement
Onshore connection locations for offshore transmission must seek to minimise environmental and other impacts, both onshore and in the marine environment and including to local communities [Paragraph 2.13.23 of NPS EN-5].	The assessment in this annex fully considers potential impacts on all relevant onshore ecological features as identified in the baseline studies of the zone of influence (refer to Volume 3: Annex 3.1: Onshore ecology desk study of the ES and Annex 3.2: Phase 1 habitat survey technical report of the ES).
Applicants should consider and address routing and avoidance/minimisation of environmental impacts both onshore and offshore at an early stage in the	Potential impacts have been considered at an early stage and in consultation with the relevant stakeholders (see **Table 1.4** in this technical report) and where possible addressed through

Summary of NPS EN-5 provision	How and where considered in the Environmental Statement
development process [Paragraph 2.10.1 of NPS-EN-5].	avoidance (see **section 1.5** of this technical report).
In the assessments of their designs, applicants should demonstrate: • How environmental, community and other impacts have been considered and how adverse impacts have followed the mitigation hierarchy i.e. avoidance, reduction and mitigation of adverse impacts through good design • How enhancements to the environment post construction will be achieved including demonstrating consideration of how proposals can contribute towards biodiversity net gain (as set out in Section 4.5 of EN-1 and the Environment Act 2021), as well as wider environmental improvements in line with the Environmental Improvement Plan and environmental targets. • How the construction planning for the proposals has been co-ordinated with that for other similar projects in the area on a similar timeline • How the mitigation hierarchy has been followed, in particular to avoid the need for compensatory measures for coastal, inshore and offshore developments affecting SACs SPAs, and Ramsar sites and MCZs as set out in EN-3 2.8. For designated landscapes the principal mitigation measure, as established by the Holford Rules, should be to seek to avoid landfall in these areas(Paragraph 4.2.29 of EN-1) [Paragraph 2.14.2 of NPS-EN-5].	Consideration of site selection is included in Volume 1, Chapter 4: Site selection of the ES. The mitigation hierarchy has been followed as described in **section 1.2** of this technical report. The resulting assessment has included consultation with relevant stakeholders to agree the best way to avoid or mitigate impacts (see **Table 1.4** in this technical report). With regard to coastal, inshore and offshore waters, these are covered in Volume 2, Chapter 2, Benthic and subtidal and intertidal ecology of the ES and Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES. An outline onshore biodiversity benefit statement (document reference J11) is submitted alongside the ES as part of the DCO application. The Project design philosophy is for the transmission infrastructure for each wind farm to remain electrically independent (i.e., each wind farm to have its own sets of cabling and substation infrastructure). However, the location of the infrastructure will be co-ordinated within shared offshore and onshore cable corridors to minimise impacts to the environment and the community.
Where biodiversity impacts are identified, including those associated with bird collision with overhead lines, the Secretary of State should be satisfied that all feasible options for mitigation have been considered and evaluated appropriately' [Paragraph 2.11.1 of NPS EN-5].	The assessment of ecological status of the water bodies affected by the Transmission Assets in this technical report has followed the mitigation hierarchy and there is no significant risk to the deterioration of any water bodies nor will the project compromise the environmental objectives of these water bodies (**section 1.6**). Additional biodiversity impacts are considered in Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.

Relevant guidance

1.1.2.8 The WFD assessment has been undertaken in accordance with Advice Note 18: The Water Framework Directive (Planning Inspectorate, 2017). The potential impact on downstream transitional and coastal water bodies has been assessed using the guidance WFD Assessment of estuarine (transitional) and coastal waters, 'Clearing the waters for All' (Environment Agency, 2017).

1.1.3 Report structure

1.1.3.1 For the purposes of undertaking the WFD assessment for the Transmission Assets, the steps outlined in **Diagram 1.1** have been undertaken. This annex has the following structure.

- **Section 1.2** sets out the overall methodology of this annex, including the baseline methodology, and overview of the proposed development, scope of the assessment.
- **Section 1.4** sets out the baseline environment in the context of the water bodies impacted.
- **Section 1.5** provides a scoping assessment of Transmission Assets and concludes whether a more detailed assessment is required.
- **Section 1.6** provides a detailed assessment of the potential impact of the Transmission Assets on the WFD objectives considering the mitigation measures proposed as part of the Transmission Assets.
- **Section 1.7** provides the conclusions and summary of the assessment.

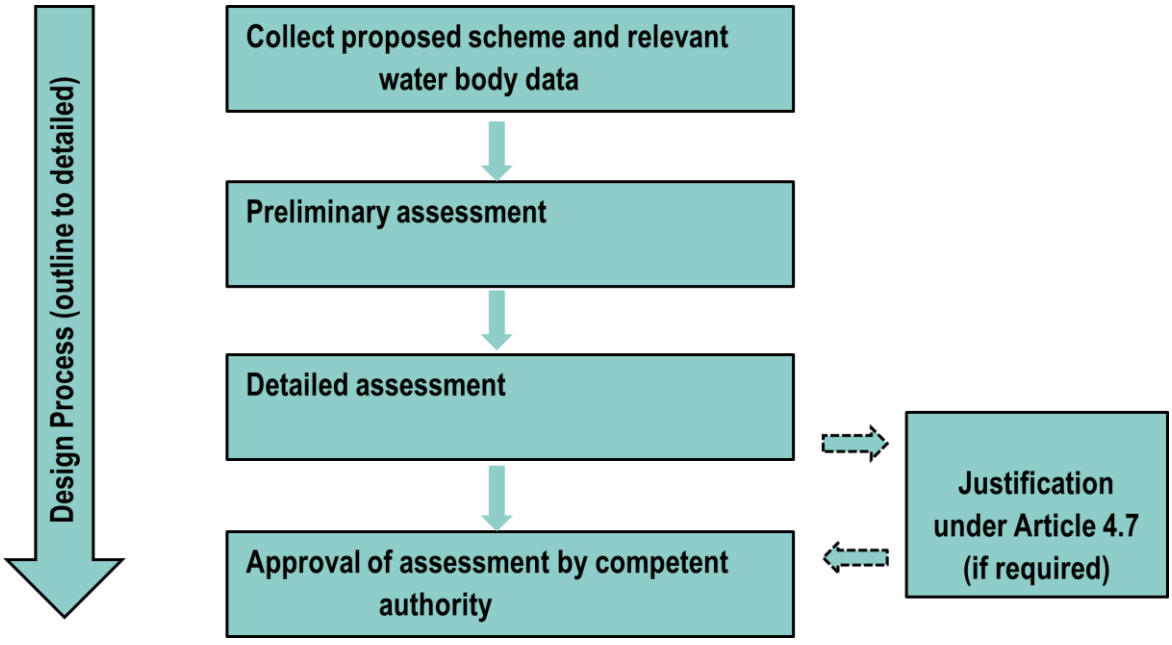


Diagram 1.1:WFD compliance process

1.2 The Transmission Assets

1.2.1.1 The components of the onshore transmission assets that have the potential to impact on the WFD objectives are outlined below. The design philosophy is for the transmission infrastructure for each wind farm to remain electrically independent. However, the location of the infrastructure will be co-ordinated within shared onshore cable corridors to minimise impacts to the environment. Nevertheless, for the purposes of this WFD assessment it has been assumed that the transmission infrastructure will be constructed sequentially (i.e., the Morecambe Offshore Windfarm: Transmission Assets

will be constructed first and the Morgan Offshore Wind Project: Transmission Assets will be constructed second, or vice versa) as this represent the maximum design envelope and worst case scenario. More detail on the nature of these activities is provided in Volume 1, Chapter 3: Project description of the ES and the maximum design scenario (MDS) outlined in **Table 1.11**.

- onshore elements (onshore infrastructure area):
  - Onshore export cables: the cables which would bring electricity from the landfall to the onshore substations.
  - Onshore substations: the onshore substations will include a substation for the Morgan Offshore Wind Project: Transmission Assets and a substation for the Morecambe Offshore Windfarm: Transmission Assets. These will each comprise a compound containing the electrical components for transforming the power supplied from the generation assets to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid.
  - The 400 kV grid connection cables: cables that will connect the proposed onshore substations to the existing National Grid Penwortham substation.
- intertidal infrastructure area:
  - the temporary and permanent areas between MLWS and MHWS .

1.2.1.2 The activities which have the potential to impact the achievement of the WFD objectives, have been identified from the key components of the onshore elements of the Transmission Assets (as set out in **paragraph 1.2.1.1**). The following activities may potentially pose a detrimental risk to the water environment in the absence of mitigation.

- Topsoil stripping, excavation, and stockpiled earth (including reinstatement) for the cable corridors, crossings, onshore substations and landfall.
- Use of oils, chemicals, and cement during construction of the different components of the Transmission Assets.
- Construction and operation of temporary bridges and culverts to facilitate crossing of watercourses by machinery should this be required, resulting in temporary impacts to the morphology of the channel and banks.
- Morphological impacts from physical changes to channel, banks and riparian zone during watercourse crossings, particularly where trenched methods are used. This has the potential to effect the supporting hydromorphological conditions of a water body.
- De-watering of trenches or excavations for onshore export cables, watercourse crossings, joint boxes, substation construction and 400 kV grid connection cables.
- Temporary abstractions from surface water/groundwater.

- Landfall and intertidal cable installation and maintenance. Either trenchless or trenching methods could be used for installation.
- Installation and maintenance of cable protection in the nearshore subtidal environment.
- Seabed clearance in the nearshore subtidal environment.
- Use of jack-up vessels for cable installation and maintenance in the nearshore subtidal or intertidal environment.
- Unexploded ordnance detonation in the nearshore subtidal or intertidal environment.

1.3 Methodology

1.3.1 Introduction

1.3.1.1 The 2017 WFD Regulations require that the competent authority, and all public authorities, in undertaking their statutory functions must prevent the deterioration in the status of all water bodies and enhance and restore all bodies of water where they are currently not achieving their environmental objectives. This means that new development should not adversely impact upon on the ability of a water body to achieve its environmental objectives.

1.3.1.2 The 2017 WFD Regulations provide for the implementation of the WFD through the designation of all surface waters (rivers, lakes, transitional (estuarine) and coastal waters) and groundwaters as water bodies and the establishment of targets to achieve their environmental objectives.

1.3.1.3 The WFD applies to WFD water bodies. The consideration of the proposals under the WFD will therefore, apply to all surface water bodies and groundwater bodies that have the potential to be impacted by the Transmission Assets.

1.3.2 Sources of information

1.3.2.1 This annex draws upon information contained within the following documents.

- Volume 2, Chapter 1: Physical processes of the ES.
- Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES.
- Volume 3, Chapter 2: Hydrology and flood risk of the ES.
- Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.
- Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.

1.3.3 Study area

1.3.3.1 For the purposes of this WFD assessment, water bodies that are within, intersect or which are hydrologically connected to the Transmission Assets

Order Limits have been identified and considered as relevant water bodies for the different stages of the WFD assessment (i.e., the WFD assessment study area, or 'study area', see **Figure 1.1**). The Stage 1 screening assessment that was undertaken within Annex B of the EIA Scoping Report identified these water bodies as the ZOI for the Transmission Assets, the Environment Agency confirmed in their consultation response that they agreed with the screening assessment (**Table 1.4)**.

1.3.3.2 There are sections of the Transmission Assets Order Limits that fall within the small coastal interbasins that drain directly, or via smaller streams, to the transitional and coastal water bodies. These areas are not within a formal WFD water body, but the potential impacts associated with the Transmission Assets Order Limits are considered in the impact to the downstream marine (transitional or coastal) water bodies. These areas are included in **Figure 1.1**, as areas outside of the formal WFD water bodies, e.g., a section of the Transmission Order Limits to the north and south of the Ribble Estuary where the proposed crossing of the estuary will be undertaken. Volume 2, Annex 2.2: WFD coastal waters assessment of the ES, includes an assessment of the impacts of the Transmission Assets seaward of the MHWS.

1.3.3.3 The seabed and coastal areas that may be influenced by changes to physical processes due to the Transmission Assets are defined in Volume 2, Chapter 1: Physical processes of the ES, as one spring tidal excursion. A spring tidal excursion is the distance suspended sediment is transported prior to being carried back on the returning tide. On this basis the coastal and transitional water bodies that have the potential to be indirectly impacted by the Transmission Assets are the Ribble Estuary (GB531207112400) transitional water body and the Mersey Mouth (GB641211630001) coastal water body which are both within the spring tidal excursion.

1.3.3.4 The surface water bodies that occur within the Transmission Assets Order Limits are illustrated in **Figure 1.1** with their contributing catchment areas. Groundwater bodies are displayed in **Figure 1.2**.

1.3.3.5 These water bodies and their associated catchment areas comprise the ZOI of the Transmission Assets for the purposes of the WFD Assessment as determined through the WFD screening assessment undertaken as part of the EIA Scoping Report (Annex B). The impact of the different project components on these water bodies is considered in this WFD assessment.

1.3.3.6 A number of WFD protected areas are connected to the water bodies within the ZOI and are discussed in **section 1.4.4** and presented on **Figure 1.1** and **Figure 1.3**. The EA Guidance 'Clearing Waters for All' (Environment Agency, 2017) recommends that protected areas that are greater than 2 km from the development area can be scoped out of the WFD Assessment.

1.3.4 Consultation

1.3.4.1 A summary of the key comments raised during consultation activities undertaken to date specific to the WFD assessment of the Transmission Assets is presented in **Table 1.4**, together with how these matters have been considered in the production of this annex.

Table 1.4: Summary of key consultation topics raised during consultation activities undertaken for the Transmission Assets relevant to the WFD assessment

Date	Consultee and type of response	Comments raised	Response to comments and where considered in this annex
8 December 2022	Canal & River Trust – scoping response	Based on the scoping boundary shown at Figure 1.1 [of the EIA Scoping Report] we have a number of assets within the boundary. The Trust lease Savick Brook to enable navigation and connectivity to the Lancaster Canal (starting in Preston). The Trust own and manage at least 3 locks to enable navigation and connectivity to the Lancaster Canal. National Cycle Route 622 is also carried along the towpath here. We also have a right of navigation over the Ribble Link (River Ribble) which provides connectivity to Savick Brook. The Ribble Link is a County Wildlife Site. The Ribble & Alt Estuaries are SPA. The Ribble Estuary is also a SSSI and Ramsar site. Our interest relates to the landfall elements of the scheme and how a connection would be made to Penwortham. Such a connection would require at least one crossing of our waterway that we have interests within and a number of assets. We would welcome further discussion with the Promoter of the scheme to establish where such a crossing (underground) of the waterways would be required. We would want to ensure that the structural integrity of our assets are safeguarded.	The Lancaster Canal is included in the WFD assessment as an Artificial Water Body. However as the Transmission Assets Order Limits do not traverse the canal there will be no direct impact on this artificial water body. The Ribble Estuary transitional water body has been included in the WFD Assessment and the potential impacts of the crossing, which will be undertaken by trenchless technology, will not impact on navigation.
8 December 2022	Environment Agency (EA) – Scoping response	Agree with the scope of the WFD Assessment	The EA accepted the proposed approach to the WFD Assessment based on the Scoping Report for the project. This annex reflects the approach outlined in the EIA Scoping Report.
8 December 2022	Environment Agency (EA) – Scoping response	We note that in Table 7.4 on page 254 [of the EIA Scoping Report] fish are scoped out of onshore impact. We agree that fish and river surveys are not required if HDD is used for river crossings. However, if open cut is required then the impact on fish and river habitats in these locations will need to be assessed.	All major crossings, such as major roads, EA main river and rail crossings will be undertaken using HDD (or other trenchless techniques), where practicable as per CoT02. A list of all measures adopted as part of the Transmission Assets (Commitments) is found in Volume 1, Annex 5.3: Commitments register of the ES. Where open cut crossings are proposed fish surveys have been undertaken and the sensitivity of the habitat assessed

Date	Consultee and type of response	Comments raised	Response to comments and where considered in this annex
			(see Volume 3, Annex 3.7: Fish and eel survey technical report.
8 December 2022	Environment Agency (EA) – scoping response	We note the intention to HDD for river crossings and the onshore cable landing area.	The WFD assessment in **section 1.6** has been undertaken on the basis of COT93 which commits to trenchless techniques at the landfall, the River Ribble and all EA main rivers traversed as per CoT02.
8 December 2022	Natural England – scoping response	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.	The impact of increased SSC upon the interest features is assessed as part of the detailed assessment in **section 1.6** of this annex, i.e. designated sites with water dependent habitats and species are included in the register of protected areas under the WFD.
8 December 2022	PINS - Scoping response	On the basis that the activities associated with the operation and maintenance of the onshore elements of the Transmission Assets are unlikely to result in accidental spills/contaminant release, and given that such effects are capable of mitigation through standard management practices, the Inspectorate agrees pollution caused by accidental spills/contaminant release on protected habitats and species during operation can be scoped out of the assessment. The ES should however detail any operational controls on maintenance works.	The potential for impact on the achievement of the WFD objectives for the water bodies within the ZOI has been scoped out of the WFD assessment. Volume 1, Chapter 3: Project description provides details on operational controls and maintenance works.
22 November 2023	National Infrastructure Team Environment Agency – section 42 response	Groundwater Dependent Terrestrial Ecosystem (GWDTE) Test for both quantitative and chemical tests. The SSSI at Lytham St Annes is groundwater dependent and the Transmission Assets will interact with	Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES considers the impact on the SSSI. It should be noted that trenchless techniques will be used to go under the SSSI. The trenchless crossing underneath the

Date	Consultee and type of response	Comments raised	Response to comments and where considered in this annex
		the groundwater. Table 1.11 has scoped these aspects out. Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions had also overlooked the groundwater interaction of the SSSI. Impact: Potential adverse WFD impacts. Solution: Consider impacts and potential mitigation options for the SSSI at Lytham St Annes.	Lytham St Annes Dunes SSSI are discussed in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions.
22 November 2023	National Infrastructure Team Environment Agency – section 42 response	The water bodies in the area impacted by this development are generally less than good ecological status in WFD Terms. Suggestion Engage with local partners to discuss potential opportunities to both mitigate for the impact of the development and improve the quality of the surrounding environment. For example a study is about to take place, funded by EA and undertaken by Ribble Rivers Trust, to scope improvement options for Liggard Brook.	The Project will seek to engage with a range of partnerships to support a range local initiatives to support and enhance local wildlife and communities.

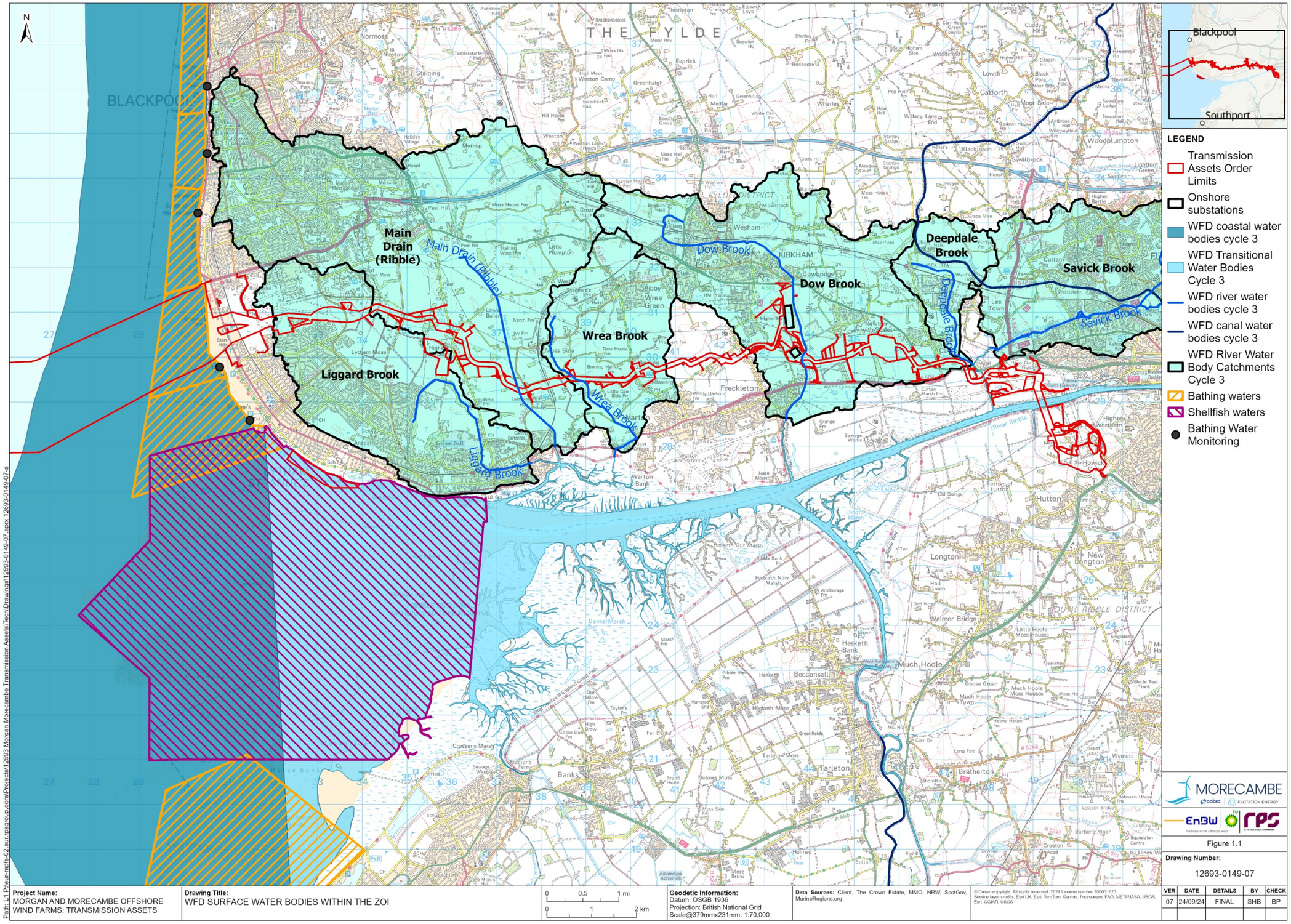
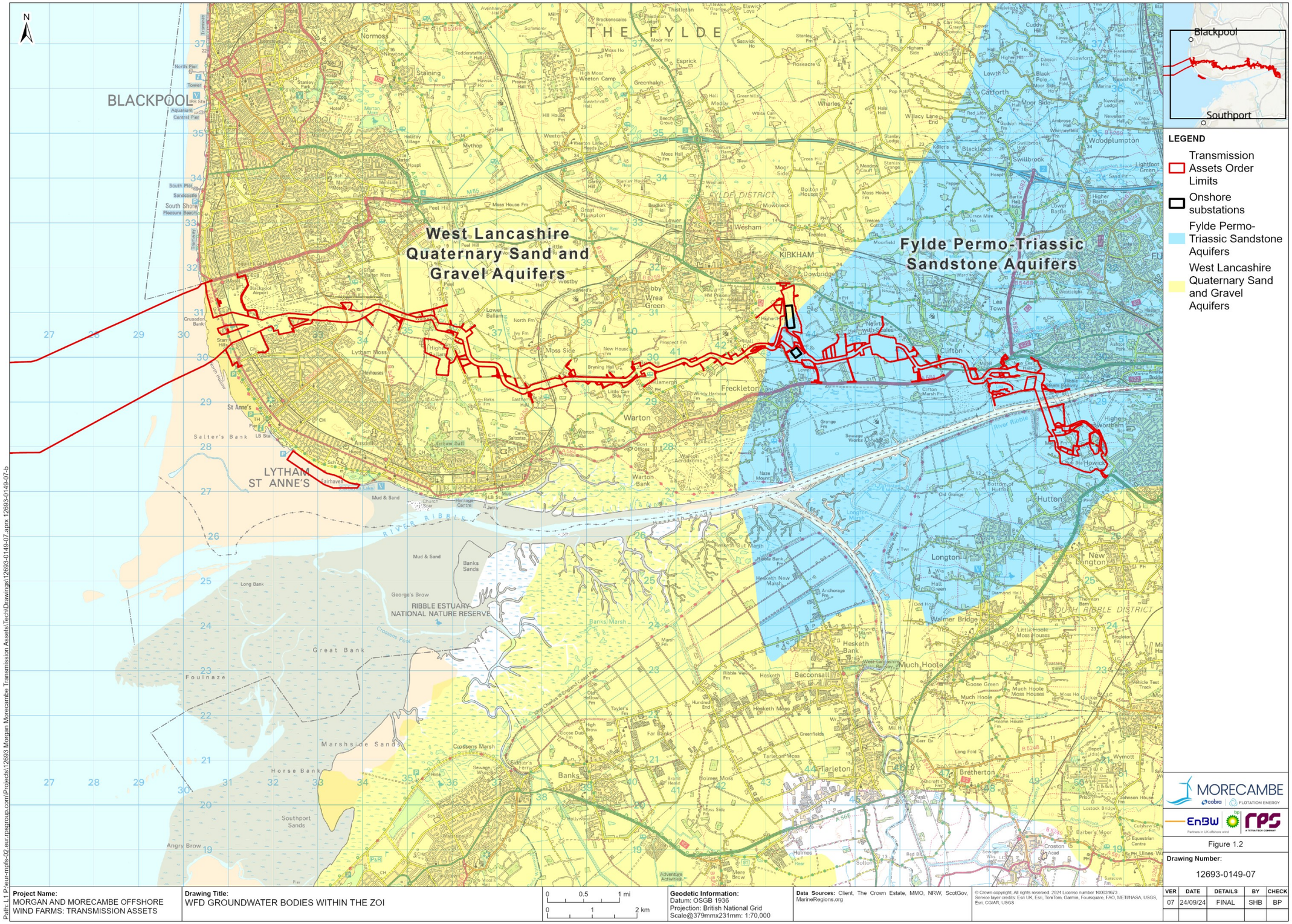


Figure 1.1 WFD surface water bodies within the ZOI



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Project Name: MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS	**Drawing Title:** WFD GROUNDWATER BODIES WITHIN THE ZOI	0 0.5 1 mi / 0 1 2 km	**Geodetic Information:** Datum: OSGB 1936 Projection: British National Grid Scale@379mmx231mm: 1:70,000	**Data Sources:** Client, The Crown Estate, MMO, NRW, ScotGov, MarineRegions.org

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Figure 1.2

Drawing Number: 12693-0149-07

Figure 1.2 WFD groundwater bodies within the ZOI

1.3.5 WFD assessment stages

1.3.5.1 The WFD surface water and groundwater assessment draws upon a number of other disciplines in determining the potential impact to the environmental objectives of the water bodies that have the potential to be impacted. These will include hydrology and water quality, terrestrial and aquatic ecology, Habitat Regulations Assessment and geology, hydrogeology and ground conditions.

1.3.5.2 To achieve the aims outlined within **section 1.1.1**, a staged approach has been adopted in undertaking the WFD assessment in accordance with the WFD and the Planning Inspectorate Advice Note 18: Water Framework Directive (Planning Inspectorate, 2017).

1.3.5.3 The WFD assessment is typically undertaken in three stages.

1. Screening – determines if there are any activities that do not need to go through the scoping or impact assessment stages.
2. Scoping – identifies the receptors that are potentially at risk from the activity and need impact assessment.
3. Impact assessment – a detailed assessment of water bodies and their quality elements that are considered likely to be affected by the Transmission Assets, identification of any areas of non-compliance; consideration of mitigation measures, enhancements, and contributions to the RBMP objectives.

1.3.5.4 A flow chart, taken from the Planning Inspectorate Advice Note 18 for assessing activities and projects for compliance with the WFD (Planning Inspectorate, 2017) has been included below in **Diagram 1.2**. This provides an overview of the recommended process to address the WFD during the pre-application process.

