



# **XLINKS MOROCCO-UK POWER PROJECT**

## **Preliminary Environmental Information Report**

**Volume 2, Appendix 3.2: Preliminary Onshore Water Framework Directive Assessment**



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# 1 PRELIMINARY WATER FRAMEWORK DIRECTIVE ASSESSMENT

## 1.1 Introduction

- 1.1.1 This document forms Volume 2, Appendix 3.2: Preliminary Onshore Water Framework Directive (WFD) Assessment of the Preliminary Environmental Information Report (PIER) prepared for the watercourses which are likely to be impacted by the UK elements of the Xlinks Morocco-UK Power Project, hereafter referred to as Proposed Development.
- 1.1.2 This document forms a screening assessment of the WFD compliance for the Proposed Development. Specifically, this document considers the potential impact of the Proposed Development landward of Mean Low Water Springs (MLWS), during the construction, operation and maintenance, and decommissioning. Further stages of the WFD assessment are to be provided within additional reports.
- 1.1.3 The aim of the WFD assessment is to assess the potential impacts of the proposed works associated with the Proposed Development against the WFD parameters for the local waterbodies. The screening assessment includes a summary of the current local conditions. Further assessment will explore the potential for the Proposed Development to contribute towards WFD objectives and any likely alterations to the WFD classifications that could arise from the Proposed Development.
- 1.1.4 The WFD assessment is required to demonstrate that the Proposed Development will not result in deterioration of the current quality status of the relevant WFD water body, and could provide improvements to the current status, in accordance with the objectives and measures set out in the South West River Basin Management Plan (RBMP).

## The Proposed Development

- 1.1.5 The Proposed Development forms the UK part of the wider Xlinks Morocco-UK Power Project proposed by the Applicant to develop a renewable energy generation facility in Morocco, connected via sub-sea electricity connection between north Africa and cables to the UK. The onshore elements of the Proposed Development comprises the UK infrastructure to be implemented onshore landward of MLWS. The key components of the onshore elements of the Proposed Development include:
- Converter Site;
  - High Voltage Direct Current (HVDC) cables;
  - Two converter stations;
  - Alverdiscott Substation Connection Development;
  - High Voltage Alternating Current (HVAC) cables;
  - Landfall; and

- Other works to facilitate the development (e.g. highways improvements, utility connections, construction compounds, drainage and access).
- 1.1.6 The onshore elements of the Proposed Development are located within the Onshore Infrastructure Area, which includes all areas required during the construction, operation and decommissioning of the Proposed Development, comprising the cable corridors, converter stations, temporary construction compounds and access.
- 1.1.7 The Converter Site is approximately 373,000 m<sup>2</sup> in area, which comprises 130,000 m<sup>2</sup> for the combined footprint of the converter stations. The Alverdiscott Substation Connection Development would occupy a footprint of approximately 28,000 m<sup>2</sup> and would be situated within the existing Alverdiscott Substation Site.
- 1.1.8 Furthermore, the Onshore HVDC Cable Corridor stretches for approximately 14.5 km with a typical permanent width of 32 m at trenched locations. In selective sections of the Onshore HVDC Cable Corridor, the permanent width would be 60 m (e.g. at trenchless crossings). The proposed Onshore HVDC Cable Corridor passes through a rural area comprising mainly grazing land with a small percentage of arable cropland. Residential areas nearby are mainly isolated properties, hamlets and some larger villages including Abbotsham, Littleham and the towns of Bideford and East-the-Water.

### Study Area

- 1.1.9 The Environment Agency (EA) Catchment Data Explorer Mapping shows watercourses located within the study area is located within the North Devon and South West Transitional and Coastal (TraC) Management Catchments which alongside 10 additional Management Catchments form the South West Basin District.
- 1.1.10 The study area, shown in **Figure 1.1**, is the zone of influence in relation to hydrology and flood risk and takes into account the range of potential impacts arising from activities associated with the Proposed Development. The zone of influence is deemed appropriate by the impacts expected to arise from the Proposed Development. Based on the above, the hydrology and flood risk study area is defined as:
- The area of land to be temporarily or permanently occupied during the construction, operation and maintenance, and decommissioning of the Proposed Development (including those parts of the landfall situated landward of MLWS);
  - Surface water receptors and flood risk receptors located within 1 km of the Converter Site and Alverdiscott Substation Connection Development;
  - Surface water receptors and flood risk receptors within 250 m of the Onshore Infrastructure Area including the following
    - Landfall;
    - HVAC Cables (which are also situated within the Converter Site and Alverdiscott Substation Site).
    - Onshore HVDC Cable Corridor; and
    - Temporary Onshore Infrastructure (e.g. construction compounds).

- 1.1.11 The buffers are considered appropriate for data collection taking into account the likely zone of influence by hydrological receptors. The buffer has also been chosen to identify any existing receptors, assets or infrastructure that have the potential to be affected by temporary flood risk as a result of the Proposed Development.
- 1.1.12 The Proposed Development is linear and therefore presents hydrological challenges as it intersects several waterbodies and is located across several catchments. Due to the significant scale of the Proposed Development, it is vital that the potential impacts of the development on local waterbodies is assessed.
- 1.1.13 For the purpose of this WFD assessment, water bodies that are within, are intersected or are hydrologically connected to the Onshore Infrastructure Area have been identified and considered as relevant water bodies.



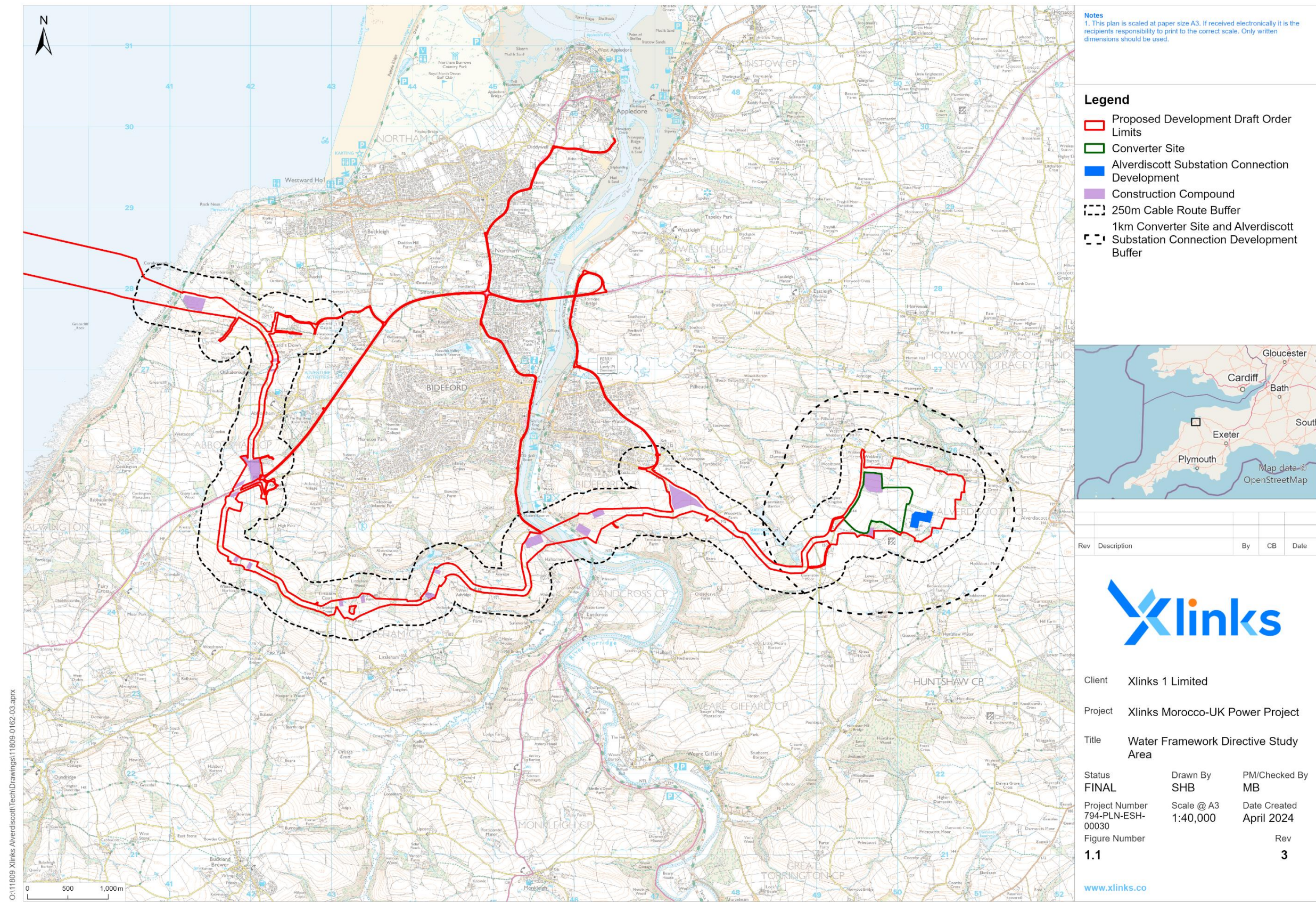


Figure 1.1: Water Framework Directive Study Area



## Water Framework Directive

- 1.1.14 The WFD (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000) is a European Union Directive which committed member states to achieve good qualitative and quantitative status of all water bodies by 2015. Under the Directive water bodies are defined as all ground and surface waters, including rivers, lakes, transitional waters, and coastal waters (up to one nautical mile from shore).
- 1.1.15 The regulations require that the impacts of a project on biology, chemistry and hydromorphology are considered in relation to WFD status classes, and are reported under a specific WFD section in any Environmental Statement or in a separate WFD compliance report (Environment Agency, 2010).
- 1.1.16 The WFD requires the prevention of deterioration and the protection enhancement, and restoration of all bodies of water. This means that new development should not adversely impact upon on the ability of a water body to achieve its environmental objectives.
- 1.1.17 It was not possible to achieve good status of all water bodies by 2015 and therefore the outstanding water bodies have objectives set for 2021 or 2027.
- 3.1.1 The WFD is transposed into law in England and Wales by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the 2017 Regulations). Under Section 2 of the European Union (Withdrawal) Act 2018, the 2017 Regulations continue to have effect in domestic law following the UK's withdrawal from the European Union.
- 1.1.18 The 2017 WFD Regulations provide the implementation of the WFD through the designation of all surface waters (rivers, lakes, transitional (estuarine) and coastal waters) and groundwaters as water bodies and the establishment of targets to achieve 'good' status.

