Xlinks 1 Limited

Xlinks Morocco-UK Power Project

Preliminary Offshore Water Framework Directive Assessment

APEM

Contents

List of Figures

List of Tables

1. Introduction

1.1 Overview

This Water Framework Directive (WFD) Assessment report considers the UK offshore elements (the Proposed Development) of the proposed Xlinks Morocco-UK Power Project (wider Project) in relation to requirements under the WFD.

This report version is considered ‘preliminary’, prepared in April 2024 alongside and to supplement the Preliminary Environmental Information Report (PEIR). Following consultations with e.g. the Environment Agency, a final WFD Assessment report will be prepared, and submitted with the Proposed Development’s application for a Development Consent Order (DCO).

The proposed works are within the Barnstaple Bay coastal water body (ID: GB610807680003), and are in the vicinity of the Lundy coastal water body (ID: GB610878040000) and the Taw / Torridge transitional water body (ID: ID: GB540805015500).

The WFD Assesssment is required to determine if the Proposed Development is anticipated to have any non-temporary effects on WFD quality elements for these water bodies, and if it could prevent the water bodies from meeting their WFD objectives.

A separate WFD Assessment has been prepared in relation to the UK onshore elements of the Xlinks Morocco-UK Power Project. The offshore and the onshore WFD assessments have been prepared separately on account of a) distinct footprints and activities, and b) specific offshore (Transitional and Coastal) WFD assessment guidance.

1.2 Project Details

The Proposed Development forms part of the wider Project proposed by the Applicant to develop a sub-sea electricity supply project from Morocco to the UK. The Project includes an electricity generation facility entirely powered by solar and wind energy combined with a battery storage facility. Located in Morocco’s renewable energy rich region of Guelmim Oued Noun, the Applicant proposes to install approximately 11.5 Gigawatts peak (GWp) of renewable energy capacity that would cover an approximate area of 1,500 km^2 and connect exclusively to Great Britain (GB) via four HVDC sub-sea cables, with a total offshore route between Morocco and the UK of approximately 4,000 km.

The extent of the Offshore Cable Corridor is from the UK Exclusive Economic Zone (EEZ) boundary to the landfall site at Cornborough Range on the north Devon coast. The total length of the Offshore Cable Corridor in UK waters is approximately 370 km.

The Offshore Cable Corridor has a nominal width of 500 m, extending up to 1500 m at some crossing locations (where the cable needs to cross existing power and telecoms cables for example).

Additional space is provisioned at crossing locations to allow existing assets to be crossed as close to 90 degrees as possible (and reduce the footprint of the crossing on the seabed).

Route optimisation studies have informed the routing of the marine cable corridor; these studies have included multiple desktop studies and marine investigation surveys. Route optimisation has considered e.g. depth, seabed features, metocean influences, external stakeholders (e.g. seabed leaseholders, fishing activities, shipping etc) and environmental constraints such as marine protected areas including Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Marine Conservation Zones (MCZs).

The width of the Offshore Cable Corridor will allow some flexibility for micro-routing of the cables within it. Flexibility for micro-routing within the Offshore Cable Corridor will be retained until cable installation, to:

- allow for the final precise cable route to adapt to the conditions encountered during construction (noting that extensive seabed characterisation surveys have already been undertaken);
- allow potential micro-routing comments from relevant stakeholders to be addressed; and
- allow the flexibility to avoid currently unforeseen hazards (such as potential UXO identified during cable lay geophysical surveys).

The Offshore Cables would consist of four 525 kV HVDC marine power cables which would be installed for the majority of the cable route as two bundled pairs (Bipole 1 and Bipole 2). The bundled pairs would be separated into four individual cables approximately 1 km offshore, before the landfall horizontal directional drilling (HDD) entry points, to allow each cable to be pulled onshore through individual HDD ducts.

In addition to the four HVDC marine power cables, two fibre optic cables (FOC) would provide a cable monitoring fibre system (DAS and/or DTS). Each FOC would be approximately 35-40 mm in diameter and laid together with the marine cables within a shared trench (one FOC per cable bundle). FOC repeaters would be required approximately every 70 km along the

Offshore Cable Corridor (four to five repeaters per bipole). At each repeater location, there would likely be a spur of FOC installed adjacent to the cables for the installation of the repeaters and ongoing maintenance purposes. The spur of FOC at each repeater location would be equal to the water depth at the repeater location.

The FOC spurs would be buried to the same depth as the HVDC cables in accordance with the Cable Burial Risk Assessment (CBRA). The CBRA will assess the detailed results of geophysical and geotechnical surveys to inform location specific installation methods and cable protection strategies. It is assumed that the FOC spurs would be buried using the same, or less intrusive, methods as the HVDC cables. The FOC spurs would be buried broadly parallel to the HVDC cables, within the boundary of the Offshore Cable Corridor taking place soon after the HVDC cable protection works.

At the landfall, the FOCs would be installed alongside an HVDC cable within an HDD duct, i.e. adjacent to one of the power cables within the same HDD duct.

1.3 Location and Context of the Works

The full Offshore Cable Corridor in UK waters is indicated in **Figure 1**.

The only activities associated with the Proposed Development that are of relevance to this WFD Assessment are those which will take place within 5 km of Transitional and Coastal waters (TraC) water bodies. This is discussed further in Section 4.1. The location of the Offshore Cable Corridor in relation to local TraC water bodies is presented in **Figure 2**.

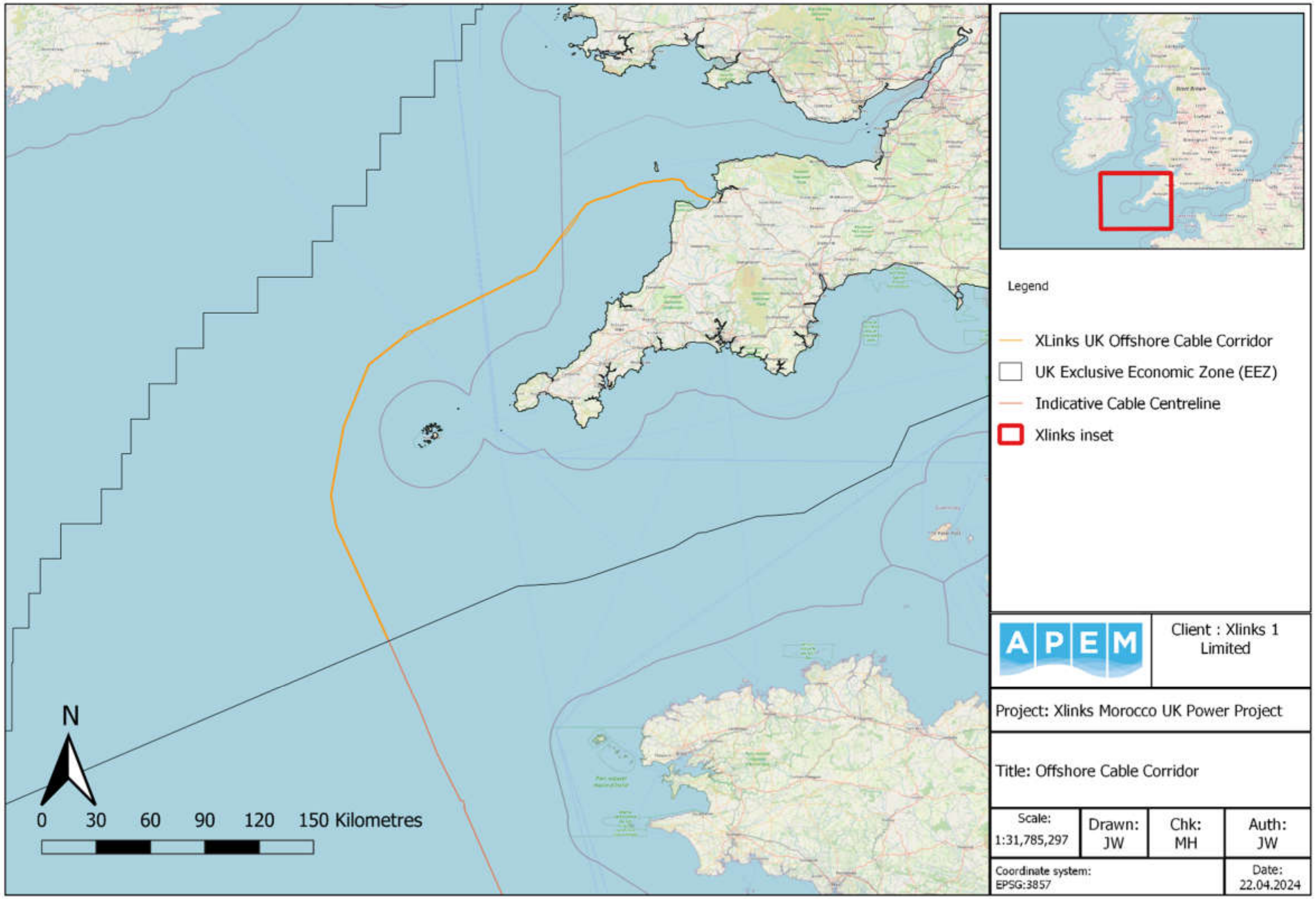

Figure 1. Offshore Cable Corridor (UK Waters)

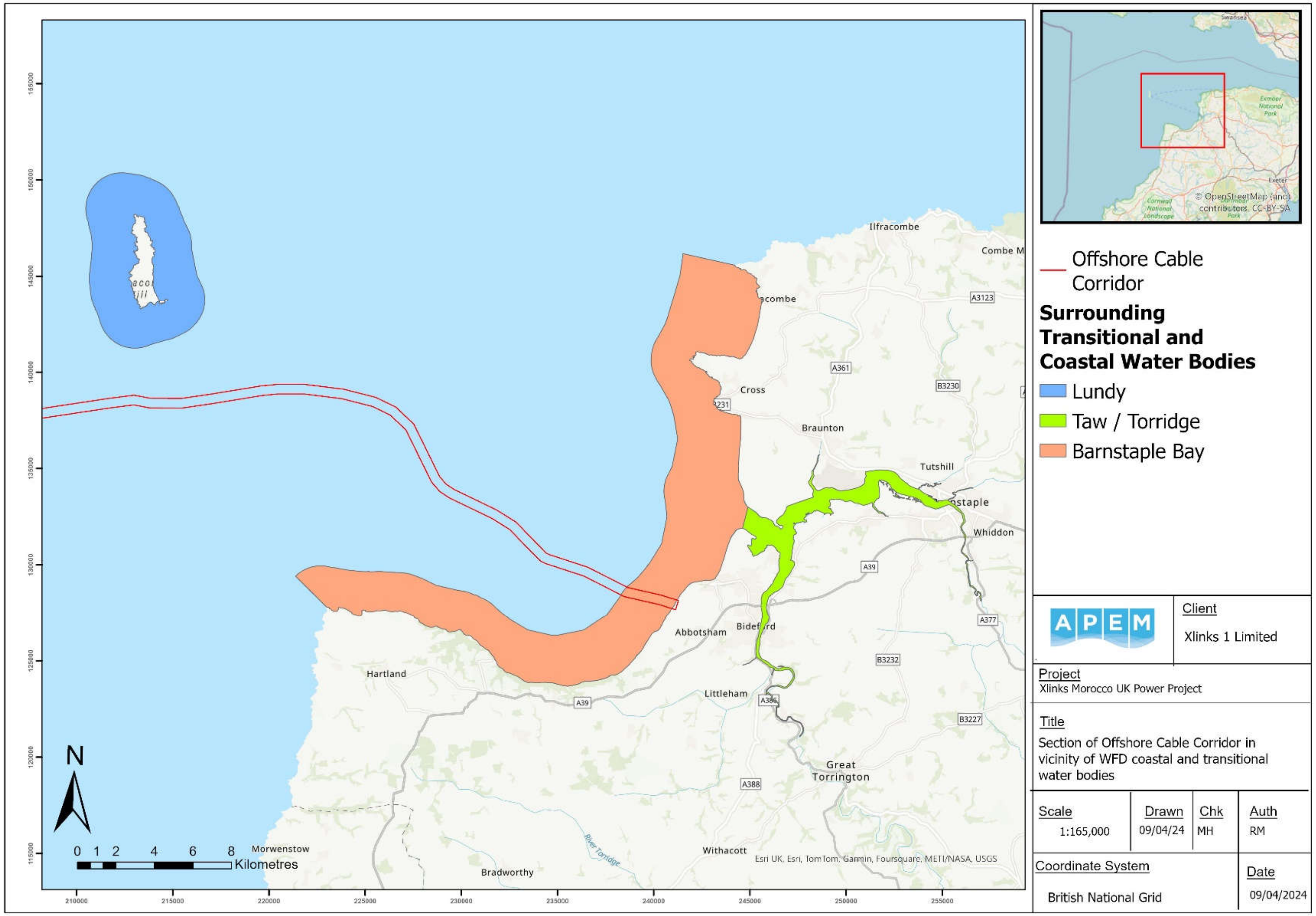

Figure 2. Section of Offshore Cable Corridor in vicinity of WFD coastal and transitional water bodies

1.4 WFD Assessment Objectives

The objective of this assessment is to consider the available data for WFD supporting elements in relevant water bodies in accordance with the Environment Agency's (EA) 'Clearing the Waters for All' guidance (EA 2023a), and in this context, consider the potential effects of the work on the status / potential of the following WFD parameters:

- Ecological potential
    - Biological supporting elements
    - Physicochemical supporting elements (and Specific Pollutants[1])
    - Hydromorphological considerations

- Chemical status
    - Priority Substances[1]
    - Other Pollutants[1]
    - Priority hazardous substances[1]

1.5 Summary of marine works

1.5.1 Programme and installation schedule

Pre-lay works such as route clearance and boulder removal may take place in 2027 ahead of cable lay and protection works.

Cable lay works for Bipole 1 (first cable bundle) are scheduled to begin in Q1 2028 and it is anticipated that these works would be completed in three sections each taking approximately one month. It is currently envisaged that two sections will be laid in 2028 and a section laid in 2029.

Dates are indicative at this time, and may be influenced by e.g. weather limitations of the CLV.

For Bipole 2 (second cable bundle), offshore works would begin in 2030 and would follow a similar schedule. The landfall HDD works are provisionally scheduled to be undertaken in advance of cable laying.

[1] Limited to chemicals on Environmental Quality Standards Directive (EQSD) list for WFD (as provided in EA, 2017). Environmental thresholds are summarised in Defra (2015).

Burial and protection activities would progress broadly in parallel with the expectation that cable lay and the start of burial would be just a few days apart (noting that burial and protection activities would take longer to complete than the cable lay).

Guard vessels would be provisioned for any periods after the cable has been laid, but has not yet been buried or protected, to minimise the risk of interactions with other marine traffic.

1.5.2 Construction Phase

Horizontal Directional Drilling – Marine Works

The cables would be installed at the landfall using an HDD technique to avoid disturbance of the intertidal zone, the beach and the foreshore including coastal cliffs. This section provides a summary of the marine elements of the HDD works.

The HDD would be undertaken in a land to sea direction. For each of the four boreholes, a pilot hole would be drilled (at c. 20 m below seabed level) to within approximately 50 m of the seabed exit points. The drilled bore would then be widened to its full intended diameter before the remainder of the bore is drilled. Redundant drilling fluid and cuttings would be removed and disposed of responsibly from the land-based works.