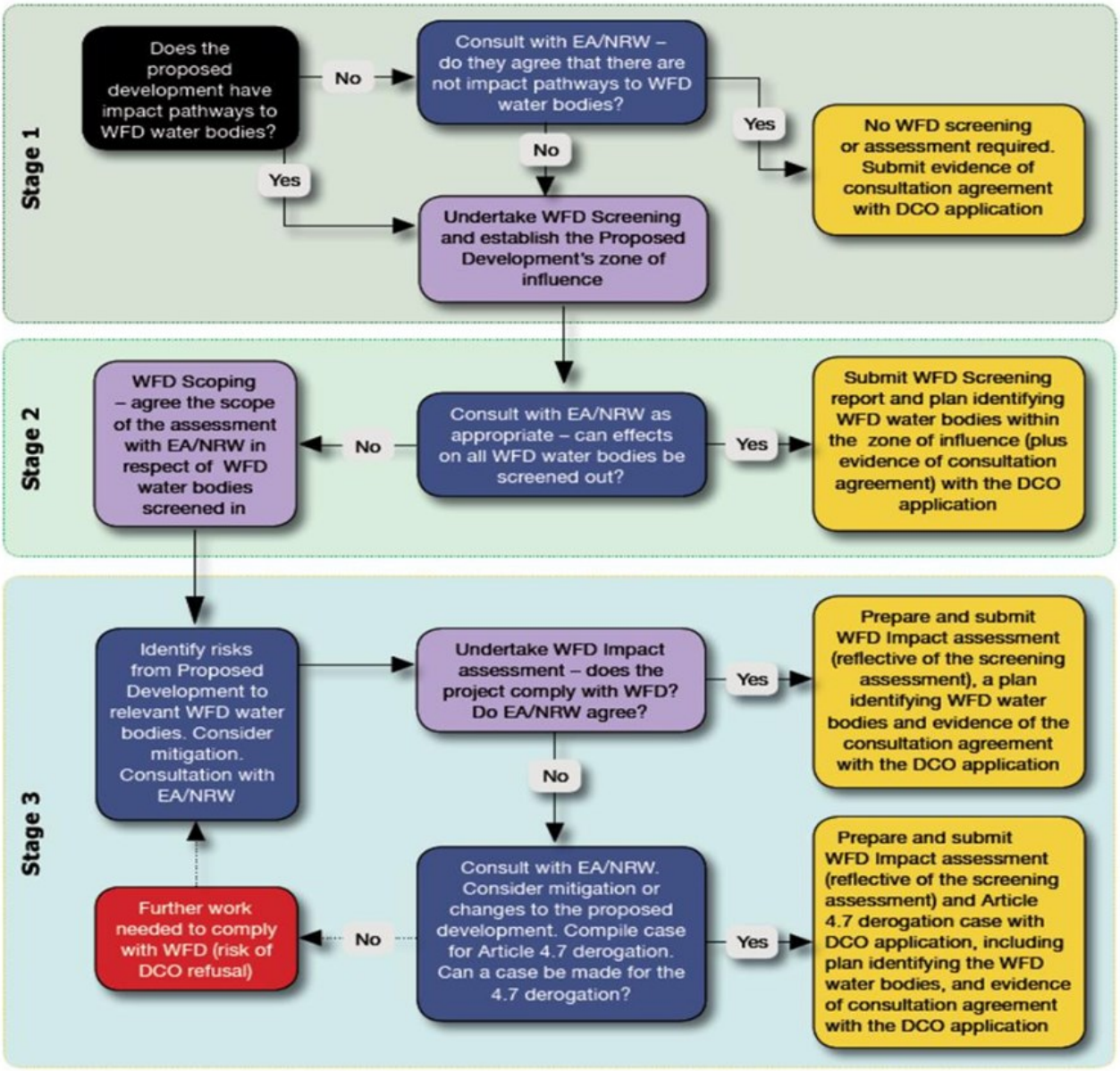

Diagram 1.2: Flow chart illustrating the WFD assessment process (Planning Inspectorate, 2017)

Screening assessment

1.3.5.5 The screening assessment was undertaken within the EIA Scoping Report (Annex B) which identified the WFD water bodies within the ZOI. Each onshore component of the Transmission Assets was reviewed in terms of potential impact to the water environment (i.e., on surface and groundwater bodies). The screening assessment concluded by summarising the potential impact to the water environment for each component of each WFD quality element within the ZOI illustrated in **Figure 1.1**, **Figure 1.2** and **Figure 1.3**.

1.3.5.6 The Environment Agency agreed with the WFD Screening assessment conclusions as communicated in their consultation response to the EIA Scoping Report (**Table 1.4**).

Scoping assessment

1.3.5.7 The WFD scoping (**section 1.5**) identifies links between the proposed activities and every WFD quality element that could be affected. It is also necessary at this stage to consider activities and how they affect the morphological mitigation measures for waterbodies, where applicable.

1.3.5.8 For all activities, the scoping phase involves considering each WFD quality element to identify all those where a possible causal link exists. That is, where water body status or environmental objectives could be affected at water body level by the proposed activities.

1.3.5.9 The scoping assessment has been applied for each activity type based on the maximum design scenario (MDS) outlined in **Table 1.11**. The potential impacts for each activity are provided in **Table 1.12** which has informed the selection of the activities which will be scoped into the assessment.

1.3.5.10 Note that the scoping assessment for transitional (Ribble Estuary) and coastal water bodies (Mersey Mouth) follows the EA Guidance, 'Clearing the Waters for All' (Environment Agency, 2017). The scoping template contained in this guidance has been used for these water bodies and is included in **Appendix B**.

1.3.5.11 **Table 1.13** provides a summary of the outcome of the scoping assessment and concludes that water quality (physico-chemical supporting conditions and chemical status) in these transitional and coastal water bodies require further detailed assessment.

1.3.5.12 **Table 1.14** outlines the potential impacts associated with the Transmission Assets and outcome of scoping assessment for the WFD assessment for groundwater bodies.

Detailed assessment

1.3.5.13 The detailed assessment (**section 1.6**) examines the potential impact on water bodies, suggesting mitigation measures and enhancements where appropriate. This also considers whether the scheme will contribute to the delivery of the relevant River Basin Management Plan, i.e., the North West River Basin Management Plan, 2022.

1.3.6 Water body classification

Surface water bodies

1.3.6.1 The WFD specifies the quality elements that are used to assess the ecological and chemical status of a surface waterbody. Quality elements are generally biological (e.g., fish, invertebrates, macrophytes) or chemical (e.g., heavy metals, pesticides, nutrients). Classifications indicate where the quality of the environment is good, where it may need improvement, and what may need to be improved. They can also be used, over the years, to plan improvements, show trends and to monitor the effectiveness of the programme of measures identified.

1.3.6.2 Chemical status is assessed from compliance with environmental quality standards for chemicals that are priority substances and/or priority hazardous substances for surface water and groundwater bodies. These are known as 'Annex X' substances listed in the 2017 WFD Regulations. The Environmental Quality Standard (EQS) Directive (2008/105/EC) lays down these standards in accordance with the provisions and objectives of the WFD. Chemical status is recorded as 'good' or 'fail'. The chemical status of groundwater also considers electrical conductivity. Chemical status for a water body is determined by the worst scoring chemical (one-out-all-out approach).

1.3.6.3 Ecological status classifications can be composed of up to four different assessments and apply to surface water bodies only.

1. An assessment of status indicated by a biological quality element such as fish, invertebrates, or algae. The presence of invasive species is also assessed as a separate test.
2. An assessment of compliance with environmental standards for supporting physio-chemical conditions, such as dissolved oxygen (DO), phosphorus, or ammonia.
3. An assessment of compliance with environmental standards for concentrations of specific pollutants, such as zinc, cypermethrin or arsenic (these are known as 'Annex VIII' substances).
4. In determining high status only, a series of tests is included to make sure that hydromorphology is largely undisturbed.

1.3.6.4 Ecological status is recorded as high, good, moderate, poor or bad. 'High' represents 'largely undisturbed conditions'. Other classes show increasing deviation from undisturbed or reference conditions. This deviation is expressed as an ecological quality ratio which ranges from zero for bad status to one for high status. As with chemical status, ecological status is determined by the worst scoring component (one-out-all-out approach).

1.3.6.5 Biological status is a sub-set of ecological status where the results of the biological quality elements are assessed (and so ignore physio-chemical and Annex VIII substances and hydromorphology). The one-out-all-out rule is also applied to give a biological status classification.

1.3.6.6 Invasive species designated as high impact are included in assessments of ecological status within England. All high status waters are screened for the presence of established high impact species, if present, the status class is downgraded to good. The EA will assess invasive non-native species (INNS) impacts at good status water bodies where high impact species are established until there is an improved understanding of the impacts of INNS on the ecology of the UK's waters and the way in which ecological status is measured (Environment Agency, 2022a).

1.3.6.7 Overall status is a composite measure that looks at ecological status, chemical status and quantitative status dependent on the water body type. So, in assessing overall status for surface waters, all four assessment types under ecological status (biology, physio-chemical, Annex VIII substances and hydromorphology) as well as incorporating the results of the chemical status

assessment (priority substances and priority hazardous substances) contribute to the classification of the water body status. The one-out-all-out rule is also applied in this situation, meaning a surface water body must have a good or better ecological status, good chemical status and good quantitative status, in the case of groundwater assessment, to be given a good overall status.

1.3.6.8 Artificial and heavily modified waterbodies (HMWB) are subject to an additional set of rules that need to be implemented prior to running the one-out-all-out calculation (Environment Agency, 2022a). These rules determine which biological elements should be used in the water body ecological potential classification. Under normal circumstances, artificial water bodies/HMWBs are classified according to an assessment of mitigation measures, defined as such:

- good ecological potential (GEP) - water bodies where all applicable mitigation is in place; and
- moderate ecological potential - water bodies where some or all relevant mitigation is missing.

1.3.6.9 However, to prevent artificial water bodies/HMWBs being incorrectly classified as good potential in situations where all mitigation is in place, but other pressures are causing an impact (e.g., nutrient enrichment or pollution from toxic substances), the methodology adopted in the UK additionally considers biological indicators providing they are not sensitive to the heavily modified nature of the water body. In situations where the physical modification has impacted on hydrology to such extent that flow conditions are failed, all biological indicators will be considered.

1.3.6.10 All surface water bodies will be classified as good ecological potential where all appropriate mitigation is in place, or moderate ecological potential in other cases, with a number of exceptions. This includes the following situation.

- In surface water bodies where the flow conditions are unaffected by the physical modification (flow conditions pass). In this situation, the water body potential will be determined by the worst of either the mitigation measures assessment, or any element that is not sensitive to the modified nature of the water body.

1.3.6.11 For rivers fish, invertebrates and macrophytes are considered to be sensitive to physical modification. Therefore, in the heavily modified water bodies traversed by the Transmission Assets, invertebrates, fish or macrophytes are not considered in the overall status classification. For example, for the Main Drain (Ribble) water body, the invertebrate condition is bad. However, as invertebrates are sensitive to physical modifications the overall ecological potential is classified as moderate, since:

- invertebrates are not considered in the overall classification (due to sensitivity); and
- mitigation measures are not in place.

Groundwater bodies

1.3.6.12 The achievement of good status in groundwater involves meeting a series of conditions which are defined in the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. To assess whether these conditions are being met, a series of tests have been designed for each of the quality elements defining good (chemical and quantitative) groundwater status.

1.3.6.13 There are five chemical and four quantitative tests (**Diagram 1.3**). Each test is applied independently, and the results combined to give an overall assessment of groundwater body chemical and quantitative status. The worst-case classification from the relevant chemical status tests is reported as the overall chemical status for the groundwater body and the worst-case classification of the quantitative tests reported as the overall quantitative status for the groundwater body. The worst result of these two is reported as the overall groundwater body status (Environment Agency, 2022b).

1.3.6.14 Chemical status is recorded as ‘good’ or ‘fail’. The chemical status of groundwater considers saline intrusion, concentrations of nitrate, pesticides and other chemicals in groundwater which put the groundwater body at risk, the impact of chemical pressures on surface waters and groundwater dependent terrestrial ecosystems (GWDTEs) and compliance with drinking water protected areas objectives defined in the WFD regulations. Chemical status for a water body is determined by the worst scoring chemical test(one-out-all-out approach).

1.3.6.15 Quantitative status measures the degree to which a body of groundwater is affected by direct and indirect abstractions (i.e., the available groundwater resource must not be exceeded by the long-term annual average rate of abstraction – water balance). Groundwater abstraction must also not cause failure of ‘good’ ecological status in water dependent surface waters and GWDTEs nor result in saline intrusion or other intrusion of poor water quality into the groundwater body.

1.3.6.16 In addition, groundwater quality monitoring data are analysed to determine whether there was a statistically and environmentally significant upward trend in pollutant concentrations in a groundwater body (Trend test). If such a trend was evident then, the groundwater body failed the test, and the Environment Agency would consider what measures are needed to reverse the trend.

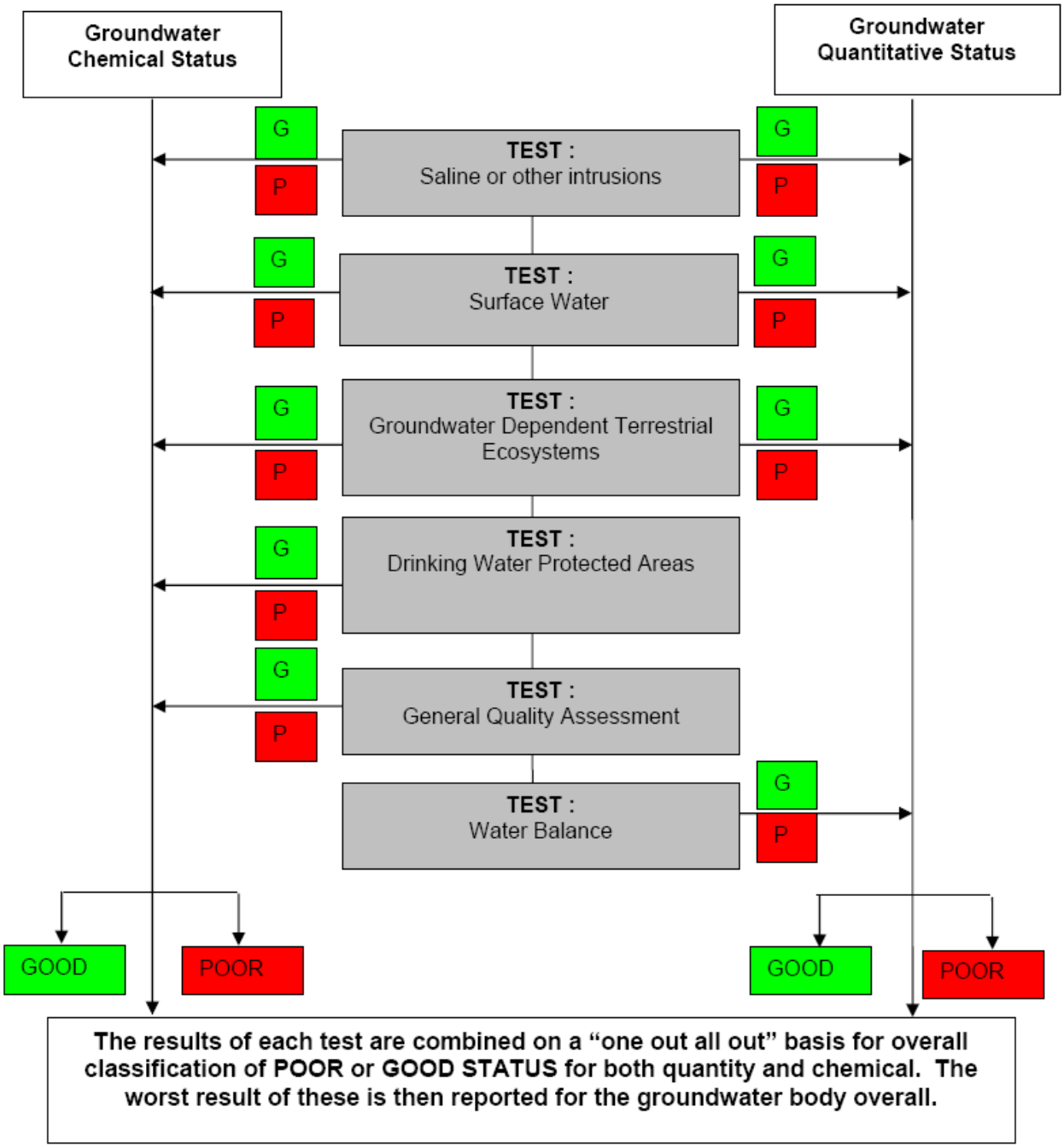

Diagram 1.3: Overview of the status assessment (classification) process (Environment Agency, 2022)

1.3.7 Water body objectives

1.3.7.1 The completion of a WFD assessment is a staged process where data on the study area and project proposals are assessed with respect to the requirements of the WFD to ascertain if the proposals have the potential to have a detrimental impact on the achievement of the environmental objectives for water bodies connected to the proposal. If the assessment concludes, after taking account of the mitigation proposed, that the proposal may either reduce the quality of any of the contributing elements of the status

of the water bodies or prevent the quality elements from achieving the standards required in the River Basin Management Plan, then this represents a failure to achieve the WFD objectives and the proposal should not go ahead unless justification for the new modification is demonstrated under Article 4.7 of the WFD. The four objectives of the WFD assessment are as follows.

Objective 1: To prevent deterioration of any contributing quality element to the status of the water body.

Objective 2: To prevent the introduction of impediment to the attainment of good WFD status for the water body.

Objective 3: To ensure the attainment of the WFD objectives for the water body are not compromised.

Objective 4: To ensure the achievement of WFD objectives in other water bodies within the same catchment are not permanently excluded or compromised.

1.4 Baseline environment – desk study

1.4.1 WFD water body status classification

1.4.1.1 Information on WFD status of the water bodies within the ZOI was collected through a detailed desktop review of existing studies and datasets. These are summarised in **Table 1.5**. The North West River Basin Management Plan states that the 2019 water body classification is the baseline from which deterioration is not permitted and therefore is the status used to assess the WFD compliance of the Transmission Assets.

Table 1.5: Summary of key desktop sources

Title	Source	Year published	Author
WFD Cycle 3 Rivers and water bodies boundary and GIS data	Catchment Data Explorer – North West River Basin District Geometry Files https://environment.data.gov.uk/catchment-planning/v/c3-plan/RiverBasinDistrict/12. Accessed: 23 September 2024.	2022	EA
C3 Classification	Catchment Data Explorer – North West River Basin District water body classification database https://environment.data.gov.uk/catchment-planning/v/c3-plan/RiverBasinDistrict/12. Accessed: 23 September 2024.	2022	EA
River Basis Management Plan Measures and Objectives	Catchment Data Explorer – North West River Basin District Programme of measures database https://environment.data.gov.uk/catchment-planning/v/c3-plan/RiverBasinDistrict/12. Accessed: 23 September 2024.	2022	EA

Title	Source	Year published	Author
Heavily Modified Uses and Mitigation Measures	Mitigation Measures Assessment for each individual surface water body on Catchment Data Explorer. https://environment.data.gov.uk/catchment-planning/v/c3-plan/WaterBody/GB112071065651/rnag?cycle=3&element=104. Accessed: 23 September 2024	2022	EA
Reasons for not achieving good Cycle 3	Reasons for not achieving good (RNAG) and reasons for deterioration (RFD) in North West River Basin District on Catchment Data Explorer. https://environment.data.gov.uk/catchment-planning/v/c3-plan/OperationalCatchment/3392. Accessed: 23 September 2024	2022	EA
North West River Basin Management Plan: update 2022	3rd Cycle River Basin Management Plan for the North West River Basin District (RBD) https://environment.data.gov.uk/catchment-planning/v/c3-plan/RiverBasinDistrict/12. Accessed: 23 September 2024.	2022	EA
North West river basin management plan updated 2022: protected area register	Register of protected areas in the North West river basin districts for information on: • drinking water protected areas; • shellfish waters; • bathing (recreational) waters; • European sites; and • nutrient sensitive areas. River Basin Management Plan Maps https://experience.arcgis.com/experience/73ed24b6d30441648f24f043e75ebed2/page/Protected-Areas/ Accessed: 27 September 2023. Catchment Data Explorer: https://environment.data.gov.uk/catchment-planning/v/c3-plan/RiverBasinDistrict/12/protected-areas. Accessed: 23 September 2024.	2022	EA
Bathing Water Profiles (2023) for: • Bispham; • Blackpool North; • Blackpool Central; • Blackpool South; • St Annes North; • St Annes; • Southport; • Ainsdale; and • Formby.	Bathing Water Profiles - Information on the status of bathing waters in England https://environment.data.gov.uk/bwq/profiles Accessed: 23 September 2024.	2023	EA

Title	Source	Year published	Author
Liverpool Bay SPA – Site Improvement Plan	The plan provides a high level overview of the matters (both current and predicted) affecting the condition of the features on the whole site (in both England and Wales),and outlines the priority measures required to improve the condition of the features. Natural England – Access to Evidence http://publications.naturalengland.org.uk/publication/5296526586806272 Accessed: 223 September 2024.	2015	Natural England
European Site Conservation Objectives for Liverpool Bay Special Protection Area Site Code: UK9020294	Natural England – Access to Evidence http://publications.naturalengland.org.uk/publication/5089733892898816 Accessed: 23 September 2024.	2019	Natural England
European Site Conservation Objectives for Ribble and Alt Estuaries Special Protection Area Site Code: UK9005103	Natural England – Access to Evidence https://publications.naturalengland.org.uk/publication/4868920422957056 Accessed: 23 September 2024.	2019	Natural England
Site Improvement Plan Sefton Ribble	The plan provides a high level overview of the matters (both current and predicted) affecting the condition of the Natura 2000 (now National Site Network) features on the site(s) and outlines the priority measures required to improve the condition of the features. https://publications.naturalengland.org.uk/publication/6274126599684096 Accessed: 23 September 2024.	2014	Natural England

1.4.1.2 The WFD Classification of the surface water and groundwater bodies within the study area is outlined in **Appendix A**. The contributing elements to ecological and chemical (for surface water) and quantitative and chemical (for groundwater) status are detailed and the driving element for the status classification highlighted. The following water bodies have been identified during the WFD screening assessment (Table 2.3 and Table 2.4 of Annex B, EIA Scoping Report):

- Liggard Brook;
- Main Drain (Ribble);
- Wrea Brook;
- Dow Brook;
- Deepdale Brook;
- Savick Brook;
- Lancaster Canal, cruising section;

- Ribble Estuary (also considered in Volume 2, Annex 2.2: WFD coastal waters assessment of the ES);
- Mersey Mouth (also considered in Volume 2, Annex 2.2: WFD coastal waters assessment of the ES);
- West Lancashire Quaternary Sand and Gravel Aquifers; and
- Fylde Permo-Triassic Sandstone Aquifers.

1.4.1.3 A summary of the key drivers for the status of each water body is outlined below for each water body. Surface water bodies are considered in **Table 1.6** and groundwater bodies are considered in **Table 1.7**. Water bodies have been split into river water bodies, artificial water bodies, transitional water bodies, coastal water bodies and groundwater bodies.

Table 1.6: Surface water bodies

Waterbody name	Waterbody reference ID	Ecological status	Chemical status	Overall status/potential
River water bodies				
Liggard Brook	GB112071065650	Biological quality elements – the key driver for the overall water body status is invertebrates with conditions indicative of bad ecological status. Macrophytes and phytobenthos are classified as high status. The key pressure identified by EA for the bad invertebrate status relates to continuous sewage discharges. Physico-chemical supporting elements –Temperature and pH are capable of supporting high ecological status. However DO levels are indicative of bad ecological conditions, and ammonia and phosphorus are only capable of supporting poor and moderate ecological status respectively. The reason for not achieving good status for these elements, as was the case for the invertebrates under the biological elements, relates to continuous sewage discharges from domestic sources. Hydromorphology – the hydrological regime in the Liggard Brook is considered to be capable of supporting good ecological potential. However, the morphology is less than good (moderate) as the necessary mitigation measures to address physical modifications from transport in this Heavily Modified Water Body (HMWB) have not been fully implemented.	Chemical status – priority hazardous substances are failing predominantly due to the mercury and its compounds and polybrominated diphenyl ethers which are ubiquitous, persistent, bioaccumulative (uPBT) substances. The recent changes to chemical status classifications have meant that biota is now also assessed and the impact of these uPBT substances is now included in the chemical status classification. There is little change in the underlying chemical status classification when these uPBT are removed and the chemical status can be viewed on the River Basin Management Plan Maps with and without uPBTs.	Moderate (HMWB)
Main Drain (Ribble)	GB112071065651	Biological quality elements – the key driver for the overall water body status is invertebrates with conditions indicative of bad ecological status. Macrophytes and phytobenthos are classified as good status. The key pressure identified by the EA for the bad invertebrate status relates to continuous sewage discharges. Physico-chemical supporting elements –temperature and pH are capable of supporting high ecological status. However DO levels are indicative of bad ecological conditions and ammonia and phosphorus are only capable of supporting moderate ecological status. The reason for not achieving good status for	Chemical status – priority hazardous substances are failing predominantly due to the mercury and its compounds and polybrominated diphenyl ethers which are uPBT substances.	Moderate (HMWB)

Waterbody name	Waterbody reference ID	Ecological status	Chemical status	Overall status/potential
		these elements, as was the case for the invertebrates under the biological elements, is continuous sewage discharges from domestic sources. Hydromorphology – the hydrological regime in the Main Drain (Ribble) is considered to be capable of supporting good ecological potential however the morphology is less than good (moderate) as the necessary mitigation measures to address physical modifications from flood protection and land drainage in this HMWB have not been fully implemented.		
Wrea Brook	GB112071065680	Biological quality elements – the biological quality elements are not monitored for this water body. Physico-chemical supporting elements –temperature and pH are capable of supporting high ecological status. However DO levels are indicative of bad ecological conditions and ammonia and phosphorus are only capable of supporting moderate ecological status. The reason for not achieving good status for these elements is not provided. Hydromorphology – the hydrological regime in the Wrea Brook is considered to be capable of supporting good ecological potential however the morphology is less than good (moderate) as the necessary mitigation measures to address physical modifications in this HMWB have not been fully implemented.	Chemical status – priority hazardous substances are failing predominantly due to the mercury and its compounds and polybrominated diphenyl ethers which are uPBT substances.	Moderate (HMWB)
Dow Brook	GB112071065670	Biological quality elements – the key driver for the overall water body status is invertebrates with conditions indicative of bad ecological status. Macrophytes and phytobenthos classified as good status. The key pressures confirmed by the EA for the bad invertebrate status relates to continuous sewage discharges, farm infrastructure and pollution incidents with private sewage discharges suspected. Physico-chemical supporting elements – temperature and pH are capable of supporting a high ecological status. However DO, ammonia and phosphorus are only capable of supporting poor ecological status. The reason for not achieving good status for these elements is confirmed as poor nutrient management	Chemical status – priority hazardous substances are failing predominantly due to the mercury and its compounds and polybrominated diphenyl ethers which are uPBT substances.	Moderate (HMWB)

Waterbody name	Waterbody reference ID	Ecological status	Chemical status	Overall status/potential
		practices resulting in diffuse pollution from agriculture. Continuous and intermittent sewage discharges are also resulting in the poor conditions for dissolved oxygen. Hydromorphology – the hydrological regime in the Dow Brook is considered to be capable of supporting high ecological potential. However, the morphology is less than good (moderate) as the necessary mitigation measures to address physical modifications in this HMWB due to urban pressures and flood protection measures have not been fully implemented.		
Deepdale Brook	GB112071065460	Biological quality elements – monitoring of the biological quality elements for this water body including invertebrates and macrophytes/phytobenthos are indicative of moderate and good ecological status respectively. The reason for not achieving good status for the invertebrates is suspected to be due to ammonia pressures resulting from private sewage (septic tanks). Physico-chemical supporting elements – all parameters sampled in this water body with the exception of phosphorus and ammonia (i.e., acid neutralising capacity, temperature, pH, DO) are capable of supporting high ecological status. Phosphorus is currently only capable of supporting poor ecological status but given the biological elements are at least moderate, the overall status for the water body is also moderate, i.e., the phosphate conditions are not resulting in poor biological conditions. The main reason for not achieving good status in the supporting physico-chemical elements is diffuse run-off from agricultural sources. Specific pollutants – specific pollutants are monitored in this water body and are indicative of conditions capable of supporting high ecological status. Hydromorphology – the hydrological regime in the Deepdale Brook is capable of supporting good ecological status as is the morphology. However, in cycle three it is suspected that physical modifications due to land use practices (improved	Chemical status – Priority hazardous substances are failing predominantly due to benzo(b)fluoranthene, mercury and its compounds and polybrominated diphenyl ethers which are uPBT substances.	Moderate

Waterbody name	Waterbody reference ID	Ecological status	Chemical status	Overall status/potential
		grassland) for agricultural purposes are resulting on an impact to the invertebrate community.		
Savick Brook	GB112071065470	Biological quality elements – monitoring of the biological quality elements for this water body includes fish, invertebrates and macrophytes/phytobenthos. Invertebrates and fish are both indicative of moderate ecological conditions and are driving the ecological status of this water body. The key pressure for fish is due to inland navigation and structures which are impacting on fish whilst the invertebrates are impacted by diffuse run-off from agriculture, intermittent sewage discharges (combined sewer overflows) and misconnections to the storm water network. Physico-chemical supporting elements – phosphate supporting conditions in this water body are indicative of poor ecological status with the remaining parameters, ammonia, DO, temperature and pH all capable of supporting high ecological status. The key pressure for phosphate conditions is due to diffuse run-off from agriculture, intermittent sewage discharges (combined sewer overflows) and misconnections to the storm water network. Hydromorphology – Savick Brook is a HMWB and requires mitigation measures to ensure that the water body can achieve good ecological potential. The mitigation measures identified are not yet fully in place so the mitigation measures assessment is moderate.	Chemical status – priority hazardous substances are failing predominantly due to the mercury and its compounds and polybrominated diphenyl ethers which are uPBT substances.	Moderate (HMWB)
Artificial water bodies				
Lancaster canal, cruising section	GB71210228	Physico-chemical supporting elements – the physico-chemical supporting elements monitored in this water body, ammonia, temperature and pH, are consistent with high ecological status. Hydromorphology – this water body requires mitigation measures to ensure that the water body can achieve good ecological potential. The mitigation measures are not yet fully in place therefore, the mitigation measures assessment and ecological potential are both moderate.	Chemical status – priority hazardous substances are failing predominantly due to the mercury and its compounds and polybrominated diphenyl ethers which are uPBT substances.	Moderate (HMWB)

Waterbody name	Waterbody reference ID	Ecological status	Chemical status	Overall status/potential
Transitional water bodies				
Ribble Estuary	GB531207112400	Biological quality elements – monitoring of the biological quality elements for this water body includes seagrass (angiosperms), fish, macroalgae, invertebrates and phytoplankton. Phytoplankton is driving the biological classification of his water body which is currently at bad ecological status. Fish status is moderate and all other biological elements are good. The key pressure resulting in the phytoplankton conditions is continuous discharges from sewage treatment works. Physico-chemical supporting elements – The dissolved inorganic nitrogen levels in this water body are consistent with moderate ecological status and are at less than good status due to the continuous discharge pressures from sewage treatment works. Hydromorphology – the Ribble Estuary is a HMWB and mitigation measures required to ensure the water body can achieve good ecological potential have not been fully implemented. Therefore, this water body cannot achieve good ecological potential until such times as these measures are in place.	Chemical status – Priority hazardous substances are failing predominantly due to benzo(b)fluoranthene, mercury and its compounds and polybrominated diphenyl ethers which are uPBT substances.	Bad (HMWB)
Coastal water bodies				
Mersey Mouth	GB641211630001	Biological quality elements – monitoring of the biological quality elements for this water body includes invertebrates and phytoplankton which are indicative of good and moderate ecological status respectively. Phytoplankton is driving the biological classification of his water body which is currently at moderate ecological status. The key pressure resulting in the phytoplankton conditions is currently unknown and is pending investigations. Physico-chemical supporting elements – the dissolved inorganic nitrogen levels in this water body are consistent with moderate ecological status and the pressure resulting in this less than good classification are currently unknown and pending	Chemical status – Priority hazardous substances are failing predominantly due to benzo(g-h-i)perylene, mercury and its compounds and polybrominated diphenyl ethers which are uPBT substances.	Moderate (HMWB)

Waterbody name	Waterbody reference ID	Ecological status	Chemical status	Overall status/potential
		investigation. DO levels are currently capable of supporting high ecological status. Specific pollutants – specific pollutants are monitored in this water body and are indicative of conditions capable of supporting high ecological status. Hydromorphology –Mersey Mouth is a HMWB due to coastal protection measures. The mitigation measures required have not yet been fully implemented. Therefore, this water body cannot achieve good ecological potential until such times as these measures are in place.		