## Determination of Good Status

### Surface Water

- 1.1.19 Good status is determined from the ecological and chemical status of surface waters. These statuses are assessed according to the following criteria:
- Biological quality (fish, benthic invertebrates, aquatic flora);
  - Hydromorphological quality (e.g., riverbank structure, river continuity and substrate of the riverbed); and
  - Physical-chemical quality (e.g., temperature, oxygenation, and nutrient conditions).
- 1.1.20 The chemical quality refers to environmental quality standards for river basin specific pollutants. These standards specify maximum concentrations for specific water pollutants. The WFD operates on a 'one out, all out' basis, so if one such concentration is exceeded, then the water body will not be classed as having a good status. The pure chemical status of surface waters is therefore classified as either good or fail with the physical-chemical quality indicators being classified as either high, good, moderate, poor, or bad.

- 1.1.21 The ecological status of surface waters is classified as being high, good, moderate, poor, or bad, whilst water bodies that have been modified (e.g., canals or contain significant flood defences) are classed as 'Heavily Modified Water bodies' (HMWB) and have to reach at least good potential by their objective year.

### **Groundwater**

- 1.1.22 The WFD stipulates that groundwater must achieve good quantitative status and good chemical status by their objective year. Groundwater bodies are classified as either good or poor. The quantity status considers elements such as impacts of saline intrusion, ability to serve groundwater and surface water abstractions, and ability to support groundwater dependent terrestrial ecosystems. The chemical status refers to the environmental quality standards for river basin specific pollutants and the priority substances specified under the WFD.

### **River Basin Management Plans**

- 1.1.23 The WFD introduced River Basin Districts (RBDs) to better manage watercourses without administrative and political boundaries. Each river basin is managed to achieve at least good status according to RBMPs, which provide a clear indication of how the objectives set for the river basin are to be reached within the required timescale.

### **Water Framework Directive Assessments**

- 1.1.24 WFD Assessments are undertaken to demonstrate that proposed works (either at strategy level or detailed design/implementation stage) can be undertaken without impacting the status of water bodies or preventing future works to enable the water bodies to achieve good status/potential.
- 1.1.25 Determination of WFD compliance comprises a series of steps intended to establish the potential impacts of a development, at an appropriate level of detail, and then to examine whether the identified impacts contravene the conditions of the WFD.
- 1.1.26 The following assessment objectives (derived from the Environmental Objectives of the Directive) are used to determine whether the Proposed Development, in and around the water environment, which is affected by the Proposed Development, comply with the overarching objectives of the WFD:
- Objective 1: To prevent deterioration in the ecological status of the water body;
  - Objective 2: To prevent the introduction of impediments to the attainment of good WFD status for the water body;
  - Objective 3: To ensure that the attainment of the WFD objectives for the water body are not compromised; and
  - Objective 4: To ensure the achievement of the WFD objectives in other water bodies within the same catchment are not permanently excluded or compromised.

### **WFD Assessment Stages**

- 1.1.27 The WFD surface water and groundwater assessment draws upon a number of other disciplines in determining the potential impact to the environmental



objectives of the water bodies that have the potential to be impacted. These will include hydrology and water quality, terrestrial and aquatic ecology, Habitat Regulations Assessment and hydrogeology.

- 1.1.28 To achieve the aims outlined within **paragraph 1.1.26**, a staged approach has been adopted in undertaking the WFD compliance assessment in accordance with the WFD and the Planning Inspectorate Advice Note 18: Water Framework Directive (Planning Inspectorate, 2017).
- 1.1.29 The WFD compliance assessment is typically undertaken in three stages.
1. **Screening** – excludes any activities that do not need to go through the scoping or impact assessment stages.
  2. **Scoping** – identifies the receptors that are potentially at risk from the activity and need impact assessment.
  3. **Impact assessment** – considers the potential impacts of the activity, identifies ways to avoid or minimise impacts, and shows if the activity may cause deterioration or jeopardise the water body achieving good status.
- 1.1.30 A flow chart, taken from the Planning Inspectorate Advice Note 18 for assessing activities and projects for compliance with the WFD (Planning Inspectorate, 2017) has been included below in **Plate 1.1**. This provides an overview of the recommended process to address the WFD during the pre-application process.

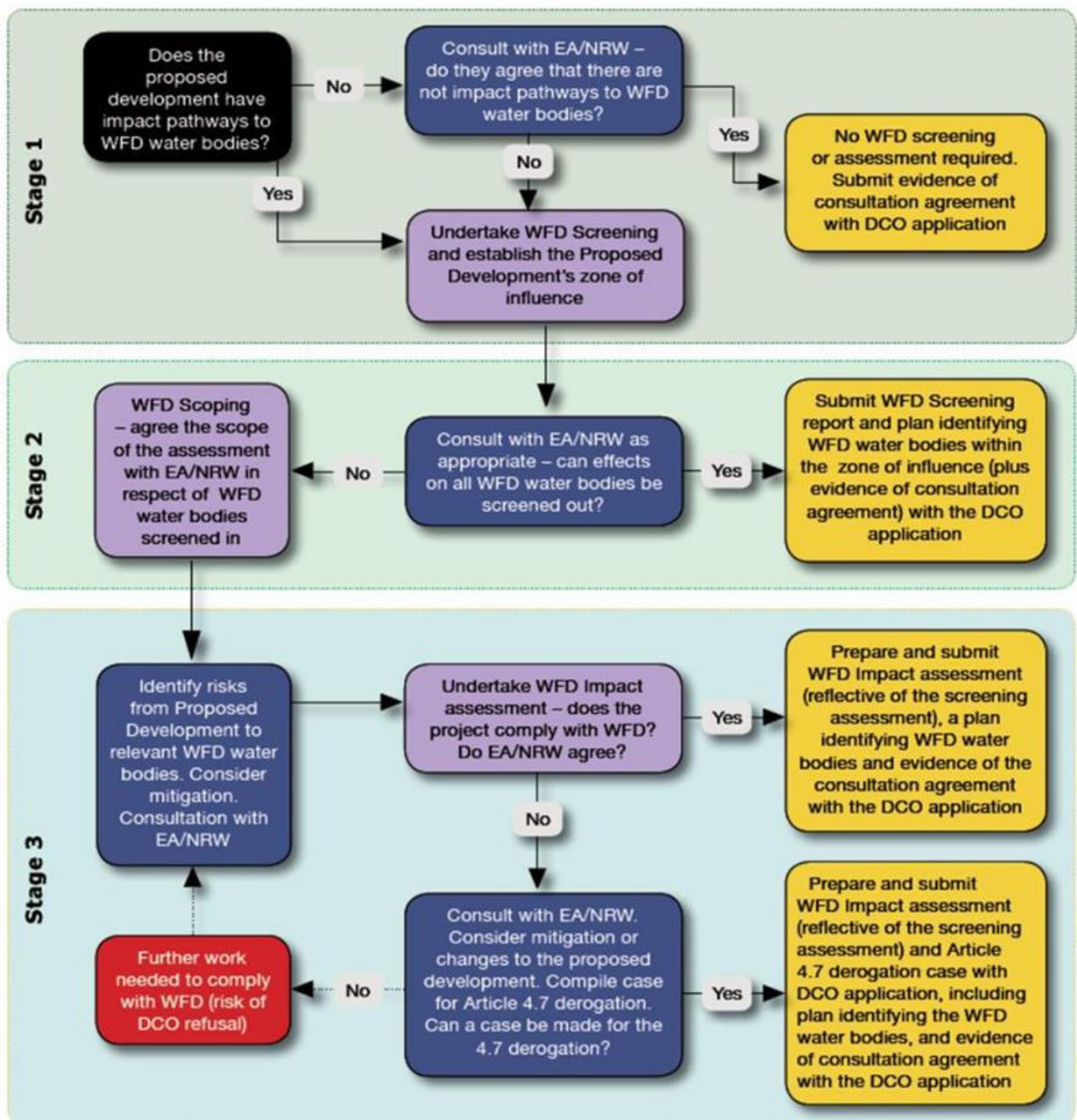


Plate 1.1 Flow chart illustrating the WFD compliance assessment process

### Screening assessment (preliminary assessment)

1.1.31 The screening assessment has been completed and is presented within this report. The screening assessment identifies the WFD water bodies within the zone of influence of the Proposed Development. Each component of the Proposed Development (onshore) has been reviewed in terms of its potential to impact to the water environment (i.e., on surface and groundwater bodies).

## **Scoping assessment**

- 1.1.32 The WFD scoping assessment will identify links between the proposed onshore activities and each WFD quality element that could be affected. It is also necessary at this stage to consider the proposed activities and how they could affect the morphological mitigation measures for waterbodies, where applicable.
- 1.1.33 The scoping phase involves considering each WFD quality element to identify those (if any) where a possible causal link exists. That is, where water body status or environmental objectives could potentially be affected at a water body level by the proposed activities.
- 1.1.34 The scoping assessment will be undertaken beyond publication of this PEIR stage and will examine each activity type based on the maximum design scenario. Where potential impacts from proposed activities exist, they will be scoped into the scoping assessment and mitigation measures highlighted for further development as design progresses.
- 1.1.35 Note that the scoping assessment for transitional (Taw / Torridge) and coastal water bodies (Barnstaple Bay) follows the EA Guidance, 'Clearing the Waters for All' (Environment Agency, 2017). The scoping template contained in Appendix B of this guidance has been used for these water bodies.