The primary HDD activity that interacts with the marine environment is the breakthrough, or 'punchout', of the drill from underneath the seabed.

During breakthrough, drilling fluid and cuttings would be released into the immediate marine environment. The use of drilling fluids that are on the OSPAR PLONOR list (Pose Little Or No Risk to the environment) would be prioritised to minimise the risk to the marine environment during breakthrough. The volume of drilling fluid and cuttings lost during breakthrough is minimised by the adopted construction approach i.e. the boreholes having already been drilled to their full diameter prior to breakthrough of the seabed and the continuous removal of drilling fluid and cuttings during this operation. Lower drilling fluid flow rates are also used during breakthrough to minimise the loss of drilling fluid.

An excavated trench may be required at HDD exit points on the seabed to remove sediment layers (sand and pebbles) that may jam HDD equipment on breakthrough or prevent subsequent duct installation once the boreholes have been drilled. Localised excavations are expected to be undertaken by either a back-hoe dredger (long arm barge mounted excavator), mass flow excavation (MFE) or a Trailing Suction Hopper Dredger (TSHD). Sediment will be removed from an area of approximately 15 m x 15 m around the exit points.

Exit points in the marine environment for the four drills are currently being considered at either 6 m water depth (approximately 540 m offshore), or at 9 m water depth (approximately 1,360 m offshore).

Dependant on the contractor’s final design and depth of the boreholes, there would be up to a 40 m separation between adjacent drill exit points for cables on the same circuit, and approximate 50 m separation between circuits (i.e., all four exit points would be within an area of the seabed of approximately 130 to 150 m wide).

HDD Duct Installation

Following drilling of the four boreholes, ducting would be installed in each bore. Three methods are being considered for the installation of ducting: pulling the ducting from either onshore or offshore or pushing the ducting through the boreholes from onshore.

A pulled installation with a pulling winch onshore requires a complete string of duct to be towed (afloat) from offshore to the HDD exit points and pulled onshore through the boreholes. If the pulling winch is located offshore, then the string of duct can be fabricated at the HDD onshore site as the duct is pulled offshore.

A pushed installation involves the fabrication of the ducts at the HDD onshore site with the ducts fed into the entry points and driven through the boreholes using a pipe thruster. The project design team have rejected any option of moving ducting across the beach, which would effectively be isolated from the HDD works. The choice of the HDD installation method avoids potential impacts to designated sites and the intertidal zone.

Once in position, the ducts are sealed at each end until ready to receive the cables. All methods of duct installation require marine vessels.

Pre-Lay Marine Surveys

The baseline UK marine investigation surveys, that included geophysical surveys, subtidal drop-down video surveys and subtidal grab surveys have been completed and have informed the environmental baseline for the PEIR.

Prior to cable installation, additional ground condition surveys may be required by the Contractor. These are unlikely to be required to further characterise the environmental baseline given the high resolution baseline data collection already compiled for the Offshore Cable Corridor within UK waters, but may be required for micro-routing purposes or to identify any UXO within the Offshore Cable Corridor that may need to be avoided or cleared. If required, UXO clearance (removal or detonation) would be undertaken by a specialist contractor and any such works would be subject to a separate consenting process at the time such need is identified. As such, consideration of effects from activities associated with UXO clearance have been excluded from this WFD Assessment report.

Route Preparation

The marine baseline investigation surveys and any pre power cable laying ground condition survey would inform the requirements for, and extent of, seabed preparation and clearance along the Offshore Cable Corridor in UK waters. Two types of seabed preparation could be required prior to cable installation:

- Clearance of debris and some local seabed features e.g. boulders and sandwaves; and
- Construction of crossing structures over existing in-service cables.

Seabed Debris

Where deemed necessary, marine debris such as abandoned, lost or discarded fishing gear that may impede the cable installation operations, would be cleared from the cable route prior to installation. This would require a pre-lay grapnel run involving towing a heavy grapnel hook of circa 1 m total width, at a max penetration depth of circa 1 m, along the centre line of each bundled cable pair route to clear debris.

Debris collected during the grapnel run would be recovered on board the vessel for onshore disposal at appropriately licensed disposal facilities.

Out of Service Cables

There are currently 28 crossings of Out of Service (OOS) telecommunication cables along the UK Offshore Cable Corridor. Subject to discussions with owners of the OOS cables, a section of these OOS cables that cross the route would be cut and recovered to the vessel for onshore disposal at appropriately licensed disposal facilities.

Sandwaves and Large Ripples

Where the baseline marine investigation surveys have identified the presence of areas of mobile sediments (e.g. sandwaves and large sand ripples) that cannot be avoided through micro-routing within the route corridor, these features may need to be removed and the seabed flattened to facilitate burial in more stable sediment.

Two methods are being considered to achieve this:

- Mass flow excavation (MFE); and

- Seabed 'surface plough'/leveller.

MFE utilises a jetting tool that uses high flow water jets to temporarily displace and suspend sediments for seabed levelling. Based on the provisional assessment of the geophysical survey data, the MFE is anticipated to be needed infrequently, potentially most appropriate to the seabed conditions in Bideford Bay.

Localised seabed levelling, where required, would be undertaken by a surface plough or leveller, with a swath width of 10-20 m wide, which is towed across the seabed to create a flatter profile.

Boulder Clearance

Areas of boulder fields have been identified along the route, which will prevent burial of the cable bundles where they cannot be avoided by micro-routing. In these areas, a pre-lay plough and / or boulder grab may be deployed for boulder clearance purposes, to increase the likelihood of successful burial.

The pre-lay plough has a boulder clearance swath width of 10-15 m. It is anticipated that up to approximately 200 km of the route may need deployment of the pre-lay plough for boulder removal.

Trench Ploughing

The pre-lay plough can also perform pre-cut trenching, to produce an initial trench to enable subsequent cable burial. The pre-lay plough has capability to perform boulder clearance, pre-cut trenching and backfill services (after cable lay). The pre-lay plough can operate in each mode independently or carry out the boulder clearance and pre-cut trenching activities simultaneously. During boulder clearance surface boulders are unearthed and relocated to an outer spoil berm. Siphoned soil from pre-lay plough trenching is relocated to an inner spoil berm to be used to backfill the trench after cable lay.

The profile of the pre-lay plough trench would be 500 mm (w) x 700mm (d) at its base, with a further 'Y' shaped profile where the cut depth is >700mm. Where ground conditions allow the pre-lay plough can trench down to a burial depth of approximately 1.5 m.

The disturbance width (swath) of the pre-lay plough in pre-cut trenching and backfill modes is 15 m.

Cable Installation Methods

The HVDC cables would be installed as two bundled pairs from a CLV. The specific CLV(s) that would install the HVDC cables is unknown at this stage and would be determined by the selected Cable Contractor. Based on CLV(s) currently in operation, it is anticipated that two turntables would be mounted on the CLV(s), each holding up to approximately 160 km of HVDC cable. As the CLV travels along the route, the two turntables release cable at the same rate and the two cables are bundled together at the stern of the vessel and fed overboard. An additional cable tank would contain the fibre optic cables, which would be installed as part of the bundle. Tensioners control the cable tension and cameras monitor the cable to ensure it is laid safely on target.

Based on the initial assessment of the geotechnical and geophysical survey data as part of a Burial Assessment Study (BAS), the cables will be buried along the entire route. For 220km of the route it is anticipated that the cables will be protected by trenching and covered by natural sediments. It is anticipated that additional protection would be required along approximately 150 km of the route.

Cable Burial Method

Burying the cables would provide protection and avoid damage and future entanglement with fishing equipment or other marine users. Burial techniques available include trench ploughing (above), trench jetting, or mechanical trench excavation. The BAS indicates that trench jetting is unsuitable for the majority of the Offshore Cable Corridor, with potential exception of shallow coastal areas in Bideford Bay, or used as a remedial measure to be applied following mechanical trenching. Mechanical trenching (mechanical cutter mounted on a remotely operated vehicle (ROV)) is expected to be the main burial method in UK waters.

Once the cables have been laid on the seabed (by the CLV), the ROV is lowered to the seabed until it straddles the cable bundle lying on the seabed. Where the mechanical cutter is deployed, the tool would lift the cables up above the seabed safely out of the way of the burial tool and would then feed the cables into the trench behind the tool. Where the water jetting ROV is deployed, two jetting legs (also known as swords) would extend down either side of the cable bundle and fluidise the seabed immediately below the cable bundle enabling it to sink under its own weight.

Cable burial depth would be monitored as the burial tool progresses. Where the target burial depth is not achieved on first pass of the tool, a second pass may be required using e.g. the water jet.

The footprint of the mechanical cutter ROV on the seabed is up to 126 m^2 (10 m width and 12.6 m in length) and the water jet ROV up to 55.2 m^2 (6 m width and 9.2 m length).

The rate of trenching progress would typically range from c.50 to 400 m per hour.

Additional Cable Protection

The preliminary BAS indicates that there is significant burial risk (due to e.g. hard seabed and / or boulder fields) that may reduce the ability to protect the cables using the ROV tools for approximately 150 km of the total length of the Offshore Cable Corridor. In these areas, the pre-lay plough would pass through prior to cable lay to determine if a trench can be produced, followed by at least one pass of the mechanical cutter after the cable bundles had been surface laid with the aim of producing a trench that can be backfilled back to / close to the seabed surface. In areas where this is not possible, the final option would be for the cable to be covered with a layer of rock protection that extends above the level of the surrounding seabed (a rock berm).

Where required, rock protection would consist of rock ranging from coarse gravel to cobbles and be up to approximately 1 m high above the seabed and up to 7 m wide. Rock berms would be constructed according to best practice e.g. are designed to be over trawlable.

Cable Crossings

Where the cables cross other in-service cables, the cable would not be buried in a trench. The trench depth would taper to seabed level at a suitable distance from the in-service cable to be crossed and the Proposed Development cable would cross above the in-service cable. The Proposed Development cable would then be buried again on the other side of the in-service cable.

Where the Proposed Development cable crosses in-service cables, whether buried or surface laid, a layer of separation in the form of a pre-lay rock berm or concrete mattresses may be installed over the crossed asset. The Proposed Development cable would then also require protection in the form of a post-lay rock berm. The height of the concrete mattress and rock berm would be approximately 1.4 m above the seabed. The footprint of each crossing would depend on factors such as the crossing angle, The maximum footprint of a cable crossing rock berm on the seabed is indicatively 3,500 m^2 (500 m length and 7 m wide).

It is anticipated that 21 in-service cable crossings would be required. All crossings and crossing agreements would be in line with international standards and best practice.

Cable Burial Depth, Width and Spacing

The intended depth at which the cables would be buried is up to a depth of 1.5 m, subject to a detailed CBRA. The provisional BAS finds an average target depth of 1.5 m, and average minimum depth of 0.8 m (n=42).

The width of the trench in which the cable bundles would be buried typically ranges from 0.5 to 1.5m. The infrequent cable joints and FOC repeater locations may require additional trench width.

The cable spacing between the two bundled pairs is expected to be between 50 – 180 m (remaining within the 500 m cable corridor at all times). Spacing may be increased to approximately 250 m in certain areas such as areas of high shipping density to reduce the risk of an anchor strike causing a fault to both cable bundles.

Installation Vessels

Cable installation activities would be undertaken on a 24 hour/7 day basis, unless interrupted by weather or other disruptions. This would maximise the available operational weather windows, vessel and equipment time, and minimise navigational impacts on other users of the sea.

A description of likely vessel groups to be utilised during the installation activities of the Proposed Development is provided below:

- Vessels for pre and post-installation surveys;
- Workboats/construction vessels and tugs for all works including route clearance/preparation, trenching, installation of rock protection/concrete mattresses, duct installation, cable pull and floating in, and dive support, depending on requirements. These workboats often deploy ROVs and would utilise geophysical survey and positioning equipment to monitor the progress of the works, and for positioning of any ROVs or other underwater equipment needed to complete the works;
- CLVs for cable laying;
- Guard vessels – as necessary, these would accompany the CLV to maintain surveillance around the worksite ensuring other vessels are kept clear, reducing the risk of collision and to protect the cable prior to burial;
- Rock placement vessel – where rock placement is required for additional cable protection (e.g. at cable crossings), a rock placement vessel may be used. Such vessels feature a rock

storage hopper and equipment by which rock can be placed in-situ on the seabed, such as fall pipes; and

- Jack up vessel / multi-cat vessel – for the HDD works (breakthrough, duct push/pull and duct sealing works) near the landfall, jack up vessels would be deployed to enable stable and safe marine works in the tidal environment.

The precise number of vessels to be used is to be determined by the Cable Contractor, however, it is expected that two pre-installation survey vessels, four trenching vessels, two rock placement vessels, one CLV (two for brief periods during changeovers), and 20 guard vessels stationed every 10 nautical miles (nm) would be required.

It is anticipated that a maximum of two jack up / multi-cat vessels would be required for the offshore HDD works.

1.5.3 Operational Phase

Inspection Surveys

The preferred installation methods are designed to minimise the number of cable inspection surveys that would be required. However, some cable inspection surveys are expected during the operational lifetime of the Project.

These surveys would involve the use of a single survey vessel equipped with an inspection ROV and geophysical survey equipment including multibeam echosounder (MBES), sidescan sonar (SSS) and a magnetometer.

The inspection survey schedule is anticipated to include surveys up to once a year for the first 5 years, and then approximately every 5 years for the remainder of the operational life of the cables (anticipated 50 years).

Maintenance and Repair

There may be a requirement to undertake unplanned maintenance works in the event of failure of components of the system or if a cable becomes exposed due to changes in seabed morphology or the activities of third parties.

Repair works for cable failure would require the exposure of the cable at the point of failure, which would require de-burial of the cable from the trench. The cable would then be cut, recovered to the surface, repaired using a section of spare cable and redeployed for reburial using similar methods to those used for installation.

Given additional cable length would need to be added to join the cut ends at the surface, the relayed cable would take up a greater footprint than the original cable through incorporation of a 'repair loop'. Any additional footprint associated with repaired sections would be anticipated to fall within the Offshore Cable Corridor.

1.5.4 Decommissioning Phase

The current anticipated lifetime of the Proposed Development offshore cables (operational phase) is 50 years, following which the Proposed Development will be decommissioned.

The options for decommissioning the cable would be evaluated at the time of decommissioning, with e.g. engineering technologies ever evolving. Current best practice, and the least environmentally damaging decommissioning option, is (in general) to de-energise the cable, disconnect it from any wider system, and secure it in place to be left in-situ, thereby avoiding unnecessary seabed disturbance.

However, other options may include the requirement for full or partial removal of the cables. The methods for removal would be broadly similar to those used during the construction phase with the potential for the cables to be removed by direct pulling, rather than de-burial. The requirement for any removal could also apply to other infrastructure installed as part of the project i.e. cable protection. The footprint of decommissioning activities (disturbance footprint at the sea bed) will be less than that of the construction phase.

The framework of environmental permitting and all applicable UK and International legislation at the time of decommissioning will be adhered to.

Once the final decommissioning measures are known, an environmental assessment (EIA or similar) will be performed prior to the decommissioning phase (i.e. in approximately 50 years' time) to assess the potential impacts that may arise. This will inform any licence applications for decommissioning.