Table 1.7: Groundwater bodies

Waterbody name	Reference ID	Quantitative status	Chemical status	Overall status
West Lancashire Quaternary Sand and Gravel Aquifers	GB41202G912700	All groundwater tests indicate that the water body is at good quantitative status. Groundwater dependent terrestrial ecosystems and dependent surface waters are satisfactory and there are no issues with saline intrusion or water balance issues due to abstraction pressures.	All groundwater tests indicate that the water body is at good chemical status. Groundwater is not negatively impacting on drinking water protected areas, surface water dependency or groundwater dependent terrestrial ecosystems. The general chemical standards are all being achieved and there are no issues with saline intrusion impacting on the groundwater chemistry or negative trends in groundwater monitoring.	Good
Fylde Permo-Triassic Sandstone Aquifers	GB41201G100500	Groundwater tests indicate that the water body is not achieving its objective for water balance which is suggesting there is over abstraction in this water body. As outlined in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES, the reasons for not achieving good status are not defined on the EA catchment data explorer but are assumed to relate to abstraction from the sandstone principal bedrock aquifer in this area. All other	Groundwater tests for chemical status have been classified as good status. Groundwater is not negatively impacting on drinking water protected areas, surface water dependency or groundwater dependent terrestrial ecosystems. The general chemical standards are all being achieved and there are no issues with saline intrusion impacting on the	Poor

Waterbody name	Reference ID	Quantitative status	Chemical status	Overall status
		quantitative groundwater tests are passing i.e., groundwater dependent terrestrial ecosystems and dependent surface waters are satisfactory and there are no issues with saline intrusion.	groundwater chemistry or negative trends in groundwater monitoring.	

1.4.2 River basin management plan objectives

1.4.2.1 As required under the WFD Regulations, the EA and other relevant public bodies aim to implement measures to achieve good overall status/potential for surface and groundwaters by 2027. Alternatives to that objective are allowable which may result in two additional options.

- An objective of less than good by 2027 (less stringent objective) due to technical infeasibility (no known technical solution is available) or disproportionate cost (unfavourable balance of costs and benefits).
- An extended deadline of good status/potential beyond 2027 for reasons of natural conditions (ecological recovery) or technical infeasibility for a small number of chemicals.

1.4.2.2 The environmental objectives for the water bodies within the ZOI are outlined in **Table 1.8**.

Table 1.8: Water body objectives from North West River Basin Management Plan (updated 2022)

Water body name	Type	Water body status	Objective	Derogation type	Reason
Liggard Brook GB112071065650	River water body	Ecological - Moderate	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical – Fail	Good 2063	Extended Deadline	Natural conditions: Chemical status recovery time
Main Drain (Ribble) GB112071065651	River water body	Ecological - Moderate	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical – Fail	Good 2063	Extended Deadline	Natural conditions: Chemical status recovery time.
Wrea Brook GB112071065680	River water body	Ecological - Moderate	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical – Fail	Good 2063	Extended Deadline	Natural conditions: Chemical status recovery time.
Dow Brook GB112071065670	River water body	Ecological - Moderate	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical – Fail	Good 2063	Extended Deadline	Natural conditions: Chemical status recovery time.

Water body name	Type	Water body status	Objective	Derogation type	Reason
Deepdale Brook GB112071065460	River water body	Ecological - Moderate	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical – Fail	Good 2063	Extended Deadline	Natural conditions: Chemical status recovery time. Technically infeasible: No known technical solution is available.
Savick Brook GB112071065470	River water body	Ecological - Moderate	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical – Fail	Good 2063	Extended Deadline	Natural conditions: Chemical status recovery time.
Lancaster Canal, cruising section GB71210228	Artificial Water Body	Ecological - Moderate	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical – Fail	Good 2063	Extended Deadline	Natural conditions: Chemical status recovery time.
Ribble Estuary GB531207112400	Transitional water body	Ecological - Bad	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical – Fail	Good 2063	Extended Deadline	Natural conditions: Chemical status recovery time. Technically infeasible: No known technical solution is available.
Mersey Mouth GB641211630001	Coastal water body	Ecological - Moderate	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical – Fail	Good 2063	Extended Deadline	Natural conditions: Chemical status recovery time. Technically infeasible: No known technical solution is available.
West Lancashire Quaternary Sand	Groundwater body	Quantitative - Good	Achieving Objectives	n/a	n/a

Water body name	Type	Water body status	Objective	Derogation type	Reason
and Gravel Aquifers GB41202G912700		Chemical - Good	Achieving Objectives	n/a	n/a
Fylde Permo-Triassic Sandstone Aquifers GB41201G100500	Groundwater body	Quantitative - Poor	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.
		Chemical - Good	Achieving Objectives	n/a	n/a

1.4.2.3 As can be seen from **Table 1.8**, all water bodies within the ZOI, with the exception of West Lancashire Quaternary Sand and Gravel Aquifers, are predicted to achieve good ecological status/potential for the surface waters or good quantitative status in the case of Fylde Permo-Triassic Sandstone Aquifers by 2027. There is therefore an extended deadline for the achievement of the environmental objectives in these water bodies beyond the original date required in the WFD, i.e., 2015. The reason for this has been due to the disproportionate cost associated with the implementation of measures required to achieve good status/potential or quantitative status in groundwater.

1.4.2.4 The West Lancashire Quaternary Sand and Gravel Aquifers is the only water body currently achieving its environmental objective.

1.4.2.5 The purpose of this WFD Assessment is to demonstrate that the Transmission Assets do not increase the risk of deterioration in any of the contributing elements to overall status in these water bodies.

1.4.2.6 The chemical status for all surface water bodies has an environmental objective of achieving good chemical status by 2063. In all cases these water bodies are failing chemical status due to uPBTs including benzo(b)fluoranthene, benzo(g-h-i)perylene, mercury and its compounds and polybrominated diphenyl ethers (PBDEs). The extended deadline of 2063 for the achievement of good chemical status has been set as whilst these uPBTs have been phased out of use, they persist in the environment and it is likely that there will not be widespread compliance with the relevant EQS in the next river basin management planning periods. All surface water bodies are failing for mercury and its compounds, and it is estimated that the recovery time to return to natural conditions will take until 2040. However, the recovery time for PBDE is longer and the extended deadline has been set at 2063 to allow natural recovery in this instance. For the Ribble Estuary, Mersey Mouth and Deepdale Brook water bodies there are also failures in benzo(b)fluoranthene and benzo(g-h-i)perylene. The reason for the extended deadline is that there is no known technical solution available and therefore additional time is required to achieve good chemical status, with an objective of good chemical status by 2063.

1.4.3 Heavily modified water bodies

1.4.3.1 Under Article 4(3) of the WFD, the EA can designate surface water bodies as HMWB. A HMWB means a body of surface water which, as a result of physical alterations by human activity, is substantially changed in character, as designated in accordance with the provisions of Annex II of the WFD. If the specified use of such a water body (e.g., flood defence, water abstraction, land drainage) or the 'wider environment' would be significantly affected by the restoration measures required to achieve good ecological status, and if no other better, technically feasible measure were provided, then the environmental objective would be 'good ecological potential'. This is in recognition of the fact that the water body will not achieve the ecological status of an unmodified natural water body without compromising the specified use for that water body. Those surface water bodies that have been classified as heavily modified are indicated in **Appendix A**.

1.4.3.2 As can be seen from **Appendix A**, all water bodies within the ZOI, with the exception of Deepdale Brook, have been identified as HMWBs. The objective for these water bodies is therefore based on the 'ecological potential' rather than ecological status. Ecological potential in artificial and HMWBs is determined by an assessment of whether measures are properly in place to mitigate the impacts of any modification on the ecology of the water body. In WFD classification, this is referred to as the mitigation measures assessment. If all mitigation measures are in place, and if the other elements of ecological status that are not sensitive to hydromorphological pressures are achieving conditions consistent with good ecological status, then the water body would be classified as being at good potential. If one or more identified mitigation measures are not implemented the water body would be classified at moderate potential. In both cases, if appropriate biological or chemical classifications are assessed to be at less than good then the potential of the water body is classified by the worst scoring element according to the usual one-out- all-out procedure. Note that there is no information available on the Catchment Data Explorer for the mitigation measures assessment for the Wrea Brook river water body.

1.4.3.3 **Table 1.9** summarises the morphological mitigation measures assessment. It is a requirement of the WFD assessment to determine whether the project will compromise the achievement of the WFD objectives by inhibiting the effectiveness of these measures and preventing the achievement of the objectives in the relevant HMWBs. Note that there is no information available on the Catchment Data Explorer for the mitigation measures assessment for the Wrea Brook river water body.

Table 1.9: HMWBs in the ZOI, specified use and mitigation measures to achieve good ecological potential

Water body name	Type	HMWB specified use	Mitigation Measure status	Mitigation measures assessment
Liggard Brook GB112071065650	River water body	Flood Protection Urbanisation	Not implemented	Moderate
Main Drain (Ribble) GB112071065651	River water body	Flood Protection Land Drainage	Not implemented	Moderate
Wrea Brook GB112071065680	River water body	No Information	No information	No information
Dow Brook GB112071065670	River water body	Flood Protection Urbanisation	Not implemented	Moderate
Savick Brook GB112071065470	River water body	Flood Protection Urbanisation Navigation including ports	Not implemented	Moderate
Ribble Estuary GB531207112400	Transitional water body	Flood Protection	Not implemented	Moderate
Mersey Mouth GB641211630001	Coastal water body	Coastal Protection	Not implemented	Moderate

1.4.3.4 The North West River Basin Management Plan recognises that without a programme of measures to address significant water management matters (due to unmitigated physical modifications) deterioration in the ecological condition of some rivers is likely unless further action is taken to mitigate the impacts of and control the development of modifications. The importance of measures to address physical modifications and morphological pressures is therefore critical. Whilst there is significant uncertainty about future trends for physical modifications, recent assessments indicate the effects of climate change and population growth will result in greater demands from flood protection, land drainage and the spread of urban areas. The purpose of this WFD assessment is to demonstrate that the Transmission Assets will not introduce further significant hydromorphological pressures that could compromise the attainment of the environmental objectives of the connected water bodies.

1.4.4 Register of protected areas

1.4.4.1 A number of waters coinciding within the ZOI are protected under other existing EU legislation which applied directly or indirectly to the UK before December 2020 and have been retained in UK law as a form of domestic legislation known as ‘retained EU legislation’. These water dependent protected areas require special protection due to their sensitivity to pollution or their particular economic, social or environmental importance. All of the

areas requiring special protection have been identified by the EA, and the areas mapped and listed in a register of protected areas (required under Regulation 10 of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017). The register of protected areas includes:

- drinking water protected areas;
- recreational waters (bathing waters);
- economically significant waters (shellfish waters);
- nutrient sensitive areas;
- Special Areas of Conservation (SACs) and
- Special Protection Areas (SPAs).

1.4.4.2 These areas have legally binding objectives in place that protect those uses from potentially harmful activities and new developments.

1.4.4.3 **Table 1.10** shows a number of protected areas associated with the water bodies coinciding with the ZOI.

Table 1.10: Protected areas connected to the water bodies within the ZOI

Water body name and ID	Protected area type					
	Drinking waters	Recreational waters (bathing waters)	Economically significant waters (shellfish waters)	Nutrient sensitive areas	SACs	SPAs
Liggard Brook GB112071065650.	×	×	×	×	×	×
Main Drain (Ribble) GB112071065651..	×	×	×	×	×	×
Wrea Brook GB112071065680	×	×	×	×	×	×
Dow Brook GB112071065670.	×	×	×	×	×	×
Deepdale Brook GB112071065460.	×	×	×	×	×	×
Savick Brook GB112071065470.	×	×	×	×	×	×
Ribble Estuary GB531207112400.	×	×	Ribble	×	Sefton Coast	Ribble and Alt Estuaries

Water body name and ID	Protected area type					
	Drinking waters	Recreational waters (bathing waters)	Economically significant waters (shellfish waters)	Nutrient sensitive areas	SACs	SPAs
Mersey Mouth GB641211630001.	x	Bispham Blackpool North Blackpool Central Blackpool South St Annes North St Annes Southport Ainsdale Formby	Ribble	x	Sefton Coast	Ribble and Alt Estuaries Liverpool Bay
West Lancashire Quaternary Sand and Gravel Aquifers GB41202G912700.	West Lancashire Quaternary Sand and Gravel Aquifers	x	x	x	x	x
Fylde Permo-Triassic Sandstone Aquifers GB41201G100500.	Fylde Permo-Triassic Sandstone Aquifers	x	x	x	x	x

[a] An x indicates that the water body does not contain this protected area type.

Drinking water protected areas

1.4.4.4 There are two Drinking Water Protected Areas associated with the groundwater bodies within the Transmission Assets Order Limits. The West Lancashire Quaternary Sand and Gravel Aquifers Drinking Water Protected Area and Fylde Permo-Triassic Sandstone Aquifers Drinking Water Protected Area are considered to be not at risk of failing to achieve their protected area objectives, i.e., achieving the drinking water standards, which is reflected in the status assessment for the groundwater bodies which includes an assessment of the groundwater chemistry to ensure compliance (**Table 1.7**). There is a surface water Drinking Water Protected Area in the Ribble River catchment (Ribble - conf Calder to tidal) but it is upstream of the ZOI and therefore is not screened in to this WFD Assessment.

Economically significant waters (shellfish waters)

1.4.4.5 The Ribble Shellfish Designated water is located within the Mersey Mouth coastal water body and the Ribble Estuary transitional water body. This protected area will not be directly affected by the Transmission Assets, but it is located within one spring tidal excursion and therefore is within the ZOI of the Transmission Assets.

Recreational waters (bathing waters)

1.4.4.6 There are a number of bathing waters associated with the Mersey Mouth coastal water body. As identified in the scoping tables for the Mersey Mouth in **Appendix B**, the Blackpool bathing waters are to the north of the Transmission Assets Order limits, the St Annes bathing water is to the south and the St. Annes North bathing water is within the Transmission Assets Order Limits. These bathing waters lie within one spring tidal excursion. These protected areas are located within the seabed and coastal areas that may be influenced by changes to physical processes due to the Transmission Assets, (defined in Volume 2, Chapter 1: Physical processes of the ES as within one spring tidal excursion of the Transmission Assets Order Limits) and therefore is within the ZOI of the Project. As identified in **section 1.3.3.3**, a spring tidal excursion is the distance suspended sediment is transported prior to being carried back on the returning tide. Therefore, these protected areas, which will not be directly impacted by the onshore Transmission Assets, are within the spring tidal excursion and have therefore the potential to be indirectly impacted by the landfall works.

Nutrient sensitive areas

1.4.4.7 A nutrient sensitive area in the context of urban wastewater treatment is a water body identified as being affected by eutrophication or having a surface water abstraction affected by elevated nitrate concentrations from wastewater treatment works. There are no such water bodies within the ZOI. The closest nutrient sensitive area is upstream of the ZOI where the River Ribble and River Darwen are designated.

1.4.4.8 Nitrate Vulnerable Zones (NVZs) are areas designated as being at risk from agricultural nitrate pollution. There are no such water bodies with the ZOI, the closest NVZ area is adjacent to the ZOI, namely the Black Sluice and Three Pools Waterway NVZ but it is upstream and will not be impacted by the Transmission Assets.

European sites (SACs/SPAs)

1.4.4.9 The provisions of the 2017 WFD Regulations only relate to water dependent habitats and species. The objective is to protect and, where necessary, improve the water environment to work towards achieving the conservation objectives for the water dependent features of these sites. European sites (SACs/SPAs) are presented on **Figure 1.3**.

1.4.4.10 SACs associated with the water bodies that have the potential to be affected by the Transmission Assets include the Sefton Coast SAC which intersects both the Ribble Estuary and the Mersey Mouth water bodies. This SAC will not be directly affected by the Transmission Assets, however, there are potential indirect impacts from run-off from the onshore corridors to the Ribble Estuary and the landfall at the Mersey Mouth which have hydrological connectivity with this site. It has therefore been included in this assessment.

1.4.4.11 The Ribble and Alt Estuaries SPA intersects the ZOI and is within both the Mersey Mouth and Ribble Estuary water bodies. The coastal habitats of this

site support many nesting and migrating birds. The site is designated for an internationally important waterbird and seabird assemblage as detailed in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. A review of the SPA conservation objectives and citation for this site have established that the qualifying features are water dependent. The key pressures and threats to the qualifying features of the SPA relate to public access/disturbance, commercial fishing and INNS. The Ribble and Alt Estuaries SPA has been included in this assessment to demonstrate that construction, operation, maintenance and decommissioning activities of the Transmission Assets do not prevent the restoration of favourable conservation status and particularly the spread of INNS.

1.4.4.12 Liverpool Bay SPA includes all of the Mersey Mouth coastal water body. It is classified for the protection of gull, tern, diver and cormorant species in breeding season and an internationally important waterbird assemblage as detailed in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. The site improvement plan for this SPA notes that water pollution from shipping and industry, particularly oil spills, represents a potential threat to the conservation status of the waterbird assemblage. Water quality impacts from the Transmission Assets within the ZOI, therefore, need to be considered in the WFD Assessment.

INNS

1.4.4.13 Some non-native animals and plants are invasive and can have significant social, economic and environmental impacts. Where they lead to greater erosion some plants, such as Himalayan balsam *Impatiens glandulifera*, can increase flood risk. Others like American signal crayfish *Pacifastacus leniusculus* can decrease river bank stability and most have negative impacts on ecology and leisure activities such as angling and water sports. There are also significant costs in controlling and safely disposing of invasive species such as Japanese knotweed *Reynoutria japonica* on development sites and managing species such as zebra mussel *Dreissena polymorpha*, which can block pipes, water intakes and other structures.

1.4.4.14 Phase 1 habitat survey (Volume 3, Annex 3.2: Phase 1 habitat survey technical report of the ES) has established that certain high impact INNS, including Himalayan Balsam and Giant Hogweed *Heracleum mantegazzianum*, which are included in assessments of ecological status of water bodies are present in survey sections 6, 7 and 8 which correspond to Dow Brook river water body and the Ribble Estuary.

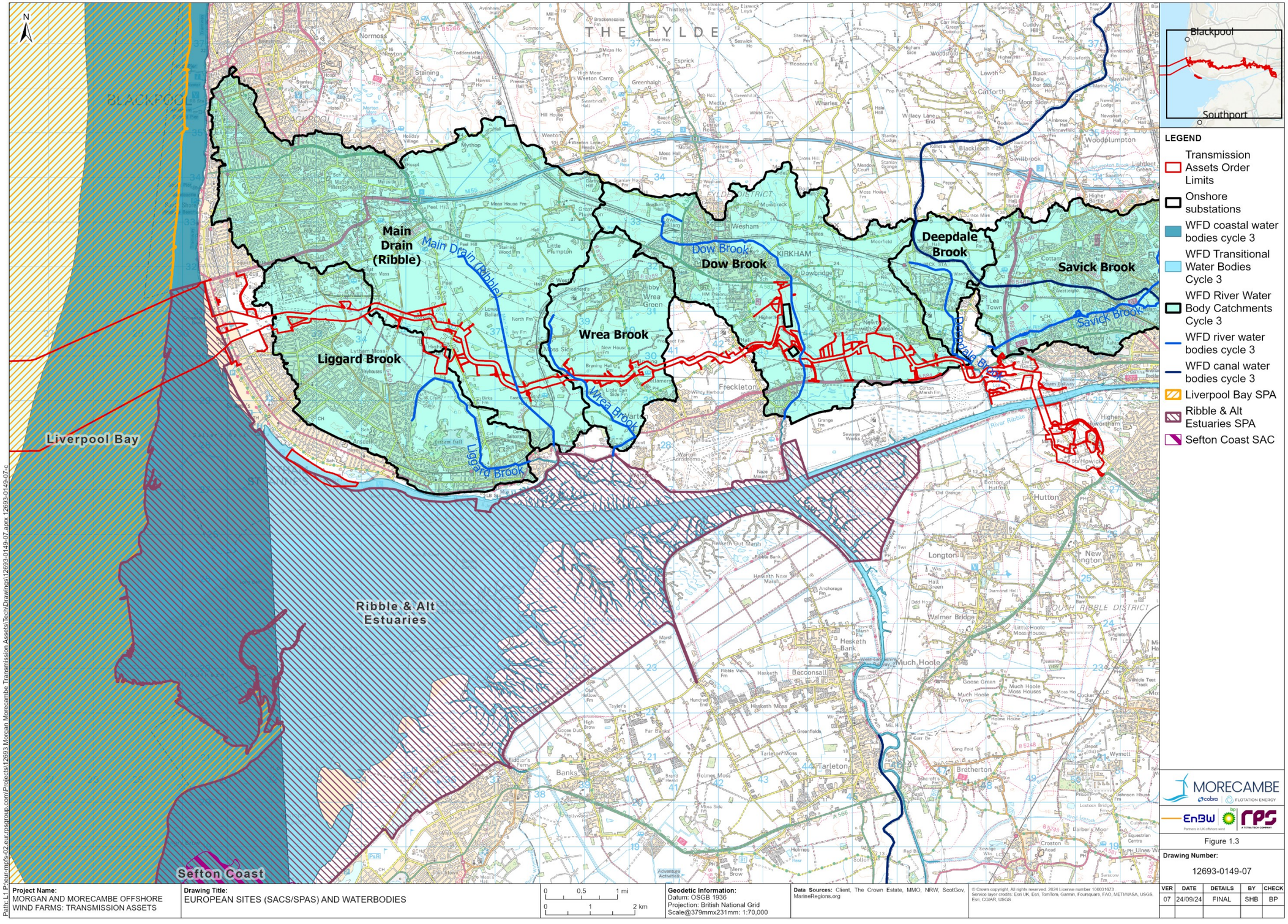

Figure 1.3 European sites (SACs/SPAs) and waterbodies

1.5 Scoping assessment

1.5.1 Maximum Design Scenario

1.5.1.1 It is necessary to identify links between the proposed activity and every quality element that could be affected. It is also necessary at this stage to consider activities and how they affect the morphological mitigation measures for those waterbodies, where applicable.

1.5.1.2 For all activities, the scoping phase involves considering each WFD quality element to identify all those where a possible causal link exists. That is, where water body status or objectives could be affected at water body level by the proposed activities.

1.5.1.3 The scoping assessment has been applied for each activity type based on the maximum design scenario (MDS) outlined in **Table 1.11**. The potential impacts for each activity is provided below which has informed the selection of the activities which will be scoped into the assessment.

1.5.1.4 The maximum design scenarios identified in **Table 1.11** have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the Project Design Envelope provided in Volume 1, Chapter 3: Project description of the ES. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Project Design Envelope (e.g., different infrastructure layout), to that assessed here be taken forward in the final design.

1.5.1.5 The outcome of this initial assessment for onshore surface water bodies is summarised in **Table 1.12** and all elements of ecological and chemical status have been scoped in for assessment across the different potential impacts identified in the MDS. The scoping assessment for transitional (Ribble Estuary) and coastal water bodies (Mersey Mouth) follows the Environment Agency Guidance, 'Clearing our Waters' (EA, 2017). The scoping template contained in this guidance has been used for these water bodies and is included in **Appendix B**.

1.5.1.6 **Table 1.13** provides a summary of the outcome of the scoping assessment and concludes that water quality (physicochemical supporting conditions and chemical status) in these transitional and coastal water bodies required further detailed assessment.

1.5.1.7 **Table 1.14** summarised the elements of the groundwater status that have been scoped in for detailed assessment.