## **Impact assessment**

- 1.1.36 If required, a detailed impact assessment will examine the potential residual impact on water bodies (including cumulative impacts), suggesting further mitigation measures and enhancements where appropriate and would be reported in the ES. A detailed assessment would also consider whether the scheme will contribute to the delivery of the relevant River Basin Management Plan, i.e., the South West River Basin Management Plan, 2022.

## **1.2 Assessment Methodology**

- 1.2.1 Based upon the requirements of the EA, in regard to authorisation of activities which may impact the water environment, a WFD screening assessment has been undertaken at this stage. This preliminary assessment has been undertaken using the following methodology:
- Identification of the water bodies within and in close proximity to the Proposed Development.
  - Collection of baseline data to identify the current status as well as future baseline and ability of the water bodies within and in close proximity to the Proposed Development to meet the WFD objectives.
  - Preliminary assessment of the potential impacts to the identified surface water bodies; this involves identifying the impacts that could improve the WFD status and/or affect the ability of the water bodies to meet the objectives of the WFD.

## **Data Sources**

- 1.2.2 The desk study comprised a review of the following sources of information:
- MAGIC online mapping (DEFRA, 2023).



- Environment Agency Catchment data explorer available online (Environment Agency, 2023).
- British Geological Survey (BGS) Geindex (BGS, 2023).
- South West River Basin District River Basin Management Plan (Environment Agency, 2022).
- National Soils Research Institute 'Soilscapes' (LandIS, 2023).

## Consultation

- 1.2.3 Based upon the requirements of the EA in regard to authorisation of activities which may impact the water environment, it has been deemed suitable to conduct a WFD Preliminary Assessment at the Planning Stage. This report provides the Preliminary Assessment for the Planning Stage.

## Potential Impacts

- 1.2.4 A review of the proposed works and the potential impacts to the identified surface water and groundwater bodies has been undertaken by identifying the impacts that could improve or reduce the WFD status or affect the ability of the water bodies to meet the objectives of the WFD.
- 1.2.5 The following factors have been considered when determining whether the potential effects of the Proposed Development are likely to lead to an improvement/reduction in status or impact on objectives being met:
- Whether the impact is temporary (such as short-term construction impacts) or permanent/long term.
  - The characteristics and sensitivity of the specific water features affected by the Proposed Development (which may be different to the designated WFD water body).
  - The scale and importance of the specific water features affected by the Proposed Development to the designated WFD water body.
  - The nature, scale, and extent of potential impact in the context of the existing pressures and proposed measures for the water body.

## 1.3 Baseline Conditions

### Scope

- 1.3.1 The surface water bodies within and in close proximity to the Proposed Development include;
- Barnstaple Bay (ID: GB610807680003);
  - Kenwith Stream (ID: GB108050014500);
  - Upper River Yeo (Bideford) (ID: GB108050014470);
  - Lower River Yeo (Bideford) (ID: GB108050014400);
  - Taw/Torridge (ID: GB540805015500);
  - Horwood Stream (ID: GB108050014510);

- Huntshaw Water (ID: GB108050014440);
- Gammaton Lower Reservoir (ID: GB30844781); and
- Gammaton Upper Reservoir (ID: GB30844798).

1.3.2 The groundwater bodies located within and in close proximity to the Proposed Development include:

- Torridge and Hartland Streams (ID: GB40802G800600).

1.3.3 The waterbodies within the vicinity of the development are shown in the following figures:

- **Figure 1.2:** Water Framework Directive river, coastal and transitional water body catchments.
- **Figure 1.3:** Water Framework Directive lake water body catchments.
- **Figure 1.4:** Water Framework Directive groundwater water body catchments.



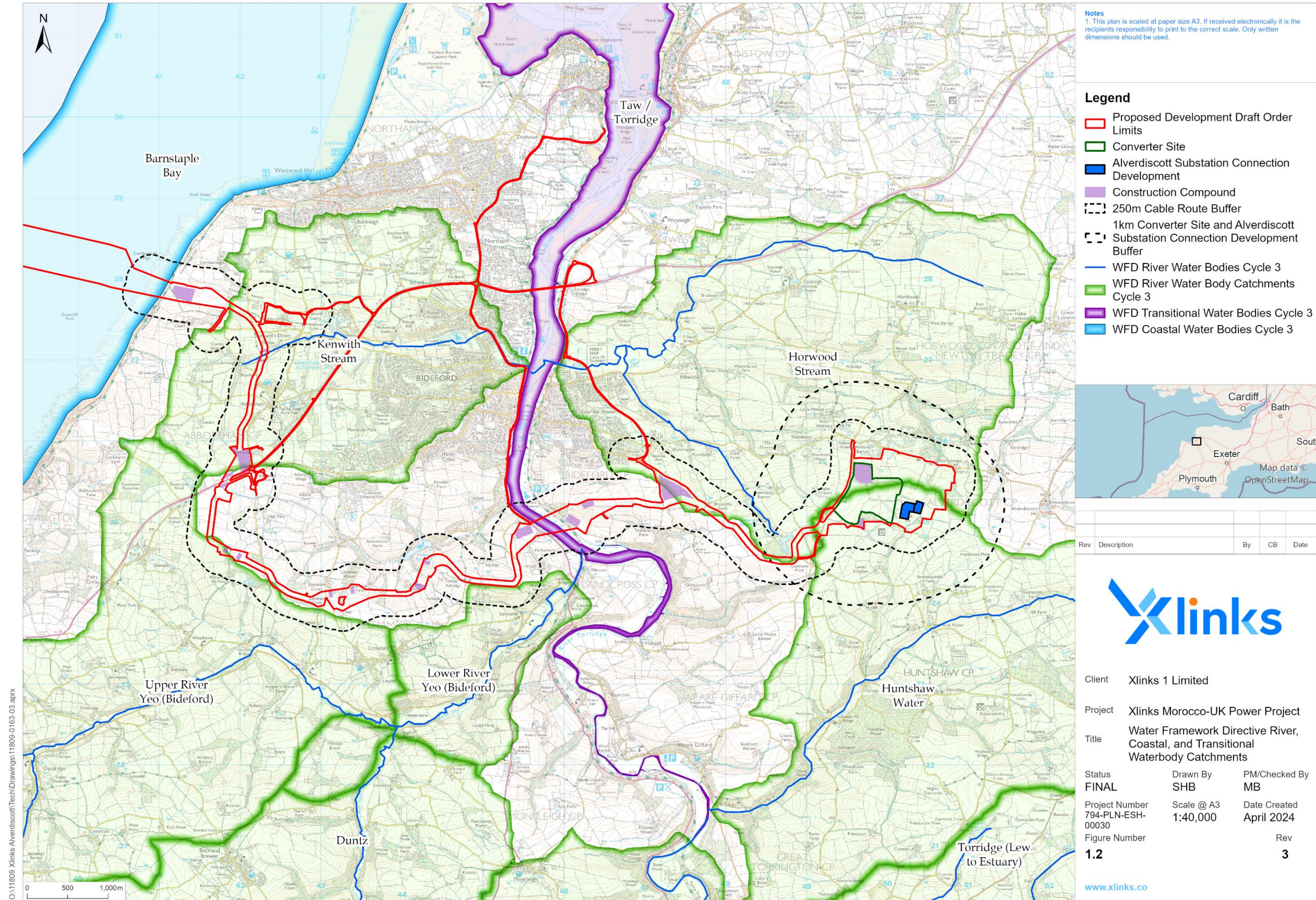


Figure 1.2: Water Framework Directive river, coastal and transitional water body catchments