Initial Offshore Decommissioning Plan

An Initial (offshore) Decommissioning Plan (IDP) containing the anticipated approach to, and methods associated with decommissioning has been prepared at EIA PEIR stage (Preliminary WFD stage). It is recognised that the Final (offshore) Decommissioning Plan (FDP) will a) be developed in the years that precede decommissioning, and b) be subject to Environmental Impact Assessment (EIA) or similar environmental appraisal and permitting at that time.

The IDP represents an initial statement of:

- the measures, methods and timescales for decommissioning the offshore cables including the parts to be removed and the methods of removal, the parts to remain in-situ and the measures to make them safe, and the measures for the clearance of debris and the restoration of the sea bed;

- the methods of providing post-decommissioning verification that the decommissioning has been completed satisfactorily; and
- the measures for post-decommissioning monitoring, maintenance and management of the seabed.

The IDP will form the basis for the FDP for the offshore elements of the Proposed Development, which will be developed in consultation with The Crown Estate and other international stakeholders in line with the following decommissioning principles:

- the measures and methods for any decommissioning will comply with any legal obligations referred to in the development consent;
- all sections of the offshore cables will be removed except for any sections which it is preferable to leave in-situ having regard to minimising risk to the safety of surface or subsurface navigation, other uses and users of the sea, the marine environment including living resources, and health and safety;
- the Applicant will comply with any national or international requirements in relation to leaving the offshore cables in-situ; and
- the seabed will be restored, as reasonably as possible and to the extent reasonably practicable, to the condition that it was in before the offshore cables were installed.

Due to the unknown element of what policies and processes will be in place when the Proposed Development reaches the end of its feasible life, the IDP and FDP will be reviewed and updated periodically in line with applicable guidance and regulations to ensure that all legislation at the time of decommissioning the system will be adhered to.

The Applicant will commence further consultation with stakeholders at least two years prior to decommissioning. This may be informed by the required permit applications at the time.

Prior to decommissioning, a contingency plan will be developed for resolving the potential issue of cables becoming exposed post-decommissioning.

The decision as to whether to recover a cable or leave *in-situ* will be taken at the appropriate time. The methods available for removal of out-of-service cables are summarised below.

Cable Recovery

All offshore cables, sections of offshore cables, or cable ends which are exposed at the time of decommissioning, or likely to become exposed, will be recovered, unless studies show that they will not pose an enduring threat to other seabed users. This will be determined by survey(s) prior to decommissioning of the Proposed Development.

Any sub-sea trenches left after cable removal will be filled by natural tidal action. Exposed cable ends will be weighted down and then allowed to naturally rebury.

To recover a cable first it is necessary to obtain one end which is used to pull the cable out of the seabed by applying traction to it from a cable engine on the recovering ship or barge. To obtain an end, the cable would likely be cut at the seabed as, considering the weight of the cables, it is unlikely that a bight of cable can be brought to the surface. Methods that can be used to obtain a single end include using an ROV and or crane with grab tooling (preferred), using divers, or using special cable hooks called “grapnels”.

ROV grab method

Initial exposure of the cables is needed prior to grabbing. This can be done by excavating a pit using water jets mounted on the ROV or a MFE. The pit size need only be sufficient to allow the ROV access to cut the cables and attach a clamp (a “cable gripper”) and lifting rope to the cables. Once the cable is exposed, cut and gripped, the ROV does not take any further part in the operation, although it may be used to monitor the recovery if deemed necessary. If the seabed is particularly consolidated above the cables, the ROV water jets or MFE can be used to weaken the soil along the route line and reduce the resistance on the cables.

Diver method

This is essentially the same as the ROV method except that the operations are diver controlled. The operation is again precise but the downsides of diver operations, e.g. human safety, depth limitations and weather dependency, are significant. This operation can only be carried out in shallow water and, for safety reasons, the use of divers should be avoided as far as possible.

Grapnel method

Grapnels come in various configurations that can cut, hook and hold a cable, whether it is exposed on the seabed or buried into it. Various types and sizes of grapnels are used for different cable sizes, burial depths and soil conditions. The grappling process is essentially the same in all cases, with the grapnel towed across the seabed at right angles to the cable line, with the point of the device penetrating into the seabed at the expected depth of the cable. Initially a grapnel fitted with cutting blades is used to cut the cable and then another is used to hook and hold it a safe distance away from the cut end. In this way a small bight of cable is recovered to the ship and recovery can be started. At the time of drafting, no grapnel exists that can both cut and hold (one end of) a cable in a single operation for a large power cable.

The main advantage of grapnel recovery is that it is a relatively simple operation that has been used over many years. The main downside is that the grapnels may be dragged across the seabed for some distance before the cable is hooked, creating wider physical disturbance. Grapnel operations may also be restricted by the proximity of other cables or other infrastructure.

Deployment of a grapnel is unlikely for the Proposed Development, however, is presented here as a fallback option in the event that e.g. a cable is dropped or lost. An ROV or crane grab is more likely to be deployed.

Any perpendicular grapnel runs would only take place in locations approved following benthic ecology and marine archaeology expert review, provisionally identified if necessary as part of the FDP i.e. areas of low environmental sensitivity would be identified for potential cable recovery by grapnel (if necessary) to avoid ‘new’ disturbance of receptors.

Cable recovery

Once a viable cable end has been recovered, the cable or cables are then recovered to the vessel in what is, in effect, a reversal of the cable lay operation; however only one vessel is usually necessary (unless burial conditions dictate the use of a de-burial system ahead of the recovery vessel). Once the ship’s capacity has been reached, the cable end is abandoned to the seabed, probably with a marker buoy attached, and the ship returns to port to discharge the recovered cable.

Crossings

Due to the protection methods employed at crossings, typically rock placement or concrete mattresses, the recovery of cable at these locations can be more complex. The presence of other, potentially still operational, assets can be a complicating factor. Where the other assets are operational at the time of decommissioning, and most likely in the case of other crossings, the likelihood is that leaving the cables in place would be the safest and most environmentally sensitive option.

Landfall sections

Recovery of the section of cable associated with the HDD is anticipated to be relatively straightforward. Cutting the cables at the seaward end and attaching a winch to the landward end should enable the cables to be pulled out of the HDD ducts and recovered intact onshore. These cables would then be transported in sections to appropriate recycling facilities.

Removal of the ducts below the Mean High Water mark would be considerably riskier and would, with current techniques, entail both environmental and safety risks. It is therefore expected that, in line with the decommissioning principles, the ducts would be left in-situ.

De-burial

As the cables are planned to be buried along the entire route, they may require de-burial in order to speed up the recovery process. A smaller ship preceding the main recovery ship using a tool such as a MFE is one possibility. Alternatively, a bespoke tool that allows for simultaneous de-burial and recovery from the same ship may be available in the future. The Applicant will benefit from knowledge gained on previous decommissioning operations on similar but older assets (which are much anticipated in the intervening decades).

It is assumed that the de-burial (and the entire decommissioning) footprint would be less than the construction phase footprint.

Offshore Decommissioning Schedule

A programme of periodic reviews of the IDP would take place, starting at a 10 yearly interval and decreasing to a three yearly interval, 10 years prior to the scheduled decommissioning in approximately 50 years' time.

The preparation of the FDP prior to the actual Proposed Development decommissioning would incorporate sufficient time to allow for the environmental assessments (e.g. EIA, decommissioning Non-Statutory Environmental Statement (NSES) or similar) to be assessed and any subsequent measures arising from the review to be implemented before the decommissioning programme is finalised. An FDP would therefore be prepared two years prior to the proposed shutdown and decommissioning of the offshore elements of the Proposed Development.

Should the Proposed Development be decommissioned early, or the life of the project be extended, the decommissioning programme will be adjusted accordingly. The FDP is expected to be informed by and include references to relevant surveys performed during the construction and operational phases of the Proposed Development.

Post-Decommissioning – Additional Surveys & Seabed Clearance

Following decommissioning, survey(s) will be carried out to show that the route has been cleared and left in a safe condition. It is likely that recovery operations will be monitored by ROV and this may prove adequate to show that the cables have been cleared and the seabed left in a safe condition. However, additional surveys, including side-scan, magnetometer and bathymetric surveys, may be required (with possible use of drop-down video or ROV to ground truth the data where necessary).

The FDP will contain details of any requirements on post-decommissioning monitoring, maintenance and remediation.

1.6 Embedded mitigation

As part of the project design process, a number of mitigation measures have been committed to, which will reduce the potential for impacts on WFD supporting elements (**Table 1**). These measures are considered standard industry practice for this type of development.

The mitigation measures proposed as part of the Proposed Development include the following types of mitigation:

- Primary (inherent) mitigation – measures included as part of the Proposed Development design. The Institute of Environmental Management and Assessment (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 Proposed Development and do not require additional action to be taken'. For example, a reduction in footprint or height.
- 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 micro-routing of the cable route).
- 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'.

Table 1. Mitigation measures adopted as part of the Proposed Development

Measure Adopted	How the Measure Will be Secured
Primary mitigation	
Cable burial	Cables will be buried (where possible) up to 1.5 m below the seabed, subject to a detailed Cable Burial Risk Assessment (CBRA). Only when burial is not possible will additional protection be installed.
Cable protection measures	Where possible cable protection structures would be kept level with the seabed, and if above the seabed they would be kept to a maximum of 1 m above seabed level.
Secondary mitigation	

Measure Adopted	How the Measure Will be Secured
There will be microrouting of the cable to minimise any potential damage to Annex I habitats.	It is anticipated that this will be implemented as a consent condition during the construction phase.
Tertiary mitigation	
Ballast Water Management Convention (2017)	All ships subject to the Ballast Water Management Convention (2017) requirements will be obliged to conduct ballast water management in accordance with the contractual provisions and those within the Convention.
Offshore Construction Environmental Management Plan (CEMP)	An Offshore CEMP will detail the best practice approach to offshore activities and would implement those measures and environmental commitments identified in the EIA. The following measures will be included in the Offshore CEMP: marine pollution prevention; waste management; marine invasive species; and dropped object procedures. An Outline Offshore CEMP will form part of the DCO (with a final Offshore CEMP finalised by offshore contractor).
Offshore Biosecurity Plan	In order to reduce the likelihood of introducing Marine Invasive Non-Native Species (MINNS) during all phases of the Proposed Development, an Offshore Biosecurity Plan will be adhered to with the incorporation of a biosecurity risk assessment.
Marine Pollution Contingency Plan (MPCP)	An MPCP will be produced as part of the Offshore CEMP and will include measures to minimise the impact of any events as well as compliance with the International Convention for the Prevention of Pollution from Ships (MARPOL).
Shipboard Oil Pollution Emergency Plan (SOPEP)	For compliance with the requirements of MARPOL, all project vessels with a gross tonnage (GT) above 400 tonnes would require a SOPEP detailing the emergency actions to be taken in the event of an oil spill.
Use of Bentonite during HDD	Bentonite will be used during HDD as the best practice drill lubricant.
HDD drill fluid system	The use of a HDD drill fluid system that allows for the monitoring of pressure loss and therefore allows for the rapid identification of potential break outs.
Vessel Management Plan (VMP)	The VMP will confirm the types and numbers of vessels that would be engaged on the Proposed Development and consider vessel coordination including indicative transit route planning. Pre-requisite contractor requirement – secured via final Offshore CEMP.

2. Water Framework Directive Requirements

2.1 Water Framework Directive

2.1.1 Overview

The WFD establishes a framework for the management and protection of Europe's water resources. It is implemented in England and Wales through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the Water Framework Regulations)[2]. Central to the WFD is the philosophy to make water bodies better through sustainable development for the joint benefits of aquatic habitats and the human environment.

Ecological status is an expression of the quality of the structure and functioning of surface water ecosystems as indicated by the condition of a number of 'quality elements'. These include biological and chemical indicators. Where a water body is defined as a Heavily Modified Water Body (HMWB), ecological status is replaced by ecological potential.

The development and implementation of strategic long-term River Basin Management Plans (RBMPs) is a key requirement of the WFD. They include a programme of measures outlining the on-going monitoring and management actions required for water bodies to achieve future objectives.

Proposed developments or activities that have the potential to affect the water environment require a WFD Assessment. In this context, compliance with the WFD means prevention of deterioration (of ecological status, chemical status and supporting element status) and avoiding prevention of ability to achieve future targets. However, WFD Article 4.7 provides a legislative framework for exemption conditions that allow implementation of schemes that cause deterioration in ecological status, for example for reasons of overriding public interest.

The subsequent Priority Substances Directive to the WFD sets out Environmental Quality Standards (EQSs, 2008/105/EC) for priority substances which is known as the Environmental Quality Standards (EQS) Directive and there have been subsequent amendments (2013/39/EU) and implementation directives (Defra, 2015). The environmental objectives of the WFD and its associated directives include the following:

---

[2] Following Brexit, existing EU environmental legislation continue to operate under the policy of "roll-over", however, decisions made by the EU will no longer be binding for courts in the UK.

- to prevent deterioration of aquatic ecosystems;
- to protect, enhance and restore water bodies to 'good' status; based on ecology (with its supporting hydromorphological and physico-chemical factors) and chemical factors for surface waters; and
- to progressively reduce pollution from priority substances and cease or phase out discharges of priority hazardous substances.

The default objective of the WFD is for all rivers, lakes, estuaries, groundwater and coastal water bodies to achieve 'good' status by 2027 at the latest. Where it is not possible to achieve this, alternative objectives can be set. The existing status, and measures required to achieve the 2027 status objective, are set out for each water body in the relevant RBMPs. The plans set out the current baseline condition of the water environment at the time of publication and provide details on the measures needed and timescales required to attain their target status.

For the following surface water bodies: rivers, lakes, estuaries and coastal waters, the overall water body status has both an ecological and a chemical component. Good 'ecological status' is defined as a 'slight variation from undisturbed natural conditions, with minimal distortion arising from human activity'. The ecological status of water bodies is determined by examining biological elements (e.g. benthic invertebrates, fish (but not in coastal water bodies)) and a number of supporting elements and conditions, including physico-chemical factors (e.g. metals and organic compounds), and hydromorphological factors (e.g. depth, width, flow, and 'structure') factors. These are all WFD quality elements, also referred to as receptors for the purposes of this assessment.

A flow chart illustrating how quality elements are combined (Cycle 3) to provide an overall water body status/potential is provided in **Figure 3**.

The classification hierarchy for surface waters is illustrated in **Figure 4**.

Only biological supporting elements have classification boundaries defined for 'high' through to 'bad' (**Figure 3**). Chemicals supporting 'chemical status' that do not meet EQS concentrations are classified as 'Failing to achieve Good' (**Figure 3**).