Table 1.11: Maximum design scenario considered for the assessment of potential impacts for WFD Assessment

Potential impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
The impact of habitat disturbance and its impact on the supporting hydromorphological conditions of water bodies during construction, operations and maintenance and decommissioning of the Transmission Assets.	✓	✓	✓	**Construction phase: landfall** The offshore export cables between the transition joint bay working area within Blackpool Airport and the beach will be installed using the direct pipe trenchless technique for a maximum length of 1,500 m. It is anticipated the direct pipe exit will be 100 m from the boundary of Lytham St Annes Dunes SSSI. • Entry pits for the direct pipe will be situated within the transition joint bay area within Blackpool Airport: The maximum number of entry pits will be six, with a maximum direct drill entry pit area of 450 m^2 per circuit with a depth of 6 m. The total duration of entry pit works which is included within the overall transition joint bay construction works is 29 months assuming a sequential construction scenario. • Exit pits on the beach: The maximum number of exit pits will be six, with a maximum area of drill exit pit of 875 m^2 per circuit, with a depth of 3 m. The maximum cofferdam area dimensions per pit is 75 m^2 (15 m x 5 m). The total duration of exit pit works on the beach is 2 weeks per circuit. • For the offshore export cable installation between exit pits and MLWS, the burial at the of the offshore export cables seaward of the direct pipe exit pits will via open trenching. The maximum number of trenches will be six. The maximum width of the stepped trench is 10 m at the top and 3 m at the bottom and are each 3 m deep. The maximum length per trench is 300 m with a maximum working area each side of the trench of 25 m. • The open trench will transition to a beach trencher, this will be 3 m wide and up to 1,250 m long, the trench will be contained within a working corridor with a 50 m width. • Cable pull in and burial will take up to six weeks per circuit and the maximum total duration of cable pull in and burial is 36 weeks of active construction assuming a sequential construction scenario. • There will be up to four compounds required west of the transition joint bays to MLWS: – Compound 1 (welfare): 300 m^2 to be active for 36 weeks; – Compound 2: 2,500 m^2 to be active for 48 weeks; – Compound 3: 510 m^2 to be active for 48 weeks; and – Compound 4: 600 m^2 to be active for 66 months (in a sequential construction scenario). • There will be two transition joint bay compounds (15,000 m^2 for Morgan and 11,500 m^2 for Morecambe) within Blackpool Airport to facilitate construction works, to be active for up to 29 months over a 45 month period. – Maximum working area of the transition joint bay: 4,900 m^2 for Morgan and 2,800 m^2 for Morecambe **Construction phase: onshore export cables** • The maximum number of trenches will be six, with a target trench depth of 1.8 m. • Onshore export cable construction corridors width 100 m, with a length of up to 17 km. Width will include two haul roads. There will be up to 110 joint bays and 110 link boxes, with 1,000 m^3 and 8 m^3 of material excavated for each joint bay and link box respectively. • There will be up to ten construction compounds along the onshore export cable corridor. During a sequential construction compounds will be present for 66 months (in a sequential construction scenario)with the following attributes: – 2 type A compounds, a maximum total area of 26,500 m^2; – 6 type B compounds a maximum total area of 79,500 m^2; and – 2 type C compounds a maximum total area of 17,500 m^2. • The maximum number of HDD locations is 120. Each major HDD location will have a compound, measuring up to 100 m x 50 m. Drilling mud will be stored and used at these compounds. **Construction phase: onshore substations** • Permanent footprint of Morgan onshore substation is 164,000 m^2, 80,000 m^2 will comprise the permanent substation footprint. There will be a 20 m wide access road, 15 m of which will be permanent. • Permanent footprint for Morecambe onshore substation is 59,500 m^2, and 29,700 m^2 will comprise the permanent substation. There will be a 20 m wide access road, 15 m of which will be permanent.	The highest risk of impact from the Onshore export cable corridor on the water environment will occur at river crossings. Typical methods of crossing watercourses fall into two categories, open-cut trenching and trenchless methods. The degree of risk is considered higher for open cut because it involves direct disturbance of the watercourse and requires closer proximity of plant machinery to the watercourse. However, trenchless crossings, if fluming of the channel is also required for plant access, can also generate sediment through the placement of the flume in the channel albeit a much lower impact, or if there is a bentonite break out during drilling operations. HDD could result in the escape to the water bodies of pressurised drilling fluids (bentonite/mud) through break out of drilling fluids from the underlying bed material or from surface run-off caused by drilling fluid returns at tunnel entry and exit points. However, this occurs very infrequently as the drilling process is closely monitored and managed and will be largely contained within the entry and exit pits. These drilling fluids may be considered a type of fine sediment with similar general potential impacts to the general construction however the source and magnitude of impact is different given the fine particle size and the potential to infiltrate river substrate and sensitive habitats and thus, in the absence of mitigation, could directly and indirectly have a negative impact on all biological quality elements. Direct pipe trenchless installations at locations such as the landfall and the Ribble Estuary crossing is a fully cased system which reduces risks associated with frack out of drilling fluids or the collapse of the drill hole if unsuitable ground conditions are encountered along the drill profile so represents a lower risk of impacting on the water body. Installation of the cables by open cut means across watercourses has the potential to impact on the hydromorphology of the river water body in the short to medium term through disturbance of the riparian zone, banks and channel adversely impacting the morphology and bank stability. Where temporary flumes will also be installed in watercourses to enable plant crossing, excavation of the riverbed to 'bed-in' the flume pipe could remove habitat and in-situ life-stages within the substrate, while placement of flumes for plant crossing followed by diversion of flow through the flume will cause loss of habitat through pipe covering, compaction, and crushing of crayfish and fish species in-situ. For benthic macroinvertebrates (excluding crayfish), the impacts are likely to be very localised because of the restricted area of excavation or flume placement (10 m length), coupled with the likelihood of rapid recolonization, predominantly from upstream habitats.

Potential impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				• Temporary works associated with Morgan onshore substation (including temporary compounds, laydown areas and working areas) are 70,000 m^2. • Temporary works associated with Morecambe onshore substation (including temporary compounds, laydown areas and working areas) are 52,500 m^2. • Duration: enabling works 12 months, main construction 54 months, (sequential construction scenario). **Construction phase: onshore 400 kV grid connection cables** • Open cut trenching: The maximum number of trenches will be four, with a target trench depth of 1.8 m. The width of the permanent cable corridor is 50 m. There will be a total of 60 joint bays and 60 link boxes. • The working area will include a construction corridor width of 76 m (which includes two haul roads), with a length of up to 13 km. Duration of installation of up to 66 months (sequential construction scenario). • There will be a maximum of 46 HDD crossings (excluding the Ribble Estuary crossing) and the HDD compound locations will be 100 m x 50 m. • Trenchless technologies will be used to cross the River Ribble. Micro-tunnelling is considered to represent the MDS due to the depth of the entry/exit pits. The temporary compound at the launch/exit (two compounds) area would be a maximum of 75 m x 400 m. There will be a maximum of four tunnels/bores over a distance of up to 650 m. The depth of the launch and receiver pits would be a maximum of 45 m. • There will be up to eight construction compounds along the 400 kV grid connection cable corridor. During a sequential construction compounds will be present for 66 months with the following attributes: – 2 type A compounds, a maximum total area of 26,270 m^2; – 4 type B compounds a maximum total area of 52,540 m^2; and – 2 type C compounds a maximum total area of 17,500 m^2. • Duration of installation is up to 66 months (sequential). **Operation and maintenance phase** • Maintenance to the onshore export cable and the 400 kV grid connection cable will be undertaken only as required. Corrective activities will be limited. • The onshore export cable, the 400 kV grid connection cable and the onshore substations will be monitored remotely but will involve regular visits. • Permanent footprint of Morgan substation is 164,000 m^2 with 80,000 m^2 of this comprising the substation footprint, exclusion attenuation and landscaping areas. The substation will include 19 permanent buildings and a 15 m wide permanent access road. • Permanent footprint for Morecambe substation is 59,500 m^2 with 29,700 m^2 of this comprising the substation footprint, excluding attenuation and landscaping areas. The substation will include nine permanent buildings and a 15 m wide permanent access road. **Decommissioning phase** • Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within construction working areas and to require no greater amount or duration of activity than assessed for construction). Onshore export cables and 400 kV grid connection cables may be recovered from the ducts for recycling but the ducts, joint bays and link boxes will only be removed if feasible and if required to return the lands to normal agricultural use. For the purposes of EIA, decommissioning of the onshore substations is expected to have no greater impact than the construction phase but in reverse sequence.	The Morgan onshore substation in the Dow Brook water body could impact on the habitat and hydromorphological supporting conditions of the ordinary water course which is a minor tributary of the Dow Brook. However the design will be undertaken in accordance with EA guidance (and CoT82). The construction compounds will be set back from water courses to ensure no direct impact or loss of habitat Maintenance during the operational phase represents limited potential for disturbance. The Onshore Cable and 400 kV grid connection cable may remain in situ in decommissioning phase with the cable ends cut, sealed and securely buried as a precautionary measure.to minimise the environmental disturbance during decommissioning. As a worst case the cables will be removed for recycling and the ducts will remain in-situ. Joint bays and link boxes will be removed only if it is feasible with minimal environmental disturbance or if their removal is required to return the land to its current agricultural use. The maximum area of these represents the maximum area that will be subject to disturbance during decommissioning of the project.
The impact of pollution caused by accidental spills/contaminant release during construction and decommissioning	✓	×	✓	**Construction phase: landfall** The offshore export cables between the transition joint bay working area within Blackpool Airport and the beach will be installed using the direct pipe trenchless technique for a maximum length of 1,500 m. It is anticipated the direct pipe exit will be 100 m from the boundary of Lytham St Annes Dunes SSSI. • Entry pits for the direct pipe will be situated within the transition joint bay area within Blackpool Airport: The maximum number of entry pits will be six, with a maximum direct drill entry pit area of 450 m^2 per circuit with a depth of 6 m. The	Activities required for the construction and decommissioning of the Transmission Assets may result in accidental spills/contaminant release which could adversely affect water body status, protected or notable habitats and species. The use of open cut trenching at the landfall represents the greatest impact during construction of the landfall and

Potential impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
of the Transmission Assets.				total duration of entry pit works which is included within the overall transition joint bay construction works is 29 months assuming a sequential construction scenario. • Exit pits on the beach: The maximum number of exit pits will be six, with a maximum area of drill exit pit of 875 m^2 per circuit, with a depth of 3 m. The maximum cofferdam area dimensions per pit is 75 m^2 (15 m x5 m). The total duration of exit pit works on the beach is 2 weeks per circuit. • For the offshore export cable installation between exit pits and MLWS, the burial at the of the offshore export cables seaward of the direct pipe exit pits will via open trenching. The maximum number of trenches will be six. The maximum width of the stepped trench is 10 m at the top and 3 m at the bottom and are each 3 m deep. The maximum length per trench is 300 m with a maximum working area each side of the trench of 25 m. • The open trench will transition to a beach trencher, this will be 3 m wide and up to 1,250 m long, the trench will be contained within a working corridor with a 50 m width. • Cable pull in and burial will take up to six weeks per circuit and the maximum total duration of cable pull in and burial is 36 weeks assuming a sequential construction scenario. • There will be up to four compounds required west of the transition joint bays to MLWS: – Compound 1 (welfare): 300 m^2 to be active for 36 weeks; – Compound 2: 2,500 m^2 to be active for 48 weeks; – Compound 3: 510 m^2 to be active for 48 weeks; and – Compound 4: 600 m^2 to be active for 36 months (in a sequential construction scenario). • There will be two transition joint bay compounds (15,000 m^2 for Morgan and 11,500 m^2 for Morecambe) within Blackpool Airport to facilitate construction works, to be active for up to 29 months over a 45 month period. – Maximum working area of the transition joint bay: 4,900 m^2 for Morgan and 2,800 m^2 for Morecambe **Construction phase: onshore export cables** • The maximum number of trenches will be six, with a target trench depth of 1.8 m. • Onshore export cable construction corridors width 100 m, with a length of up to 17 km. Width will include two haul roads. There will be up to 110 joint bays and 110 link boxes, with 1,000 m^3 and 8 m^3 of material excavated for each joint bay and link box respectively. • There will be up to ten construction compounds along the onshore export cable corridor. During a sequential construction compounds will be present for 66 months (in a sequential construction scenario)with the following attributes: – 2 type A compounds, a maximum total area of 26,500 m^2; – 6 type B compounds a maximum total area of 79,500 m^2; and – 2 type C compounds a maximum total area of 17,500 m^2. • The maximum number of HDD locations is 120. Each major HDD location will have a compound, measuring up to 100 m x 50 m. Drilling mud will be stored and used at these compounds. **Construction phase: onshore substations** • Permanent footprint of Morgan onshore substation is 164,000 m^2, 28,000 m^2 of which will be impermeable and 80,000 m^2 will comprise the permanent substation footprint. There will be a 20 m wide access road, 15 m of which will be permanent. • Permanent footprint for Morecambe onshore substation is 59,500 m^2, 33,000 m^2 of which will be impermeable and 29,700 m^2 will comprise the permanent substation. There will be a 20 m wide access road, 15 m of which will be permanent. • Temporary works associated with Morgan onshore substation (including temporary compounds, laydown areas and working areas) are 70,000 m^2. • Temporary works associated with Morecambe onshore substation (including temporary compounds, laydown areas and working areas) are 52,500 m^2. • Duration: enabling works 12 months, main construction 54 months, testing/commissioning 21 months (sequential construction scenario).	therefore represents the greatest threat of contamination as spills would be easier to contain in a smaller area. The use of open cut trenching along the Onshore export cable corridor and 400 kV grid connection cable corridor represents the greatest area for construction and therefore also represents the greatest threat of contamination as spills would be easier to contain in a smaller area. The maximum area of the substation, permanent road, and construction compounds represent the greatest area for potential contamination. The maximum area of decommissioning represents the greatest area for potential contamination. Concrete will be used during the construction process at the joint bays, link boxes, and as foundations for built structures such as the buildings in the onshore substation. The use of cement and concrete in the construction of the hardstanding areas and associated infrastructure has the potential to impact upon water quality. Fresh concrete and cement is highly alkaline and therefore is likely to affect water quality if washed into the water courses along the onshore cable corridor. Construction of landfall and onshore infrastructure will involve the use of plant and machinery as well as the associated temporary storage of construction materials, oils, fuels and chemicals in designated areas within the temporary site compounds and in suitable mobile bowsers on the working spread. There is the potential for spillage or release of fuel oil and other dangerous substances which could impact on the surface water bodies associated with the working area. It is also possible that small residue amounts left on site may be mobilised by surface run- off and washed into the receiving waterbodies. Any use of concrete, for example, to cover cable conduits in open cut construction poses a risk to aquatic species such as invertebrates and fish. Crossing of temporary flumes/bridges also poses a risk of spillage of such pollutants. Oils and petroleum in particular can have large impacts on aquatic species, and depending on the extent of a spill, may reduce respiration rates by altering oxygen exchange at the water-air interface or cause complete elimination of invertebrates and fish from streams. During decommissioning, the dismantling of the onshore substation and each link box has the potential to cause adverse impacts on surrounding watercourses and receptors. The use of heavy vehicles and the removal of the infrastructure may lead to an increased risk of contaminated run-off, reducing the water quality (in turn WFD classification) in surrounding watercourses.

Potential impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				Construction phase: onshore 400 kV grid connection cables • Open cut trenching: The maximum number of trenches will be four, with a target trench depth of 1.8 m. The width of the permanent cable corridor is 50 m. There will be a total of 60 joint bays and 60 link boxes. • The working area will include a construction corridor width of 76 m (which includes two haul roads), with a length of up to 13 km. Duration of installation of up to 66 months (sequential construction scenario). • There will be a maximum of 46 HDD crossings (excluding the Ribble Estuary crossing) and the HDD compound locations will be 100 m x 50 m. • Trenchless technologies will be used to cross the River Ribble. Micro-tunnelling is considered to represent the MDS due to the depth of the entry/exit pits. The temporary compound at the launch/exit (two compounds) area would be a maximum of 75 m x 400 m. There will be a maximum of four tunnels/bores over a distance of up to 650 m. The depth of the launch and receiver pits would be a maximum of 45 m. • There will be up to eight construction compounds along the 400 kV grid connection cable corridor. During a sequential construction compounds will be present for 66 months with the following attributes: – 2 type A compounds, a maximum total area of 26,270 m^2; – 4 type B compounds a maximum total area of 52,540 m^2; and – 2 type C compounds a maximum total area of 17,500 m^2. • Duration of installation is up to 66 months (sequential). **Operation and maintenance phase** • Maintenance to the onshore export cable and the 400 kV grid connection cable will be undertaken only as required. Corrective activities will be limited. • The onshore export cable, the 400 kV grid connection cable and the onshore substations will be monitored remotely but will involve regular visits. • Permanent footprint of Morgan substation is 164,000 m^2 with 80,000 m^2 of this comprising the substation footprint, exclusion attenuation and landscaping areas. The substation will include 19 permanent buildings and a 15 m wide permanent access road. • Permanent footprint for Morecambe substation is 59,500 m^2 with 29,700 m^2 of this comprising the substation footprint, excluding attenuation and landscaping areas. The substation will include nine permanent buildings and a 15 m wide permanent access road. **Decommissioning phase** • Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within construction working areas and to require no greater amount or duration of activity than assessed for construction). Onshore export cables and 400 kV grid connection cables may be recovered from the ducts for recycling but the ducts, joint bays and link boxes will only be removed if feasible and if required to return the lands to normal agricultural use. For the purposes of EIA, decommissioning of the onshore substations is expected to have no greater impact than the construction phase but in reverse sequence.	
Increase in suspended sediments due to construction, operation and maintenance and/or decommissioning related activities, and the potential impact to physical features.	✓	×	✓	**Construction phase: landfall** The offshore export cables between the transition joint bay working area within Blackpool Airport and the beach will be installed using the direct pipe trenchless technique for a maximum length of 1,500 m. It is anticipated the direct pipe exit will be 100 m from the boundary of Lytham St Annes Dunes SSSI. • Entry pits for the direct pipe will be situated within the transition joint bay area within Blackpool Airport: The maximum number of entry pits will be six, with a maximum direct drill entry pit area of 450 m^2 per circuit with a depth of 6 m. The total duration of entry pit works which is included within the overall transition joint bay construction works is 29 months assuming a sequential construction scenario. • Exit pits on the beach: The maximum number of exit pits will be six, with a maximum area of drill exit pit of 875 m^2 per circuit, with a depth of 3 m. The maximum cofferdam area dimensions per pit is 75 m^2 (15 m x5 m). The total duration of exit pit works on the beach is 2 weeks per circuit. • For the offshore export cable installation between exit pits and MLWS, the burial at the of the offshore export cables seaward of the direct pipe exit pits will via open trenching. The maximum number of trenches will be six. The maximum	Potential impacts associated with pollution from mobilised suspended solids (sediment) is generally considered a significant risk to water bodies. Suspended sediment due to run off from stripped construction areas and excavations can have a negative impact on water quality, water dependant habitats and aquatic ecology. This is particularly true in sloping areas with underlying clay following topsoil stripping as well as areas of moderate to high rainfall. Suspended solids within surface water bodies may have an effect on: • The survival of fish eggs in gravel beds or spawning grounds as a result of deoxygenation caused by sediment deposition;

Potential impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				width of the stepped trench is 10 m at the top and 3 m at the bottom and are each 3 m deep. The maximum length per trench is 300 m with a maximum working area each side of the trench of 25 m. • The open trench will transition to a beach trencher, this will be 3 m wide and up to 1,250 m long, the trench will be contained within a working corridor with a 50 m width. • Cable pull in and burial will take up to six weeks per circuit and the maximum total duration of cable pull in and burial is 36 weeks assuming a sequential construction scenario. • There will be up to four compounds required west of the transition joint bays to MLWS: – Compound 1 (welfare): 300 m^2 to be active for 36 weeks; – Compound 2: 2,500 m^2 to be active for 48 weeks; – Compound 3: 510 m^2 to be active for 48 weeks; and – Compound 4: 600 m^2 to be active for 36 months (in a sequential construction scenario). • There will be two transition joint bay compounds (15,000 m^2 for Morgan and 11,500 m^2 for Morecambe) within Blackpool Airport to facilitate construction works, to be active for up to 29 months over a 45 month period. – Maximum working area of the transition joint bay: 4,900 m^2 for Morgan and 2,800 m^2 for Morecambe **Construction phase: onshore export cables** • The maximum number of trenches will be six, with a target trench depth of 1.8 m. • Onshore export cable construction corridors width 100 m, with a length of up to 17 km. Width will include two haul roads. There will be up to 110 joint bays and 110 link boxes, with 1,000 m^3 and 8 m^3 of material excavated for each joint bay and link box respectively. • There will be up to ten construction compounds along the onshore export cable corridor. During a sequential construction compounds will be present for 66 months (in a sequential construction scenario)with the following attributes: – 2 type A compounds, a maximum total area of 26,500 m^2; – 6 type B compounds a maximum total area of 79,500 m^2; and – 2 type C compounds a maximum total area of 17,500 m^2. • The maximum number of HDD locations is 120. Each major HDD location will have a compound, measuring up to 100 m x 50 m. Drilling mud will be stored and used at these compounds. **Construction phase: onshore substations** • Permanent footprint of Morgan onshore substation is 164,000 m^2, 28,000 m^2 of which will be impermeable and 80,000 m^2 will comprise the permanent substation footprint. There will be a 20 m wide access road, 15 m of which will be permanent. • Permanent footprint for Morecambe onshore substation is 59,500 m^2, 33,000 m^2 of which will be impermeable and 29,700 m^2 will comprise the permanent substation. There will be a 20 m wide access road, 15 m of which will be permanent. • Temporary works associated with Morgan onshore substation (including temporary compounds, laydown areas and working areas) are 70,000 m^2. • Temporary works associated with Morecambe onshore substation (including temporary compounds, laydown areas and working areas) are 52,500 m^2. • Duration: enabling works 12 months, main construction 54 months, testing/commissioning 21 months (sequential construction scenario). **Construction phase: onshore 400 kV grid connection cables** • Open cut trenching: The maximum number of trenches will be four, with a target trench depth of 1.8 m. The width of the permanent cable corridor is 50 m. There will be a total of 60 joint bays and 60 link boxes. • The working area will include a construction corridor width of 76 m (which includes two haul roads), with a length of up to 13 km. Duration of installation of up to 66 months (sequential construction scenario). • There will be a maximum of 46 HDD crossings (excluding the Ribble Estuary crossing) and the HDD compound locations will be 100 m x 50 m.	• The survival of plants and algae by smothering; and • The survival of young fish and aquatic invertebrates such as mayfly larvae through gill damage from sediment particles. Once a sediment load enters a river it can result in long-term changes that cause chronic harm. Sediment causes river hydromorphological changes, which in turn change the dynamics of the river into the future. Both bed and suspended materials, and subsequent changes in channel form associated with changes in sediment supply, may affect benthic invertebrates in many ways at various stages in their life cycle. Direct mortality is the first stage in the damage that sediment causes to a benthic invertebrate population. Subsequent stages can be caused by sediment that infiltrates the river bed and decreases oxygen supply in interstitial areas, and destroys habitat for juvenile stages of the many benthic invertebrate life cycles. The sediment subsequently provides a medium for macrophyte growth. Macrophytes can smother the river substrate and habitat further, and can trap more sediment which exacerbates the problem in the long term. Sediment infiltration of river bed gravels can also have a negative effect on fish species. Potential sources of fine sediment during the construction phase include: • topsoil stripping/soil and vegetation clearance; • trench excavation and backfilling across watercourses (open cut only); • installation of temporary crossing structures and associated movement of plant machinery; • bank disturbance caused by plant equipment; • run-off from topsoil and subsoil storage; • construction of dams and over pumping to divert flow and allow excavation of the pipeline trench under dry conditions in the channel; • water over-pumping and discharge of sediment laden water back to the watercourse; • removal of flumes/dams/crossing culverts; • reinstatement of bank soils and vegetation; and • Break out of drilling fluids at crossings undertaken by HDD. There is also a potential to impact on drainage with the pathway to water courses and drainage ditches shortened resulting in faster delivery of water from the working corridor to water courses with possible changes to the flow regime which could result in impacts to biology and morphology through pressures such as scouring. The Onshore export cable corridor could provide a pathway for sediment laden run-off which could impact on

Potential impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				• Trenchless technologies will be used to cross the River Ribble. Micro-tunnelling is considered to represent the MDS due to the depth of the entry/exit pits. The temporary compound at the launch/exit (two compounds) area would be a maximum of 75 m x 400 m. There will be a maximum of four tunnels/bores over a distance of up to 650 m. The depth of the launch and receiver pits would be a maximum of 45 m. • There will be up to eight construction compounds along the 400 kV grid connection cable corridor. During a sequential construction compounds will be present for 66 months with the following attributes: – 2 type A compounds, a maximum total area of 26,270 m^2; – 4 type B compounds a maximum total area of 52,540 m^2; and – 2 type C compounds a maximum total area of 17,500 m^2. • Duration of installation is up to 66 months (sequential). **Operation and maintenance phase** • Maintenance to the onshore export cable and the 400 kV grid connection cable will be undertaken only as required. Corrective activities will be limited. • The onshore export cable, the 400 kV grid connection cable and the onshore substations will be monitored remotely but will involve regular visits. • Permanent footprint of Morgan substation is 164,000 m^2 with 80,000 m^2 of this comprising the substation footprint, exclusion attenuation and landscaping areas. The substation will include 19 permanent buildings and a 15 m wide permanent access road. • Permanent footprint for Morecambe substation is 59,500 m^2 with 29,700 m^2 of this comprising the substation footprint, excluding attenuation and landscaping areas. The substation will include nine permanent buildings and a 15 m wide permanent access road. **Decommissioning phase** Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within construction working areas and to require no greater amount or duration of activity than assessed for construction). Onshore export cables and 400 kV grid connection cables may be recovered from the ducts for recycling but the ducts, joint bays and link boxes will only be removed if feasible and if required to return the lands to normal agricultural use. For the purposes of EIA, decommissioning of the onshore substations is expected to have no greater impact than the construction phase but in reverse sequence.	the morphology of the channel resulting in a change in flow types, substrate condition and channel type. During decommissioning, the dismantling of the onshore substation and each link box has the potential to cause adverse impacts on surrounding watercourses and receptors. The use of heavy vehicles and the removal of the infrastructure may lead to an increase in turbid runoff, reducing the water quality (and in turn WFD classification) in surrounding watercourses.
The impact of spreading INNS during construction and decommissioning of the Transmission Assets.	✓	×	✓	**Construction phase: landfall** The offshore export cables between the transition joint bay working area within Blackpool Airport and the beach will be installed using the direct pipe trenchless technique for a maximum length of 1,500 m. It is anticipated the direct pipe exit will be 100 m from the boundary of Lytham St Annes Dunes SSSI. • Entry pits for the direct pipe will be situated within the transition joint bay area within Blackpool Airport: The maximum number of entry pits will be six, with a maximum direct drill entry pit area of 450 m^2 per circuit with a depth of 6 m. The total duration of entry pit works which is included within the overall transition joint bay construction works is 29 months assuming a sequential construction scenario. • Exit pits on the beach: The maximum number of exit pits will be six, with a maximum area of drill exit pit of 875 m^2 per circuit, with a depth of 3 m. The maximum cofferdam area dimensions per pit is 75 m^2 (15 m x5 m). The total duration of exit pit works on the beach is 2 weeks per circuit. • For the offshore export cable installation between exit pits and MLWS, the burial at the of the offshore export cables seaward of the direct pipe exit pits will via open trenching. The maximum number of trenches will be six. The maximum width of the stepped trench is 10 m at the top and 3 m at the bottom and are each 3 m deep. The maximum length per trench is 300 m with a maximum working area each side of the trench of 25 m. • The open trench will transition to a beach trencher, this will be 3 m wide and up to 1,250 m long, the trench will be contained within a working corridor with a 50 m width. • Cable pull in and burial will take up to six weeks per circuit and the maximum total duration of cable pull in and burial is 36 weeks assuming a sequential construction scenario. • There will be up to four compounds required west of the transition joint bays to MLWS:	Construction and decommissioning of the Transmission Assets may cause the spread of INNS, which could adversely affect the status of native protected or notable habitats and species and present a risk in the achievement of the environmental objectives of the water bodies affected where the INNS are considered as High Impact species based on UKTAG's alien species classification list (UKTAG, 2021). The use of open cut trenching methods for water course crossings along the onshore cable route and 400 kV grid connection cable corridor represent the greatest potential for spreading INNS as high impact species have been identified in the Dow Brook and Ribble Estuary water bodies. The maximum area required for the construction of the Onshore export cable corridor, 400 kV grid connection cable corridor, and the associated infrastructure represents the maximum area that INNS can be spread but the mobilisation of INNS on machinery and plant between river water bodies and through hydrological connectivity is also a key concern.