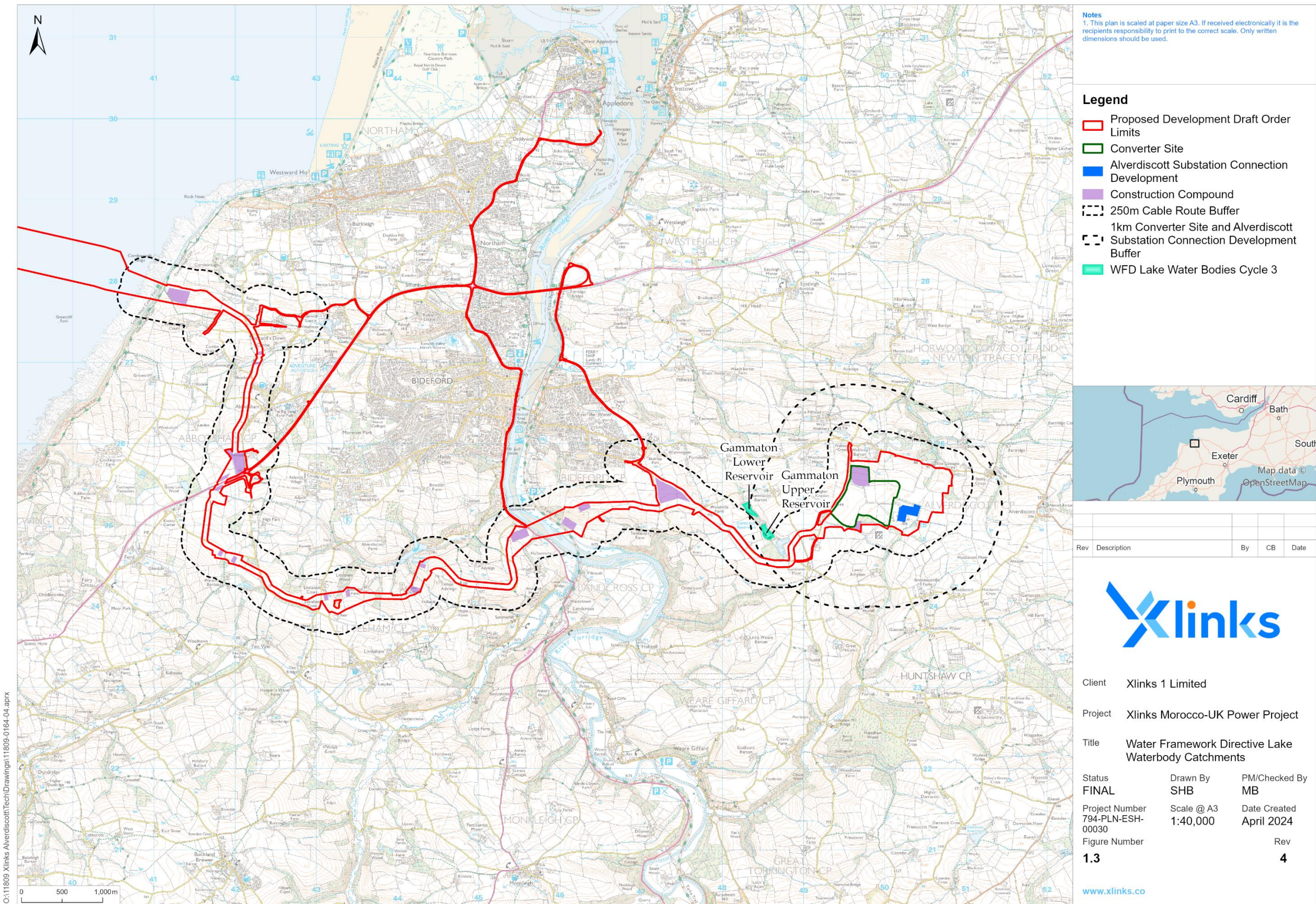


Figure 1.3: Water Framework Directive lake water body catchments



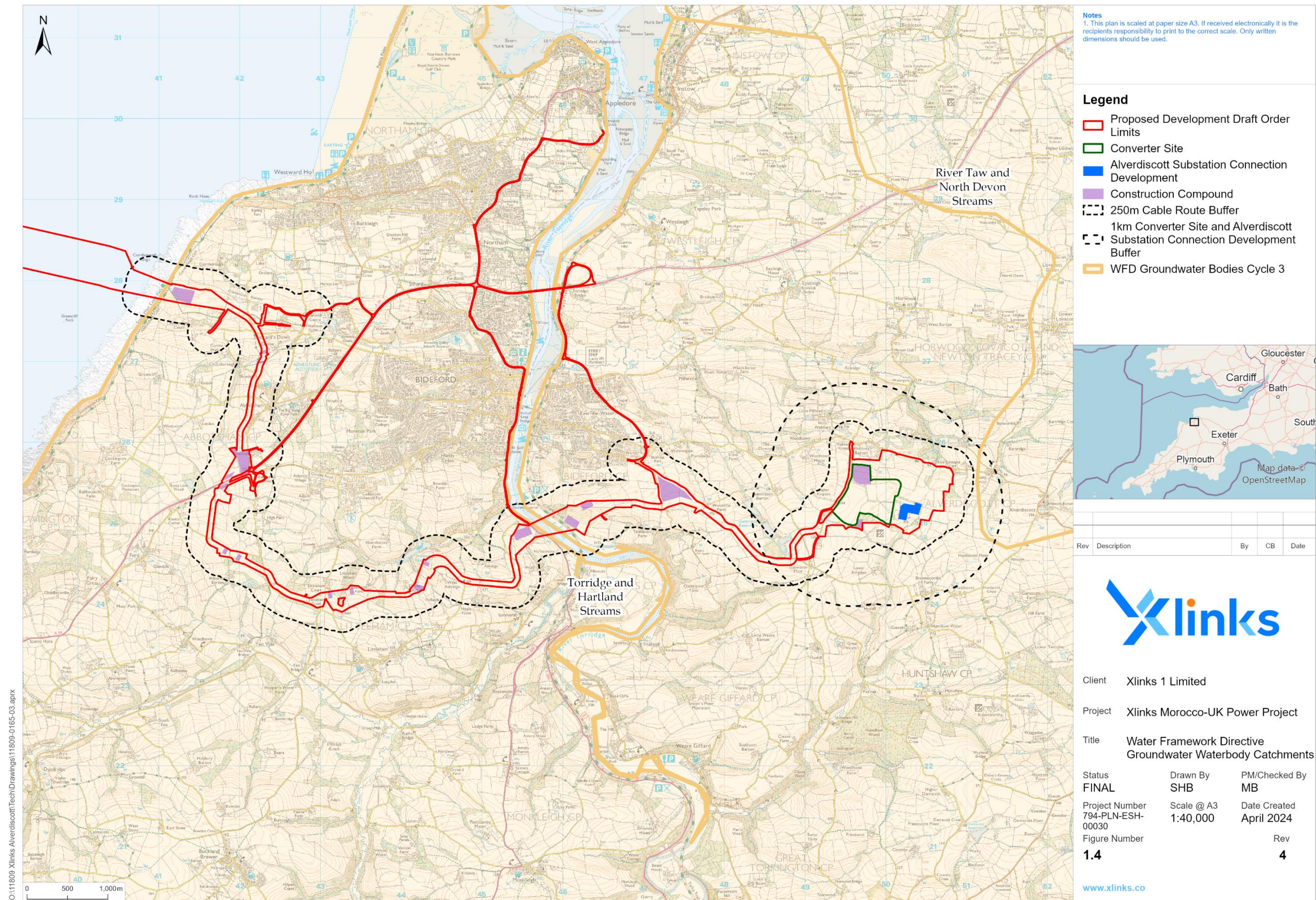


Figure 1.4: Water Framework Directive groundwater water body catchments



## Waterbodies

### Barnstaple Bay

- 1.3.4 Barnstaple Bay is a large area of water off the northwest coast of Devon. The bay extends from Baggy Point in the northeast to Hartland Point in the south west. Barnstaple Bay is classified as a Coastal water, therefore the EA is responsible for the maintenance, improvement, or construction to manage risks to the water body.
- 1.3.5 Barnstaple Bay is located within the South West River Basin District, in South West TraC Management Catchment. It is part of the Barnstaple Bay Operational Catchment.
- 1.3.6 Barnstaple Bay is monitored as part of the WFD classifications. The Barnstaple Bay Catchment comprises a surface area of approximately 111 km<sup>2</sup>. The proposed landfill location of the cable route is located immediately adjacent to Barnstaple Bay.
- 1.3.7 Water quality within Barnstaple Bay is monitored against the objectives of the WFD. 2019 results report that the overall status of the water body is assessed to be 'Good', with ecological quality assessed to be 'Good' and chemical quality assessed to be 'Fail'. A detailed summary of current WFD monitoring results is presented in **section 1.4**.
- 1.3.8 The Mermaid's Pool to Rowden Gut SSSI is located within Barnstaple Bay. The North Devon Biosphere Reserve is also located within Barnstaple Bay.
- 1.3.9 EA data regarding reasons for not achieving good indicate that the presence of 'Polybrominated diphenyl ethers (PBDE)' and 'Mercury and Its Compounds' are the key contributors. No specific activity or sector have been deemed responsible. This is likely due to the sources and pathways for both elements, as often they are released from combustion and consumer products.

### Kenwith Stream

- 1.3.10 Kenwith Stream rises near Abbotsham, and flows in an easterly direction towards the River Torridge. The catchment extends from the east of Abbotsham to Bideford adjacent to the River Torridge. Kenwith Stream is classified as an ordinary watercourse, therefore the LLFA is responsible for the maintenance, improvement, or construction to manage risks to the water body.
- 1.3.11 Kenwith Stream is located within the South West River Basin District, in the North Devon Management Catchment. It is part of the Torridge Operational Catchment.
- 1.3.12 Kenwith Stream is monitored as part of the WFD classifications. The Kenwith Stream Catchment comprises an area of approximately 10.8 km<sup>2</sup>. A section of the proposed Onshore HVDC Cable Corridor passes through the catchment.
- 1.3.13 Water quality within Kenwith Stream is monitored against the objectives of the WFD. 2019 results report that the overall status of the water body is assessed to be 'Moderate', with ecological quality assessed to be 'Moderate' and chemical quality assessed to be 'Fail'. A detailed summary of current WFD monitoring results is presented in **section 1.4**.
- 1.3.14 The Kenwith Valley Local Nature Reserve is located within the Kenwith Stream catchment.



- 1.3.15 EA data regarding reasons for not achieving good indicate that the following elements are responsible:
- Phosphates due to 'poor soil management', 'poor nutrient management' and 'poor livestock management' from agriculture and rural land management, and 'sewage discharge (continuous)' from the water industry;
  - Macrophytes and Phytobenthos Combined due to 'poor livestock management' from agriculture and rural land management, and 'sewage discharge (continuous)' from the water industry
  - The presence of 'PBDE' and 'Mercury and Its Compounds', no specific activity or sector have been deemed responsible.

### Upper River Yeo (Bideford)

- 1.3.16 The River Yeo rises in two branches near Cranford and Melbury, and flows in an easterly direction. The catchment extents from Cranford and Melbury, across to Abbotsham in the north and Littleham in the east. Upper River Yeo (Bideford) is classified as an ordinary watercourse, therefore the LLFA is responsible for the maintenance, improvement, or construction to manage risks to the water body.
- 1.3.17 Upper River Yeo (Bideford) is located within the South West River Basin District, in North Devon Management Catchment. It is part of the Torridge Operational Catchment.
- 1.3.18 Upper River Yeo (Bideford) is monitored as part of the WFD classifications. The Upper River Yeo (Bideford) Catchment comprises an area of approximately 25 km<sup>2</sup>. A section of the proposed Onshore HVDC Cable Corridor passes through the catchment.
- 1.3.19 Water quality within Upper River Yeo (Bideford) is monitored against the objectives of the WFD. 2019 results report that the overall status of the water body is assessed to be 'Poor', with ecological quality assessed to be 'Poor' and chemical quality assessed to be 'Fail'. A detailed summary of current WFD monitoring results is presented in **section 1.4**.
- 1.3.20 EA data regarding reasons for not achieving good indicate that the following elements are responsible:
- Phosphates due to 'poor nutrient management' from agriculture and rural land management, and 'sewage discharge (continuous)' from the water industry;
  - Macrophytes and Phytobenthos Combined due to 'poor nutrient management' from agriculture and rural land management, and 'sewage discharge (continuous)' from the water industry
  - The presence of 'PBDE' and 'Mercury and Its Compounds', no specific activity or sector have been deemed responsible.
- 1.3.21 The Jennetts Reservoir Nitrate Vulnerable Zone (NVZ) is located within the Upper River Yeo (Bideford) catchment. Jennetts Reservoir (EA, 2016) is described as '*an impounded, moderate alkalinity, shallow reservoir that functions as a natural lake. This reservoir is run as a 7 acre coarse fishery by South West Lakes Trust, but no longer serves public water supply.*' It is indicated that the stream has sources of one small stream and surface water runoff. The catchment for the reservoir has a significant amount of farming, there are reported to be 6/7 farms including at least one large dairy farm, and surface water runoff from industrial estates may also contribute to nutrient levels. The reservoir is designated as an

existing eutrophic water. Nitrogen levels are above the threshold and biological elements show that they are impacted by the high nutrient levels. Due to the location of the Jennetts Reservoir NVZ, it is likely that the Upper River Yeo (Bideford) will discharge into this zone.