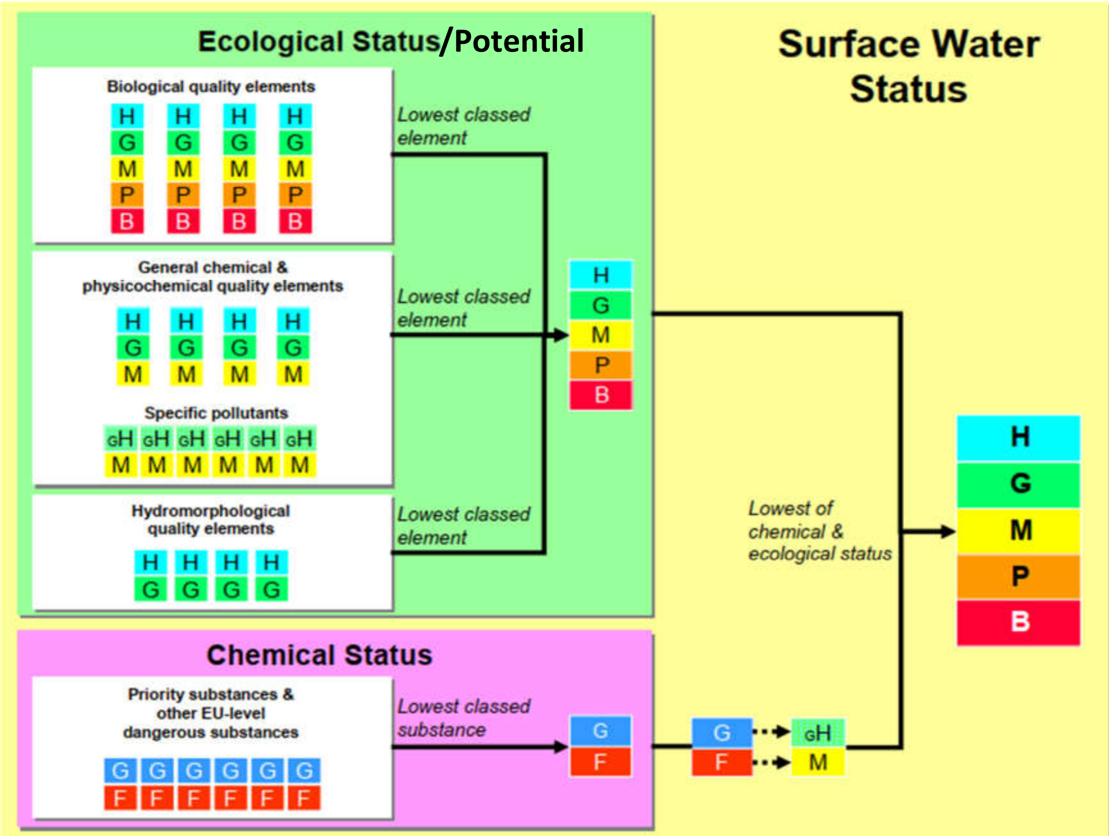

Figure 3. WFD quality elements – Bringing all the strands of evidence together (Environment Agency 2022)

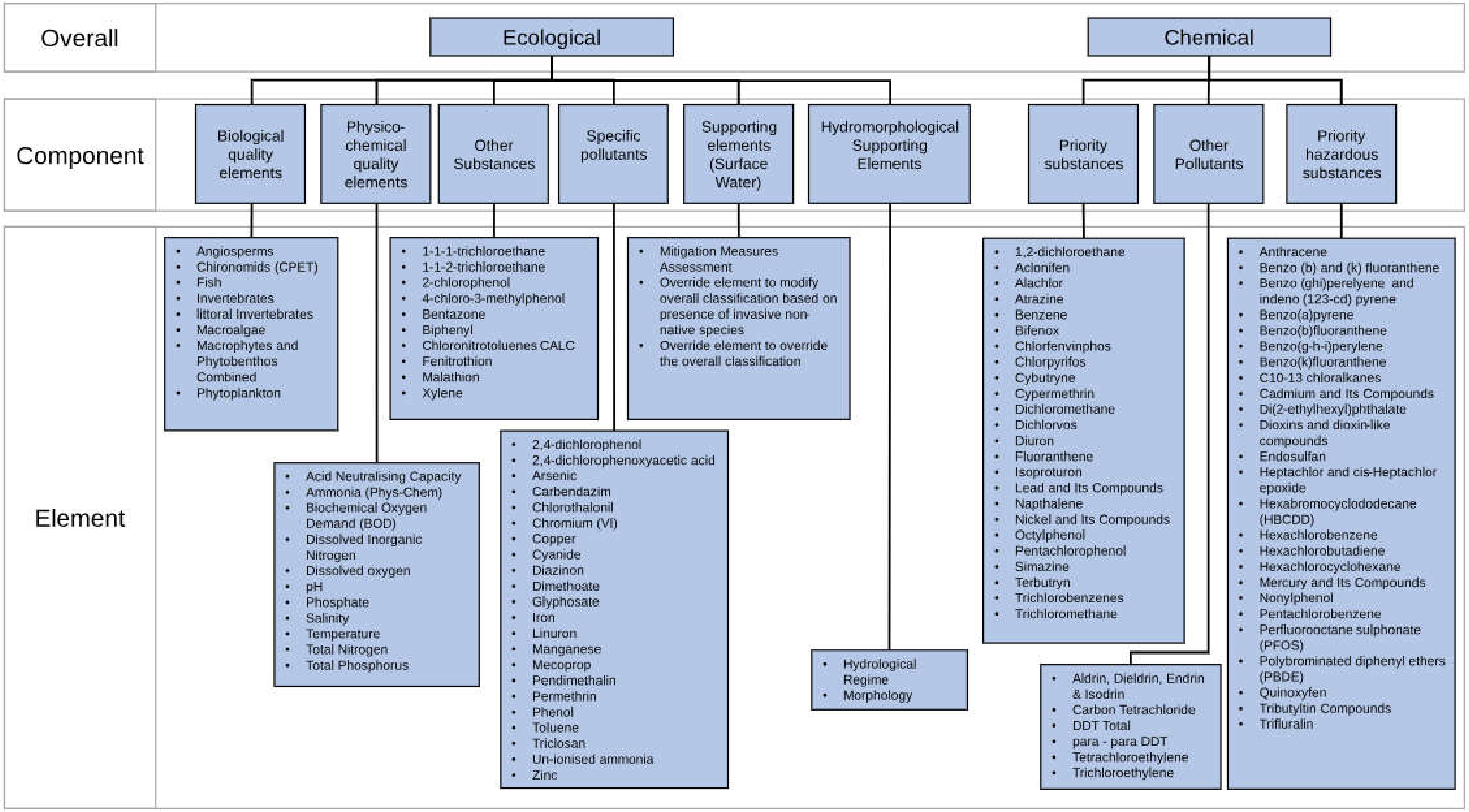

Figure 4. Classification hierarchy for surface waters (from Environment Agency 2023b)

2.1.2 Coastal Water Bodies

Coastal water bodies include those that have not been designated as transitional water bodies, extending one nautical mile from a baseline defined by the land points where territorial waters are measured.

The Proposed Development is within the Barnstaple Bay WFD coastal water body. The status of the water body is indicated in **Table 2**. The Offshore Cable Corridor is also approximately 3.5 km from the Lundy WFD coastal water body and the status of this water body is indicated in **Table 3**.

The WFD quality elements for coastal WFD water bodies are as follows:

- Hydromorphological:
    - tidal regime:
        - direction of dominant currents; and
        - wave exposure
    - morphological conditions:
        - depth variation;
        - quantity, structure, and substrate of the bed;
        - dominant currents;
        - wave exposure; and
        - structure of the intertidal zone.
- Biological:
    - phytoplankton;
    - other aquatic flora; and
    - benthic invertebrates (including assessment of imposex in dog whelks).
- Physico-chemical and chemical:
    - transparency;
    - thermal conditions;
    - dissolved oxygen;
    - nutrients;
    - salinity; and
    - pollution by substances being discharged (e.g. chemicals, metals, pesticides).

Table 2. Cycle 3 classifications for the Barnstaple Bay coastal water body

Summary			
Water Body ID		**GB610807680003**	
Water Body Area		**11,114.15 ha**	
Water Body Type		**Coastal Water**	
Hydromorphological designation		**Not heavily modified**	
Overall Status		**Moderate**	
Parameter		**Year**	
		2019	**2022**
Chemical Status		**Fail**	**Does not require assessment**
Priority Substances		**Good**	**Does not require assessment**
Priority Hazardous Substances		**Fail** (due to Mercury and PBDE)	**Does not require assessment**
Ecological Status		**Good**	**Moderate**
Biological Quality Elements	Angiosperms	**Not Available**	**Not Available**
	Fish	**Not Available**	**Not Available**
	Invertebrates	**Not Available**	**Moderate**
	Macroalgae	**Good**	**Good**
	Phytoplankton	**Good**	**Good**
Physico-chemical Quality Elements	Dissolved Inorganic Nitrogen	**Good**	**High**
	Dissolved Oxygen	**High**	**High**
Specific Pollutants	Various	**High**	**High**
Hydromorphological supporting elements	Morphology	**High**	**High**

Table 3. Cycle 3 classifications for the Lundy coastal water body

Summary			
Water Body ID		**GB610878040000**	
Water Body Area		**3,918.267 ha**	
Water Body Type		**Coastal**	
Hydromorphological designation		**Not designated artificial or heavily modified**	
Overall Status		**Good**	
Parameter		**Year**	
		2019	**2022**
Chemical Status		**Fail**	**Does not require assessment**
Priority Substances		**Good**	**Does not require assessment**
Priority Hazardous Substances		**Fail** (due to Mercury and PBDE)	**Does not require assessment**
Ecological Status		**Good**	**Not Available**
Biological Quality Elements	Angiosperms	**Not Available**	**Not Available**
	Fish	**Not Applicable**	**Not Applicable**
	Invertebrates	**Good**	**Not Available**
	Macroalgae	**Not Available**	**Not Available**
	Phytoplankton	**Not Available**	**Not Available**
Physico-chemical Quality Elements	Dissolved Inorganic Nitrogen	**Not Available**	**Not Available**
	Dissolved Oxygen	**Not Available**	**Not Available**
Specific Pollutants	Various	**Not Available**	**Not Available**
Hydromorphological supporting elements	Morphology	**High**	**Not Available**

2.1.3 Transitional Water Bodies

Transitional water bodies include bodies of surface water in the vicinity of river mouths that typically correspond to estuaries. Therefore, they are influenced by tides and are characterised both by saline water due to their proximity to coastal waters and by freshwater due to inputs of river flows.

At the landfall, the Offshore Cable Corridor is approximately 5 km from the Taw / Torridge transitional water body (**Figure 2**) and the status of this water body is indicated in **Table 4**.

The WFD quality elements for transitional WFD water bodies such as the Taw / Torridge water body are as follows:

- Hydromorphological:
  - tidal regime:
    - freshwater flow; and
    - wave exposure.
  - morphological conditions:
    - depth variation;
    - quantity, structure, and substrate of the bed; and
    - structure of the intertidal zone.
- Biological:
  - phytoplankton;
  - other aquatic flora;
  - benthic invertebrates; and
  - fish.
- Physico-chemical and chemical:
  - transparency;
  - thermal conditions;
  - dissolved oxygen;
  - nutrients;
  - salinity; and
  - pollution by substances being discharged (e.g. chemicals, metals, pesticides)

Table 4. Cycle 3 classifications for the Taw / Torridge transitional water body

Summary			
Water Body ID		**GB540805015500**	
Water Body Area		**1,458.70 ha**	
Water Body Type		**Transitional**	
Hydromorphological designation		**Heavily modified water body – Flood protection**	
Overall Potential		**Moderate**	
Parameter		**Year**	
		2019	**2022**
Chemical Status		**Fail**	**Does not require assessment**
Priority Substances		**Good**	**Does not require assessment**
Priority Hazardous Substances		**Fail** (due to Mercury, PBDE and Benzo(g-h-i)perylene)	**Does not require assessment**
Ecological Potential		**Moderate**	**Moderate**
Biological Quality Elements	Angiosperms	**Good**	**Good**
	Fish	**Good**	**Good**
	Invertebrates	**Good**	**Good**
	Macroalgae	**High**	**High**
	Phytoplankton	**Good**	**Good**
Physico-chemical Quality Elements	Dissolved Inorganic	**Moderate**	**Moderate**
	Dissolved Oxygen	**High**	**High**
Specific Pollutants	Various	**High**	**High**
Hydromorphological supporting elements	Hydrological regime	**Supports Good**	**Supports Good**

3. Methods

The assessment followed the EA's 'Clearing the Waters for All' guidance (EA, 2023a), which was developed specifically to assess the effects of activities in transitional and coastal waters in relation to WFD targets. The assessment approach is based on the following three stages:

- Screening;
- Scoping; and
- (Impact) Assessment.

3.1 Screening

The screening stage is used to determine if the activities for the proposed works are classed as low risk activities. The EA guidance (EA, 2023a) indicates that the following activities qualify as low risk activities:

- A self-service marine licence activity or an accelerated marine licence activity that meets specific conditions;
- Maintaining pumps at pumping stations;
- Removing blockages or obstacles like litter or debris within 10 m of an existing structure to maintain flow;
- Replacing or removing existing pipes, cables or services crossing over a water body – but not including any new structure or supports, or new bed or bank reinforcement; and
- 'Over water' replacement or repairs to, for example, bridge, pier, and jetty surfaces, if you minimise bank or bed disturbance.

Where the proposed works do not fulfil criteria for a low-risk activity, the assessment continues to the Scoping stage.

3.2 Scoping

The Scoping stage is used to determine if the proposed activities pose potential risks to the following receptors based on the quality elements of the water body of concern. The EA guidance (EA, 2023a) specifies consideration of the following quality elements:

- Hydromorphology;
- Biology – habitats;

- Biology – fish (not for coastal water bodies);
- Water quality;
- Protected areas; and
- Invasive non-native species (INNS)

Scoping for coastal and transitional water bodies has been undertaken by using the Scoping template provided in the EA guidance (EA, 2023a). The Scoping template identifies a range of criteria against which proposed activities can be considered to determine whether they pose potential risks to receptors and, therefore, whether there is a requirement to carry out an impact assessment for those receptors.

3.3 Impact Assessment

The impact assessment stage involves determination of the potential impacts of the proposed activities on the specific parameters that are taken forward from Scoping (EA, 2023a).

The assessment involved consideration of whether the proposed activities (as set out in Section 1.5) will have a non-temporary impact on status of WFD quality elements in the WFD water bodies potentially affected by the Proposed Development (EA, 2023a). The impact assessment was carried out following the steps in the impact assessment section of the EA guidance (EA, 2023a).

The WFD assessment has also followed principles of EIA guidance (e.g. CIEEM, 2018) where applicable in that the following aspects have been considered when assessing the potential for a change in WFD status due to impacts on WFD quality elements. Although these aspects have been considered, they are not necessarily referred to directly in the assessment text:

- Nature of effect i.e. beneficial / adverse; direct / indirect;
- Extent of the effect (geographical area e.g. site-wide, local, district, regional, and the size of the population affected);
- Likelihood of effect occurring;
- Value and sensitivity of receptor;
- Magnitude of effect;
- Duration; and
- Temporary or permanent effect. If the effect occurs on all of, or a proportion of, a community/population on a continual basis it can be considered to be permanent (e.g. a

continual cooling water discharge). If it is not on a continual basis when considering the community / assemblage / population or habitat level, it can be described as temporary.

If it was considered that the activity would not affect the potential / status of a given WFD receptor (taking account of any embedded mitigation measures) then no further evaluation or mitigation was required for the WFD assessment for that receptor (WFD supporting element). If possible adverse effects were identified, then the next step is to identify suitable mitigation measures to address the potential effect (EA, 2023a).