Potential impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				– Compound 1 (welfare): 300 m² to be active for 36 weeks; – Compound 2: 2,500 m² to be active for 48 weeks; – Compound 3: 510 m² to be active for 48 weeks; and – Compound 4: 600 m² to be active for 36 months (in a sequential construction scenario). • There will be two transition joint bay compounds (15,000 m² for Morgan and 11,500 m² for Morecambe) within Blackpool Airport to facilitate construction works, to be active for up to 29 months over a 45 month period. – Maximum working area of the transition joint bay: 4,900 m² for Morgan and 2,800 m² for Morecambe **Construction phase: onshore export cables** • The maximum number of trenches will be six, with a target trench depth of 1.8 m. • Onshore export cable construction corridors width 100 m, with a length of up to 17 km. Width will include two haul roads. There will be up to 110 joint bays and 110 link boxes, with 1,000 m³ and 8 m³ of material excavated for each joint bay and link box respectively. • There will be up to ten construction compounds along the onshore export cable corridor. During a sequential construction compounds will be present for 66 months (in a sequential construction scenario)with the following attributes: – 2 type A compounds, a maximum total area of 26,500 m²; – 6 type B compounds a maximum total area of 79,500 m²; and – 2 type C compounds a maximum total area of 17,500 m². • The maximum number of HDD locations is 120. Each major HDD location will have a compound, measuring up to 100 m x 50 m. Drilling mud will be stored and used at these compounds. **Construction phase: onshore substations** • Permanent footprint of Morgan onshore substation is 164,000 m², 28,000 m² of which will be impermeable and 80,000 m² will comprise the permanent substation footprint. There will be a 20 m wide access road, 15 m of which will be permanent. • Permanent footprint for Morecambe onshore substation is 59,500 m², 33,000 m² of which will be impermeable and 29,700 m² will comprise the permanent substation. There will be a 20 m wide access road, 15 m of which will be permanent. • Temporary works associated with Morgan onshore substation (including temporary compounds, laydown areas and working areas) are 70,000 m². • Temporary works associated with Morecambe onshore substation (including temporary compounds, laydown areas and working areas) are 52,500 m². • Duration: enabling works 12 months, main construction 54 months, testing/commissioning 21 months (sequential construction scenario). **Construction phase: onshore 400 kV grid connection cables** • Open cut trenching: The maximum number of trenches will be four, with a target trench depth of 1.8 m. The width of the permanent cable corridor is 50 m. There will be a total of 60 joint bays and 60 link boxes. • The working area will include a construction corridor width of 76 m (which includes two haul roads), with a length of up to 13 km. Duration of installation of up to 66 months (sequential construction scenario). • There will be a maximum of 46 HDD crossings (excluding the Ribble Estuary crossing) and the HDD compound locations will be 100 m x 50 m. • Trenchless technologies will be used to cross the River Ribble. Micro-tunnelling is considered to represent the MDS due to the depth of the entry/exit pits. The temporary compound at the launch/exit (two compounds) area would be a maximum of 75 m x 400 m. There will be a maximum of four tunnels/bores over a distance of up to 650 m. The depth of the launch and receiver pits would be a maximum of 45 m. • There will be up to eight construction compounds along the 400 kV grid connection cable corridor. During a sequential construction compounds will be present for 66 months with the following attributes: – 2 type A compounds, a maximum total area of 26,270 m²;	The maximum area required for the construction of the onshore substation and permanent access road represents the maximum area that INNS can be spread. The Onshore export cables and 400 kV grid connection cables ducting shall remain in situ in decommissioning phase with only the link boxes needing removal. The maximum area of these plus the area of the haul road (assumed for access) represents the maximum area that INNS can be spread.

Potential impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				– 4 type B compounds a maximum total area of 52,540 m^2; and – 2 type C compounds a maximum total area of 17,500 m^2. • Duration of installation is up to 66 months (sequential). **Operation and maintenance phase** • Maintenance to the onshore export cable and the 400 kV grid connection cable will be undertaken only as required. Corrective activities will be limited. • The onshore export cable, the 400 kV grid connection cable and the onshore substations will be monitored remotely but will involve regular visits. • Permanent footprint of Morgan substation is 164,000 m^2 with 80,000 m^2 of this comprising the substation footprint, exclusion attenuation and landscaping areas. The substation will include 19 permanent buildings and a 15 m wide permanent access road. • Permanent footprint for Morecambe substation is 59,500 m^2 with 29,700 m^2 of this comprising the substation footprint, excluding attenuation and landscaping areas. The substation will include nine permanent buildings and a 15 m wide permanent access road. **Decommissioning phase** Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within construction working areas and to require no greater amount or duration of activity than assessed for construction). Onshore export cables and 400 kV grid connection cables may be recovered from the ducts for recycling but the ducts, joint bays and link boxes will only be removed if feasible and if required to return the lands to normal agricultural use. For the purposes of EIA, decommissioning of the onshore substations is expected to have no greater impact than the construction phase but in reverse sequence.	
Electromagnetic Fields (EMFs) from cabling during the operational phase.	×	✓	×	**Onshore export cables** • Maximum number of cables: 18 • Maximum number cable circuits: 6 • Indicative target trench depth: 1.8 m • Maximum voltage: 275 kV • Permanent cable corridor width 70 m with a length of up to 17 km **400 kV grid connection cable** • Maximum number of cables: 12 • Maximum number cable circuits: 4 • Indicative target trench depth: 1.8 m • Maximum voltage: 400 kV • Permanent corridor width of 50 m, with a length of up to 13 km	The potential for EMF from power cables to impact fish and other aquatic species has been studied extensively, particularly the interference with species such as Atlantic Salmon and the impairment of migration and navigation. The key operational impact on water bodies from EMFs is from the onshore cable corridor and the 400 kV grid connection cable corridor. The maximum design scenario presents the greatest extent to which the EMF may impact on the biological elements of ecological status.
The impact of heat generated by the onshore export cables on groundwater quality, during the operation and maintenance phase.	×	✓	×	**Onshore export cables** • Maximum number of cables: 18 • Maximum number cable circuits: 6 • Indicative target trench depth: 1.8 m • Maximum voltage: 275 kV • Permanent cable corridor width 70 m with a length of up to 17 km **400 kV grid connection cable** • Maximum number of cables: 12 • Maximum number cable circuits: 4	Maximum number of cables will result in greatest potential for heat generation and larger permanent cable corridor width (and therefore larger area potentially impacted).

Potential impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				• Indicative target trench depth: 1.8 m • Maximum voltage: 400 kV • Permanent corridor width of 50 m, with a length of up to 13 km	

Table 1.12: Potential impacts associated with the Transmission Assets and outcome of scoping assessment for the WFD assessment for onshore surface water bodies

Potential impact	Biological elements				Hydro-morphological supporting elements		Physico-chemical supporting elements	Chemical	
	Fish	Invertebrates	Macrophytes	Macrophytes and phytobentos combined	Hydrological regime	Morphology		Priority hazardous substances	Priority substances
The impact of habitat disturbance and its impact on the supporting hydromorphological conditions (e.g., channel form, channel substrate, riparian zone and floodplain connectivity) of water bodies during construction, operations and maintenance and decommissioning of the Transmission Assets.	Scoped in				Scoped in		Scoped in	Scoped out Habitat disturbance will not result in release of any priority or priority hazardous substances.	
The impact of pollution caused by accidental spills/contaminant release during construction and decommissioning of the Transmission Assets.	Scoped in				Scoped out The impact of pollution should not have any impact on the physical attributes of the water bodies.		Scoped in	Scoped in	
Increase in suspended sediments due to construction, operation and maintenance and/or decommissioning related activities, and the potential impact to physical features.	Scoped in				Scoped in		Scoped in	Scoped in	
The impact of spreading INNS during construction and decommissioning of the Transmission Assets.	Scoped in				Scoped in		Scoped in	Scoped out INNS will not result in an increase in priority or priority hazardous substances.	
Electromagnetic Fields (EMFs) from cabling during the operation of the Transmission Assets.	Scoped out The potential for EMF to impact fish and other aquatic species has been studied extensively, particularly the interference with species such as Atlantic Salmon *Salmo salar* and the impairment of migration and navigation. The operation of offshore wind energy projects is not expected to negatively affect commercial and recreational fishes. A study by the U.S. Department of the Interior, Bureau of Ocean Energy Management within the southern New England area found Negligible effects, if any, on bottom-dwelling species and no negative effects on pelagic species are expected due to their distance from the power cables buried in the seafloor or under main rivers and the level of magnetic field generated from AC cables (CSA Ocean Sciences Inc., 2019).				Scoped out EMFs will not impact on the hydromorphology of the water bodies affected.		Scoped out EMFs will not impact on the physico-chemical supporting elements of the water bodies affected.	Scoped out EMFs will not impact on the chemical status of the water bodies affected.	

Table 1.13: Summary of scoping exercise undertaken in accordance with the EA Guidance, WFD Assessment: Estuarine and Coastal Waters

Receptor	Water Body	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	Ribble	No	The Ribble transitional water body is a HMWB with the specified use being flood protection. The mitigation measures assessment is moderate which means that the EA and other responsible bodies have yet to implement all the relevant and required mitigation measures in the water body. Until the water body mitigation measures are implemented the water body will not achieve good ecological potential irrespective of the status of the other contributing elements. The mitigation measures required relate to alteration to flood defence structures. The potential impact from the onshore infrastructure will have no impact on the ability to implement these measures nor will it result in any changes to the supporting morphological condition in the transitional water body.
	Mersey Mouth	No	The Mersey Mouth coastal water body is a HMWB with the specified use being coastal protection. The mitigation measures assessment is moderate which means that the EA and other responsible bodies have yet to implement all the relevant and required mitigation measures in the water body to achieve good ecological potential. Until the water body mitigation measures are implemented the water body will not achieve good ecological potential irrespective of the status of the other contributing elements. The mitigation measures required relate to alteration to coastal defence structures. The potential impact from the onshore infrastructure will have no impact on the ability to implement these measures nor will it result in any changes to the supporting morphological condition in the transitional water body.
Biology: habitats	Ribble	Yes	Footprint of entry and exit pits for the crossing of the Ribble Estuary are within 500 m of a high sensitivity habitat i.e., saltmarsh.
	Mersey Mouth	No	Footprint of landfall is not within 500 m of a sensitive habitat.
Biology: fish	Ribble	No	Fish migration in the marine or freshwater environment will not be at risk from the proposed activities given the nature of the construction proposed, direct pipe at the landfall and the micro-tunnelling or direct pipe installation at the Ribble Estuary.
	Mersey Mouth	No	
Water quality	Ribble	Yes	A broad range of potential pollutants which may include chemicals from the Environmental Quality Standards Directive (EQSD) list can accumulate on surfaces during construction. These can subsequently be washed off during high rainfall/storm events, polluting the receiving waterbodies and should therefore be assessed further.
	Mersey Mouth	Yes	During the construction phase, there is a potential risk of accumulation of standing water and accidental discharges of untreated run-off whilst the temporary and the operational surface water drainage system is being constructed. Potential risk of contamination from the operation and maintenance activities have been scoped out with agreement form the Planning Inspectorate.
Protected areas	Ribble	Yes	The following protected areas are all within 2 km of the Transmission Assets Order Limits (Distance within which protected areas should be considered based on the EA Guidance for WFD Assessment: Estuarine and Coastal Waters (Environment Agency, 2017). • SPA – Ribble and Alt Estuaries SPA. • Shellfish waters – Ribble.
	Mersey Mouth	Yes	The following protected areas are all within 2 km of the Transmission Assets Order Limits. • SPA – Ribble and Alt Estuaries SPA, Liverpool Bay SPA. • Bathing waters - The Blackpool bathing waters are to the north of the Transmission Assets Order Limits whilst the St Annes bathing water is within the Transmission Assets Order Limits and St Annes North bathing waters is to the south. All bathing waters are within 2 km. • Shellfish waters – Ribble is located in the Mersey Mouth and is within one spring tidal excursion of the landfall for Transmission Assets Order Limits.
Invasive non-native species	Ribble	Yes	The landfall and onshore infrastructure are unlikely to result in the spread of INNS in the transitional water body and therefore it is not considered further in this assessment.
	Mersey Mouth	Yes	The onshore infrastructure is unlikely to result in the spread of INNS in the coastal water body and therefore it is not considered further in this assessment.

Table 1.14: Potential impacts associated with the Transmission Assets and outcome of scoping assessment for the WFD assessment for groundwater bodies

Potential impact	Quantitative Status					Chemical Status				
	Groundwater Dependent Terrestrial Ecosystems test	Dependent surface water body status	Saline Intrusion	Water Balance	Drinking Water Protected Area	General Chemical Test	Groundwater Dependent Terrestrial Ecosystems test	Dependent Surface Water Body Status	Saline Intrusion	Trend Assessment - Groundwater supporting element
The impact of mobilisation of existing areas of contamination causing a deterioration of groundwater quality.	**Scoped out,** contamination will not impact on quantitative status.	**Scoped out,** contamination will not impact on quantitative status.	**Scoped out** (Saline Intrusion not identified as a potential impact Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES.	**Scoped out,** contamination will not impact on quantitative status.	**Scoped out,** contamination will not impact on quantitative status.	**Scoped in** for underlying aquifer units (see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES).	**Scoped out** (see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES). For groundwater discharge to be important, the land drains and watercourses must be in continuity with locally important surface aquifers. Within the majority of the Transmission Assets Order Limits, land drains, watercourses and small ponds are underlain by clay rich deposits of glacial till or tidal flat deposits. These geological units do not contain significant groundwater and do not contribute significantly to surface flows. This is supported by the large number of small, isolated ponds across the study area and absence of abstractions, which reflect the low permeability of the underlying geology.		**Scoped out** (Saline Intrusion not identified as a potential impact Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES.	**Scoped out** (Groundwater trends not identified as an issue in Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES.
The impact of reduced groundwater quantity or quality in aquifer units: impact on existing groundwater abstractions.	**Scoped out** (see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES). For groundwater discharge to be important, the land drains and watercourses must be in continuity with locally important surface aquifers. Within the majority of the ZOI, land drains, watercourses and small ponds are underlain by clay rich deposits of glacial till or tidal flat deposits. These geological units do not contain significant groundwater and do not contribute significantly to surface flows. This is supported by the large number of small, isolated ponds across the study area and absence of abstractions, which reflect the low permeability of the underlying geology.		**Scoped out** (Saline Intrusion not identified as a potential impact, Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES.	**Scoped in** for underlying aquifer units (see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES). Major adverse impact possible on licensed groundwater abstractions.		**Scoped in** (As above - Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES.	**Scoped out** (As above - see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES).		**Scoped out** (As above - Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES.	**Scoped out** (As above - see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES.
The impact of pollution caused by accidental spills/contaminant release during construction and decommissioning of the Transmission Assets.	**Scoped out** (see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES. For groundwater discharge to be important, the land drains and watercourses must be	**Scoped out** (see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES). For groundwater discharge to be important, the land drains and	**Scoped out** (Saline Intrusion not identified as a potential impact Volume 3, Chapter 1: Geology, hydrogeology	**Scoped out,** contamination will not impact on quantitative status.	**Scoped out,** contamination will not impact on quantitative status.	**Scoped in** (see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES).	**Scoped out** (see Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES). For groundwater discharge to be important, the land drains and watercourses must be in continuity with locally important surface aquifers. Within the majority of the ZOI, land drains, watercourses and small ponds		**Scoped out** (Saline Intrusion not identified as a potential impact Volume 3, Chapter 1: Geology, Hydrogeology and ground	**Scoped out** Construction, operation and decommissioning of the onshore elements of the Transmission Assets should not impact on the long term trends in the ground water given

Potential impact	Quantitative Status					Chemical Status				
	Groundwater Dependent Terrestrial Ecosystems test	Dependent surface water body status	Saline Intrusion	Water Balance	Drinking Water Protected Area	General Chemical Test	Groundwater Dependent Terrestrial Ecosystems test	Dependent Surface Water Body Status	Saline Intrusion	Trend Assessment - Groundwater supporting element
	in continuity with locally important surface aquifers. Within the majority of the ZOI, land drains, watercourses and small ponds are underlain by clay rich deposits of glacial till or tidal flat deposits. These geological units do not contain significant groundwater and do not contribute significantly to surface flows. This is supported by the large number of small, isolated ponds across the study area and absence of abstractions, which reflect the low permeability of the underlying geology.	watercourses must be in continuity with locally important surface aquifers. Within the majority of the ZOI, land drains, watercourses and small ponds are underlain by clay rich deposits of glacial till or tidal flat deposits. These geological units do not contain significant groundwater and do not contribute significantly to surface flows. This is supported by the large number of small, isolated ponds across the study area and absence of abstractions, which reflect the low permeability of the underlying geology.	and ground conditions).				are underlain by clay rich deposits of glacial till or tidal flat deposits. These geological units do not contain significant groundwater and do not contribute significantly to surface flows. This is supported by the large number of small, isolated ponds across the study area and absence of abstractions, which reflect the low permeability of the underlying geology.		conditions of the ES).	the assessment undertaken in Volume 3, Chapter 1: Geology, Hydrogeology and ground conditions of the ES.
The impact of heat generated by the onshore export cables on groundwater quality	**Scoped out** See Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES. It is anticipated that any heat dissipation will be localised and confined to the areas immediately surrounding the onshore cables. On this basis, it is unlikely that there will be any impact on the quality or temperature of groundwater at its point of abstraction during operation. This impact is therefore excluded from further consideration.									

1.6 Detailed assessment

1.6.1 Introduction

1.6.1.1 Based on the outcome of the scoping assessment, the detailed assessment establishes whether the activities associated with the Transmission Assets will:

- cause deterioration in water body status;
- impinge upon protected areas designated under the European Directives listed in Article 5 of the WFD and outlined in **section 1.4.4** of this annex; and
- prevent the achievement of WFD status objectives.

1.6.1.2 This is the stage of the assessment where evidence is provided to demonstrate that the proposed works are compliant. Specifically, for each quality element it must be shown that the activities scoped into the assessment will not cause a deterioration in status of any of the contributing quality elements nor prevent the achievement of WFD objectives. Where appropriate, it is also the stage where design mitigation, aimed at reducing the effect of an activity, is considered.

1.6.1.3 The assessment looks at each individual water body within the ZOI in the context of its status, the main contributing elements to the status classification, the objective of the water body and scoped in activities.

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

1.6.2.1 For the purposes of the WFD assessment process, the term 'measures adopted as part of the project' is used to include the following measures (adapted from IEMA, 2016):

- Embedded mitigation. This includes the following.
  - Primary (inherent) mitigation - measures included as part of the project design. IEMA describes these as ‘modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project and do not require additional action to be taken’. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the project and the parameters secured in the DCO and/or marine licences. For example, a reduction in footprint or height.
  - Tertiary (inexorable) mitigation. IEMA describes these as ‘actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects’. It may be helpful to secure such measures through a Code of Construction Practice or similar.

- Secondary (foreseeable) mitigation. IEMA describes these as 'actions that will require further activity in order to achieve the anticipated outcome'. These include measures required to reduce the significance of environmental effects (such as lighting limits) and may be secured through environmental management plan.

1.6.2.2 In addition, where relevant, measures have been identified that may result in enhancement of environmental conditions. Such measures are clearly identified within Volume 1, Annex 5.3: Commitments register of the ES. The measures relevant to this chapter are summarised in **Table 1.15.**

1.6.2.3 Embedded measures that will form part of the final design (and/or are established legislative requirements/good practice) have been taken into account as part of the initial assessment presented in **section 1.6.3** and **section 1.6.4** below (i.e., the initial determination of impact magnitude and significance of effects assumes implementation of these measures). This ensures that the measures to which the Applicants are committed are taken into account in the assessment of effects.

1.6.2.4 Where an assessment identifies likely significant adverse effects, further or secondary mitigation measures may be applied. These are measures that could further prevent, reduce and, where possible, offset these effects. They are defined by IEMA as actions that will require further activity in order to achieve the anticipated outcome and may be imposed as part of the planning consent, or through inclusion in the ES (referred to as secondary mitigation measures in IEMA, 2016). For further or secondary measures, both pre-mitigation and residual effects are presented.

Table 1.15: Measures adopted as part of the Transmission Assets

Commitment number	Measures adopted	How the measure will be secured
Embedded measures		
CoT02	The following features will be crossed by trenchless techniques, as set out in the Onshore Crossing Schedule submitted as part of the application for development consent: • A, B and Classified unnumbered roads (known as C roads) (including the Preston Western Distributor Road, A582 South Ribble Western Distributor Upgrade and M55 Heyhouses Link Road; excluding Leech Lane); • All Environment Agency Main Rivers, including: Moss Sluice, east of Midgeland Road along Pegs Lane; Savick Brook, south of A583; Wrea Brook southeast of Cartmell Lane; Dow Brook east of Lower Lane between the A584 and the A583; Middle Pool north of Lund Way; and • All Network Rail crossings, including along the line which runs between Blackpool North and Preston, south of Cartmell Lane; and at the Network Rail crossing along the line which runs to Blackpool North, south east of Squires Gate, parallel to the A584.	DCO Schedules 2A & 2B, Requirement 5(2) (Detailed design parameters onshore); DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT03	A range of sensitive historical, cultural and ecological conservation areas (including statutory and non-statutory designations) have been directly avoided where practicable during the site selection process for Morgan and Morecambe Offshore Wind Farms: Transmission Assets footprint. The Works Plans identify the areas where different works are currently proposed. These include, but are not restricted to: • Listed Buildings • Scheduled Monuments • Registered Parks and Gardens • Onshore Conservation Areas • Onshore National Site Network • Offshore National Site Network • Sites of Special Scientific Interest (Onshore only) • Local Nature Reserves • Local Wildlife sites • Lancashire Wildlife Trust Reserves • Royal Society for the Protection of Birds (RSPB) Reserves • National Trust land; • Ancient Woodland sites and known Tree Preservation Orders (TPOs); & • non-designated built heritage assets. Where possible, unprotected areas of woodland, mature and protected trees (i.e. veteran trees) have and will also be avoided, including the veteran tree located to the north east of National Grid Penwortham substation.	DCO Article 3(1); Works Plans - Onshore and Intertidal
CoT04	An Outline Pollution Prevention Plan (PPP) forms part of the Outline Code of Construction Practice submitted with the application for development consent. Detailed PPP(s) will be developed in accordance with the Outline PPP and includes details of emergency spill procedures. Good practice guidance detailed in the Environment Agency's Pollution Prevention Guidance notes (including Pollution Prevention Guidance notes 01, 05, 08 and 21) will be followed where appropriate, or the latest relevant available guidance.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)

Commitment number	Measures adopted	How the measure will be secured
CoT06	The construction area associated with onshore export cable corridor will be 100 m working width and the 400kv grid connection cable corridor will be working width 76 m to minimise the construction footprint, except at complex trenchless technique crossings, including, but not limited to: • Network Railway Crossings; • A, B and Classified unnumbered roads (known as C roads), including B5261 (Queensway); • the approach to landfall; • river and water course crossings; and • sensitive utility assets (e.g. high pressure gas pipelines). The widths of both the onshore export cable corridor and 400kv grid connection cable corridor also increases up to 270 m in width, on the access and egress to the onshore substations, to facilitate consideration of trenchless crossings as well as being subject to detailed design. These increased widths and crossing methodologies are set out in the Onshore Crossing Schedule and Works Plans-Onshore and Intertidal.	DCO Schedules 2A & 2B, Requirement 5 (Detailed design parameters onshore); Works Plans - Onshore and Intertidal
CoT08	Post-construction, the working area will be reinstated to pre-existing condition as far as reasonably practical in line with the DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (PB13298), Institute of Quarrying (IQ) Good Practice Guide for Handling Soils in Mineral Workings (IQ, 2021) and British Society of Soil Science (BSSS) Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (BSSS, 2022).	DCO Schedules 2A & 2B, Requirement 18 (Restoration of land temporarily used for construction); DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT09	The Outline Code of Construction Practice (CoCP) has been submitted as part of the application for development consent. Detailed CoCP(s) will be developed in accordance with the outline CoCP. The Outline CoCP includes information about drainage during construction.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT10	Where trenchless techniques are proposed for Environment Agency Main Rivers, the following distances will be used: • 8 m from the bank of the Environment Agency Main River or landward toe of any associated flood defence structure; • 16 m from tidal Environment Agency Main Rivers or the landward toe of any flood defences, where the Main River is a sea defence structure; and • a minimum of 2 m vertical clearance will be maintained below the hard bed of all Environment Agency Main Rivers, including the landward toe of any associated flood defences. Final vertical clearance depths beneath Environment Agency Main Rivers will be identified during detailed design stage, in consultation with the Environment Agency, to ensure the export cables remain buried for the operational lifetime of the project.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice); DCO Schedule 10, Part 9
CoT11	An Outline Operational Drainage Management Plan for the substation sites has been prepared and submitted with the application for development consent. The Plan will include measures to ensure that existing land drainage is reinstated and/or maintained. This will include measures to limit discharge rates and attenuate flows to maintain greenfield runoff rates at the onshore substations. It will also include measures to control surface water runoff, including measures to prevent flooding of the working areas or offsite and to ensure any runoff is treated appropriately. Detailed Operational Drainage Management Plan(s) will be developed in accordance with the Outline Operational Drainage Management Plan and in line with the latest relevant drainage guidance notes in consultation with the Environment Agency and the Lead Local Flood Authority (Lancashire County Council).	DCO Schedules 2A & 2B, Requirement 20 (Outline Operational Drainage Management Plan)
CoT22	Prior to the commencement of works, the contractor (or project appointed Land Agent) will undertake a record of condition, (which will accompany previously captured soil condition data, identifying and describing the physical and nutrient characteristics of the existing soil profiles). Such work will inform the reinstatement under CoT08.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT24	Where practicable, during construction, access routes within the onshore export cable corridor and 400kV grid connection corridor (i.e. for example, the use of haul roads) will be used, to minimise potential impacts to the local road network.	DCO Schedules 2A & 2B, Requirement 9 (Traffic and Transport) Access to Works Plan
CoT25	Topsoil and subsoil will be stored in separate stockpiles and managed in line with the DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (PB13298), Institute of Quarrying (IQ) Good Practice Guide for Handling Soils in Mineral Workings (IQ, 2021) and British Society of Soil Science (BSSS) Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (BSSS, 2022). Any suspected or confirmed contaminated soils will be appropriately separated, contained and tested before removal (if required). This will be done in accordance with the Outline Soil Management Plan, as part of the Outline CoCP, prepared and submitted with the application for development consent.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)

Commitment number	Measures adopted	How the measure will be secured
CoT30	An Outline Contaminated Land and Groundwater Discovery Strategy, as part of the Outline CoCP has been submitted with the application for development consent, to identify any suspected areas of contamination and any remedial measures which may be required. Detailed strategies will identify the construction protocol for discovery of any currently unknown contamination and any remedial measures that may be required.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT35	An Outline Code of Construction Practice (CoCP) has been prepared and submitted with the application for development consent. Detailed CoCP(s) will be developed in accordance with the outline CoCP. The Outline CoCP will include measures to maintain and address: • flood protection and control measures; • water environment and drainage; • pollution prevention; • geology and ground conditions; • ecology and nature conservation (including protected species and invasive species); • historic environment; • soil management; • traffic and transport; • noise management measures; • air quality and dust management; • landscape and visual; • recreation; and • bentonite breakout .	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT36	Onshore Decommissioning Plan(s) will be developed prior to decommissioning. The Onshore Decommissioning Plan(s) will include provisions for the removal of all onshore above ground infrastructure and the decommissioning of below ground infrastructure (if and where relevant and practicable), and details relevant to flood risk, pollution prevention and avoidance of ground disturbance. The Onshore Decommissioning Plan(s) will be in line with the latest relevant available guidance.	DCO Schedules 2A & 2B, Requirement 22 (Onshore decommissioning)
CoT39	Fences, walls, ditches and drainage outfalls will be retained at the landfall and along the onshore export cable corridor and 400 kV grid connection cable corridor, where possible. Where it is not reasonably practicable to retain them, any damage will be repaired and reinstated as soon as reasonably practical. The Environment Agency must be notified if damage occurs to any Environment Agency main river or related flood infrastructure.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT44	The Project Description (Volume 1, Chapter 3 of the Environmental Statement) sets out that the installation of the offshore export cables under Lytham St Annes SSSI and the St Annes Old Links Golf Course will be undertaken by direct pipe trenchless installation technique. The exit pits associated with the direct pipe installation will be at least 100 m seaward of the western boundary of the SSSI.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
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)
CoT82	Where trenchless techniques are proposed for crossing ordinary watercourses, the entry and exit pits will be set back a minimum of 8 m from the bank of the watercourse. These crossings are detailed in the Onshore Crossing Schedule. Where required, geomorphological surveys will be undertaken on ordinary watercourses that may be crossed by trenched techniques. These will be used to inform detailed designs prior to construction.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice); DCO Schedule 10
CoT84	An Outline Code of Construction Practice (CoCP) has been prepared and submitted with the application for development consent. Detailed CoCP(s) will be developed in accordance with the Outline CoCP. In order to manage impacts to field drainage, the Outline CoCP stipulates field drainage plans will be developed in consultation with the relevant landowners. If required, additional field drainage will be installed to ensure the existing drainage of the land is maintained during and after construction.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)

Commitment number	Measures adopted	How the measure will be secured
CoT86	An Outline Code of Construction Practice (CoCP) has been prepared and submitted with the application for development consent. Detailed CoCP(s) will be developed in accordance with the Outline CoCP. Where required, trenched techniques may be used for minor ditches or smaller watercourses that are frequently dry. In these cases, measures will be implemented to protect water quality and flow and these will be detailed within the Outline CoCP.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT90	The Project Description (Volume 1, Chapter 3 of the Environmental Statement) sets out that the installation of the 400kV Grid Connection Cable Corridor beneath the River Ribble will be undertaken by direct pipe or micro tunnel trenchless installation techniques.	DCO Schedules 2A & 2B, Requirement 5(3)(Detailed design parameters onshore); and Requirement 8 (Code of Construction Practice)
CoT94	The Outline Code of Construction practice (CoCP) has been submitted as part of the application for development consent. Detailed CoCP(s) will be developed in accordance with the outline CoCP. The outline CoCP details appropriate studies (e.g. Site Investigations) proposed to be undertaken where major HDDs (or other trenchless techniques) are proposed, during the detailed design stage to confirm ground conditions.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
Secondary mitigation		
CoT19	All trenchless crossings will be undertaken by non-impact methods such as HDD (or other trenchless techniques including micro tunnelling and direct pipe), excluding preparatory works, in order to minimise construction noise and vibration beyond the immediate location of works	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT27	All temporary compounds will be removed and sites will be reinstated when construction has been completed.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice); and DCO Schedules 2A & 2B, Requirement 16 (Restoration of land used temporarily for construction)
CoT41	Where the onshore export cable corridor or 400 kV grid connection cable corridor crosses sites of particular sensitivity (e.g. embanked Environment Agency surface watercourses, Sites of Special Scientific Interest or groundwater inner Source Protection Zones) hydrogeological risk assessment(s) will be undertaken to inform a site-specific crossing method statement(s) where required. These will be agreed with the relevant stakeholders prior to construction.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT76	Detailed Ecological Management Plan(s) (EMP) will be developed in accordance with the Outline Ecological Management Plan (OEMP). The Outline Ecological Management Plan has been prepared and submitted as part of the application for development consent and includes but is not limited to pre-construction, construction and post-construction mitigation measures relating to habitats and protected or notable species, species mitigation licences and the role of the Ecological Clerk of Works (ECoW) where relevant. The Outline Ecological Management Plan also includes a Breeding Bird Protection Plan which will set out mitigation measures such as vegetation clearance in winter (e.g., hedgerows), pre-construction breeding bird survey, appropriate protection zones upon confirmation of nest building/breeding taking place of key protected or sensitive species. In addition to the Breeding Bird Protection Plan, the OEMP sets out species-specific mitigation plans for Important Ecological Features identified as part of the assessment. Detailed Ecological Management Plan(s) will include details of any long term mitigation and management measures relevant to onshore ecology and nature conservation and in relation to onshore and intertidal ornithology. This will include the management of ecological mitigation areas. The Detailed EMPs will be developed in consultation with the relevant statutory advisors and regulators.	DCO Schedules 2A & 2B, Requirement 12 (Ecological Management Plan)

1.6.3 Deterioration in water body status

1.6.3.1 As part of the project design process, a number of embedded measures have been proposed to reduce the potential impacts for the water environment. As there is a commitment to implementing these measures, they are considered inherently part of the design of the Transmission Assets and have therefore been considered in the assessment presented in this detailed WFD assessment. These measures are considered standard industry practice for this type of development. The construction measures set out below are contained within an outline CoCP (Volume 1, Annex 3.1: Outline CoCP of the ES).