### Lower River Yeo (Bideford)

- 1.3.22 The River Yeo rises in two branches near Cranford and Melbury, and flows in an easterly direction. The catchment extends from Littleham in the west to Landcross in the east. Lower River Yeo (Bideford) is classified as an ordinary watercourse, therefore the LLFA is responsible for the maintenance, improvement, or construction to manage risks to the water body.
- 1.3.23 Lower River Yeo (Bideford) is located within the South West River Basin District, in North Devon Management Catchment. It is part of the Torridge Operational Catchment.
- 1.3.24 Lower River Yeo (Bideford) is monitored as part of the WFD classifications. The Lower River Yeo (Bideford) Catchment comprises an area of approximately 4.2 km<sup>2</sup>. A section of the proposed cable route passes through the catchment.
- 1.3.25 Water quality within Lower River Yeo (Bideford) is monitored against the objectives of the WFD. 2019 results report that the overall status of the water body is assessed to be 'Moderate', with ecological quality assessed to be 'Moderate' and chemical quality assessed to be 'Fail'. A detailed summary of current WFD monitoring results is presented in **section 1.4**.
- 1.3.26 No sites designated as ecologically significant are located within the Lower River Yeo (Bideford) catchment.
- 1.3.27 EA data regarding reasons for not achieving good indicate that the following elements are responsible:
- Phosphates due to 'poor nutrient management' from agriculture and rural land management, and 'sewage discharge (continuous)' from the water industry;
  - Macrophytes and Phytobenthos Combined due to 'poor nutrient management' from agriculture and rural land management, and 'sewage discharge (continuous)' from the water industry
  - The presence of 'PBDE' and 'Mercury and Its Compounds', no specific activity or sector have been deemed responsible.
- 1.3.28 The Jennetts Reservoir NVZ is located within the Lower River Yeo (Bideford) catchment. Jennetts Reservoir is described as '*an impounded, moderate alkalinity, shallow reservoir that functions as a natural lake (EA, 2016). This reservoir is run as a 7 acre coarse fishery by South West Lakes Trust, but no longer serves public water supply.*' It is indicated that the stream has sources of one small stream and surface water runoff. The catchment for the reservoir has a significant amount of farming, there are reported to be 6/7 farms including at least one large dairy farm, and surface water runoff from industrial estates may also contribute to nutrient levels. The reservoir is designated as an existing eutrophic water. Nitrogen levels are above the threshold and biological elements show that they are impacted by the high nutrient levels. Due to the location of the Jennetts Reservoir NVZ, it is likely that the Lower River Yeo (Bideford) will discharge into this zone.

## Taw/Torridge

- 1.3.29 The Taw/Torridge Water Body catchment extends from the east, near to Tawstock and to the south, near to Weare Giffard, and joins the bay near to Yelland. The Taw/Torridge is classified as a main river, therefore, the EA is responsible for the maintenance, improvement, or construction to manage risks to the water body.
- 1.3.30 Taw/Torridge Transitional Water body is located within the South West River Basin District, in South West TraC Management Catchment. It is part of the Taw and Torridge Estuary Operational Catchment.
- 1.3.31 The Taw/Torridge Water body is monitored as part of the WFD classifications. The Catchment comprises an area of approximately 14.4 km<sup>2</sup>. A section of the proposed Onshore HVDC Cable Corridor passes through the catchment.
- 1.3.32 Water quality within the Taw/Torridge is monitored against the objectives of the WFD. 2019 results report that the overall status of the water body is assessed to be 'Moderate', with ecological quality assessed to be 'Moderate' and chemical quality assessed to be 'Fail'. A detailed summary of current WFD monitoring results is presented in **section 1.4**.
- 1.3.33 The Taw-Torridge Estuary SSSI is located within the Taw/Torridge Water Body catchment.
- 1.3.34 EA data regarding reasons for not achieving good indicate that the following elements are responsible:
- Dissolved inorganic nitrogen due to 'poor soil management', 'poor nutrient management' and 'poor livestock management' from agriculture and rural land management, and 'sewage discharge (continuous)' and 'sewer discharge (intermittent)' from the water industry, and septic tanks;
  - The presence of 'Benzo(g-h-i)perylene', 'PBDE' and 'Mercury and Its Compounds', no specific activity or sector have been deemed responsible.

## Horwood Stream

- 1.3.35 Horwood Stream extends from the east of Horwood and north of Greatwood, and flows to west to the River Torridge. Horwood Stream is classified as an ordinary watercourse, therefore the LLFA is responsible for the maintenance, improvement, or construction to manage risks to the water body.
- 1.3.36 Horwood Stream is located within the South West River Basin District, in North Devon Management Catchment. It is part of the Torridge Operational Catchment.
- 1.3.37 Horwood Stream is monitored as part of the WFD classifications. The Horwood Stream Catchment comprises an area of approximately 18 km<sup>2</sup>. A section of the Onshore Infrastructure Area is situated within the catchment of Horwood Stream.
- 1.3.38 Water quality within Horwood Stream is monitored against the objectives of the WFD. 2019 results report that the overall status of the water body is assessed to be 'Moderate', with ecological quality assessed to be 'Moderate' and chemical quality assessed to be 'Fail'. A detailed summary of current WFD monitoring results is presented in **section 1.4**.
- 1.3.39 No sites designated as ecologically significant are located within the Horwood Stream catchment.



- 1.3.40 EA data regarding reasons for not achieving good indicate that the following elements are responsible:
- Macrophytes and Phytobenthos Combined due to 'poor livestock management', 'poor nutrient management' and 'poor soil management' from agriculture and rural land management, and 'sewage discharge (continuous)' from the water industry.
  - The presence of 'PBDE' and 'Mercury and Its Compounds', no specific activity or sector have been deemed responsible.

### Huntshaw Water

- 1.3.41 Huntshaw Water rises near Cloggs Hill, and flows in an westerly direction. The catchment extends from the east near Lashingcott Moor to Van's Wood in the west. Huntshaw Water is classified as an ordinary watercourse, therefore the LLFA is responsible for the maintenance, improvement, or construction to manage risks to the water body.
- 1.3.42 Huntshaw Water is located within the South West River Basin District, in North Devon Management Catchment. It is part of the Torridge Operational Catchment.
- 1.3.43 Huntshaw Water is monitored as part of the WFD classifications. The Huntshaw Water Catchment comprises an area of approximately 17.7 km<sup>2</sup>. The proposed Converter Site, Alverdiscott Substation Site and a section of the proposed HVAC cable corridor passes through the catchment.
- 1.3.44 Water quality within Huntshaw Water is monitored against the objectives of the WFD. 2019 results report that the overall status of the water body is assessed to be 'Moderate', with ecological quality assessed to be 'Moderate' and chemical quality assessed to be 'Fail'. A detailed summary of current WFD monitoring results is presented in **section 1.4**.
- 1.3.45 No sites designated as ecologically significant are located within the Horwood Stream catchment.
- 1.3.46 EA data regarding reasons for not achieving good indicate that the following elements are responsible:
- Phosphates due to 'poor livestock management' from agriculture and rural land management, and 'sewage discharge (continuous)' from the water industry;
  - Macrophytes and Phytobenthos Combined due to 'poor livestock management' from agriculture and rural land management, and 'sewage discharge (continuous)' from the water industry
  - The presence of 'PBDE' and 'Mercury and Its Compounds', no specific activity or sector have been deemed responsible.

### Gammaton Reservoirs

- 1.3.47 Gammaton Upper Reservoir is a spring-fed lake, located within Gammaton, approximately 3.5 km east of Alverdiscott. The Upper Reservoir flows into the Gammaton Lower Reservoir which is located immediately upstream to the north.
- 1.3.48 Gammaton Upper and Lower Reservoirs are both located within the South West River Basin District, in North Devon Management Catchment. They are part of the Torridge Operational Catchment.

- 1.3.49 Gammaton Reservoirs are monitored as part of the WFD classifications. The Gammaton Lower Reservoir Catchment comprises an area of approximately 0.45 km<sup>2</sup>. The Onshore Infrastructure Area is situated approximately 500 m south east from the Gammaton Lower Reservoir. The Gammaton Upper Reservoir Catchment comprises an area of approximately 0.34 km<sup>2</sup>. The Onshore Infrastructure Area is situated approximately 150 m south east from the Gammaton Lower Reservoir.
- 1.3.50 2019 results report that the overall status of Gammaton Lower Reservoir is assessed to be 'Moderate', with ecological quality assessed to be 'Moderate' and chemical quality assessed to be 'Fail'.
- 1.3.51 2019 results report that the overall status of Gammaton Upper Reservoir is assessed to be 'Moderate', with ecological quality assessed to be 'Moderate' and chemical quality assessed to be 'Fail'.
- 1.3.52 A detailed summary of current WFD monitoring results is presented in **section 1.4**.
- 1.3.53 Gammaton Lower Reservoir is classified under the Nitrates Directive as a Eutrophic Lake and Gammaton Reservoirs are classified as Drinking Water Protected Areas.
- 1.3.54 EA data regarding reasons for not achieving good indicate that the following elements are responsible:
- Phytoplankton due to 'poor nutrient management' from agriculture and rural land management, 'reservoir/impoundment' from the water industry, and 'Natural conditions'.
  - The presence of 'PBDE' and 'Mercury and Its Compounds', no specific activity or sector have been deemed responsible.