4. WFD Assessment

4.1 Screening

4.1.1 *Screening of activities*

The proposed activities were considered against the list of low-risk activities identified under the EA guidance (EA, 2023a). It was concluded that they do not qualify as low risk activities and, accordingly, they were taken forward to the Scoping stage.

4.1.2 *Screening of water bodies*

All transitional and coastal water bodies located within 5 km of the Proposed Development were initially identified. A 5 km search distance (in all directions from the Offshore Cable Corridor extents) is equivalent to the benthic ecology study area that is applied within the PEIR. This screening distance is considered suitably precautionary as it exceeds the maximum modelled sediment dispersal distance (3.9 km) predicted under maximum bed current velocities at any one location along the entire Offshore Cable Corridor. The water bodies initially identified within 5 km were:

- 'Barnstaple Bay' coastal water body (ID: GB610807680003);
- 'Lundy' coastal water body (ID: GB610878040000); and
- 'Taw / Torridge' transitional water body (ID: GB540805015500).

The Proposed Development is within the Barnstaple Bay WFD coastal water body, which was consequently screened in for further assessment.

The Lundy WFD coastal water body was found to be 3.5 km from the Proposed Development. The zone of influence (ZoI) for suspended sediment dispersion was calculated to be a maximum distance of 3.9 km from the Offshore Cable Corridor (Volume 3 of the PEIR,

Appendix 8.1, High Level Assessment of Sediment Dispersion), and this is considered to be the impact with the greatest ZoI (see PEIR submitted for the Proposed Development). However, further consideration of the sediment dispersal calculations confirms that in the area nearest to the Lundy coastal water body, suspended sediment is anticipated to fall out of suspension in the immediate vicinity of the Offshore Cable Corridor and would not reach the Lundy WFD coastal water body (PEIR Volume 3, Appendix 8.1, High Level Assessment of Sediment Dispersion). In addition, fish are not an ecological element considered for coastal water bodies (unless affecting fish entering an estuary), consequently there are not anticipated to be mobile WFD receptors that could reach the Proposed Development from the Lundy WFD coastal water body. Thus, there is no anticipated pathway for impact on Lundy WFD coastal water body supporting elements. For these reasons the Lundy WFD coastal water body was screened out of the assessment and is not considered further within this WFD assessment.

The Taw / Torridge transitional water body is located 5 km from the Proposed Development therefore benthic habitats are not expected to be affected by the Proposed Development. However, fish from the Taw / Torridge transitional water body could swim to, or past, the Offshore Cable Corridor. Consequently, the Taw / Torridge transitional water body has been screened in for further assessment.

4.2 Scoping

The completed Scoping template for the Barnstaple Bay WFD coastal water body and the Taw / Torridge transitional water body are provided as Appendix 1.

4.2.1 Barnstaple Bay WFD coastal water body

As indicated in the Scoping template, the following WFD quality elements were **scoped in** to the requirement for more detailed assessment:

- Hydromorphology:
    - The proposed works may have potential direct effects on hydromorphology within the Barnstaple Bay WFD coastal water body.

- Biology – Habitats (lower sensitivity):
    - The footprint area of the Proposed Development in the Barnstaple Bay coastal water body covers more than 1% of the area of a number of lower sensitivity habitats within the water body.

- Fish:
  - Although fish are not usually considered for a coastal water body, it is considered the Proposed Development could potentially affect movement in and out of the Taw / Torridge Estuary via the Barnstaple Bay water body, so it has been included taking a precautionary approach.
- Water Quality:
  - Activities associated with the Proposed Development may have potential effects on the water quality of the Barnstaple Bay coastal water body.
- WFD Protected Areas:
  - The Proposed Development intersects with the Bristol Channel Approaches SAC.
- Invasive Non-native Species:
  - Due to vessel activity, interactions between equipment and the seabed, introduction of structures to the seabed during construction, and potential colonisation of introduced hard structures by INNS during operation and beyond, there is potential for introduction and spread of marine INNS to the Barnstaple Bay coastal water body.

The following WFD quality elements were **scoped out** of the impact assessment:

- Biology – Habitats (Higher sensitivity):
  - The proposed works are not within 500 m of a higher sensitivity habitat. The closest higher sensitivity habitat is polychaete reef, which is approximately 700 m from the proposed works.

4.2.2 Taw / Torridge transitional water body

As indicated in the Scoping template, the following WFD quality element was **scoped in** to the requirement for more detailed assessment:

- Fish:
  - Activities associated with the Proposed Development could potentially affect normal fish behaviour like movement, migration or spawning and could affect movement of fish in and out of the Taw / Torridge Estuary.

The following WFD quality elements were **scoped out** of the impact assessment:

- Hydromorphology; Biology: habitats; Water Quality; Protected Areas; Invasive Non-Native Species:
  - These were all scoped out as the proposed works are not in the Taw / Torridge water body, with no identified pathway to affect these supporting elements in the Taw / Torridge water body. The Proposed Development is thus not anticipated to result in a deterioration in the status of these elements or prevent the Taw / Torridge water body from meeting its WFD objectives in relation to these elements.

4.3 Impact Assessment

4.3.1 Hydromorphology

There is potential for localised changes to seabed morphology due to the creation of trenches to install the cable, and the potential use of cable protection (rock placement) in some areas. These changes also have the potential to have localised effects on current speed and sediment transport and areas of scour.

As indicated in **Table 1**, where possible, cables will be buried up to 1.5 m below the seabed, subject to a detailed Cable Burial Risk Assessment (CBRA). Only when full burial is not possible will additional protection be installed. In addition, where possible, any rock placement would be kept level with the seabed, and if necessitated above the seabed they would be kept to a maximum of 1 m above seabed level.

The sediment type within the part of the Offshore Cable Corridor that intersects the Barnstaple Bay coastal water body is soft sediment (sand and mud) (see PEIR Volume 3, Chapter 1: Benthic Ecology). Consequently, it is likely that no rock placement will be required in this section of the Offshore Cable Corridor and should rock placement be required there is high confidence (based on the provisional Burial Assessment Study) that this would only be required within trench (i.e. it would not extend above existing sea bed level).

The HDD exit points will be in water depths of between 6 m and 9 m where frequent reworking of sediments is likely to be a feature of the baseline environment.

Assessment

Overall, the area in which a trench would be created, and cable protection potentially installed is very small in relation to the area of the Barnstaple Bay coastal water body (the width of any trench would be 0.5 to 1.5 m). The low profile of any cable protection (highly likely to have no profile extending above the existing sea bed level), will minimise any effects on local hydrodynamics and thereby any associated changes in seabed morphology. Areas of rock protection may experience some initial periods of scour in the immediate vicinity following installation, however, this would be very localised in the immediate vicinity of the rock protection (order of metres) and would reduce in scale over time and any associated seabed morphology changes are anticipated to be very small. Measurable scour is most likely negligible given the likelihood of no above sea bed rock placement in the Offshore Cable Corridor within the Barnstaple Bay water body.

Given the nature of the proposed works, it is considered that operation and maintenance activities would likely result in negligible or minor effects only on seabed morphology (noting the anticipated negligible scour above).

Overall, taking account of the scale of the potential effects during construction and operation and maintenance in relation to the area of the water body, it is considered that the Proposed Development would not result in a deterioration in the status of the hydromorphology of the water body or prevent the Barnstaple Bay coastal water body from meeting its WFD objectives in relation to hydromorphology.

4.3.2 Biology – Lower Sensitivity Habitats

The justification for inclusion of lower sensitivity habitats in the impact assessment, as outlined in the Scoping Template in Appendix 1, is that the proposed activities:

- coincide with 1% or more of at least one lower sensitivity habitat.

Magic Maps (DEFRA 2024) indicates that the lower sensitivity habitat 'subtidal soft sediments like sand and mud' intersects with approximately 127.4 ha of the proposed area of works (Offshore Cable Corridor) within the Barnstaple Bay coastal water body. The area of 'subtidal soft sediments like sand and mud' within the water body is 9,280.57 ha. The proposed works are therefore in 1.3% of the lower sensitivity habitat 'subtidal soft sediments like sand and mud', within the Barnstaple Bay coastal water body.

Works associated with cable installation within the Barnstaple Bay coastal water body includes seabed preparation, cable laying activities and potential installation of cable protection. During operation and maintenance, if cables need to be repaired, they will be exposed and replaced. Cables may also be removed during decommissioning. Potential impacts to biological habitats include temporary habitat loss/disturbance and long-term habitat loss/change (should any in-trench rock protection be required).

Assessment

A detailed characterisation of the benthic habitats which may be directly or indirectly impacted by the Proposed Development is provided in the PEIR within Volume 3, Chapter 1: Benthic Ecology. The assessment within the PEIR concluded that there would be no adverse significant effects on benthic receptors (including within Barnstaple Bay) from temporary habitat loss/disturbance and long-term habitat loss/change associated with the Proposed Development.

Given that the benthic habitats that characterise the Offshore Cable Corridor are common and widespread throughout the wider region (as described within Section 1.5 of Volume 3, Chapter 1: Benthic Ecology), it is considered that activities resulting in temporary habitat loss/disturbance and long-term habitat loss/change during construction would affect only a a very small area compared to their overall extent in the wider region, including in the Barnstaple Bay coastal water body.

The sensitivity of biotopes that are known to characterise the Offshore Cable Corridor have been assessed according to the detailed Marine Evidence-based Sensitivity Assessment (MarESA) information (Table 1.21 of PEIR Volume 3, Chapter 1: Benthic Ecology). The Barnstaple Bay coastal water body is predominantly characterised by 'Atlantic Infralittoral Sand' (MB52). The MarESA assessment determined that the representative biotope 'Sparse fauna in Atlantic infralittoral mobile clean sand' (MB5231) has low sensitivity to temporary habitat loss/disturbance and high sensitivity to long-term habitat loss/change. However, none of the biotopes likely to be affected are rare or geographically restricted. As detailed within the PEIR baseline characterisation, comparable habitats are distributed within the wider region. Therefore, given the relatively small spatial scales for any habitat loss/disturbance outlined above, this loss is not expected to undermine regional ecosystem functions or diminish biodiversity.

The impact of temporary habitat loss/disturbance on benthic habitats is predicted to be of local spatial extent (i.e. restricted to constrained disturbance areas along the cable trenches i.e. not across the entire Offshore Cable Corridor). In addition, it would be of short-term duration (limited to the duration of construction, operation and decommissioning activities), intermittent and with high reversibility. The impact of long-term habitat loss/change on benthic habitats is predicted to be of long-term duration (as a worst case it is assumed to occur throughout the operational phase) but of localised spatial extent. Within-trench rock protection is unlikely to be required within Barnstaple Bay (benthic sediments (sand) are amenable to effective trenching and refill) and where this turns out to be necessary it is highly unlikely to be required above seabed level (given findings of the Burial Assessment Study). Consequently, normal surface movements of sands (and connectivity of habitats) are expected to continue unimpeded and trenches will tend to cover rapidly. Since the loss of subtidal habitat will largely be temporary and recovery will occur, any effects are predicted to be on a small scale and only for a limited period of time.

Consequently, it is considered that the Proposed Development would not result in a deterioration in the status of the biological supporting elements of the Barnstaple Bay coastal water body or prevent this water body from meeting its WFD objectives in relation to benthic invertebrates (currently listed at Moderate).

4.3.3 Biology – Fish

Beam trawl, otter trawl and seine net surveys conducted within the estuarine regions of the Rivers Taw and Torridge (5 km from landfall) between 2007 and 2023 identified an abundance of sea bass *Dicentrarchus labrax*, sand smelt *Atherina presbyter*, lesser sand eel *Ammodytes tobianus,* thicklip grey mullet *Chelon labrosus* and goby (*Pomatoschistus microps* and *Pomatoschistus minutus*). Additionally, otter trawls caught an abundance of Atlantic herring *Clupea harengus*, sprat *Sprattus sprattus* and whiting *Merlangius merlangus*, and beam trawls caught an abundance of plaice *Pleuronectes platessa*. Other species of note included flounder *Platichthys flesus*, horse mackerel *Trachurus trachurus*, greater sand eel *Hyperplus lanceolatus* and pollack *Pollachius pollachius* (EA, 2024).

Atlantic salmon, European eel, brown/sea trout, river lamprey and twaite shad occur within the Taw-Torridge Estuary and connected tributaries (Davies *et al*., 2020; EA, 2024) and European eel, Atlantic salmon and sea trout are listed features of the Taw-Torridge Estuary SSSI. All of these migratory diadromous species could interact with the Proposed Development.

Fish fauna is assessed as a quality element in WFD transitional water bodies, which are classified using the Transitional Fish Classification Index (TFCI) (WFD-UKTAG, 2014). The Taw / Torridge transitional water body is classified as being at good potential for fish, based on the 2022 assessment (**Table 4**).

The TFCI is a multi-metric index composed of ten individual components, known as metrics, and each metric is assessed by comparing the observed metric values with those expected metric values under reference conditions. The ten metrics are:

- species composition;
- presence of indicator species;
- species relative abundance;

- number of taxa that make up 90% of the abundance;
- number of estuarine resident taxa;
- number of estuarine-dependent marine taxa;
- functional guild composition;
- number of benthic invertebrate feeding taxa;
- number of piscivorous taxa; and
- feeding guild composition.

The species relevant to the calculation of the TFCI are predominantly marine/estuarine residents. Consideration is specifically given to diadromous species within one metric of the TFCI, but only as an indicative presence/absence measure.

Normative definitions set out in Annex V of the WFD describe the aspects of the fish fauna biological quality element in transitional waters that must be included in the ecological status assessment of transitional waters, namely:

- species composition;
- abundance; and
- disturbance-sensitive species.

The WFD normative definitions of ‘high’, ‘good’, and ‘moderate’ status for transitional water body fish as described in Annex V of the Directive are set out in **Table 5**.

Table 5. Normative definitions of ‘high’, ‘good’ and ‘moderate’ status/potential for transitional fish.

High Status/Potential	Good Status/Potential	Moderate Status/Potential
Species composition and abundance is consistent with undisturbed conditions.	The abundance of the disturbance-sensitive species shows slight signs of distortion from type-specific conditions attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements.	A moderate proportion of the type-specific disturbance-sensitive species are absent as a result of anthropogenic impacts on physicochemical or hydromorphological quality elements.

The main potential effect on fish receptors associated with the Taw / Torridge transitional water body is considered to be the generation of underwater noise and vibration, primarily during the construction phase for the proposed development. It is also considered that any noise generated by the works would not reach the water body, so only fish swimming to the Offshore Cable Corridor from the water body or passing the Offshore Cable Corridor on the way to the water body, could potentially be affected. It should be noted that there is no pile driving associated with the works and the activities involved are anticipated to generate relatively low levels of noise and vibration.

Fish migrating past the Offshore Cable Corridor also have the potential to be affected by temporary and long-term habitat loss, temporary increases in suspended sediments, changes in water quality and electromagnetic field effects.