1.6.3.2 The North West River Basin Management Plan states that the 2019 water body classification is the baseline from which deterioration is not permitted. Therefore, this is the status classification that must not deteriorate when considering the impact of the Transmission Assets on the deterioration of water body status objective.

1.6.3.3 The detailed assessment demonstrates that taking into consideration the mitigation measures committed to (see Volume 1, Annex 5.3: Commitments register of the ES), there will be no deterioration in the individual elements of ecological and chemical status and therefore no deterioration in the overall status WFD status classification outlined in **Table 1.15** of this annex.

1.6.3.4 **Table 1.16** and **Table 1.17** provide the justification for this assessment based on the different quality elements, the potential impacts scoped into the WFD assessment and mitigation measures for the Transmission Assets.

Table 1.16: Summary of mitigation measures to ensure the surface water body status does not deteriorate

Activity	Biological supporting elements				Hydro-morphological supporting elements		Physico-chemical supporting elements	Chemical		WFD Compliant
	Fish	Invertebrates	Macrophytes	Macrophytes and Phytobentos combined	Hydrological Regime	Morphology		Priority hazardous substances	Priority Substances	
Habitat disturbance and its impact on the supporting hydromorphological conditions of water bodies during construction, operation and maintenance and decommissioning of the Transmission Assets.	The preparation of the temporary working corridor has the potential to increase suspended sediment load to water courses and ultimately to downstream transitional and coastal water bodies with the associated impacts that this can have on the biological quality elements. The potential for the spread of invasive non-native species is also a risk. Measures will be set in place to minimise the potential for pollution from sediment deposition into watercourses and from works vehicles, including measures to prevent transfer of invasive plant or animal species between watercourses though the biosecurity protocol which will form part of the Outline CoCP (CoT35, Table 1.16). All construction work will be undertaken in accordance with good environmental practice based on legal responsibilities and guidance in accordance with the general overarching guidance on good environmental management. The method of achieving this will be through the Outline CoCP (CoT35, Table 1.16) and associated management plans, i.e.: • Pollution Prevention Plan • Public Rights of Way (PRoW) Management Plan • Site Waste Management Plan • Soil Management Plan • Spillage and Emergency Response Plan • Surface water and Groundwater Management Plan • Biosecurity protocol. • Bentonite Breakout Plan. As per CoT09, Table 1.16, information on the management of drainage during construction will be included in the CoCP and a surface water and groundwater management plan will be prepared. this will ensure adequate controls are in place to remove risk to the biological elements and supporting hydromorphological conditions from construction drainage and run-off. As per CoT82 an eight metre buffer will be maintained between the banks of ordinary watercourses and all temporary working areas for Transmission Assets where practically possible. The same buffer, where possible, will be maintained for the permanent onshore substation sites. The width of the construction corridor will be kept to a minimum to reduce the construction footprint as per CoT06, Table 1.15. Haul roads will be used (CoT24, Table 1.15) to ensure the damage to agricultural land and soils will be minimised and to reduce the source of soil rutting and damage which can result in sediment laden run-off from construction areas which can impact negatively on aquatic ecology and the biological supporting elements. In addition the implementation of measures under CoT25, Table 1.16, will ensure soil will be stored and managed in accordance with Construction Code of Practice for Sustainable Use of Soils on Construction Sites (PB13298) or the latest relevant available government guidance which will mitigation potential for significant impact on the biological elements and supporting hydromorphological elements from the disturbance of habitat through direct indirect effects associated with sediment deposition from construction run-off. As per CoT84 any field drainage intercepted during the cable installation will either be reinstated following the installation of the cable or diverted to a secondary channel through the installation of post construction drainage. Any works undertaken will be in agreement with the appropriate stakeholders. The onshore substation station will result in the construction of low permeability surfacing, increasing the rate of surface water run-off from the site. As per CoT11, an Outline Operational Onshore Substation Drainage Management Plan will be prepared to ensure the existing run-off rates to the surrounding water environment are maintained at pre- development rates and therefore will not result in significant alteration of the habitats and supporting hydromorphology.							Scoped out.		When the mitigation outlined for the biological, hydro-morphological and physico-chemical supporting elements of surface water status are implemented this activity will not compromise the environmental objectives for the water bodies affected and is therefore WFD compliant.
	Temporary Bridges and flumes Where temporary bridges are proposed this will involve the construction of temporary bridge structures and the installation of bridge sections. These procedures will avoid any instream or immediate bank works to avoid any direct physical modification. Where flumes or culverts are proposed for the haul road the flume/culvert sections will be placed on the riverbed and adequately bedded down by pushing into the substrate to ensure that a suitable depth of water and flow velocity is maintained within the pipes to facilitate the upstream passage of fish. The length of each flumed section will be 10 m to allow an adequate running track for the movement of plant.									

Activity	Biological supporting elements				Hydro-morphological supporting elements		Physico-chemical supporting elements	Chemical		WFD Compliant
	Fish	Invertebrates	Macrophytes	Macrophytes and Phytobentos combined	Hydrological Regime	Morphology		Priority hazardous substances	Priority Substances	
	Watercourse crossings As per CoT02 and CoT90 the methodology for main river crossings and landfall will be by trenchless technology. Furthermore, as per CoT10 HDD (or other trenchless techniques) entry and exit points will be located at least 10 m away from Environment Agency main river watercourses and 10 m from Environment Agency surface watercourses or the landward toe of the surface watercourse flood defences. Where a surface watercourse is to be crossed by HDD (or other trenchless techniques), the onshore export cables and 400 kV grid connection cables will be installed at least 2 m beneath the hard bed of any watercourses and the optimal clearance depth beneath watercourses will be agreed with the relevant authorities prior to construction. For open cut crossings of small or less sensitive water courses the outline method statement for water course crossings will set out the different methods that can be used to install the cable. In all cases the cable will be installed in near dry conditions through the isolation of the section of channel in question. In these cases, measures will be implemented to protect water quality and flow and these will be detailed within the outline CoCP as per CoT86. The outline CoCP (CoT35, Table 1.16) includes measures to minimise risks associated with HDD including a bentonite breakout plan which provides a protocol for dealing with bentonite breakout, reducing risks to acceptable levels. When these measures are employed, the water course crossings will not result in a significant impact or deterioration in the baseline status as a result of habitat disturbance from water course crossings.								
The impact of pollution caused by accidental spills/contaminant release during construction and decommissioning of the Transmission Assets.	Oils and petroleum in particular from construction machinery used during the construction of the Transmission Assets can have large impacts on aquatic species, and depending on the extent of a spill, may reduce respiration rates by altering oxygen exchange at the water-air interface or cause complete elimination of invertebrates and fish from streams. As per CoT4, Table 1.15, an Outline Onshore Pollution Prevention Plan (PPP) will form part of the Outline Code of Construction Practice, which will be prepared and submitted with the application for development consent. Onshore PPP(s) will be developed in accordance with the Outline Onshore PPP and will include details of emergency spill procedures. Good practice guidance detailed in the Pollution Prevention Guidance notes (including Pollution Prevention Guidance notes 01, 05, 08 and 21) will be followed where appropriate, or the latest relevant available guidance.				Scoped out.		As per biological supporting elements.	As per CoT4, Table 1.15, an Outline Onshore Pollution Prevention Plan (PPP) will form part of the Outline Code of Construction Practice, which will be prepared and submitted with the application for development consent. Onshore PPP(s) will be developed in accordance with the Outline Onshore PPP and will include details of emergency spill procedures. Good practice guidance detailed in the Pollution Prevention Guidance notes (including Pollution Prevention Guidance notes 01, 05, 08 and 21) will be followed where appropriate, or the latest relevant available guidance.	When the mitigation outlined for the biological, physico-chemical supporting elements and chemical elements of surface water status are implemented this activity will not compromise the environmental objectives for the water bodies affected and is therefore WFD compliant.
Increase in suspended sediments due to construction, operation and maintenance and/or decommissioning related activities, and the potential impact to physical features.	The preparation of the temporary working corridor has the potential for suspended sediment and the impacts that this can have on the above biological quality elements. The potential for the spread of INNS is also a risk. Measures will be set in place to minimise the potential for pollution from sediment deposition into watercourses and from works vehicles, including measures to prevent transfer of invasive plant or animal species between watercourses though the biosecurity protocol which will form part of the Outline CoCP (CoT35, Table 1.16). All construction work will be undertaken in accordance with good environmental practice based on legal responsibilities and guidance in accordance with the general overarching guidance on good environmental management. Surface water flowing into the cable trenches during the construction period will be managed in accordance with the Outline Pollution Prevention Plan which has been prepared and submitted with the application for development consent. The Onshore includes details of emergency spill procedures. Good practice guidance detailed in the Environment Agency's General Pollution Prevention notes (including General Pollution Prevention notes 01, 05, 08 and 21) will be followed where appropriate, or the latest relevant available guidance. In addition to the pollution prevention measures laid out in the Outline CoCP of the ES, an Outline Onshore Infrastructure Drainage Strategy has been prepared and submitted with the application for development consent. An Onshore Infrastructure Construction Drainage Scheme will be developed for the temporary onshore construction works in accordance with the Outline Onshore Infrastructure Drainage Strategy. The detailed						There is potential for sediment bound nutrients (ammonia, phosphorus and nitrates) and other contaminants to reduce the quality of the supporting physico-chemical conditions particularly DO, biological oxygen demand and phosphorus. See mitigation outlined for the Biological and hydromorphological supporting elements which will ensure the supporting physico-chemical elements will not be	As with the physico-chemical elements, sediment bound contaminants could carry priority or priority hazardous substances into the aquatic environment. The measures outlined to address the potential impact to the biological and physico-chemical supporting conditions will ensure that the quality elements for chemical status will not be put at risk of deterioration in their individual status.	When the mitigation outlined for the biological, hydro-morphological, physico-chemical supporting elements and chemical elements of surface water status are implemented this activity will not compromise the environmental objectives for the water bodies affected and is therefore WFD compliant.

Activity	Biological supporting elements				Hydro-morphological supporting elements		Physico-chemical supporting elements	Chemical		WFD Compliant
	Fish	Invertebrates	Macrophytes	Macrophytes and Phytobentos combined	Hydrological Regime	Morphology		Priority hazardous substances	Priority Substances	
	Onshore Infrastructure Construction Drainage Scheme(s) will ensure that existing land drainage is maintained during construction and will identify specific drainage measures for each area of land based on information identified and recorded by a land drainage consultant prior to construction. It will include measures to control surface water runoff, including measures to prevent flooding of the working area or offsite and to ensure any runoff is treated appropriately. The detailed Onshore Infrastructure Construction Drainage Scheme(s) will be developed in consultation with landowners, the Lead Local Flood Authority (Lancashire County Council) and the Environment Agency. This will ensure that drainage from the surrounding lands is not directed to the Onshore Infrastructure Area corridor with only rainfall incident on the corridor collecting sediment laden water ensuring the volumes of water for treatment in advance of discharge is significantly reduced. These measures will ensure that significant sediment export to the existing drainage network and water courses will be avoided and will not result in a change to the channel form or significant habitat disturbance.						significantly affected to put any of the water bodies at risk of deterioration in their individual status.			
The impact of spreading INNS during construction and decommissioning of the Transmission Assets.	INNS can negatively affect the health of the water environment and are a direct threat to the ecological objectives of a water body. INNS are also considered to be one of the main threats to biodiversity worldwide. A biosecurity protocol will be included in the CoCP (CoT35, Table 1.16) which will minimise the risk posed by INNS generally through improved biosecurity to prevent the spread of existing invasive species or new introductions.				The proliferation of INNS can change the hydromorphology of a water body and result in a deviation from the supporting hydromorphological conditions expected. INNS can lead to greater erosion of the riparian zone. Some plants, such as Himalayan balsam, can expose river banks when they die back during the winter months resulting in greater risks of erosion. These pressures can impact on the hydromorphology of the water body. A biosecurity protocol will be included in the CoCP (CoT35, Table 1.16) which will minimise the risk posed by INNS generally through improved biosecurity to prevent the spread of existing invasive species or new introductions.		INNS can alter the physico chemical supporting conditions particularly resulting in changes to dissolved oxygen levels. The biosecurity protocol will minimise the risk posed by INNS generally through improved biosecurity to prevent the spread of existing invasive species or new introductions.	Scoped out.		When the mitigation outlined for the biological, hydro-morphological and physico-chemical supporting elements of surface water status are implemented this activity will not compromise the environmental objectives for the water bodies affected and is therefore WFD compliant.

Table 1.17: Summary of mitigation measures to ensure the groundwater body status does not deteriorate

Potential Impact	Quantitative Status					Chemical Status				
	Groundwater Dependent Terrestrial Ecosystems test	Dependent Surface Water Body Status	Saline Intrusion	Water Balance	Drinking Water Protected Area	General Chemical Test	Groundwater Dependent Terrestrial Ecosystems test	Dependent Surface Water Body Status	Saline Intrusion	Trend Assessment – Groundwater supporting element
The impact of mobilisation of existing areas of contamination causing a deterioration of groundwater quality.	**Scoped out** Contamination will not impact on the quantitative status of GWDTE and is assessed under chemical status. This test relates to the impacts of abstractions on the ecology of GWDTE.	**Scoped out** Contamination will not impact on quantitative status of dependent surface water bodies and is assessed under chemical status. This test assesses the impact of abstractions on dependent surface water flows	**Scoped out** (Saline Intrusion not identified as a potential impact Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES)	**Scoped out** Contamination will not impact on the water balance quantitative status Which assesses the impacts of abstraction against the available groundwater resource in the groundwater body	**Scoped out** Contamination will not impact on quantitative status of drinking water protected areas.	The impact significance as assessed in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES, assuming the implementation of the mitigation measures outlined in **Table 1.15**, particularly CoT10, CoT30, CoT35, CoT44, CoT90, CoT94 and CoT36, is negligible to minor.	**Scoped out** (see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).	**Scoped out** (see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).	**Scoped out** (see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).	**Scoped out**
The impact of reduced groundwater quantity or quality in aquifer units: Impact on existing groundwater abstractions.	**Scoped in** (see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES). For groundwater discharge to be important, the land drains and watercourses must be in continuity with locally important surface aquifers. Within the majority of the ZOI, land drains, watercourses and small ponds are underlain by clay rich deposits of glacial till or tidal flat deposits. These geological units do not contain significant groundwater and do not contribute significantly to surface flows. This is supported by the large number of small, isolated ponds across the study area and absence of abstractions, which reflect the low permeability of the underlying geology. The Lytham St Anne's Dunes SSSI citation states that the dunes support a wide range of species which vary according to the depth of water and degree of moisture retention in relation to the water table, however the groundwater at this location will be tidally influenced and saline water is expected in the saturated coastal sand and gravel deposits. Freshwater may be encountered if a lens forms above the saline water where dunes extend above MHWS. The construction of entry/exit pits, transition joint bays, onshore export cables, 400 kV grid connection cables and associated joint bays or link boxes will require dry excavations. Groundwater dewatering of open trenches and		**Scoped out** (Saline Intrusion not identified as a potential impact Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).		**Scoped in** for underlying aquifer units (see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES). Major adverse effect possible on licensed groundwater abstractions during construction. The approach outlined in CoT119 is proposed to reduce the impact on Licenced abstraction GW_01 to minor adverse. A private groundwater source risk assessment (CoT41, Table 1.15) shall be undertaken for any private groundwater supply sources identified on or near the onshore elements of the Transmission Assets through the survey of private water users. The risk assessment shall determine the required mitigation measures for each private water supply source.	**Scoped in** (As above – Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES). The significance of effect as assessed in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES, assuming the implementation of the mitigation measures outlined in **Table 1.15**, particularly CoT4, CoT09, CoT30, CoT35, CoT36 is negligible to minor. During construction the significance of effect was considered to be moderate adverse, however additional mitigation in the form of ground investigation will be completed within areas where potentially significant sources of contamination have been identified either within, or in close proximity to, the ZOI (CoT30, Table 1.16). Where ground	**Scoped out** (As above – see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions pf the ES).	**Scoped Out** (As above - Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).	**Scoped Out** (As above – see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).

Potential Impact	Quantitative Status					Chemical Status				
	Groundwater Dependent Terrestrial Ecosystems test	Dependent Surface Water Body Status	Saline Intrusion	Water Balance	Drinking Water Protected Area	General Chemical Test	Groundwater Dependent Terrestrial Ecosystems test	Dependent Surface Water Body Status	Saline Intrusion	Trend Assessment – Groundwater supporting element
	excavations may therefore be required through pumping. Groundwater levels will recover after construction assuming that the excavated materials are used as backfill and are not subject to artificial compaction. This will be controlled through the CoCP and the Surface Water and Groundwater Management Plan. An Outline CoCP (document reference J1) is provided, together with an Outline Surface Water and Groundwater Management Plan (document reference J1.9) as part of the application for development consent. An assessment of the potential significance of effect on the dune slacks in the SSSI is provided in Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.				Negligible effects are anticipated during the operational and decommissioning phases.	investigation identifies potential risks to sensitive receptors from any contamination identified, then a remediation strategy would be prepared.				
The impact of pollution caused by accidental spills/contaminant release during construction and decommissioning of the Transmission Assets.	**Scoped out** (see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).	**Scoped out** (see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).	**Scoped out** (Saline Intrusion not identified as a potential impact Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).	**Scoped out** contamination will not impact on quantitative status.	**Scoped out** contamination will not impact on quantitative status of drinking water protected areas.	The impact significance is minor, with the mitigation measures outlined in **Table 1.15,** particularly CoT04, CoT35. CoT36, implemented, as assessed in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES, and therefore no further mitigation is required to ensure groundwater quality is protected.	**Scoped out** (see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).		**Scoped out** (Saline intrusion not identified as a potential impact, see Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES).	**Scoped out** (based on the assessment undertaken in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES)
The Impact of heat generated by the onshore export cables on groundwater quality.	**Scoped out** See Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES. It is anticipated that any heat dissipation will be localised and confined to the areas immediately surrounding the onshore cables. On this basis, it is unlikely that there will be any impact on the quality or temperature of groundwater at its point of abstraction during operation. This impact is therefore excluded from further consideration.									

1.6.4 Protected area objectives

1.6.4.1 A number of protected areas listed on the WFD register of protected areas are located within the ZOI. These protected areas have their own monitoring and assessment requirements to determine their condition. They are often assessed for additional pollutants or requirements relevant to their designation. For example, faecal coliform levels are assessed within shellfish and bathing waters. Therefore, it is important that the standards required for these protected areas are also met. If they are not met, a water body which would otherwise meet the requirements of the WFD, may have the status reduced to 'less than good' as it is not meeting the protected area objectives. The water bodies within the ZOI that contain protected areas listed in the register of protected areas are detailed in **Table 1.10**.

1.6.4.2 As outlined in **section 1.4.4** and **Table 1.10**, the protected areas linked to the water bodies within the ZOI include drinking waters in the groundwaters, bathing waters in the Mersey Mouth coastal water body, shellfish waters and European sites in the Mersey Mouth and Ribble Estuary water bodies.

Drinking water protected areas

1.6.4.3 Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES, outlines that there is the potential to impact on licensed abstractions or existing Source Protection Zones (SPZ) and private groundwater supplies. **Table 1.17**, details the mitigation which will ensure that groundwater abstractions will not be significantly affected.

1.6.4.4 The mitigation strategy developed as part of the ongoing design of the project and 'measures adopted as part of the project', particularly CoT04, CoT09, CoT30, CoT90, CoT35 and CoT36 will ensure the quantity and quality of the drinking water sources will not be compromised by the Transmission Assets.

Recreational waters

1.6.4.5 There are a number of bathing waters associated with the Mersey Mouth coastal water body. As identified in the scoping tables for the Mersey Mouth in **Appendix B (Table 1.42)**, the Blackpool bathing waters are to the north of the Transmission Assets Order Limits, the St Annes North bathing water is within the Transmission Assets Order Limits whilst the St Annes North Bathing water is to the south. These bathing waters lie within one spring tidal excursion and have therefore the potential to be impacted by the landfall works.

1.6.4.6 Pathogens are unlikely to be a source of contamination as the working area will be fenced off in advance of construction and the land application of slurry and manures in the working area will not occur during construction. The location of septic tanks and their percolation area is not considered as a significant risk to bathing waters based on the bathing water profiles for the Blackpool and St Annes bathing waters. The 'Call of Nature' campaign was run by Morecambe Bay Partnership with the support of the North West Catchment Partnerships, which resulted in the development of user friendly materials to educate private sewage treatment plant owners in the

maintenance requirements and ways to identify causes for concern. Any potential for septic tanks and their percolation area to be located within the construction area will be noted in pre-construction record of condition surveys (CoT22, **Table 1.15**) and protective measures taken to ensure that they are not impacted. On this basis there will be no pathogen source within the working area during the construction period and therefore no potential to impact on the downstream coastal and transitional water bodies and associated bathing waters.

1.6.4.7 Nutrient export from the project will be limited with welfare facilities at the main compound and secondary compounds adequately managed through the site waste management plan included as part of the CoCP (CoT35, **Table 1.15**). Particulate phosphorus export from sediment laden water will be adequately managed through soil management measures and pollution prevention measures.

Economically significant waters (shellfish waters)

1.6.4.8 The Ribble Shellfish Designated water is located within the Mersey Mouth coastal water body and Ribble Estuary transitional water body. As outlined in **Section 1.4.4**, this designated shellfish water is within the one spring tidal excursion. However, the potential for impact on the shellfish designation is indirect in terms of run-off from the onshore construction activities via the Ribble Estuary transitional water body and through the construction of the landfall in the Mersey Mouth coastal water body. Each exit pit (six in total) of the direct pipe on the North Beach at Lytham St Annes will have a maximum area of drill exit pit of 875 m^2, with a depth of 3 m and a cofferdam will be installed to ensure significant sediment export from the exit pit of the direct pipe trenchless installation to the Mersey Mouth coastal water body will not occur. Similarly the use of trenchless techniques to cross the Ribble Estuary will ensure that there will not be significant sediment loading that would result in a significant effect on the shellfish designation. In addition the control measures during construction as outlined in **Table 1.16** will ensure that the protected area objectives for the shellfish waters including bacteriological, dangerous substances and suspended sediment will not be adversely affected.

Nutrient sensitive areas

1.6.4.9 There are no water bodies within the ZOI that have been designated as nutrient sensitive in the context of urban wastewater treatment.

1.6.4.10 There are no NVZs with the ZOI.

European sites (SACs/SPAs)

1.6.4.11 The provisions of the WFD Regulations 2017 only relate to water dependent habitats and species. The objective is to protect and, where necessary, improve the water environment to work towards achieving the conservation objectives for the water dependent features of these sites.

1.6.4.12 SACs associated with the water bodies that have the potential to be affected by the Transmission Assets include the Sefton Coast SAC which intersects both the Ribble Estuary and the Mersey Mouth water bodies. This SAC will not be directly affected by the Transmission Assets, however, there are potential indirect impacts from run-off the onshore corridors to the Ribble Estuary and the landfall at the Mersey Mouth which have hydrological connectivity with this site. The EA Guidance 'Clearing the Waters for All' (Environment Agency, 2017) recommends that protected areas that are greater than 2 km from the development area can be scoped out of the WFD assessment. The Sefton Coast SAC is approximately 12 km at its closest point to the Transmission Assets Order Limits and more than 15 km from the River Ribble crossing (which will be undertaken by direct pipe or micro-tunnelling trenchless techniques), therefore, there will be no likely significant effects on this SAC.

1.6.4.13 The Ribble and Alt Estuaries SPA is within the ZOI and is within both the Mersey Mouth and Ribble Estuary water bodies. The coastal habitats of this site support many nesting and migrating birds. The site is designated for an internationally important waterbird and seabird assemblage, more detail is provided in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. The key pressures and threats to the qualifying features of the SPA relate to public access/disturbance, commercial fishing and INNS. Given the length of the construction period, there will be a requirement that the landfall works are managed so as not to result in significant disturbance to the waterbird assemblage. The impact on the habitat that the birds use within the Mersey Mouth and Ribble Estuary will be limited and not significant given the use of trenchless techniques to cross the Ribble Estuary and to construct the landfall, and the implementation of pollution prevention measures as outlined in **Table 1.15** and **Table 1.16**. Biosecurity measures to prevent the spread of INNS will also be implemented during the construction phase. The mitigation measures proposed will not compromise the achievement of the conservation objectives of this European Site.