### Torridge and Hartland Streams

- 1.3.55 The Torridge and Hartland Streams groundwater body catchment extends from Okehampton in the east, to the coast near Bideford in the west.
- 1.3.56 Torridge and Hartland Streams Groundwater body is located within the South West River Basin District, in the South West GW Management Catchment. It is part of the Torridge and Hartland Streams Operational Catchment.
- 1.3.57 Torridge and Hartland Streams is monitored as part of the WFD classifications. The groundwater catchment comprises an area of approximately 914 km<sup>2</sup>. The proposed Converter Site, HVAC cables, Alverdiscott Substation Site and a section of the proposed Onshore HVDC Cable Corridor is situated within the catchment.
- 1.3.58 Water quality within Torridge and Hartland Streams is monitored against the objectives of the WFD. 2019 results report that the overall status of the water body is assessed to be 'Poor', with 'Good' Quantitative elements and chemical quality assessed to be 'Poor'. A detailed summary of current WFD monitoring results is presented in **section 1.4**.
- 1.3.59 No sites designated as ecologically significant are located within the Horwood Stream catchment.
- 1.3.60 EA data regarding reasons for not achieving good indicate that the following elements are responsible:

- Suspect data, relating to the Chemical Drinking Water Protected Area designation. No specific activity or sector have been deemed responsible.
- 1.3.61 There are no additional ecological reports or river habitat surveys available to inform this assessment.
- 1.3.62 No additional surface water sampling has been undertaken to inform this assessment.

### Geology and Hydrology

- 1.3.63 British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the Onshore Infrastructure Area is situated on a variety of intermittent bed rock geology, consisting of the following:
- Superficial Deposits – Torridge River Terrace Deposits, 1 member (gravel, sand and silt) is only present around the banks of the River Torridge, at the location where the Onshore HVDC Cable Corridor crosses this section (British Geological Survey, 2022a).
  - Bideford Formation – Sandstone
  - Crackington Formation – Mudstone and siltstone
  - Bude Formation – Mudstone and Siltstone
  - Bude Formation – Sandstone
- 1.3.64 The BGS borehole logs indicated that there were no boreholes records within the vicinity of the Onshore Infrastructure Area (British Geological Survey, 2022a).
- 1.3.65 The soils for the cable corridor are described as the following by the National Soils Research Institute:
- Freely draining acid loamy soils over rock
  - Freely draining slightly acid loamy soils
  - Slowly permeable seasonally wet acid loamy and clayey soils
  - Freely draining slightly acid loamy soils
- 1.3.66 The superficial deposits are indicated to be Secondary A and Secondary Undifferentiated aquifers. The Bedrock is a Secondary A Aquifer.
- 1.3.67 EA online groundwater Source Protection Zone (SPZ) mapping indicates that the Onshore Infrastructure Area is not located within a groundwater SPZ.

## 1.4 Water Body Details

### Background

- 1.4.1 The RBMP system provides a catchment-based approach to managing water bodies, in accordance with the WFD.

### Coastal Water Bodies

- 1.4.2 The Coastal Water Bodies sit at the base of the following hierarchy;
1. The South West River Basin District.



2. South West TraC Management Catchment.
3. Barnstaple Bay Operational Catchment.
4. Monitored Coastal Water Bodies:
  - Barnstaple Bay (ID: GB610807680003).

## **Transitional Water Bodies**

- 1.4.3 The Transitional Water Bodies sit at the base of the following hierarchy;
1. The South West River Basin District.
  2. South West TraC Management Catchment.
  3. Taw and Torridge Estuary Operational Catchment.
  4. Monitored Coastal Water Bodies:
    - Taw/Torridge (ID: GB540805015500).

## **Surface Water Bodies**

- 1.4.4 The Surface Water Bodies sit at the base of the following hierarchy;
1. The South West River Basin District.
  2. North Devon Management Catchment.
  3. Torridge Operational Catchment.
  4. Monitored Surface Water Bodies:
    - Kenwith Stream (ID: GB108050014500).
    - Upper River Yeo (Bideford) (ID: GB108050014470).
    - Lower River Yeo (Bideford) (ID: GB108050014400).
    - Horwood Stream (ID: GB108050014510).
    - Huntshaw Water (ID: GB108050014440).
    - Gammaton Lower Reservoir (ID: GB30844781).
    - Gammaton Upper Reservoir (ID: GB30844798).

## **Groundwater Bodies**

- 1.4.5 The Groundwater Bodies sit at the base of the following hierarchy;
1. The South West River Basin District.
  2. South West GW Management Catchment.
  3. Torridge and Hartland Streams Operational Catchment.
  4. Monitored Surface Water Bodies:
    - Torridge and Hartland Streams (ID: GB40802G800600).

## South West River Basin District

- 1.4.6 The Proposed Development is located within the overarching South West RBD, which covers 21,000 km<sup>2</sup>. The RBD comprises nine management catchments, 37 surface water operational catchments and contains 735 water bodies.
- 1.4.7 In 2019, 100% of the district’s water bodies were classified as fail for chemical status and 21% of the district’s water bodies were assessed as being in good or better condition for ecological status.

## WFD Classification by Water body

- 1.4.8 The WFD runs in 6-year cycles, and is currently within the third cycle, which runs from 2022- 2027. The Cycle 3 interim classification will be available in 2024, however a classification update was published in 2022. This data set is incomplete, therefore, to provide a holistic picture of water body classification, 2022 data will be presented alongside the 2019 Cycle 2 data.
- 1.4.9 It should also be noted, for the 2019 chemical status assessment, methods and evidence base were updated. Due to this change, all waterbodies now fail chemical status and cannot be compared to previous years.

## Monitored Coastal Water Bodies

### Barnstaple Bay

- 1.4.10 Barnstaple Bay is classified as a coastal water and not designated as artificial or heavily modified. The overall classification is ‘Moderate’ with ‘Good’ ecological status and ‘Fail’ chemical status for Cycle 2 (2019). The Cycle 3 (2022) data indicates ‘Moderate’ ecological status. Chemical status has not been assessed. A summary is provided in **Table 1.1**.

**Table 1.1: EA Water Body Classification for Barnstaple Bay**

Classification Item	2019	2022
<b>Ecological</b>	Good	Moderate
<b>Biological quality elements</b>	Good	Moderate
Invertebrates	N/A	Moderate
Infaunal Quality Index	N/A	Moderate
Macroalgae	Good	Good
Rocky Shore Macroalgae	Good	Good
Phytoplankton	Good	Good
<b>Physico-chemical quality elements</b>	Good	High
Dissolved Inorganic Nitrogen	Good	High
Dissolved oxygen	High	High
<b>Hydromorphological Supporting Elements</b>	High	High

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Classification Item	2019	2022
Morphology	High	High
<b>Specific pollutants</b>	High	High
Arsenic	High	High
Chromium (VI)	High	High
Copper	High	High
Iron	High	High
Zinc	High	High
<b>Chemical</b>	Fail	Does not require assessment
<b>Priority hazardous substances</b>	Fail	Does not require assessment
Benzo(a)pyrene	Good	N/A
Benzo(b)fluoranthene	Good	N/A
Benzo(g-h-i)perylene	Good	N/A
Benzo(k)fluoranthene	Good	N/A
Cadmium and Its Compounds	Good	N/A
Dioxins and dioxin-like compounds	Good	N/A
Heptachlor and cis-Heptachlor epoxide	Good	N/A
Hexabromocyclododecane (HBCDD)	Good	N/A
Hexachlorobenzene	Good	N/A
Hexachlorobutadiene	Good	N/A
Mercury and Its Compounds	Fail	N/A
Nonylphenol	Good	N/A
Perfluorooctane sulphonate (PFOS)	Good	N/A
Polybrominated diphenyl ethers (PBDE)	Fail	N/A
Tributyltin Compounds	Good	N/A
<b>Priority substances</b>	Good	Does not require assessment
Fluoranthene	Good	N/A
Lead and Its Compounds	Good	N/A
Nickel and Its Compounds	Good	N/A
Octylphenol	Good	N/A
Trichloromethane	Good	N/A
<b>Other Pollutants</b>	Does not require assessment	Does not require assessment



## Monitored Transitional Water Bodies

### Taw/Torrige

1.4.11 Taw/Torrige is classified as a transitional water and is designated as heavily modified. The overall classification is ‘Moderate’ with ‘Moderate’ ecological status and ‘Fail’ chemical status for Cycle 2 (2019). The Cycle 3 (2022) data indicates ‘Moderate’ ecological status. Chemical status has not been assessed. A summary is provided in **Table 1.2**.