Assessment

A detailed characterisation of the fish receptors which may be directly or indirectly impacted by the Proposed Development is provided in the PEIR within Volume 3, Chapter 2: Fish and Shellfish Ecology. The assessment within the PEIR concluded that there would be no adverse significant effects on fish receptors throughout the construction, operation and maintenance, and decommissioning phases of the project (applying to all local fish receptors). Given the scale and nature of the proposed works, it is considered unlikely that activities will result in significant impacts to fish within Taw / Torridge transitional water body.

Consequently, it is considered that the Proposed Development would not result in a deterioration in the status of the fish element of the Taw / Torridge transitional water body or prevent this water body from meeting its WFD objectives in relation to fish.

4.3.4 Water Quality

The proposed works do not involve the intentional release of chemical substances to the marine environment. Accidental spillages of oil and other chemical substances has the potential to occur during the proposed works (as with any activities within the marine environment). However, best practice pollution prevention guidelines will be followed to minimise the risk of accidental spillages and the risk of introduction of contaminants throughout the construction works.

Activities which disturb the seabed have the potential to remobilise contaminants that are bound in the sediment back into the water environment. The total area that is likely to be disturbed, and therefore the potential volume of material disturbed, resulting in the potential release of sediment bound contaminants, is localised in extent and small in the context of the water body. A high-level estimate of the total area of potential disturbance in the Barnstaple Bay water body is 0.645 ha, compared to the overall Barnstaple Bay WFD water body area of 175 ha (<0.4% of water body area). This area estimate is based on 450 m^2 associated with

HDD exit pit excavations, and up to 6,000 m^2 associated with trench excavations (c. 2,000 m [l] x 1.5 m [max. trench width] x 2 [no.] =6000 m^2; noting that cables will split prior to HDD but HDD is planned to at least 600 m offshore)).

In addition, the nature of the subtidal sediments is predominantly coarse (which tend to have lower levels of adsorbed contaminants, compared to finer sediment fractions).

Assessment

Following any sediment disturbance and resuspension, on account of construction activities, the majority of sediments are expected to be deposited in the immediate vicinity of the works. The release of contaminants such as arsenic and Polycyclic Aromatic Hydrocarbons (PAHs) from the small proportion of fine sediments is likely to be rapidly dispersed with the tide and/ or currents and any increased bioavailability resulting in adverse eco-toxicological effects is not expected (any associated water quality concentration change of these parameters would be very short-term and likely negligible/not measurable above background).

Sediment chemistry testing has been undertaken as part of the background characterisation studies and compared against available threshold levels. The use of Cefas Guideline Action Levels is undertaken as part of a 'weight of evidence' approach, principally to assess material suitability for disposal at sea. In general, contaminant concentrations below Cefas Action Level 1 (CAL1) are typically of no concern and are unlikely to influence a marine licensing decision making; concentrations above CAL2 are not normally suitable for disposal at sea. Site-specific sediment grab samples collected for the Proposed Development were analysed for metals, organotins and PAHs. The results of the analysis are presented in PEIR Volume 3, Appendix 8.3 Sediment Sample Chemistry Results. Analysis of the sediment concentrations against Cefas Action Level 1 and Action Level 2 revealed arsenic concentrations above the Level 1 threshold at three locations sampled within the Barnstaple Bay coastal water body but less than the Probable Effect Level (PEL) under the Canadian marine Sediment Quality Guidelines (CCME 1999).

Project specific high-level assessment was undertaken to understand potential sediment dispersion. The key findings of the assessment are presented in PEIR Volume 3, Appendix 8.1 High Level Assessment of Sediment Disturbance. The results of the high-level assessment indicated that suspended sediment within the Barnstaple Bay coastal water body could travel a maximum distance of approximately 3.9 km in a south-westerly direction (estimated to settle within approximately 5 hours) under peak spring tide current velocities, however it is also recognised that bed sediments in this area will routinely be mobilised into suspension under these peak current events – consequently, there will tend to be a degree of baseline disturbance (and potential release/reabsorption) of chemicals associated with sediments. As above, any associated water quality chemical concentration change (e.g. associated with arsenic) would be very short-term and likely negligible/not measurable above background and would approximate similar conditions during regular tidal events (or other routine disturbance events).

A characterisation of the physical processes and water quality which may be directly or indirectly impacted by the Proposed Development is provided in the PEIR within Volume 3, Chapter 8: Physical Processes. The assessment within the PEIR concluded that there would be no adverse significant effects on physical processes receptors from sediment disturbance or seabed change and changes to water quality as a result of suspended sediment and release of chemicals from sediment associated with the Proposed Development. In response to the recognition that sediment dispersion will be greatest at times of peak current flows (spring tides), excavation works associated with the HDD pits will avoid peak spring tides and any predicted periods of high wave activity.

Overall, the impact on water quality is predicted to be of to be of local spatial extent and short-term duration, with low volumes of sediment to be disturbed. As such, the proposed works are not expected to lead to a deterioration of water quality within the Barnstaple Bay coastal water body, nor prevent this water body from meeting its WFD objectives in relation to elements associated with water quality.

4.3.5 WFD Protected Areas

There is one WFD Protected Area within 2 km of the Proposed Development. This site is the Bristol Channel Approaches Special Area of Conservation (SAC), which intersects with the Offshore Cable Corridor. The site is only designated for the feature harbour porpoise *Phocoena phocoena*, and the site supports an estimated 4.7 % of the UK Celtic and Irish Sea (CIS) Management Unit (MU) harbour porpoise population. This site is recognised as being particularly important for porpoises during the winter when high densities persistently occur throughout the site.

There are no Shellfish Water Protected Areas, Nutrient Sensitive Areas, or Bathing Waters within 2 km of the proposed works.

Assessment

The Bristol Channel Approaches SAC and potential effects on its features has been considered within the HRA Screening Report that is prepared alongside the EIA PEIR and this preliminary WFD assessment.

The following potential adverse effects were identified that could impact on species or habitats that are interest features of the designated site:

- Underwater noise and vibration;
- Collision risk;
- Changes to water quality due to pollution; and
- Physical change to another seabed/sediment type.

Screening of these potential effects, with consideration of sources, pathways and effects on receptors concluded that there may be likely significant effects to the site, due to the potential effects of underwater noise and vibration on designated marine mammal features (screened in but not confirmed as an actual impact during HRA Stage 1). As such, the HRA assessment was taken forward to Stage 2 – Appropriate Assessment. While this assessment has not yet been finalised, it should be noted that the noise levels anticipated to be generated by the Proposed Development are relatively low, especially in comparison to activities such as pile driving (which is not associated with the Proposed Development). In addition, the feature of the Bristol Channel Approaches SAC is harbour porpoise which is not associated with any of the quality elements of the Barnstaple Bay coastal water body and or the status of the water body under consideration.

Overall, any potential effects on the harbour porpoise feature of the Bristol Channel Approaches SAC (to be confirmed in the Report to Inform Appropriate Assessment that will be submitted with the ES) are not expected to lead to a deterioration of any WFD protected areas or prevent the Barnstaple Bay coastal water body from meeting its WFD objectives.

4.3.6 Invasive Non-native Species

There is potential for the introduction/spread of marine INNS due to vessel activity in relation to the proposed development, and interactions between equipment and introduced infrastructure materials (rock placement) with the marine environment.

In addition, the placement of any materials within the Barnstaple Bay coastal water body, such as cable protection (placed rock), provides an opportunity for colonisation by a range of marine species, which could include INNS.

The precise number of vessels to be used and vessel return trips is yet to be determined. However, for the purposes of the PEIR, there is anticipated to be in the region of 30 vessels or less (across the entire UK Offshore Cable Corridor at any one time) associated with the construction phase of the proposed development (PEIR Volume 1, Chapter 3: Project Description). The operational phase would see very few vessel movements, associated only with ad-hoc repairs (if needed) and operational phase surveys (approx. once per year over the first c.5 years, then approximately every 5 years thereafter). While the scale of potential decommissioning activities is currently unknown (on account of optionality that still exists), vessel movements and impacts are likely to be no greater than those predicted for construction works (and likely much reduced).

The project will follow and adopt relevant best practice guidelines at all stages of the project (construction, operation and maintenance, and decommissioning) through the implementation of a Biosecurity Plan to minimise the introduction/spread of INNS, implemented via e.g. a Construction Environmental Management Plan (CEMP) – an outline offshore CEMP is provided as Volume 1, Appendix 3.3 of the PEIR. Any vessels used for the delivery of materials to site will adhere to industry legislation, codes of conduct and/or best practice to reduce the risk of introduction or spread of invasive non-native species.

Assessment

A characterisation of the benthic ecology and biodiversity which may be directly or indirectly impacted by the Proposed Development is provided in the PIER within Volume 3, Chapter 1: Benthic Ecology. The assessment within the PIER concluded that there would be no adverse significant effects on benthic receptors from introduction and spread of INNS associated with the Proposed Development.

The sensitivity of all biotopes that are known to characterise the Offshore Cable Corridor have been assessed according to the detailed Marine Evidence based Sensitivity Assessment (MarESA) sensitivity assessments (Table 1.21 of Volume 3, Chapter 1: Benthic Ecology). The Barnstaple Bay coastal water body is predominantly characterised by 'Atlantic Infralittoral Sand' (MB52). The MarESA assessment determined that the representative biotope 'Sparse fauna in Atlantic infralittoral mobile clean sand' (MB5231) is not sensitive to the introduction and spread of INNS. The impact is predicted to be of regional spatial extent and long-term duration.

Considering the existing status of the Barnstaple Bay coastal water body, alongside the perceived low risk and the proposed management of marine INNS via best practice management practices, there is not predicted to be a deterioration in the ecological status of this water body, with respect to benthic ecology and biodiversity. Consequently, any effects associated with the potential introduction and spread of INNS are not expected to lead to a deterioration of the Barnstaple Bay coastal water body (or any of the relevant ecological supporting elements) or prevent this water body from meeting its WFD objectives.

5. Cumulative Effects Assessment

Plans and projects to include in the WFD cumulative effects assessment may include:

- Approved plans;
- Projects under construction;
- Approved but as yet unconstructed projects; and
- Projects for which an application has been made (including early stage submissions e.g. scoping report), and currently under consideration and will be consented before the proposed activities begin.

The cumulative effects assessment considers the effects of the proposed activities on the Barnstaple Bay and Taw / Torridge water body supporting elements when combined with the effects of other plans and projects in the area.

To identify the plans and projects a desktop review of the websites of the following organisations was undertaken:

- Marine Management Organisation (MMO) marine licence public register.
- GOV.UK 'Explore Marine Plans' website.
- The Planning Inspectorate National Infrastructure Planning website.
- The Crown Estate (TCE) Floating Offshore Wind Leasing Round 5 information, via TCE website.

Only plans and projects that have the potential to interact with the marine environment, within 30 km of the Offshore Cable Corridor (entire extent of the UK marine Proposed Development) were considered further. Note for consistency with the PEIR, all schemes / projects identified within 30 km of the Offshore Cable Corridor are presented (c.f. PEIR Volume 1, Appendix 5.4 for full description of methods), with distances to the relevant WFD water bodies included in **Table 6** below.

Table 6. Projects identified within 30 km of the Offshore Cable Corridor

Planning reference / Site code	Project title	Location	Distance from the Barnstaple Bay costal waterbody (km)	Distance from the Taw / Torridge transitional waterbody (km)	Description	Potential cumulative effect on water body
MLA/2023/ 00227	Nearshore seaweed cultivation of native species	North Devon, off coast near Illfracombe	12.8	16.2	This is to be a Kelp Farm on ropes similar to successful Kelp farms in Scotland, NI, Britany, Faroe Islands, Norway and New England that all follow the same basic principles of Buoys anchored to the seabed or to blocks in roughly 50-meter frequencies, main ropes connecting the buoys in each direction creating a grid. Growing ropes are then connected to main ropes to run parallel at 10-meter centres. Proposal is for multiple bays which equate to an area of 100 hectares. Aim to install the seeded lines, seabed anchors, buoys etc during the autumn of 2024 in order to grow the first crop during the winter and harvest in spring 2025.	There is a potential temporal overlap during the operation phase of the proposed development. There are potential cumulative effects with fish and shellfish, and commercial fisheries receptors.
MLA/2021/ 00324	The TwinHub Floating	Off coast near St Ives	104.0	119.7	Wave Hub Limited is seeking consent to construct and deploy two	There is a potential temporal overlap during the operation phase

Planning reference / Site code	Project title	Location	Distance from the Barnstaple Bay costal waterbody (km)	Distance from the Taw / Torridge transitional waterbody (km)	Description	Potential cumulative effect on water body
	Offshore Wind Demonstration Project				semisubmersible platforms with two turbines each in order to generate up to 32MW power from renewable floating offshore wind energy. The Site already consists of existing cables and onshore infrastructure which was originally granted consent in 2007. No further work to existing infrastructure is anticipated. Assembly is planned to be completed and both platforms will be sequentially floated to site to the anchors and mooring lines during Q4 2024. Commissioning will take place during Q1 2025 with a commercial operation date in Q2 2025.	of the proposed development. There are potential cumulative effects with fish and shellfish receptors.
EIA/2022/00002	White Cross Floating Offshore Windfarm	52km off the North Cornwall and North Devon coast (west-north-west of Hartland Point).	51.6	74.8	"Proposed offshore windfarm located in the Celtic Sea with a capacity of up to 100MW. The Windfarm Site is located over 52km off the North Cornwall and North Devon coast (west-north-west of Hartland Point),	There is a potential temporal overlap during the operation phase of the proposed development. There are potential cumulative effects with benthic ecology, fish and shellfish, shipping and

Planning reference / Site code	Project title	Location	Distance from the Barnstaple Bay costal waterbody (km)	Distance from the Taw / Torridge transitional waterbody (km)	Description	Potential cumulative effect on water body
					in a water depth of 60m – 80m. The Windfarm Site covers 50km2. The current wind turbine design envelope for the project is a WTG capacity of 12-24 MW, 6-8 three bladed horizontal axis turbines with a rotor diameter of 220-300 m. Construction is anticipated to commence in mid 2024 with the site anticipated to be operational by 2026."	navigation, other marine users, and commercial fisheries receptors.
n/a	The Crown Estate's Celtic Sea Floating Offshore Wind Leasing Round 5 - Project Development Area 2 (PDA2)	Celtic Sea	75.1	98.1	Project Development Area (PDA) 2 sits within Welsh and English Governance and is one of three suitable PDAs identified within the Celtic Sea for floating offshore wind development, each of which having a potential capacity of up to 1.5 GW. Currently in the early stages of the project, the schedule for PDA 2 is unknown, however, pre-consent metocean surveys are planned for early 2024	There is a potential temporal overlap during the construction and operation phase of the proposed development. There are potential cumulative effects with fish and shellfish receptors.

Planning reference / Site code	Project title	Location	Distance from the Barnstaple Bay costal waterbody (km)	Distance from the Taw / Torridge transitional waterbody (km)	Description	Potential cumulative effect on water body
					and geotechnical investigations are planned for summer 2024.	
n/a	The Crown Estate's Celtic Sea Floating Offshore Wind Leasing Round 5 - Project Development Area 3 (PDA3)	Celtic Sea	50.5	73.1	Project Development Area (PDA) 3 sits within English Governance and is one of three suitable PDAs identified within the Celtic Sea for floating offshore wind development, each of which having a potential capacity of up to 1.5 GW. Currently in the early stages of the project, the schedule for PDA 3 is unknown, however, pre-consent metocean surveys are planned for early 2024 and geotechnical investigations are planned for summer 2024.	There is a potential temporal overlap during the construction and operation phase of the proposed development. There are potential cumulative effects with benthic ecology, fish and shellfish, marine mammals and sea turtles, physical processes, marine archaeology and cultural heritage, shipping and navigation, other marine users, and commercial fisheries receptors.