1.6.4.14 Liverpool Bay SPA incorporates all of the North Wales coastal water body. The site improvement plan for this SPA notes that water pollution from shipping and industry, particularly oil spills, represents a potential threat to the conservation status of the waterbird assemblage. Potential impacts with embedded mitigation from the Transmission Assets on surface water and groundwater status have been assessed in **Table 1.16** and **Table 1.18**. With the mitigation measures proposed the Transmission Assets will not compromise the achievement of the conservation objectives of this European Site.

1.6.4.15 On this basis the Transmission Assets will not compromise the protected area objectives for the water bodies impacted and therefore will not cause any deterioration in status or compromise the achievement of the objectives for the water bodies in question.

1.6.5 Achievement of the WFD objectives

1.6.5.1 During the River Basin Management cycle the EA have undertaken a characterisation of the water bodies, as is required under Article 5 of the

WFD, to establish the key pressures and associated pathways that are resulting in a status classification of less than good status. A programme of measures is then put in place to assist in the achievement of the WFD objectives. The key objective of the WFD was to achieve good ecological status or potential by 2015, however, extended timelines can apply where there are justifiable reasons (e.g., due to issues with disproportionate cost, affordability, technical difficulties or natural recovery times). In these instances, the objective of the achievement of good status may be the end of the second river basin management cycle in 2021, or the third river basin management cycle in 2027. Where good status is unlikely to be achieved then less stringent objectives can apply to a water body.

1.6.5.2 **Table 1.18** outlines the objectives for each water body within the ZOI and the key quality elements driving the status. The Significant Water Management Issues (SWMI), where known, resulting in a status of less than good are summarised and the measures that are recommended in the River Basin Management Plan to achieve the WFD objectives are identified. Currently there are a number of the water bodies that are not achieving good status and in some cases, as highlighted in **Table 1.18**, less stringent objectives will be necessary as certain water bodies are not predicted to be achieving good status by the end of the third river basin management cycle, (i.e., 2027). The final column of **Table 1.18** assesses the potential impact on the achievement of the WFD objectives and concludes for all water bodies, that the Transmission Assets will not prevent the achievement of the WFD objectives.

Table 1.18: Significant Water Management Issues (SWMI), source, programme of measures and assessment of impact of the Transmission Assets on the WFD objectives.

Water body name	Type	Overall status /Potential	Significant water management issue	Source activity	Examples of River Basin Management Plan measures	Objective	Derogation Type	Reason	Impact on WFD Objectives
Liggard Brook GB112071065650	River water body	Ecological – Moderate	Point Source from water industry	Sewage discharge (continuous)	Sewage treatment improvements by changes to licence conditions at specific sites.	Good by 2027	Extended Deadline	Disproportionate cost.	The SWMI for this water body is point sources from the water industry (continuous sewage discharges). Measures have been recommended in the North Western RBMP to ensure the achievement of the WFD objective. The construction, operation and decommissioning of the Transmission Assets will not prevent the implementation or effectiveness of these measures given the design mitigation and the pollution prevention measures proposed as part of the Transmission Assets and detailed in **Table 1.15**, **Table 1.16** and **Table 1.17**.
		Chemical – Fail	Measures delivered to address reason, awaiting recovery.	n/a	n/a	Good by 2063	Extended Deadline	Natural conditions: Chemical status recovery time.	Measures are already in place for these uPBTs which have been phased out of use. The persistence of this chemical requires ongoing monitoring to establish when the EQS is achieved (currently predicted as 2063). The phasing out of these compounds means that they will not be used for the Transmission and therefore will not prevent the natural recovery of the water body.
Main Drain (Ribble) GB112071065651	River water body	Ecological – Moderate	Point Source from water industry	Sewage discharge (continuous)	Sewage treatment improvements by changes to licence conditions at specific sites.	Good 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.	The SWMI for this water body is point sources from the water industry (continuous sewage discharges). Measures have been recommended in the North Western RBMP to ensure the achievement of the WFD objective. The construction, operation and decommissioning of the Transmission Assets will not prevent the implementation or effectiveness of these measures given the design mitigation and the pollution prevention measures proposed as part of the Transmission Assets and detailed in **Table 1.16**, **Table 1.17** and **Table 1.18**.

Water body name	Type	Overall status /Potential	Significant water management issue	Source activity	Examples of River Basin Management Plan measures	Objective	Derogation Type	Reason	Impact on WFD Objectives
		Chemical – Fail	Measures delivered to address reason, awaiting recovery	n/a	n/a	Good by 2063	Extended Deadline	Natural conditions: Chemical status recovery time	Measures are already in place for these uPBTs which have been phased out of use. The persistence of this chemical requires ongoing monitoring to establish when the EQS is achieved (currently predicted as 2063). The phasing out of these compounds means that they will not be used for the Transmission and therefore will not prevent the natural recovery of the water body.
Wrea Brook GB112071065680	River water body	Ecological – Moderate	Not identified	Not identified	n/a	Good by 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.	The SWMI for this water body is not identified and further investigation into the reason for not achieving good status are required. The Transmission Assets will not prevent the implementation of this investigative programme and based on the schedule of commitments (**Table 1.15**) will not prevent the water body from achieving its environmental objectives.
		Chemical – Fail	Measures delivered to address reason, awaiting recovery.	n/a	n/a	Good by 2063	Extended Deadline	Natural conditions: Chemical status recovery time.	Measures are already in place for these uPBTs which have been phased out of use. The persistence of this chemical requires ongoing monitoring to establish when the EQS is achieved (currently predicted as 2063). The phasing out of these compounds means that they will not be used for the Transmission and therefore will not prevent the natural recovery of the water body.
Dow Brook GB112071065670	River water body	Ecological – Moderate	Point Source from water industry.	Sewage discharge (continuous)	Sewage treatment improvements by changes to licence conditions at specific sites.	Good by 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.	The SWMI for this water body are point and diffuse agricultural sources and point sources from the water industry (sewage) domestic/general public (private sewage). Measures have been recommended in the North Western RBMP to ensure the achievement of the WFD objective. The construction of the Transmission Assets will not prevent the implementation or effectiveness of these measures given the design mitigation and the pollution prevention measures proposed as part of the Transmission Assets and detailed in **Table 1.16**, **Table 1.17** and **Table 1.18**. The construction will see the suspension of agricultural activities across the working area for the duration of the construction with full
			Diffuse source from agriculture.	Poor nutrient management	Catchment schemes e.g., farm nutrient management plans and soil testing, – improved farming practice. Championing the Farmed Environment provides advice to farmers on environmental improvements.				
			Point Source from water industry.	Sewage discharge (intermittent)	Sewage treatment improvements by changes to licence conditions at specific sites.				

Water body name	Type	Overall status /Potential	Significant water management issue	Source activity	Examples of River Basin Management Plan measures	Objective	Derogation Type	Reason	Impact on WFD Objectives
			Point Source from agriculture.	Farm/site infrastructure	Catchment Sensitive Farming Rural Development Programme England – various farm infrastructure improvements and wider agricultural practice.				reinstatement after the construction. There will be a reduction in nutrient export from the area during construction. The Dow Brook is also a HMWB and not all mitigation measures in the North Western RBMP have been implemented to allow the achievement of good ecological potential. However, the Transmission Assets will not prevent the long term achievement of these measures given the temporary nature of any physical modification to minor water courses (no main rivers are directly affected due to the use of trenchless techniques for the cable crossings).
			Point Source from domestic/general public.	Private Sewage Treatment	Morecambe Bay Partnership with the support of the North West Catchment Partnerships, which resulted in the development of user friendly materials to educate private sewage treatment plant owners into maintenance requirement and ways to identify causes for concern.				
		Chemical – Fail	Measures delivered to address reason, awaiting recovery.	n/a	n/a	Good by 2063	Extended Deadline	Natural conditions: Chemical status recovery time.	Measures are already in place for these uPBTs which have been phased out of use. The persistence of this chemical requires ongoing monitoring to establish when the EQS is achieved (currently predicted as 2063). The phasing out of these compounds means that they will not be used for the Transmission and therefore will not prevent the natural recovery of the water body.
Deepdale Brook GB112071065460	River water body	Ecological – Moderate	Diffuse source from agriculture.	Poor nutrient management.	Catchment schemes e.g., farm nutrient management plans and soil testing, – improved farming practice. Championing the Farmed Environment provides advice to farmers on environmental improvements.	Good by 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.	The SWMI for this water body are diffuse agricultural source due to poor nutrient management. The Transmission Assets will not impact on measures introduced in the North Western RBMP to address this matter nor will they increase the magnitude of this pressure given the design mitigation and the pollution prevention measures proposed as part of the Transmission Assets and detailed in **Table 1.16**, **Table 1.17** and **Table 1.18**.
			Point Source Domestic/General public	Private Sewage Treatment	Morecambe Bay Partnership with the support of the North West Catchment Partnerships, which resulted in the development of user friendly materials to educate private sewage treatment plant owners into maintenance requirement and ways to identify causes for concern.				Private sewage treatment will not be impacted by the Transmission Assets as pre-condition surveys and landowner engagement will ensure the infrastructure will avoid these features as required under CoT22, **Table 1.15**.

Water body name	Type	Overall status /Potential	Significant water management issue	Source activity	Examples of River Basin Management Plan measures	Objective	Derogation Type	Reason	Impact on WFD Objectives
		Chemical – Fail	Unknown (pending investigation)	Unknown (pending investigation)	n/a	Good by 2063	Extended Deadline	Natural conditions: Chemical status recovery time.	The cause for the failures in Benzo(b)fluoranthene are unknown and the measure is to investigate the source. The Transmission Assets will not prevent this measure from occurring or provide a source of this chemical to the receiving environment. As outlined above measures for mercury and PBDE are already in place as these chemicals are no longer in use.
Savick Brook GB112071065470	River water body	Ecological – Moderate	Diffuse sources from agriculture	Poor nutrient management	Catchment schemes e.g., farm nutrient management plans and soil testing, – improved farming practice. Championing the Farmed Environment provides advice to farmers on environmental improvements.	Good by 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.	The SWMI for this water body are diffuse agricultural source due to poor nutrient management. The Transmission Assets will not impact on measures introduced in the North Western RBMP to address this matter nor will they increase the magnitude of this pressure. Point sources from the water industry (intermittent discharges) and from domestic misconnections will not be impacted by the Transmission Assets. Measures to address these are regulatory or advisory and will not be impacted by the Transmission Assets.
			Point source from water industry	Sewage discharge (intermittent)	Sewage treatment improvements by changes to licence conditions at specific sites.				
			Point source from domestic/general public.	Misconnections					
		Chemical – Fail	Measures delivered to address reason, awaiting recovery.	n/a	n/a	Good by 2063	Extended Deadline	Natural conditions: Chemical status recovery time.	Measures are already in place for these uPBTs which have been phased out of use. The persistence of this chemical requires ongoing monitoring to establish when the EQS is achieved (currently predicted as 2063). The phasing out of these compounds means that they will not be used for the Transmission and therefore will not prevent the natural recovery of the water body.

Water body name	Type	Overall status /Potential	Significant water management issue	Source activity	Examples of River Basin Management Plan measures	Objective	Derogation Type	Reason	Impact on WFD Objectives
Lancaster Canal, cruising section GB71210228	Artificial Water Body	Ecological – Moderate	Physical modification.	Navigation including ports.	Under investigation.	Good by 2027	Extended Deadline	Disproportionately expensive: Disproportionate burdens.	Investigations are underway to identify the mitigation measures required to ensure this artificial water body achieves good ecological potential. These investigations will not be affected by the Transmission Assets as the Project is downstream of the canal and there is not potential for direct or indirect impact.
		Chemical – Fail	Unknown (pending investigation).	Unknown (pending investigation).	Investigation into Reason for 'Not Achieving Good Status'.	Good by 2063	Extended Deadline	Natural conditions: Chemical status recovery time.	Measures are already in place for these uPBTs which have been phased out of use. The persistence of this chemical requires ongoing monitoring to establish when the EQS is achieved (currently predicted as 2063). The phasing out of these compounds means that they will not be used for the Transmission and therefore will not prevent the natural recovery of the water body.
Ribble Estuary GB531207112400	Transitional water body	Ecological – Bad	Point source from water industry.	Sewage discharge (continuous).	Sewage treatment improvements by changes to licence conditions at specific sites.	Good by 2027	n/a	n/a	The driving element for the less than good status is nutrient levels that are impacting on the Phytoplankton. The main source is from continuous sewage discharges. The Transmission Assets will not introduce any significant additional loading to the wastewater infrastructure during the operation nor will there be significant additional nutrient run-off during construction due to the mitigation measures to prevent run-off from the working areas under the CoCP and supporting management plans (COT35, **Table 1.15**). On this basis the Transmission Assets will not prevent the achievement of good status in this water body.
		Chemical – Fail	Unknown (pending investigation) for benzo(b)fluoranthene. Measures delivered to address reason for Mercury and PBDE, awaiting recovery.	Unknown (pending investigation).	Investigation into Reason for Not Achieving Good Status.	Good by 2063	Extended deadline	Natural conditions: Chemical status recovery time.	The cause for the failures in Benzo(b)fluoranthene are unknown and the measure is to investigate the source. The Transmission Assets will not prevent this measure from occurring or provide a source of this chemical to the receiving environment. As outlined above, measures for mercury and PBDE are already in place as these chemicals are no longer in use.

Water body name	Type	Overall status /Potential	Significant water management issue	Source activity	Examples of River Basin Management Plan measures	Objective	Derogation Type	Reason	Impact on WFD Objectives
Mersey Mouth GB641211630001	Coastal water body	Ecological – Moderate	Unknown (pending investigation).	Unknown (pending investigation).	Investigation into 'Reason for Not Achieving Good Status'.	Good by 2027	Extended deadline	Disproportionately expensive: Disproportionate burdens.	Investigations are required to identify the source of the pressure resulting in the impact so that measures can be recommended. The driving element for the less than good status is nutrient levels that are impacting on the Phytoplankton. The Transmission Assets will not introduce any significant additional loading to the wastewater infrastructure during the operation nor will there be significant additional nutrient run-off during construction due to the control measure to prevent run-off from the working areas. On this basis the Transmission Assets will not prevent the achievement of good status in this water body.
		Chemical – Fail	Unknown (pending investigation) for Benzo(g-h-i)perylene. Measures delivered to address reason for Mercury and PBDE, awaiting recovery.	Unknown (pending investigation).	Investigation into Reason for 'Not Achieving Good Status'.	Good by 2063	Extended deadline	Natural conditions: Chemical status recovery time.	The cause for the failures in Benzo(g-h-i) peryleneare unknown and the measure is to investigate the source. The Transmission Assets will not prevent this measure from occurring or provide a source of this chemical to the receiving environment. As outlined above measures for mercury and PBDE are already in place as these chemicals are no longer in use.
West Lancashire Quaternary Sand and Gravel Aquifers GB41202G912700	Groundwater body	Quantitative Status – Good	n/a	n/a	n/a	n/a	n/a	n/a	This water body is achieving its environmental objective and the commitments and mitigation outlined in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES and **Table 1.17** will ensure the status is protected.
		Qualitative Status – Good	n/a	n/a	n/a	n/a	n/a	n/a	
Fylde Permo-Triassic Sandstone Aquifers GB41201G100500	Groundwater body	Quantitative Status – Poor	Not identified but assume that it is abstraction related.	Not Identified	Various measures to address abstraction pressures.	Good by 2027	Extended deadline	Disproportionately expensive: Disproportionate burdens.	Measures recommended in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES and summarised in **Table 1.17**, will ensure the Transmission Assets will not have a significant impact on abstractions within the ZOI and therefore will not prevent the achievement of the objective for this water body.
		Qualitative Status – Good	n/a	n/a	n/a	n/a	n/a	n/a	This water body is achieving its environmental objective and the commitments and mitigation outlined in the Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES will ensure the status is protected.

1.7 Assessment summary and conclusion

1.7.1.1 A WFD assessment has been undertaken for the onshore elements of the Transmission Assets. The assessment is based on guidance developed by the EA and Planning Inspectorate and is undertaken in a staged approach to ensure that those components of the Transmission Assets and the associated activities are assessed in the context of the quality elements that contribute to overall WFD status.

1.7.1.2 The key focus of the assessment was to ensure that the landfall and onshore elements of the Transmission Assets do not result in a deterioration in the current WFD status based on the 2019 baseline as reported in the North West River Basin Management Plan 2022-2027 and also to ensure that the project does not compromise the achievement of the WFD objectives for the improvement in the overall status of the water bodies which could be affected. The assessment also considers the protected areas linked to the water bodies in question and ensures that the protected area objectives are also unaffected.

1.7.1.3 The scoping stage of the WFD assessment has concluded that there were a number of components and activities associated with landfall and onshore elements of the Transmission Assets that represented a risk to the WFD status and objectives and therefore were scoped into the assessment. The relevant quality elements contributing to the overall status were considered and how each potential impact could affect these.

1.7.1.4 The overall conclusion of the WFD assessment is that there will be no risk of deterioration in status or the prevention of the achievement of the objectives for the relevant water bodies nor will the protected area objectives be compromised.

1.8 References

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Table 1.19: Surface water status

Operational catchment	Water body name and ID	Water body type	Heavily modified or artificial water body	Ecological Status/Potential						Chemical Status			Element driving status	
				Hydrological regime	Morphology (Mitigation Measures assessment)	Specific pollutants	Physio-chemical quality elements	Biological quality elements	Overall ecological status/potential	Priority substances	Priority hazardous substances	Overall chemical status	Ecological	Chemical
Savick Brook and Fylde South Drains	Liggard Brook GB112071065650	River	Yes	Supports Good	(Moderate or less)	High	Moderate	Bad	Moderate	Good	Fail	Fail	Mitigation Measures for HMWB	Mercury and its compounds and Polybrominated diphenyl ethers
Savick Brook and Fylde South Drains	Main Drain (Ribble) GB112071065651	River	Yes	Supports Good	(Moderate or less)	High	Moderate	Bad	Moderate	Good	Fail	Fail	Mitigation Measures for HMWB	Mercury and its compounds and Polybrominated diphenyl ethers
Savick Brook and Fylde South Drains	Wrea Brook GB112071065680	River	Yes	High	(Moderate or less)	-	-	-	Moderate	Good	Fail	Fail	Mitigation Measures for HMWB	Mercury and its compounds and Polybrominated diphenyl ethers
Savick Brook and Fylde South Drains	Dow Brook GB112071065670	River	Yes	High	(Moderate or less)	High	Moderate	Bad	Moderate	Good	Fail	Fail	Mitigation Measures for HMWB	Mercury and its compounds and Polybrominated diphenyl ethers
Savick Brook and Fylde South Drains	Deepdale Brook GB112071065460	River	No	Supports Good	Supports Good	High	Moderate	Moderate	Moderate	Good	Fail	Fail	Invertebrates Ammonia Phosphorus	Benzo(b)fluoranthene Mercury and its compounds Polybrominated diphenyl ethers
Savick Brook and Fylde South Drains	Savick Brook GB112071065470	River	Yes	High	(Moderate or less)	High	Moderate	Moderate	Moderate	Good	Fail	Fail	Mitigation Measures for HMWB Invertebrates Fish Phosphate	Mercury and its compounds and Polybrominated diphenyl ethers
Savick Brook and Fylde South Drains	Lancaster Canal, cruising section GB71210228	Canal (AWB)	Yes	-	(Moderate or less)	-	High	-	Moderate	Good	Fail	Fail	Mitigation Measures for AWB	Mercury and its compounds and Polybrominated diphenyl ethers
Ribble	Ribble Estuary GB531207112400	Transitional	Yes	-	(Moderate or Less)	High	High	Bad	Bad	Good	Fail	Fail	Phytoplankton	Benzo(b)fluoranthene Mercury and its compounds Polybrominated diphenyl ethers
Mersey Mouth	Mersey Mouth GB641211630001	Coastal	Yes	-	(Moderate or less)	High	Moderate	Moderate	Moderate	Good	Fail	Fail	Mitigation Measures for HMWB Phytoplankton	Benzo(g-h-i)perylene Mercury and its compounds Polybrominated diphenyl ethers

Table 1.20: Groundwater status

Water body name and ID	Quantitative status				Chemical status						Overall water body status	Driving element
	Groundwater Dependent Terrestrial Ecosystems test	Dependent surface water body status	Saline intrusion	Water balance	Drinking water protected area	General chemical test	Groundwater Dependent Terrestrial Ecosystems test	Dependent surface water body status	Saline intrusion	Trend assessment – groundwater supporting element		
West Lancashire Quaternary Sand and Gravel Aquifers GB41202G912700	Good	Good	Good	Good	Good	Good	Good	Good	Good	No Trend	Good	NA Achieving objective
Fylde Permo-Triassic Sandstone Aquifers GB41201G100500	Good	Good	Good	Poor	Good	Good	Good	Good	Good	No Trend	Poor	Quantitative – Water Balance

Appendix B: WFD Scoping Assessment

B.1 WFD Scoping Assessment – Ribble Transitional Water Body

B.1.1 WFD assessment: scoping template for activities in estuarine and coastal waters

The text in this appendix is taken from the Environment Agency WFD scoping assessment template.

'Use this template to record the findings of the scoping stage of your WFD assessment for an activity in an estuary or coastal water. If your activity will:

- *take place in or affect more than one water body, complete a template for each water body; and*
- *include several different activities or stages as part of a larger project, complete a template for each activity as part of your overall WFD assessment The WFD assessment guidance for estuarine and coastal waters will help you complete the table.'*

Table 1.21: Ribble transitional water body introduction to proposed activity

Your activity	*Description, notes or more information*
Applicants name	*Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL).*
Application reference number (where applicable)	*N/A*
Name of activity	*Morgan and Morecambe Offshore Wind Farms: Transmission Assets*

Your activity	Description, notes or more information
Brief description of activity	*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.* *Key elements include* ***Landfall:*** • *landfall site: this is where the offshore export cables are jointed to the onshore export cables. This term applies to the entire landfall area between Mean Low Water Springs (MLWS) and the transition joint bay. This includes all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).* ***Onshore elements:*** • *onshore export cables: these cables will link the landfall site and the proposed onshore substations;* • *onshore substations: the proposed substations containing the components for transforming the power supplied via the onshore export cables up to 400 kV; and* • *400 kV grid connection cables: these 400 kV cables will connect the proposed onshore substations to the existing National Grid Penwortham substation. Circuit breaker infrastructure may also be required within the 400 kV grid connection cable corridor.*
Location of activity (central point XY coordinates or national grid reference)	*British National Grid 347100, 428300*
Footprint of activity (ha)	*Approximately 500 ha based on the maximum design scenario for the landfall, onshore cable corridor (permanent and temporary requirements), Grid connection cable corridor (permanent and temporary requirements) and the onshore substation footprint.*
Timings of activity (including start and finish dates)	*Construction programme of approximately 66 months for onshore elements, assuming sequential construction.*
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	*The indicative capacity of the Morgan Offshore Windfarm Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets is 1,500 MW. The onshore infrastructure will consist of up to 18 onshore export cables buried in up to six trenches and two onshore High Voltage Alternating Current (HVAC) substation to allow the power to be transferred to the National Grid via the existing National Grid Penwortham substation.*

Your activity	Description, notes or more information
Use or release of chemicals (state which ones)	*Chemicals used on site will be mainly oils and diesel fuels during construction, however there will be no direct release of chemicals.*

Table 1.22: Ribble transitional water body description of the Ribble WFD water body

Water body[1]	Description, notes or more information
WFD water body name	*Ribble*
Water body ID	*GB531207112400*
River basin district name	*North West*
Water body type (estuarine or coastal)	*Transitional*
Water body total area (ha)	*4077*
Overall water body status (2022)	*Bad*
Ecological status	*Bad*
Chemical status	*Fail*
Target water body status and deadline	*Ecological Status – Good (2027), Chemical Status – Good 2063 (Natural recovery)*
Hydromorphology status of water body	*Not high*
Heavily modified water body and for what use	*Yes- Flood Protection*

[1] Water body information can be found in the Environment Agency's catchment data explorer and the water body summary table. Magic maps provide additional information on habitats and protected areas. Links to these information sources can be found in the WFD assessment guidance for estuarine and coastal waters

Water body[1]	Description, notes or more information
Higher sensitivity habitats present	*Saltmarsh is present within the water body which could be indirectly impacted by the Transmission Assets through crossing of the Ribble Estuary by HDD or from onshore run-off*
Lower sensitivity habitats present	*Intertidal Soft Sediment is the lower sensitivity habitat present within the Transmission Assets Order Limits*
Phytoplankton status	*Bad*
History of harmful algae	*n/a*
WFD protected areas within 2 km	*Ribble Shellfish Water, Ribble and Alt Estuaries SPA, Sefton Coast SAC*

B.1.2 Specific risk information

'Consider the potential risks of your activity to each of these receptors: hydromorphology, biology (habitats and fish), water quality and protected areas. Also consider INNS.'

B.1.2.1 Section 1: Hydromorphology

'Consider if hydromorphology is at risk from your activity.

Use the water body summary table to find out the hydromorphology status of the water body, if it is classed as heavily modified and for what use.'

Table 1.23: Ribble transitional water body identification of hydromorphology risk issues

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		✓	*No. The onshore landfall, export cable, substation and grid connection cable will have no direct impact on this transitional water body and will not result in any physical changes to the water body as the crossing of the estuary is proposed by conventional tunnelling*
Could significantly impact the hydromorphology of any water body		✓	*Whilst there may be temporary impacts for the river water bodies traversed by the cable corridors and the realignment of a minor water course for the onshore substation has the potential to impact on these water bodies there will be no impact to this transitional water body as trenchless crossing methods are proposed for the crossing.*
Is in a water body that is heavily modified for the same use as your activity		✓	*Not modified for the same activity. Ribble transitional Water body is designated as a HMWB for flood protection and is currently moderate for the mitigation measures 'assessment meaning that at least one Mitigation Measure that is required in this water body has not yet been implemented – so the Mitigation Measure Assessment has not reached 'Good'. It is not possible for this water body to achieve GEP even if all the other relevant elements in the water body are 'Good.'* *The mitigation measures required relate to alteration to flood defence structures. The potential impact from the onshore infrastructure will have no impact on the ability to implement these measures nor will it result in any changes to the supporting morphological condition in the transitional water body, particularly as trenchless technologies are proposed for the crossing, except potential changes to sediment volumes from run-off from the working area which will be controlled by measures with the code of construction practice*

B.1.2.2 Section 2: Biology

Habitats

Consider if habitats are at risk from your activity.

Use the water body summary table and Magic maps, or other sources of information if available, to find the location and size of these habitats.'

Table 1.24: Ribble transitional water body identification of sensitive habitats

Higher sensitivity habitats [2]	*Lower sensitivity habitats*[3]
Saltmarsh	*Intertidal soft sediments like sand and mud*

Table 1.25: Ribble transitional water body biology habitats risk issues

Consider if the footprint[4] *of your activity is:*	*Yes*	*No*	*Biology habitats risk issue(s)*
0.5 km^2 or larger		✓	*No: The crossing of this water body will be undertaken by trenchless methods and there will therefore be no direct impact on the Ribble Transitional Water Body . Therefore the footprint of the activity associated with the Transmission Assets in this water body is zero, i.e., <0.5 km^2.*
1% or more of the water body's area		✓	*The footprint of the activity associated with the Transmission Assets in this water body is zero, i.e., < 1% of the water body area.*
Within 500 m of any higher sensitivity habitat	✓		*Yes: The location of the crossing point of the Ribble means the entry and exit pits at either side of the estuary are likely to be within 500 metres of saltmarsh habitat.*

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

[3] Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures

[4] Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
1% or more of any lower sensitivity habitat		✓	*No: Footprint not 1% or more of any lower sensitivity habitat.*

Fish

'Consider if fish are at risk from your activity, but only if your activity is in an estuary or could affect fish in or entering an estuary.'

Table 1.26: Ribble transitional water body biology fish risk issues

Consider if your activity:	Yes	No	Biology fish risk issue(s)
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.		✓	*No: The works do not have the potential to delay or prevent fish entering the Ribble Estuary. Construction works for the landfall and onshore elements of the proposal will take place within river water body catchments and in the intertidal area of the Mersey Mouth coastal water body and not the estuary.* *The potential for EMF to impact fish species has been studied extensively, particularly the interference with species such as Atlantic Salmon and the impairment of migration and navigation. The operation of offshore wind energy projects is not expected to negatively affect commercial and recreational fishes. A study by the U.S. Department of the Interior, Bureau of Ocean Energy Management within the south New England area found Negligible effects, if any, on bottom-dwelling species and no negative effects on pelagic species are expected due to their distance from the power cables buried in the seafloor (CSA Ocean Sciences Inc., 2019).*
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).	*N/A*	*N/A*	
Could cause entrainment or impingement of fish.	*N/A*	*N/A*	

B.1.2.3 Section 3: Water quality

'Consider if water quality is at risk from your activity.