**Table 1.2. EA Water Body Classification for Taw/Torrige**

Classification Item	2019	2022
<b>Ecological</b>	Moderate	Moderate
<b>Biological quality elements</b>	Good	Good
Angiosperms	Good	Good
Saltmarsh	Good	Good
Fish	Good	Good
Invertebrates	Good	Good
Infaunal Quality Index	Good	Good
Macroalgae	High	High
Furoid Extent	High	High
Phytoplankton	Good	Good
<b>Physico-chemical quality elements</b>	Moderate	Moderate
Dissolved Inorganic Nitrogen	Moderate	Moderate
Dissolved oxygen	High	High
<b>Hydromorphological Supporting Elements</b>	Supports good	Supports good
Hydrological Regime	Supports good	Supports good
<b>Supporting elements (Surface Water)</b>	Moderate	Moderate
Mitigation Measures Assessment	Moderate or less	Moderate or less
<b>Specific pollutants</b>	High	High
Arsenic	High	High
Chromium (VI)	High	High
Copper	High	High
Iron	High	High
Un-ionised ammonia	High	High
Zinc	High	High
<b>Chemical</b>	Fail	Does not require assessment

Classification Item	2019	2022
<b>Priority hazardous substances</b>	Fail	Does not require assessment
Benzo(a)pyrene	Good	N/A
Benzo(b)fluoranthene	Good	N/A
Benzo(g-h-i)perylene	Fail	N/A
Benzo(k)fluoranthene	Good	N/A
Cadmium and Its Compounds	Good	N/A
Dioxins and dioxin-like compounds	Good	N/A
Heptachlor and cis-Heptachlor epoxide	Good	N/A
Hexabromocyclododecane (HBCDD)	Good	N/A
Hexachlorobenzene	Good	N/A
Hexachlorobutadiene	Good	N/A
Mercury and Its Compounds	Fail	N/A
Nonylphenol	Good	N/A
Perfluorooctane sulphonate (PFOS)	Good	N/A
Polybrominated diphenyl ethers (PBDE)	Fail	N/A
Tributyltin Compounds	Good	N/A
<b>Priority substances</b>	Good	Does not require assessment
Fluoranthene	Good	N/A
Lead and Its Compounds	Good	N/A
Nickel and Its Compounds	Good	N/A
Octylphenol	Good	N/A
Trichloromethane	Good	N/A
<b>Other Pollutants</b>	Does not require assessment	Does not require assessment

## Monitored Surface Water Bodies

### Kenwith Stream

- 1.4.12 Kenwith Stream is classified as a river and not designated as artificial or heavily modified. The overall classification is 'Moderate' with 'Moderate' ecological status and 'Fail' chemical status for Cycle 2 (2019). The Cycle 3 (2022) data indicates 'Moderate' ecological status. Chemical status has not been assessed. A summary is provided in **Table 1.3**.

**Table 1.3. EA Water Body Classification for Kenwith Stream**

<b>Classification Item</b>	<b>2019</b>	<b>2022</b>
<b>Ecological</b>	Moderate	Moderate
<b>Biological quality elements</b>	Moderate	Moderate
Invertebrates	High	High
Macrophytes and Phytobenthos Combined	Moderate	Moderate
Macrophytes Sub Element	High	High
Phytobenthos Sub Element	Moderate	Moderate
<b>Physico-chemical quality elements</b>	Moderate	Moderate
Ammonia (Phys-Chem)	High	High
Dissolved oxygen	High	High
Phosphate	Moderate	Poor
Temperature	High	High
pH	High	High
<b>Hydromorphological Supporting Elements</b>	Supports good	Supports good
Hydrological Regime	High	High
Morphology	Supports good	Supports good
<b>Chemical</b>	Fail	Does not require assessment
<b>Priority hazardous substances</b>	Fail	Does not require assessment
Benzo(a)pyrene	Good	N/A
Dioxins and dioxin-like compounds	Good	N/A
Heptachlor and cis-Heptachlor epoxide	Good	N/A
Hexabromocyclododecane (HBCDD)	Good	N/A
Hexachlorobenzene	Good	N/A
Hexachlorobutadiene	Good	N/A
Mercury and Its Compounds	Fail	N/A
Perfluorooctane sulphonate (PFOS)	Good	N/A
Polybrominated diphenyl ethers (PBDE)	Fail	N/A
<b>Priority substances</b>	Good	Does not require assessment
Cypermethrin (Priority)	Good	N/A
Fluoranthene	Good	N/A



Classification Item	2019	2022
Other Pollutants	Does not require assessment	Does not require assessment

### Upper River Yeo (Bideford)

1.4.13 Upper River Yeo (Bideford) is classified as a river and not designated as artificial or heavily modified. The overall classification is ‘Poor’ with ‘Poor’ ecological status and ‘Fail’ chemical status for Cycle 2 (2019). The Cycle 3 (2022) data indicates ‘Poor’ ecological status. Chemical status has not been assessed. A summary is provided in Table 4.

**Table 1.4. EA Water Body Classification for Upper River Yeo (Bideford)**

Classification Item	2019	2022
<b>Ecological</b>	Poor	Poor
<b>Biological quality elements</b>	Poor	Poor
Fish	Poor	Poor
Invertebrates	Good	Good
Macrophytes and Phytobenthos Combined	Moderate	Moderate
Phytobenthos Sub Element	Moderate	Moderate
<b>Physico-chemical quality elements</b>	Moderate	Moderate
Ammonia (Phys-Chem)	High	High
Dissolved oxygen	High	High
Phosphate	Moderate	Moderate
Temperature	High	High
pH	High	High
<b>Hydromorphological Supporting Elements</b>	Supports good	Supports good
Hydrological Regime	Supports good	Supports good
Morphology	Supports good	Supports good
<b>Chemical</b>	Fail	Does not require assessment
<b>Priority hazardous substances</b>	Fail	Does not require assessment
Benzo(a)pyrene	Good	N/A
Dioxins and dioxin-like compounds	Good	N/A
Heptachlor and cis-Heptachlor epoxide	Good	N/A
Hexabromocyclododecane (HBCDD)	Good	N/A
Hexachlorobenzene	Good	N/A
Hexachlorobutadiene	Good	N/A

Classification Item	2019	2022
Mercury and Its Compounds	Fail	N/A
Perfluorooctane sulphonate (PFOS)	Good	N/A
Polybrominated diphenyl ethers (PBDE)	Fail	N/A
<b>Priority substances</b>	Good	Does not require assessment
Cypermethrin (Priority)	Good	N/A
Fluoranthene	Good	N/A
<b>Other Pollutants</b>	Does not require assessment	Does not require assessment

### Lower River Yeo (Bideford)

1.4.14 Lower River Yeo (Bideford) is classified as a river and not designated as artificial or heavily modified. The overall classification is ‘Moderate’ with ‘Moderate’ ecological status and ‘Fail’ chemical status for Cycle 2 (2019). The Cycle 3 (2022) data indicates ‘Moderate’ ecological status. Chemical status has not been assessed. A summary is provided in **Table 1.5**.

**Table 1.5. EA Water Body Classification for Lower River Yeo (Bideford)**

Classification Item	2019	2022
<b>Ecological</b>	Moderate	Moderate
<b>Biological quality elements</b>	Moderate	Moderate
Fish	N/A	Good
Invertebrates	High	High
Macrophytes and Phytobenthos Combined	Moderate	Moderate
Phytobenthos Sub Element	Moderate	Moderate
<b>Physico-chemical quality elements</b>	Moderate	Moderate
Ammonia (Phys-Chem)	High	High
Dissolved oxygen	High	High
Phosphate	Moderate	Moderate
Temperature	High	Good
pH	High	High
<b>Hydromorphological Supporting Elements</b>	Supports good	Supports good
Hydrological Regime	Supports good	Supports good
Morphology	Supports good	Supports good
<b>Chemical</b>	Fail	Does not require assessment
<b>Priority hazardous substances</b>	Fail	Does not require assessment
Benzo(a)pyrene	Good	N/A

Classification Item	2019	2022
Dioxins and dioxin-like compounds	Good	N/A
Heptachlor and cis-Heptachlor epoxide	Good	N/A
Hexabromocyclododecane (HBCDD)	Good	N/A
Hexachlorobenzene	Good	N/A
Hexachlorobutadiene	Good	N/A
Mercury and Its Compounds	Fail	N/A
Perfluorooctane sulphonate (PFOS)	Good	N/A
Polybrominated diphenyl ethers (PBDE)	Fail	N/A
<b>Priority substances</b>	Good	Does not require assessment
Cypermethrin (Priority)	Good	N/A
Fluoranthene	Good	N/A
<b>Other Pollutants</b>	Does not require assessment	Does not require assessment

### Horwood Stream

1.4.15 Horwood Stream is classified as a river and not designated as artificial or heavily modified. The overall classification for Cycle 2 (2019) is 'Moderate' with a 'Moderate' ecological potential and 'Fail' chemical status. A summary is provided in **Table 1.6**.

**Table 1.6. EA Water Body Classification for Horwood Stream**

Classification Item	2019	2022
<b>Ecological</b>	Moderate	Moderate
<b>Biological quality elements</b>	Moderate	Moderate
Invertebrates	Good	Moderate
Macrophytes and Phytobenthos Combined	Moderate	Moderate
Macrophytes Sub Element		Moderate
Phytobenthos Sub Element	Moderate	Moderate
<b>Physico-chemical quality elements</b>	Good	Good
Ammonia (Phys-Chem)	High	High
Dissolved oxygen	High	High
Phosphate	Good	Good
Temperature	High	High
pH	High	High
<b>Hydromorphological Supporting Elements</b>	Supports good	Supports good



Classification Item	2019	2022
Hydrological Regime	High	High
Morphology	Supports good	Supports good
<b>Supporting elements (Surface Water)</b>	Moderate	N/A
Mitigation Measures Assessment	Moderate or less	N/A
<b>Chemical</b>	Fail	Does not require assessment
<b>Priority hazardous substances</b>	Fail	Does not require assessment
Benzo(a)pyrene	Good	N/A
Dioxins and dioxin-like compounds	Good	N/A
Heptachlor and cis-Heptachlor epoxide	Good	N/A
Hexabromocyclododecane (HBCDD)	Good	N/A
Hexachlorobenzene	Good	N/A
Hexachlorobutadiene	Good	N/A
Mercury and Its Compounds	Fail	N/A
Perfluorooctane sulphonate (PFOS)	Good	N/A
Polybrominated diphenyl ethers (PBDE)	Fail	N/A
<b>Priority substances</b>	Good	Does not require assessment
Cypermethrin (Priority)	Good	N/A
Fluoranthene	Good	N/A
<b>Other Pollutants</b>	Does not require assessment	Does not require assessment

## Huntshaw Water

1.4.16 Huntshaw Water is classified as a river and not designated as artificial or heavily modified. The overall classification is ‘Moderate’ with ‘Moderate’ ecological status and ‘Fail’ chemical status for Cycle 2 (2019). The Cycle 3 (2022) data indicates ‘Moderate’ ecological status. Chemical status has not been assessed. A summary is provided in **Table 1.7**.