The projects listed in **Table 6** have been assessed within the respective PEIR chapters where appropriate.

Potential cumulative effects that may impact hydromorphology have been identified and assessed in the PEIR within Volume 3 Chapter 8, Physical Processes. The cumulative effects assessment for physical processes found that the risk of impact on physical processes receptors is not higher than impacts for the Proposed Development in isolation. The scale of potential change to hydromorphology within the Barnstaple Bay coastal waterbody as a result of the Proposed Development is small and localised to areas where cable protection may be deployed (noting that this is unlikely to be required above sea bed level in this area). There is no spatial overlap between the other plans and projects listed in **Table 6** and the Barnstaple Bay coastal waterbody. The potential for significant cumulative effects from the Proposed Development with other projects, plans and activities is therefore considered unlikely to result in a deterioration in status of the Barnstaple Bay water body.

Potential cumulative effects that may impact 'biology – lower sensitivity habitats', and relevant INNS have been identified and assessed in the PEIR within Volume 3 Chapter 1, Benthic Ecology. The cumulative effects assessment for benthic ecology found that the risk of impact on benthic ecology receptors is not higher than impacts for the Proposed Development in isolation. Impacts to benthic habitats as a result of the Proposed Development will be localised to the Offshore Cable Corridor and are considered to be temporary and reversible. There is no spatial overlap between the other plans and projects listed in **Table 6** and the Barnstaple Bay coastal waterbody. The potential for significant cumulative effects from the Proposed Development with other projects, plans and activities is therefore considered unlikely to result in a deterioration in status of the Barnstaple Bay water body.

Potential cumulative effects that may impact biology – fish, and relevant non-native invasive species have been identified and assessed in the PEIR within Volume 3 Chapter 2, Fish and Shellfish Ecology. The cumulative effects assessment for fish and shellfish ecology found that the risk of impact on fish and shellfish ecology receptors is not higher than impacts for the Proposed Development in isolation. The biological parameter 'fish' is not reported for coastal waterbodies under the Directive (e.g., the Barnstaple Bay coastal waterbody). Therefore, potential impacts on fish from the Proposed Development are limited to the Taw / Torridge transitional waterbody. No pathway to impacts on fish within the Taw / Torridge transitional waterbody have been identified due to proposed project design (i.e., trenchless cable installation – c.f. Preliminary Onshore WFD Assessment). Therefore, the potential for significant cumulative effects due to the Proposed Development with other projects, plans and activities is considered unlikely to result in a deterioration in status of the Taw / Torridge transitional waterbody.

Potential cumulative effects that may impact water quality have been identified and assessed in the PEIR within Volume 3 Chapter 8, Physical Processes. The cumulative effects assessment for physical processes (including changes to water quality) found that the risk of impact on receptors is not higher than impacts for the Proposed Development in isolation. Project activities which may result in changes to water quality are typically those involving sediment disturbance and thus an increase in increased suspended sediment. Impacts of water quality from the construction and operation of the Proposed Development will be temporary. Similarly, the operational and maintenance activities of other plans and projects will also be temporary and likely to be infrequent and impacts would be much reduced compared to construction. There is also the potential for accidents to occur, releasing chemicals/substances into the marine environment. It is anticipated that other projects, and plans identified in **Table 6** will also adopt similar pollution prevention measures to minimise the risk of such impacts. Therefore, the potential for significant cumulative effects to water quality, including physico-chemical, specific pollutant and chemical parameters, from the Proposed Development with other projects and plans is considered unlikely to result in the deterioration in status of the Barnstaple Bay coastal waterbody.

Potential cumulative effects that may impact WFD protected areas have been identified and assessed within an in-combination assessment within the HRA Screening report (APEM, 2024). No increased potential for Likely Significant Effects (LSE) were identified within the Screening report and thus the potential for significant cumulative effects on WFD protected areas, from the Proposed Development with other projects and plans is considered unlikely to result in the deterioration in status of the Barnstaple Bay coastal waterbody (or the current or future status of its Protected Areas).

6. Summary

This assessment has considered the potential effects of the Proposed Development on WFD quality elements (WFD supporting elements) in the WFD water bodies in proximity to the Offshore Cable Corridor. The assessment has considered potential effects of the proposed activities on the hydromorphological, biological and chemical quality elements for these water bodies.

The Scoping stage identified that the following receptors for the Barnstaple Bay coastal water body could potentially be affected by the works and were scoped in for further assessment:

- Hydromorphology
- Biology - Lower sensitivity habitats
- Biology – Fish
- Water quality
- WFD protected areas
- Invasive non-native species

The Scoping stage also identified that the following receptors for the Taw / Torridge transitional water body could potentially be affected by the works and were scoped in for further assessment:

- Biology – Fish

The Lundy coastal water body is located 3.5 km from the Proposed Development and within the initial consideration zone for suspended sediment dispersion. However, review of sediment dispersal calculations confirmed that any disturbed sediment is anticipated to fall out of suspension in the immediate vicinity of the Offshore Cable Corridor and would not reach the Lundy WFD coastal water body (Volume 3, Appendix 8.1, High Level Assessment of Sediment Dispersion). Additionally, fish are not an ecological element considered for coastal water bodies (unless affecting fish entering an estuary), consequently there are not anticipated to be mobile WFD receptors that could be affected by the Proposed Development. For these reasons, the Lundy WFD coastal water body was screened out of the full assessment.

6.1 Barnstaple Bay Coastal Waterbody

6.1.1 Hydromorphology

Based on the small area of trenching and cable protection (rock placement) potentially required within the Barnstaple Bay coastal water body, relative to the total area of the water body, effects on local hydrodynamics and associated changes in seabed morphology are anticipated to be negligible. Additionally, any initial period of scour surrounding cable protection will be localised in the immediate vicinity and would reduce in scale over time. Any associated seabed morphology changes are anticipated to be very small. This assessment assumes some placement of rock above seabed level is necessary within the water body, which the provisional Burial Assessment Study finds is highly unlikely. Therefore, it is considered that the Proposed Development would not result in a deterioration in the status of the Barnstaple Bay coastal water body or prevent the water body from meeting its WFD objectives in relation to hydromorphology.

6.1.2 Biology - Lower Sensitivity Habitats

Given that the benthic habitats which characterise the area of the Offshore Cable Corridor, and particularly the Barnstaple Bay coastal water body, are common and widespread throughout the region, the spatial extent of temporary habitat loss/disturbance and long-term habitat loss as a result of the Proposed Development will be limited relative to the available habitat. Additionally, based on the low sensitivity of the habitats affected by the Proposed Development, and the high recoverability of those habitats and associated communities, any effects of temporary habitat loss/disturbance will be temporary and reversible. Therefore, it is considered that the Proposed Development would not result in a deterioration in the status of the benthic invertebrate element of the Barnstaple Bay coastal water body or prevent the water body from meeting its WFD objectives in relation to benthic invertebrates (associated WFD supporting element).

6.1.3 Water Quality

The results of sediment contamination analyses show that arsenic concentrations in samples from within the water body are, in places above Cefas Action Level 1. Based on the nature and duration of the works, and the sediment characteristics within the water body, it is anticipated that any sediment bound contaminants remobilised into the water column would be rapidly diluted and dispersed. The scale of any such release would be comparable to routine background disturbance events. Any such release is not anticipated to result in a deterioration in the status of the Barnstaple Bay WFD water body or prevent the water body from meeting its WFD objectives. Additionally, any changes to water quality as a result of increased suspended sediment within the Barnstaple Bay coastal water body will be highly localised in extent and of short-term duration, with very low volumes of sediment likely to be disturbed. Therefore, it is considered that the Proposed Development would not result in a deterioration in the status of the water quality element of the Barnstaple Bay coastal water body or prevent the water body from meeting its WFD objectives in relation to water quality.

6.1.4 WFD Protected Areas

For WFD Protected Areas the main consideration was that the Proposed Development is within 2 km of the Bristol Channel Approaches SAC, which intersects with the Offshore Cable Corridor. There are no Shellfish Water Protected Areas, Nutrient Sensitive Areas, or Bathing Waters within 2 km of the proposed works. The Bristol Channel Approaches SAC is designated for the feature harbour porpoise. The HRA screening assessment concluded that there is potential for likely significant effects (LSE), due to the potential effects of underwater noise and vibration on designated marine mammal features. Noise levels anticipated to be generated by the Proposed Development are relatively low, especially in comparison to activities such as pile driving (which is not associated with the Proposed Development). Notably, the feature of the Bristol Channel Approaches SAC (harbour porpoise) is not associated with any of the quality elements of the Barnstaple Bay coastal water body or the status of the water body under consideration. The findings of the Stage 2 HRA will be reviewed in preparation of the final offshore WFD assessment for completeness, however, it is concluded that the Proposed Development would not result in a deterioration of any WFD protected areas or prevent the Barnstaple Bay coastal water body from meeting its WFD objectives.

*6.1.5 **Invasive Non-native Species***

Based on the nature and duration of the works, there is potential for the introduction/spread of marine INNS due to vessel activity and introduced infrastructure materials within the marine environment. However, the introduction and presence of infrastructure materials (i.e. rock placement if required) within the Barnstaple Bay coastal water body will have a limited footprint – the provisional Burial Assessment Study confirms low risk to standard burial and backfill with existing sediments. The project will follow and adopt relevant best practice guidelines at all stages of the project through the implementation of a Biosecurity Plan to minimise the introduction/spread of INNS. Any vessels used for the delivery of materials to site will adhere to industry legislation, codes of conduct and/or best practice to reduce the risk of introduction or spread of invasive non-native species. Therefore, it is considered that the Proposed Development would not result in a deterioration in the status of the invasive species element of the Barnstaple Bay coastal water body or prevent the Barnstaple Bay coastal water body from meeting its WFD objectives in relation to invasive species.

Overall, it was concluded that the proposed works are not expected to produce non-temporary effects on the biological, hydromorphological and chemical quality elements of the Barnstaple Bay coastal coastal water body and is not expected to prevent the Barnstaple Bay coastal water body from meeting its WFD objectives.

6.2 Taw / Torridge Transitional Water body

*6.2.1 **Biology – Fish***

Based on the nature and the duration of the works, there is potential for impacts on fish due to underwater noise and vibration, primarily during the construction phase of the Proposed

Development. However, it is considered highly unlikely that any noise generated by the works would reach the water body. Fish swimming through the Offshore Cable Corridor from the Taw / Torridge transitional water body or passing the Offshore Cable Corridor on the way to the water body, could still potentially be affected. However, there is no pile driving associated with the works and the activities involved are anticipated to generate relatively low levels of noise and vibration. Therefore, it is considered that the Proposed Development would not result in a deterioration in the status of the fish element of the Taw / Torridge transitional water body or prevent the Taw / Torridge transitional water body from meeting its WFD objectives in relation to fish.

Overall, it was concluded that the proposed works are not expected to produce non-temporary effects on the biological, hydromorphological and chemical quality elements of the Taw / Torridge transitional water body and is not expected to prevent the Taw / Torridge transitional water body from meeting its WFD objectives.

7. References

CCME 1999. Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines and chemical factsheets.

CIEEM (Chartered Institute of Ecology and Environmental Management). 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Updated April 2022. Chartered Institute of Ecology and Environmental Management, Winchester.

Defra 2015. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

Environment Agency 2016. Environmental Quality Standards Directive (EQSD) list for WFD assessments. Available at: https://www.gov.uk/government/publications/list-of-chemicals-for-water-framework-directive-assessments/environmental-quality-standards-directive-eqsd-list-for-wfd-assessments. Accessed: April 2024.

Environment Agency 2022. Rules for assessing surface water body ecological status and potential.

Environment Agency 2023a. Water Framework Directive: Estuarine and Coastal Waters 'Clearing the waters for all' https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters

Environment Agency 2023b. https://environment.data.gov.uk/catchment-planning/help/usage Accessed March 2024.

Environment Agency 2024. Transitional & coastal water fish surveys. National Fish Populations Database.

GEOxyz 2024. Geotech, Env and Reconnaissance surveys. Environmental Report - UK. Ref: 6050H-837-RR-05

MAGIC. 2024. Available at: https://magic.defra.gov.uk/magicmap.aspx

WFD-UKTAG 2014. UKTAG Transitional and Coastal Water Assessment Method: Fish Fauna Transitional Fish Classification Index.

Appendix 1. Scoping Template - Barnstaple Bay WFD coastal water body

Your activity	**Description, notes or more information**
Applicant name	Xlinks Ltd
Application reference number (where applicable)	Not applicable
Name of activity	Xlinks Morocco UK Power Project
Brief description of activity	The Proposed Development would comprise the following offshore elements: • Approximately 370 km of subsea buried HVDC cable, which would be routed from the landfall location at Cornborough Range to the UK Exclusive Economic Zone (EEZ) boundary. The offshore cable infrastructure would continue beyond the UK EEZ, however, this does not form part of the Proposed Development. • Landfall HDD works (beneath the entire intertidal) are provisionally scheduled to be undertaken in advance of cable laying.
Location of activity (central point XY coordinates or national grid reference)	Landfall location - Cornborough, UK. Latitude: 51°38.8115'N. Longitude: 004°49.5932'W
Footprint of activity (ha)	20,483 ha (area of Offshore Cable Corridor within UK waters); approx. 175 ha in the Barnstaple Bay WFD water body
Timings of activity (including start and finish dates)	Pre-lay works such as route clearance and boulder removal may take place in 2027 ahead of cable lay and protection works. Note, the provisional Burial Assessment Study suggests that no pre-lay activities will be required within Barnstaple Bay. Cable lay works for Bipole 1 (first cable bundle) are scheduled to begin in Q1 2028 and it is anticipated that these works (across the entire UK length) would be completed in three

Your activity	Description, notes or more information
	sections each taking approximately one month. It is currently envisaged that two sections will be laid in 2028 and a section laid in 2029. Dates are indicative at this time, and may be influenced by e.g. weather limitations of the CLV. For Bipole 2 (second cable bundle), offshore works would begin in 2030 and would follow a similar schedule. The landfall HDD works (within Barnstaple Bay water body) are provisionally scheduled to be undertaken in advance of cable laying (2028).
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	Use of jack-up vessels for temporary installation purposes at the HDD exit locations (within Barnstaple Bay). HDD exit pits (15m x 15m x4 in number) excavated using either a back-hoe dredger (long arm barge mounted excavator), mass flow excavation (MFE) or a Trailing Suction Hopper Dredger (TSHD). Cable burial techniques may include trench ploughing, trench jetting or mechanical trench excavation. • Mechanical trenching, ROV on seabed with footprint up to 126 m^2 (10 m width and 12.6 m length). • For water jetting ROV, seabed footprint of up to 55.2 m^2 (6 m width and 9.2 m length). • Cable spacing 50 – 180 m between the two bundles. • Trench width of 0.5 to 1.5 m. • Target cable burial depth of 1.5 m.