Use the water body summary table to find information on phytoplankton status and harmful algae.'

Table 1.27: Ribble transitional water body water quality risk issues

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days).	✓		*A broad range of potential pollutants, such as hydrocarbons i.e., fuels, can accumulate on surfaces of the working area as a result of a fuel leakage or spills. These can subsequently be washed off during high rainfall/storm events, polluting the receiving waterbodies and should therefore be assessed further.* *During the construction phase, there is a potential risk of accumulation of standing water on the application site and accidental discharges of untreated run-off whilst the temporary and operational surface water drainage system is being constructed. Given that the estimated construction phase for the proposed development is estimated to be 66 months based on sequential construction, the impacts associated with the construction phase must be assessed further.* *The Dissolved Inorganic Nitrogen (DIN) and dissolved oxygen (DO) levels for this water body are good. Particulate bound nutrients could find a pathway to this coastal water body through Hydrological links.* *Pathogens from the land application of slurries and manures will not be a source of contamination as the working area will be fenced off in advance of construction and the land application of slurry and manures in the working area will not occur in advance of construction. The location of septic tanks and their percolation area is not considered as a significant risk to bathing waters however work has been undertaken by the Morecambe Bay Partnership with the support of the North West Catchment Partnerships, which resulted in the development of user friendly materials to educate private*

Consider if your activity:	Yes	No	Water quality risk issue(s)
			sewage treatment plant owners into maintenance requirement and ways to identify causes for concern. Any potential for septic tanks and their percolation area will be noted in pre-construction record of condition surveys and protective measures taken to ensure that they are not impacted. *On this basis there will be no pathogen source within the working area during the construction period and therefore no potential to impact on the downstream transitional or coastal water bodies and associated bathing waters.* *The operation and maintenance activities are unlikely to generate contaminated runoff and thus there will be low potential for likely significant effects with regards to pollution. The Planning Inspectorate agreed that impact of contaminated runoff on the chemical and biological status of surface water receptors arising from the operation and maintenance of the onshore transmission assets can be scoped out of further assessment.* *The decommissioning phase is expected to have no greater impact than the construction phase.*
Is in a water body with a phytoplankton status of moderate, poor or bad	✓		*Phytoplankton classification is Bad.* *However the construction, operational and decommissioning phases of the development are unlikely to present significant sources of nutrients that would result in further impact to this status element.*
Is in a water body with a history of harmful algae		✓	*The bathing water profiles for the area were consulted (https://environment.data.gov.uk/wales/bathing-waters/profiles/) and note that blooms of the algae Phaeocystis do occur along this coastline during warm and calm weather in May and June. This typically produces a cream or brown coloured scum along the water's edge. The risks to human health from contact, ingestion or inhalation with marine algae that currently occur in UK coastal waters are considered to be low.*

Consider if your activity:	Yes	No	Water quality risk issue(s)
			It is assumed for the purpose of this assessment that harmful algal blooms are therefore not a common occurrence in this coastal water body.

Consider if water quality is at risk from your activity through the use, release or disturbance of chemicals.

Table 1.28: Ribble transitional water body water quality risk issues (chemical)

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list.	✓		*During the construction phase, there is a potential risk of accumulation of standing water on the application site and accidental discharges of untreated run-off whilst the temporary and the operational surface water drainage system is being constructed.* *During construction a broad range of potential pollutants which may include chemicals from the EQSD list can accumulate on surfaces. These can subsequently be washed off during high rainfall/storm events, polluting the receiving waterbodies and should therefore be assessed further.* *The operation and maintenance activities are unlikely to generate contaminated runoff and thus there will be low potential for likely significant effects with regards to pollution. The Planning Inspectorate agreed that impact of contaminated runoff on the chemical and biological status of surface water receptors arising from the operation and maintenance of the onshore transmission assets can be scoped out of further assessment.*
It disturbs sediment with contaminants above Cefas Action Level 1.		✓	*There will be no disturbance of sediment within the Marine environment as part of the Onshore infrastructure.*

Table 1.29: Ribble transitional water body water quality risk issues (mixing zone)

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	*Yes*	*No*	*Water quality risk issue(s)*
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list.		✓	*There will be no direct discharges of chemicals into the coastal water body and no associated mixing zone.*

B.1.2.4 Section 4: WFD protected areas

'Consider if WFD protected areas are at risk from your activity. These include:

- *special areas of conservation (SAC);*
- *special protection areas (SPA);*
- *shellfish waters;*
- *bathing waters; and*
- *nutrient sensitive areas.'*

Use Magic maps to find information on the location of protected areas in your water body (and adjacent water bodies) within 2 km of your activity.

Table 1.30: Ribble transitional water body protected areas risk issues

Consider if your activity is:	*Yes*	*No*	*Protected areas risk issue(s)*
Within 2 km of any WFD protected area[6]	✓		***SPA - Ribble and Alt Estuaries SPA*** *The Site Improvement Plan (SIP) for this SPA notes that the key pressures and threats to the qualifying features of the SPA relate to public access/disturbance, commercial fishing and Invasive and non-native species (INNS). Therefore it will be important to ensure the construction and operation of the Transmission Assets does not prevent the restoration of favourable conservation status and particularly the spread of INNS.* ***Bathing Waters*** *No Bathing Waters in this water body and the Transmission Assets Order Limits within the Ribble Estuary is more than 2 km from the nearest bathing water in the Mersey Mouth coastal water body. Pathogens from the land application of slurries and manures will not be a source of contamination as the working area will be fenced off in advance of construction and the land application of slurry and manures in the working area will not occur in advance of construction. The location of septic tanks and there percolation area is not considered as a significant risk to bathing waters based on a review of bathing water profile. Any potential for septic tanks and their percolation area will be noted in pre-construction record of condition surveys and protective measures taken to ensure that they are not impacted.* *On this basis there will be no pathogen source within the working area during the construction period and therefore no potential to impact on the downstream Transitional water body and associated bathing waters.* ***Shellfish Waters*** *The Ribble Shellfish Designated water is located within the Mersey Mouth coastal water body and the Ribble Estuary transitional water body. This protected area is located within the seabed and coastal areas that may be influenced by changes to physical processes due to the Transmission Assets Order Limits, (defined in Volume 2, Chapter 1: Physical processes of the ES) as one Spring Tidal Excursion.*

'Record the findings for WFD protected areas and go to section 5: invasive non-native species.'

B.1.2.5 Section 5: Invasive non-native species (INNS)

'Consider if there is a risk your activity could introduce or spread INNS.

Risks of introducing or spreading INNS include:

- *materials or equipment that have come from, had use in or travelled through other water bodies; and*
- *activities that help spread existing INNS, either within the immediate water body or other water bodies.'*

Table 1.31: Ribble transitional water body INNS risk issues

Consider if your activity could:	*Yes*	*No*	*INNS risk issue(s)*
Introduce or spread INNS		✓	*The negative effects of invasive non- native species has been risk assessed as part of the River Basin Management Plan. High Impact Species can impact on the ecological status of a water body.* *The Onshore infrastructure development in the Ribble Estuary is unlikely to result in the spread of INNS in the transitional water body, the key high impact species recorded were riparian species, Himalayan Balsam and Giant Hogweed and therefore it is not considered further in this assessment. The risk to river water bodies is assessment in the main WFD Technical Annex.*

'Record the findings for INNS and go to the summary section.

B.1.3 Summary

Summarise the results of scoping here.'

Table 1.32: Ribble transitional water body summary of risk issues

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	*No*	*The Ribble transitional Water body is a heavily modified water body with the specified use being Flood Protection Use. The mitigation measures assessment is moderate - which means that EA and other responsible bodies have yet to implement all the relevant and required mitigation measures in the water body. Until the water body mitigation measures are implemented the water body will not achieve good ecological potential irrespective of the status of the other contributing elements. The mitigation measures required relate to alteration to flood defence structures. The onshore infrastructure will have no impact on the ability to implement these measures nor will it result in any changes to the supporting morphological condition in the transitional water body given that trenchless methods for crossing the estuary are proposed.*
Biology: habitats	*Yes*	*Footprint of entry and exit pits for the direct pipe or micro-tunnelling crossing of the Ribble Estuary are likely to be within 500 metres of a high sensitivity habitat i.e., saltmarsh*
Biology: fish	*No*	*Fish migration in the marine or freshwater environment will not be at risk from the proposed activities*
Water quality	*Yes*	*A broad range of potential pollutants which may include chemicals from the EQSD list can accumulate on surfaces during construction. These can subsequently be washed off during high rainfall/storm events, polluting the receiving waterbodies and should therefore be assessed further.* *During the construction phase, there is a potential risk of accumulation of standing water on the Application Site and accidental discharges of untreated run-off whilst the temporary and the operational surface water drainage system is being constructed.* *Potential risk of contamination from the operation and maintenance activities have been scoped out with agreement form the Planning Inspectorate*
Protected areas	*Yes*	*The following protected areas are all within 2km of the Transmission Assets Order Limits* *SPA – Ribble and Alt Estuaries SPA* *Shellfish Waters - Ribble*

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Invasive non-native species	*No*	*The landfall and onshore infrastructure is unlikely to result in the spread of INNS in the transitional water body and therefore it is not considered further in this assessment.*

'If you haven't identified any receptors at risk during scoping, you don't need to continue to the impact assessment stage and your WFD assessment is complete.

If you've identified one or more receptors at risk during scoping, you should continue to the impact assessment stage.

Include your scoping results in the WFD assessment document you send to your activity's regulator as part of your application for permission to carry out the activity.'

B.2 WFD Scoping Assessment – Mersey Mouth Coastal Water Body

B.2.1 WFD assessment: scoping template for activities in estuarine and coastal waters

'Use this template to record the findings of the scoping stage of your WFD assessment for an activity in an estuary or coastal water. If your activity will:

- *take place in or affect more than one water body, complete a template for each water body; and*
- *include several different activities or stages as part of a larger project, complete a template for each activity as part of your overall WFD assessment The WFD assessment guidance for estuarine and coastal waters will help you complete the table.'*

Table 1.33: Mersey mouth coastal water body introduction to proposed activity

Your activity	*Description, notes or more information*
Applicants name	*Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL).*
Application reference number (where applicable)	*N/A*
Name of activity	*Morgan and Morecambe Offshore Wind Farms: Transmission Assets*
Brief description of activity	*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.* *Key elements include:* ***Landfall:*** *landfall site: this is where the offshore export cables are jointed to the onshore export cables. This term applies to the entire landfall area between Mean Low Water Springs (MLWS) and the transition joint bay. This includes all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).* ***Onshore elements:*** *onshore export cables: these cables will link the landfall site and the proposed onshore substations;*

Your activity	Description, notes or more information
	onshore substations: the proposed substations containing the components for transforming the power supplied via the onshore export cables up to 400 kV; and *400 kV grid connection cables: these 400 kV cables will connect the proposed onshore substations to the existing National Grid Penwortham substation. Circuit breaker infrastructure may also be required within the 400 kV grid connection cable corridor.*
Location of activity (central point XY coordinates or national grid reference)	*British National Grid 330500, 430685*
Footprint of activity (ha)	*Approximately 500 ha based on the maximum design scenario for the landfall, onshore cable corridor (permanent and temporary requirements), Grid connection cable corridor (permanent and temporary requirements) and the onshore substation footprint.*
Timings of activity (including start and finish dates)	*Construction programme of approximately 66 months for onshore elements based on sequential construction.*
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	*The indicative capacity of the Morgan Offshore Windfarm Project: Generation Assets and the Morecambe Offshore Windfarm: Generation Assets is 1,500 MW. The onshore infrastructure will consist of up to 18 onshore export cables buried in up to six trenches and two onshore High Voltage Alternating Current (HVAC) substation to allow the power to be transferred to the National Grid via the existing Penwortham National Grid substation*
Use or release of chemicals (state which ones)	*Chemicals used on site will be mainly oils and diesel fuels during construction, however there will be no direct release of chemicals.*

Table 1.34: Mersey mouth coastal water body description of the Mersey mouth water body

Water body[1]	Description, notes or more information
WFD water body name	*Mersey Mouth*
Water body ID	*GB531207112400*
River basin district name	*North West*
Water body type (estuarine or coastal)	*Coastal*
Water body total area (ha)	*42120*
Overall water body status (2022)	*Moderate*

Water body[1]	Description, notes or more information
Ecological status	Moderate
Chemical status	Fail
Target water body status and deadline	Ecological Status - Good (2027) Chemical Status – Good 2063 (Natural recovery)
Hydromorphology status of water body	Not high
Heavily modified water body and for what use	Yes- Coastal Protection
Higher sensitivity habitats present	No Sensitive habitats present
Lower sensitivity habitats present	Habitat present within the Transmission Assets Order Limits Subtidal Soft Sediment (Sand, Mud and Mixed A5.2, A5.3, A5.4) Intertidal Soft Sediment (Sand, Mud and Mixed A2.2, A2.3, A2.4)
Phytoplankton status	Moderate
History of harmful algae	n/a
WFD protected areas within 2km	Ribble Shellfish Water Ribble and Alt Estuaries SPA Sefton Coast SAC Liverpool Bay SPA

[1] Water body information can be found in the Environment Agency's catchment data explorer and the water body summary table. Magic maps provide additional information on habitats and protected areas. Links to these information sources can be found in the WFD assessment guidance for estuarine and coastal waters.

B.2.2 Specific risk information

Consider the potential risks of your activity to each of these receptors: hydromorphology, biology (habitats and fish), water quality and protected areas. Also consider invasive non-native species (INNS).

B.2.2.1 Section 1: Hydromorphology

Consider if hydromorphology is at risk from your activity.

Use the water body summary table to find out the hydromorphology status of the water body, if it is classed as heavily modified and for what use.

Table 1.35: Mersey mouth coastal water body identification of hydromorphology risk issues

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	✓		*Yes. The onshore landfall will have potential for direct impact on this Coastal water body. Indirect impacts to coastal water body via hydrological pathways from the onshore corridor traversing river water bodies*
Could significantly impact the hydromorphology of any water body		✓	*Whilst there may be temporary impacts for the river water bodies traversed by the cable corridors and the realignment of a minor water course for the onshore substation has the potential to impact on these water bodies there will be no impact to this coastal water body.*
Is in a water body that is heavily modified for the same use as your activity		✓	*Not modified for the same activity. Mersey Mouth Coastal Water body is designated as a HMWB for coastal protection and is currently moderate for the mitigation measures 'assessment meaning that at least one Mitigation Measure that is required in this water body hasn't yet been implemented – so the Mitigation Measure Assessment has not reached 'Good'. It is not possible for this water body to achieve GEP even if all the other relevant elements in the water body are 'Good'.* *The potential impact from the onshore infrastructure will have no impact on the ability to implement these measures nor will it result in any changes to the supporting morphological condition in the transitional water body except potential changes to sediment volumes from run-off from the working area which will be controlled by measures with the code of construction practice*

B.2.2.2 Section 2: Biology

Habitats

Consider if habitats are at risk from your activity.

Use the water body summary table and Magic maps, or other sources of information if available, to find the location and size of these habitats.

Table 1.36: Mersey mouth coastal water body identification of sensitive habitats

Higher sensitivity habitats [5]	*Lower sensitivity habitats* [6]
	Subtidal Soft Sediment (Sand, Mud and Mixed A5.2, A5.3, A5.4)
	Intertidal Soft Sediment (Sand, Mud and Mixed A2.2, A2.3, A2.4)

Table 1.37: Mersey mouth coastal water body biology habitats risk issues

Consider if the footprint[7] *of your activity is:*	*Yes*	*No*	*Biology habitats risk issue(s)*
0.5km^2 or larger		✓	*No: The landfall will be undertaken by direct pipe installation from the beach and include railway, road, dunes and coastal path. The MDS for the landfall construction requires cable pull in, cofferdams for the exit pits and open cut trenching on the beach with a combined area of 0.015 km^2 within the coastal water body.*
1% or more of the water body's area		✓	*the footprint of the landfall activity associated with the Transmission Assets in this water body is < 1% (0.015 km^2) of the water body area when the cable pull in, cofferdams and open cut trenching on the beach are considered.*
Within 500m of any higher sensitivity habitat		✓	*No*

[5] Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures

[6] Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures

[7] Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.

Consider if the footprint[7] of your activity is:	Yes	No	Biology habitats risk issue(s)
1% or more of any lower sensitivity habitat		✓	*No: Majority of coastal water body is lower sensitivity habitat with minor areas of mussel beds and polychaete reefs to the south extents. Footprint is 0.003% of lower sensitive habitats*

Fish

Consider if fish are at risk from your activity, but only if your activity is in an estuary or could affect fish in or entering an estuary.

Table 1.38: Mersey mouth coastal water body biology fish risk issues

Consider if your activity:	Yes	No	Biology fish risk issue(s)
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.		✓ *Go to next section*	*No: The works do not have the potential to delay or prevent fish entering the Ribble Estuary. Construction works for the landfall will be restricted to the area above MHWS and will not obstruct fish passage.* *The potential for EMF to impact fish species has been studied extensively, particularly the interference with species such as Atlantic Salmon and the impairment of migration and navigation. The operation of offshore wind energy projects is not expected to negatively affect commercial and recreational fishes. A study by the U.S. Department of the Interior, Bureau of Ocean Energy Management within the south New England area found Negligible effects, if any, on bottom-dwelling species and no negative effects on pelagic species are expected due to their distance from the power cables buried in the seafloor (CSA Ocean Sciences Inc., 2019)*
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).			
Could cause entrainment or impingement of fish.			

B.2.2.3 Section 3: Water quality

Consider if water quality is at risk from your activity.

Use the water body summary table to find information on phytoplankton status and harmful algae.

Table 1.39: Mersey mouth coastal water body water quality risk issues

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	✓		*A broad range of potential pollutants, such as hydrocarbons i.e., fuels can accumulate on surfaces of the working area. These can subsequently be washed off during high rainfall/storm events, polluting the receiving waterbodies and should therefore be assessed further.* *During the construction phase, there is a potential risk of accumulation of standing water on the application site and accidental discharges of untreated run-off whilst the temporary and the operational surface water drainage system is being constructed. Given that the estimated construction phase for the proposed development is estimated to be 32 months, the impacts associated with the construction phase must be assessed further.* *The Dissolved Inorganic Nitrogen (DIN) and dissolved oxygen (DO) levels for this water body are good. Particulate bound nutrients could find a pathway to this coastal water body through Hydrological links.* *Pathogens from the land application of slurries and manures will not be a source of contamination as the working area will be fenced off in advance of construction and the land application of slurry and manures in the working area will not occur in advance of construction. The location of septic tanks and there percolation area is not considered as a significant risk to bathing waters however work has been undertaken by the Morecambe Bay Partnership with the support of the North West Catchment Partnerships, which resulted in the development of user friendly materials to educate private sewage treatment plant owners into maintenance requirement*

Consider if your activity:	Yes	No	Water quality risk issue(s)
			and ways to identify causes for concern. Any potential for septic tanks and their percolation area will be noted in pre-construction record of condition surveys and protective measures taken to ensure that they are not impacted. *On this basis there will be no pathogen source within the working area during the construction period and therefore no potential to impact on the downstream transitional or coastal water bodies and associated bathing waters.* *The operation and maintenance activities are unlikely to generate contaminated runoff and thus there will be low potential for likely significant effects with regards to pollution. The Planning Inspectorate agreed that impact of contaminated runoff on the chemical and biological status of surface water receptors arising from the operation and maintenance of the onshore transmission assets can be scoped out of further assessment.*
Is in a water body with a phytoplankton status of moderate, poor or bad.	✓		*Phytoplankton classification is Moderate.* *However the construction, operational and decommissioning phases of the development are unlikely to present significant sources of nutrients that would result in further impact to this status element.*
Is in a water body with a history of harmful algae.		✓	*The bathing water profiles for the area were consulted (https://environment.data.gov.uk/wales/bathing-waters/profiles/) and note that blooms of the algae Phaeocystis do occur along this coastline during warm and calm weather in May and June. This typically produces a cream or brown coloured scum along the water's edge. The risks to human health from contact, ingestion or inhalation with marine algae that currently occur in UK coastal waters are considered to be low.* *It is assumed for the purpose of this assessment that harmful algal blooms are therefore not a common occurrence in this coastal water body.*

Consider if water quality is at risk from your activity through the use, release or disturbance of chemicals.

Table 1.40: Mersey mouth coastal water body water quality risk issue (chemical)

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list.	✓		*During the construction phase, there is a potential risk of accumulation of standing water on the application site and accidental discharges of untreated run-off whilst the temporary and the operational surface water drainage system is being constructed.* *During construction a broad range of potential pollutants which may include chemicals from the EQSD list can accumulate on surfaces. These can subsequently be washed off during high rainfall/storm events, polluting the receiving waterbodies and should therefore be assessed further.* *The operation and maintenance activities are unlikely to generate contaminated runoff and thus there will be low potential for likely significant effects with regards to pollution. The Planning Inspectorate agreed that impact of contaminated runoff on the chemical and biological status of surface water receptors arising from the operation and maintenance of the onshore transmission assets can be scoped out of further assessment.*
It disturbs sediment with contaminants above Cefas Action Level 1.		✓	*There will be no disturbance of sediment within the Marine environment as part of the landfall and onshore infrastructure.*

Table 1.41: Mersey mouth coastal water body water quality risk issue (mixing zone)

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	*Yes*	*No*	*Water quality risk issue(s)*
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list		✓	*There will be no direct discharges of chemicals into the coastal water body and no associated mixing zone.*

[5] Carry out your impact assessment using the Environment Agency's surface water pollution risk assessment guidance, part of Environmental Permitting Regulations guidance.

Record the findings for water quality go on to section 4: WFD protected areas.

B.2.2.4 Section 4: WFD protected areas

Consider if WFD protected areas are at risk from your activity. These include:

- *special areas of conservation (SAC);*
- *special protection areas (SPA);*
- *shellfish waters;*
- *bathing waters; and*
- *nutrient sensitive areas.*

Use Magic maps to find information on the location of protected areas in your water body (and adjacent water bodies) within 2km of your activity.

Table 1.42: Mersey mouth coastal water body protected area risk issues

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2 km of any WFD protected area[6]	✓		***SPA - Ribble and Alt Estuaries SPA*** *The Ribble and Alt Estuaries SPA is within the ZOIs and is within both the Mersey Mouth and Ribble Estuary water bodies. The coastal habitats of this site support many nesting and migrating birds. The site is designated for an internationally important waterbird and seabird assemblage as detailed in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. A review of the SAC conservation objectives and citation for this site have established that the qualifying features are water dependent. The key pressures and threats to the qualifying features of the SPA relate to public access/disturbance, commercial fishing and Invasive and non-native species (INNS). Therefore it will be important to ensure the construction and operation of the Transmission Assets does not prevent the restoration of favourable conservation status and particularly the spread of INNS.* ***Liverpool Bay SPA*** *Liverpool Bay SPA incorporates all of the Mersey Mouth coastal water body. It is classified for the protection of gull, tern, diver and cormorant species in breeding season and an internationally important waterbird assemblage as detailed in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. The Site Improvement Plan (SIP) for this SPA notes that water pollution from Shipping and Industry, particularly oil spills, represents a potential threat to the conservation status of the waterbird assemblage. Water quality impacts from the Transmission Assets, therefore, need to be considered in the WFD Assessment.* ***Bathing Waters*** *There are a number of bathing waters associated with the Mersey Mouth coastal water body. The Blackpool bathing waters are to the north of the Transmission Assets Order Limits, the Annes North bathing water is within the Transmission Assets Order Limits whilst the Annes North Bathing water is to the south. These bathing waters lie within one spring tidal excursion and have therefore the potential to be impacted by the landfall works.* *Pathogens from the land application of slurries and manures will not be a source of contamination as the working area will be fenced off in advance of construction and the land application of slurry and manures in the working area will not occur in advance of construction. The location of septic tanks and there percolation area is not considered as a significant risk to bathing waters based on a review of bathing*

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
			water profile. Any potential for septic tanks and their percolation area will be noted in pre-construction record of condition surveys and protective measures taken to ensure that they are not impacted. *On this basis there will be no pathogen source within the working area during the construction period and therefore no potential to impact on the downstream Transitional water body and associated bathing waters* ***Shellfish Waters*** *The Ribble Shellfish Designated water is located within the Mersey Mouth coastal water body and the Ribble Estuary transitional water body. This protected area is located within the seabed and coastal areas that may be influenced by changes to physical processes due to the Transmission Assets Order Limits, (defined in Volume 2, Chapter 1: Physical processes of the ES) as one Spring Tidal Excursion.*

[6] *Note that a regulator can extend the 2km boundary if your activity has an especially high environmental risk.*

Record the findings for WFD protected areas and go to section 5: invasive non-native species.

B.2.2.5 Section 5: Invasive non-native species (INNS)

Consider if there is a risk your activity could introduce or spread INNS.

Risks of introducing or spreading INNS include:

- *materials or equipment that have come from, had use in or travelled through other water bodies*
- *activities that help spread existing INNS, either within the immediate water body or other water bodies*

Table 1.43: Mersey mouth coastal water body INNS risk issues

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS		✓	*The negative effects of invasive non- native species has been risk assessed as part of the River Basin Management Plan. High Impact Species can impact on the ecological status of a water body.* *The Landfall in the Mersey Mouth is unlikely to result in the spread of INNS in the coastal water body. The key high impact species recorded were riparian species, Himalayan Balsam and Giant Hogweed in the Onshore infrastructure and therefore it is not considered further in this assessment. The risk to river water bodies is assessment in the main WFD Technical Annex.*

B.2.2.6 Summary

Summarise the results of scoping here.

Table 1.44: Mersey mouth coastal water body summary of risk issues

Receptor	*Potential risk to receptor?*	*Note the risk issue(s) for impact assessment*
Hydromorphology	*No*	*The Mersey Mouth coastal water body is a heavily modified water body with the specified use being coastal Protection Use. The mitigation measures assessment is moderate which means that EA and other responsible bodies have yet to implement all the relevant and required mitigation measures in the water body to achieve good ecological potential. Until the water body mitigation measures are implemented the water body will not achieve good ecological potential irrespective of the status of the other contributing elements.* *The mitigation measures required relate to alteration to flood defence structures. The potential impact from the onshore infrastructure will have no impact on the ability to implement these measures nor will it result in any changes to the supporting morphological condition in the transitional water body.*
Biology: habitats	*No*	*Footprint of landfall is not within 500 metres of a sensitive habitat*
Biology: fish	*No*	*Fish migration in the marine or freshwater environment will not be at risk from the proposed landfall activities*

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Water quality	*Yes*	*A broad range of potential pollutants which may include chemicals from the EQSD list can accumulate on surfaces during construction. These can subsequently be washed off during high rainfall/storm events, polluting the receiving waterbodies and should therefore be assessed further.* *During the construction phase, there is a potential risk of accumulation of standing water on the Application Site and accidental discharges of untreated run-off whilst the temporary and the operational surface water drainage system is being constructed.* *Potential risk of contamination from the operation and maintenance activities have been scoped out with agreement form the Planning Inspectorate.*
Protected areas	*Yes*	*The following protected areas are all within 2 km of the Transmission Assets Order Limits* *SPA – Ribble and Alt Estuaries SPA, Liverpool Bay* *Bathing Waters - The Blackpool bathing waters are to the north of the Transmission Assets Order Limits, the Annes North bathing water is within the Transmission Assets Order Limits whilst the Annes North Bathing water is to the south all within 2 km.* *Shellfish Waters – Ribble is located in the Mersey Mouth and is within one spring tidal excursion of the landfall for Transmission Assets Order Limits.*
Invasive non-native species	*No*	*The Onshore infrastructure is unlikely to result in the spread of INNS in the coastal water body and therefore it is not considered further in this assessment.*

If you haven't identified any receptors at risk during scoping, you don't need to continue to the impact assessment stage and your WFD assessment is complete.

If you've identified one or more receptors at risk during scoping, you should continue to the impact assessment stage.

Include your scoping results in the WFD assessment document you send to your activity's regulator as part of your application for permission to carry out the activity.'