Your activity	Description, notes or more information
	Full target depth cable burial is expected across entire length within Barnstaple Bay (based on known sandy substrates and provisional Burial Assessment Study). There remains possibility that additional placement of rock protection will be required. Where possible any rock placement would be within trench, with above sea bed level rock placement a last resort. Rock placement (excluding crossings) would be <1 m in height above sea bed in all places. Note there are no crossings of existing cables within the Barnstaple Bay water body.
Release of chemicals	The Proposed Development does not include any direct chemical release activities. There is the potential to temporarily disturb existing sea bed sediments (during trenching and installation activities) and thus the extent of any baseline sediment contamination has been investigated. Chemical Action Levels (cALs) (or Cefas Action Levels) and Canadian marine Sediment Quality Guidelines were used to characterise the broad contamination status of sediment samples taken during the subtidal ecology surveys for the Proposed Development as detailed in GEOxyz (2024). Analyses of sediment concentrations of heavy metals conducted for the Proposed Development indicated that arsenic concentrations exceeded cAL1 at eight stations, but they were below cAL2 and the Probable Effects Level (PEL). All of these samples were located within Bideford Bay and off the north coast of Devon. Results from the provisional Burial Assessment Study indicate that there are no identified sand waves and/ or large ripples present and as a result, no seabed preparation will be required in this area. Heavy metal concentrations were found to be below cAL1 at all other stations.

Your activity	Description, notes or more information
	Concentrations for hydrocarbon compounds (total PAHs) were found to exceed cAL1 at a number of stations sampled during the survey.

Water body	Description, notes or more information
WFD water body name	Barnstaple Bay
Water body ID	GB610807680003
River basin district name	South West
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	11114.15
Overall water body status	Moderate
Ecological status	Moderate
Chemical status	Fail (2019)
Target water body status and deadline	Good by 2015
Hydromorphology status of water body	High
Heavily modified water body and for what use	No
Higher sensitivity habitats present	Polychaete reef (0.6 ha)
Lower sensitivity habitats present	Cobbles, gravel and shingle (37.39 ha), Intertidal soft sediment (946.20 ha), Rocky shore (167.05 ha), Subtidal rocky reef (184.95 ha), and Subtidal soft sediments (9280.57 ha)
Phytoplankton status	Good
History of harmful algae	Not monitored
WFD protected areas within 2km	Bristol Channel Approaches / Dynesfeydd Môr Hafren

Section 1: Hydromorphology

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	✓		Activities associated with the Proposed Development may have potential direct effects on the hydromorphology within the water body.
Could significantly impact the hydromorphology of any water body	✓		Activities associated with the Proposed Development may have potential direct effects on the hydromorphology within the water body.
Is in a water body that is heavily modified for the same use as your activity		✓	The water body is not heavily modified

Section 2: Biology

Habitats

Higher sensitivity habitats to be considered for WFD	Lower sensitivity habitats
chalk reef	cobbles, gravel and shingle
clam, cockle and oyster beds	intertidal soft sediments like sand and mud
intertidal seagrass	rocky shore
maerl	subtidal boulder fields
mussel beds, including blue and horse mussel	subtidal rocky reef
polychaete reef	subtidal soft sediments like sand and mud
saltmarsh	
subtidal kelp beds	
subtidal seagrass	

Consider if the footprint of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5 km^2 or larger	✓		Yes (1.75 km^2) in the WFD water body
1% or more of the water body's area			Yes
Within 500 m of any higher sensitivity habitat			No – Closest is Polychaete reef (distance of 700 m)
1% or more of any lower sensitivity habitat			Yes – more than 1% of cobbles, gravel and shingle; intertidal soft sediment; rocky shore; subtidal rocky reef; and subtidal soft sediments like sand and mud

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.

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	✓		Although the Barnstaple Bay WFD water body is a coastal water body, there is potential for the Proposed Development to affect fish entering the Taw / Torridge Estuary. Consequently, taking a precautionary approach fish have been considered for the water body.
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier,	✓		Although the Barnstaple Bay WFD water body is a coastal water body, there is potential for the Proposed Development to affect fish entering the Taw / Torridge Estuary.

Consider if your activity:	Yes	No	Biology fish risk issue(s)
noise, chemical change or a change in depth or flow)			Consequently, taking a precautionary approach fish have been considered for the water body. A range of activities associated with the proposed development could impact on normal fish behaviour like movement, migration or spawning. This includes noise, chemical changes, sediment disturbance, changes to water quality, EMF effects, and habitat loss.
Could cause entrainment or impingement of fish		✓	Not applicable to the proposed development.

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.

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)	✓		Activities associated with the Proposed Development may have potential direct effects on the water quality of waterbodies within the vicinity of the Proposed Development – increase in SSC; albeit temporary. HDD at the landfall has the potential to release drilling fluids (e.g. 'breakout' of HDD drill slurry); albeit temporary. There is also a risk of accidental spillages from vessels of oil and other hazardous substances.

Consider if your activity:	Yes	No	Water quality risk issue(s)
Is in a water body with a phytoplankton status of moderate, poor or bad		✓	The status for phytoplankton is Good
Is in a water body with a history of harmful algae		✓	This has not been monitored

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

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	✓		Yes (potential for sediments to be disturbed). Requires impact assessment
It disturbs sediment with contaminants above Cefas Action Level 1	✓		Yes (potential for sediments to be disturbed). Requires impact assessment
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		✓	The Proposed Development has no active discharges and does not have a mixing zone.

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
- nutrient sensitive areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2 km of any WFD protected area	✓		Proposed Development overlaps with the Bristol Channel Approaches / Dynesfeydd Môr Hafren. There are no other WFD protected areas within 2 km of the Proposed Development.

Section 5: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	✓		The installation of the cables will require various vessels. These vessels present the opportunity for the introduction and spread of marine INNS. There is also the potential for INNS to be spread and introduced via the use of equipment/materials introduced to the water column, and INNS could potentially colonise introduced structures e.g. cable protection.

Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	Yes	*Activities associated with the Proposed Development may have potential direct effects on the hydromorphology within the water body.*
Biology: habitats	Yes	*The activity has a footprint larger than 0.5 km^2 in the water body, covers more than 1% of the water body's area, and is in more than 1% of a number of lower sensitivity habitats*
Biology: fish	Yes	*A range of activities associated with the proposed development could impact on normal fish behaviour like movement, migration or spawning. This includes noise, chemical changes, sediment disturbance, changes to water quality, EMF effects, and direct habitat loss. Although fish are not usually considered for coastal water bodies there is potential for the Proposed Development to affect fish entering the Taw / Torridge Estuary which is why they have been included here.*
Water quality	Yes	*Activities associated with the Proposed Development may have potential direct effects on the water quality of water bodies within the vicinity of the Proposed Development*
Protected areas	Yes	*The proposed development intersects with the Bristol Channel Approaches SAC.*
Invasive non-native species	Yes	*Required vessels, equipment, and colonisation of hard structures introduced to the marine environment could potentially present the opportunity for the introduction and spread of marine INNS.*

Appendix 2. Scoping Template – Taw / Torridge WFD coastal water body

Your activity	Description, notes or more information
Applicant name	Xlinks Ltd
Application reference number (where applicable)	Not applicable
Name of activity	Xlinks Morocco UK Power Project
Brief description of activity	The Proposed Development would comprise the following offshore elements: • Approximately 370 km of subsea buried HVDC cable, which would be routed from the landfall location at Cornborough Range to the UK Exclusive Economic Zone (EEZ) boundary. The offshore cable infrastructure would continue beyond the UK EEZ, however, this does not form part of the Proposed Development. • Landfall HDD works (beneath the entire intertidal) are provisionally scheduled to be undertaken in advance of cable laying.
Location of activity (central point XY coordinates or national grid reference)	Landfall location - Cornborough, UK. Latitude: 51°38.8115’N. Longitude: 004°49.5932’W
Footprint of activity (ha)	20,483 (area of Offshore Cable Corridor within UK waters)
Timings of activity (including start and finish dates)	Pre-lay works such as route clearance and boulder removal may take place in 2027 ahead of cable lay and protection works. Note, the provisional Burial Assessment Study suggests that no pre-lay activities will be required within Barnstaple Bay. Cable lay works for Bipole 1 (first cable bundle) are scheduled to begin in Q1 2028 and it is anticipated that these works (across the entire UK length) would be completed in three sections each taking approximately one month. It is currently envisaged that two sections will be laid in 2028 and a section laid in 2029.

Your activity	Description, notes or more information
	Dates are indicative at this time, and may be influenced by e.g. weather limitations of the CLV. For Bipole 2 (second cable bundle), offshore works would begin in 2030 and would follow a similar schedule. The landfall HDD works (within Barnstaple Bay water body) are provisionally scheduled to be undertaken in advance of cable laying (2028).
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	Use of jack-up vessels for temporary installation purposes at the HDD exit locations (within Barnstaple Bay). HDD exit pits (15m x 15m x4 in number) excavated using either a back-hoe dredger (long arm barge mounted excavator), mass flow excavation (MFE) or a Trailing Suction Hopper Dredger (TSHD). Cable burial techniques may include trench ploughing, trench jetting or mechanical trench excavation. • Mechanical trenching, ROV on seabed with footprint up to 126 m^2 (10 m width and 12.6 m length). • For water jetting ROV, seabed footprint of up to 55.2 m^2 (6 m width and 9.2 m length). • Cable spacing 50 – 180 m between the two bundles. • Trench width of 0.5 to 1.5 m. • Target cable burial depth of 1.5 m. Full target depth cable burial is expected across entire length within Barnstaple Bay (based on known sandy substrates and provisional Burial Assessment Study). There remains possibility that additional placement of rock protection will be required. Where

Your activity	Description, notes or more information
	possible any rock placement would be within trench, with above sea bed level rock placement a last resort. Rock placement (excluding crossings) would be <1 m in height above sea bed in all places. Note there are no crossings of existing cables within the Barnstaple Bay water body.
Release of chemicals	The Proposed Development does not include any direct chemical release activities. There is the potential to temporarily disturb existing sea bed sediments (during trenching and installation activities) and thus the extent of any baseline sediment contamination has been investigated. Chemical Action Levels (cALs) (or Cefas Action Levels) and Canadian marine Sediment Quality Guidelines were used to characterise the broad contamination status of sediment samples taken during the subtidal ecology surveys for the Proposed Development as detailed in GEOxyz (2024). Analyses of sediment concentrations of heavy metals conducted for the Proposed Development indicated that arsenic concentrations exceeded cAL1 at eight stations, but they were below cAL2 and the Probable Effects Level (PEL). All of these samples were located within Bideford Bay and off the north coast of Devon. Results from the provisional Burial Assessment Study indicated that there are no identified sand waves and/ or large ripples present and as a result, no seabed preparation will be required in this area. Heavy metal concentrations were found to be below cAL1 at all other stations. Concentrations for hydrocarbon compounds (total PAHs) were found to exceed cAL1 at a number of stations sampled during the survey.

Water body	Description, notes or more information
WFD water body name	Taw / Torridge
Water body ID	GB540805015500
River basin district name	South West
Water body type (estuarine or coastal)	Estuarine
Water body total area (ha)	1458.6998
Overall water body status	Moderate
Ecological status	Moderate
Chemical status	Fail
Target water body status and deadline	Moderate by 2015
Hydromorphology status of water body	Supports Good
Heavily modified water body and for what use	Yes (Flood Protection)
Higher sensitivity habitats present	Mussel beds, saltmarsh
Lower sensitivity habitats present	Intertidal soft sediment, rocky shore, subtidal rocky reef, subtidal soft sediments
Phytoplankton status	Good
History of harmful algae	Yes
WFD protected areas within 2km	Braunton Burrows SAC, Taw estuary shellfish waters, Instow bathing waters, Taw Estuary coastal sensitive area

Section 1: Hydromorphology

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		✓	Activities associated with the Proposed Development will not have potential direct effects on the hydromorphology within the water body.
Could significantly impact the hydromorphology of any water body		✓	Activities associated with the Proposed Development will not have potential direct effects on the hydromorphology within the water body.
Is in a water body that is heavily modified for the same use as your activity		✓	Activity is not in the water body

Section 2: Biology

Habitats

Higher sensitivity habitats	Lower sensitivity habitats
chalk reef	cobbles, gravel and shingle
clam, cockle and oyster beds	intertidal soft sediments like sand and mud
intertidal seagrass	rocky shore
maerl	subtidal boulder fields
mussel beds, including blue and horse mussel	subtidal rocky reef
polychaete reef	subtidal soft sediments like sand and mud
saltmarsh	
subtidal kelp beds	
subtidal seagrass	

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5 km^2 or larger		✓	No – footprint is not within the waterbody
1% or more of the water body's area			No
Within 500 m of any higher sensitivity habitat			No
1% or more of any lower sensitivity habitat			No

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.

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	✓		Areas of work for the Proposed Development will occur in an estuary, or could affect fish in the estuary. Work will also occur outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary
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)	✓		A range of activities associated with the proposed development could impact on normal fish behaviour like movement, migration or spawning. This includes noise, chemical changes, sediment disturbance, changes to water quality, EMF effects, and direct habitat loss.
Could cause entrainment or impingement of fish		✓	Not applicable to the proposed development.

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.

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)		✓	No. Any water quality changes from the Proposed Development would be associated with disturbance of sediment and the Taw / Torridge is outside of the zone of influence associated with sediment disturbance (as described by sediment dispersion calculations; c.f. PEIR Volume 3, Appendix 8.1).
Is in a water body with a phytoplankton status of moderate, poor or bad		✓	The status for phytoplankton is Good
Is in a water body with a history of harmful algae		✓	No – the Taw / Torridge water body does have history of harmful algae, but the Proposed Development is not located in the Taw / Torridge water body or with a pathway for influence on the Taw / Torridge water body.

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

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		✓	No – the Proposed Development is not in the Taw / Torridge water body. No pathway for influence on the water quality of the Taw / Torridge water body is present.
It disturbs sediment with contaminants above Cefas Action Level 1		✓	No – the Proposed Development is not in the Taw / Torridge water body. No pathway for influence on the water quality of the Taw / Torridge water body is present.
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		✓	The Proposed Development has no active discharges and does not have a mixing zone.

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
- 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.

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2 km of any WFD protected area		✓	The Proposed Development overlaps with the Bristol Channel Approaches / Dynesfeydd Môr Hafren. There are no other WFD protected areas within 2 km of the Proposed Development.

Section 5: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS		✓	Activity is not within the Taw / Torridge water body.

Summary

Summarise the results of scoping here.

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	*Not applicable – Addressed for Barnstaple Bay coastal waterbody*
Biology: habitats	No	*Not applicable – Addressed for Barnstaple Bay coastal waterbody*
Biology: fish	Yes	*A range of activities associated with the proposed development could impact on normal fish behaviour like movement, migration or spawning. This includes noise, chemical changes, sediment disturbance, changes to water quality, EMF effects, and direct habitat loss.*
Water quality	No	*Not applicable – Addressed for Barnstaple Bay coastal waterbody*
Protected areas	No	*Not applicable – Addressed for Barnstaple Bay coastal waterbody*
Invasive non-native species	No	*Not applicable – Addressed for Barnstaple Bay coastal waterbody*