**Table 1.7. EA Water Body Classification for Huntshaw Water**

Classification Item	2019	2022
<b>Ecological</b>	Moderate	Moderate
<b>Biological quality elements</b>	Moderate	Moderate
Invertebrates	Good	Good
Macrophytes and Phytobenthos Combined	Moderate	Moderate
Phytobenthos Sub Element	Moderate	Moderate

Classification Item	2019	2022
<b>Physico-chemical quality elements</b>	Moderate	Moderate
Ammonia (Phys-Chem)	High	High
Dissolved oxygen	High	High
Phosphate	Moderate	Moderate
Temperature	High	High
pH	High	High
<b>Hydromorphological Supporting Elements</b>	Supports good	Supports good
Hydrological Regime	High	High
Morphology	Supports good	Supports good
<b>Chemical</b>	Fail	Does not require assessment
<b>Priority hazardous substances</b>	Fail	Does not require assessment
Benzo(a)pyrene	Good	N/A
Dioxins and dioxin-like compounds	Good	N/A
Heptachlor and cis-Heptachlor epoxide	Good	N/A
Hexabromocyclododecane (HBCDD)	Good	N/A
Hexachlorobenzene	Good	N/A
Hexachlorobutadiene	Good	N/A
Mercury and Its Compounds	Fail	N/A
Perfluorooctane sulphonate (PFOS)	Good	N/A
Polybrominated diphenyl ethers (PBDE)	Fail	N/A
<b>Priority substances</b>	Good	Does not require assessment
Cypermethrin (Priority)	Good	
Fluoranthene	Good	
<b>Other Pollutants</b>	Does not require assessment	Does not require assessment

### Gammaton Lower Reservoir (ID: GB30844781)

1.4.17 Gammaton Lower Reservoir is classified as a lake and is designated as heavily modified. The overall classification is 'Moderate' with 'Moderate' ecological status and 'Fail' chemical status for Cycle 2 (2019). The Cycle 3 (2022) data indicates 'Moderate' ecological status. Chemical status has not been assessed for Cycle 3 (2022). A summary is provided in **Table 1.8**.

**Table 1.8. EA Water Body Classification for Gammaton Lower Reservoir**

<b>Classification Item</b>	<b>2019</b>	<b>2022</b>
<b>Ecological</b>	Moderate	Moderate
<b>Biological quality elements</b>	Moderate	Moderate
Macrophytes and Phytobenthos Combined	N/A	N/A
Macrophytes Sub Element	Moderate	Moderate
Phytoplankton	Moderate	Moderate
<b>Physico-chemical quality elements</b>	Moderate	Moderate
Salinity	High	High
Total Nitrogen	Poor	Bad
Total Phosphorus	Good	Good
<b>Supporting elements (Surface Water)</b>	Moderate	Moderate
Expert Judgement	Moderate	Moderate
Mitigation Measures Assessment	Moderate or less	Moderate or less
<b>Specific pollutants</b>	High	High
Copper	High	High
<b>Chemical</b>	Fail	Does not require assessment
<b>Priority hazardous substances</b>	Fail	Does not require assessment
Benzo(a)pyrene	Good	N/A
Dioxins and dioxin-like compounds	Good	N/A
Heptachlor and cis-Heptachlor epoxide	Good	N/A
Hexabromocyclododecane (HBCDD)	Good	N/A
Hexachlorobenzene	Good	N/A
Hexachlorobutadiene	Good	N/A
Mercury and Its Compounds	Fail	N/A
Perfluorooctane sulphonate (PFOS)	Good	N/A
Polybrominated diphenyl ethers (PBDE)	Fail	N/A
<b>Priority substances</b>	Good	Does not require assessment
Fluoranthene	Good	N/A
<b>Other Pollutants</b>	Does not require assessment	Does not require assessment

### **Gammaton Upper Reservoir (ID: GB30844798)**

1.4.18 Gammaton Upper Reservoir is classified as a lake and is designated as heavily modified. The overall classification is ‘Moderate’ with ‘Moderate’ ecological status



and 'Fail' chemical status for Cycle 2 (2019). Ecological and Chemical status has not been assessed for Cycle 3 (2022). A summary is provided in **Table 1.9**.

**Table 1.9. EA Water Body Classification for Gammaton Upper Reservoir**

Classification Item	2019	2022
<b>Ecological</b>	Moderate	N/A
<b>Supporting elements (Surface Water)</b>	Moderate	N/A
Expert Judgement	Moderate	N/A
Mitigation Measures Assessment	Moderate or less	N/A
<b>Chemical</b>	Fail	Does not require assessment
<b>Priority hazardous substances</b>	Fail	Does not require assessment
Benzo(a)pyrene	Good	N/A
Dioxins and dioxin-like compounds	Good	N/A
Heptachlor and cis-Heptachlor epoxide	Good	N/A
Hexabromocyclododecane (HBCDD)	Good	N/A
Hexachlorobenzene	Good	N/A
Hexachlorobutadiene	Good	N/A
Mercury and Its Compounds	Fail	N/A
Perfluorooctane sulphonate (PFOS)	Good	N/A
Polybrominated diphenyl ethers (PBDE)	Fail	N/A
<b>Priority substances</b>	Good	Does not require assessment
Fluoranthene	Good	N/A
<b>Other Pollutants</b>	Does not require assessment	Does not require assessment

## Monitored Groundwater Bodies

### Torridge and Hartland Streams

1.4.19 Torridge and Hartland Streams is classified as a groundwater body. The overall classification for Cycle 2 (2019) is 'Poor', with 'Good' Quantitative elements and chemical quality assessed to be 'Poor'. No data for Cycle 3 (2022) has been published at the present time. A summary is provided in **Table 1.10**.

**Table 1.10. EA Water Body Classification for Torridge and Hartland Streams,**

Classification Item	2019
<b>Overall Water Body</b>	Poor
<b>Quantitative</b>	Good
Quantitative Status element	Good

<b>Classification Item</b>	<b>2019</b>
Quantitative Dependent Surface Water Body Status	Good
Quantitative GWDTEs test	Good
Quantitative Saline Intrusion	Good
Quantitative Water Balance	Good
<b>Chemical (GW)</b>	Poor
Chemical Status element	Poor
Chemical Dependent Surface Water Body Status	Poor
Chemical Drinking Water Protected Area	Poor
Chemical GWDTEs test	Good
Chemical Saline Intrusion	Good
General Chemical Test	Poor
<b>Supporting elements (Groundwater)</b>	
<b>Prevent and Limit Objective</b>	Active
<b>Trend Assessment</b>	Upward trend

## WFD Measures

- 1.4.20 The South West RBMP states that the Significant Water Management Issues in the district are: physical modifications, pollution from wastewater, pollution from rural areas, changes to the natural flow and level of water, pollutions from towns, cities and transport, and negative effects of non-native invasive species.
- 1.4.21 The South West RBMP sets out an overview of the planned improvements for the South West River Basin District.
- 1.4.22 The Plan outlines the measures to achieve the priorities for the area. Some of the key measures are detailed below:
- Physical Modifications:
    - Habitat restoration or creation.
    - River restoration and fish pass improvements.
    - Removal of barriers to fish passage.
    - Riparian tree planting and fencing.
  - Managing Pollution:
    - Pollution control initiatives.
  - Changes to Natural Flow and Levels:
    - Control pattern/timing of abstractions.
    - Water demand management.
    - Improvement to condition of channel/bed and/or banks/shoreline.
    - Use alternative source/relocate abstraction or discharge.

- Manage Non-Invasive Native Species:
  - Mitigation, control and eradication.
  - Building awareness and understanding.
  - Early detection, monitoring and rapid response.
  - Prevent introduction.
- Peatland Restoration:
  - Implementation of tried and tested methodologies in line with the England Peat Action Plan.

1.4.23 Measures from the above list which are relevant to the pressures impacting the waterbodies and will be considered within the mitigation/improvements suggested within the Proposed Development.

## 1.5 Development specific WFD classification

- 1.5.1 The majority of waterbodies within proximity to the Onshore HVDC Cable Corridor, HVAC Cables, Alverdiscott Substation Connection Development, and Converter Site pass through greenfield land, and can be considered relatively natural. Therefore, it is acknowledged that although the classifications provided above may not be wholly representative, they can be considered suitable for the basis of a preliminary assessment.
- 1.5.2 Due to the nature of the Proposed Development, and the number of waterbodies which span the length of the Onshore Infrastructure Area, it is deemed that a holistic summary which considers the relevant waterbodies is suitable for a preliminary assessment of the WFD classification.
- 1.5.3 A qualitative estimate summary has been undertaken of the WFD categories for the sub-reach adjacent to the Proposed Development. This is provided in **Table 1.11**.

**Table 1.11: Summary WFD Status of Water Bodies Adjacent to the Proposed Development**

Water body	Overall Water Body	Ecological	Biological quality elements	Hydro-morphological supporting elements	Physico-chemical quality elements	Specific Pollutants	Chemical	Priority Hazardous Substances
Barnstaple Bay	Moderate	2019 – Good 2022 - Moderate	2019 – Good 2022 - Moderate	2019 – High 2022 - High	2019 – Good 2022 - High	2019 – High 2022 - High	2019 – Fail 2022 - DNRA	2019 – Fail 2022 - DNRA
Kenwith Stream	Moderate	2019 – Moderate 2022 - Moderate	2019 – Moderate 2022 - Moderate	2019 - Supports Good 2022 - Supports Good	2019 – Moderate 2022 - Moderate	No Data	2019 – Fail 2022 - DNRA	2019 – Fail 2022 - DNRA
Upper River Yeo (Bideford)	Poor	2019 – Poor 2022 - Poor	2019 – Poor 2022 - Poor	2019 - Supports Good 2022 - Supports Good	2019 – Moderate 2022 - Moderate	No Data	2019 – Fail 2022 - DNRA	2019 – Fail 2022 - DNRA
Lower River Yeo (Bideford)	Moderate	2019 – Moderate 2022 - Moderate	2019 – Moderate 2022 - Moderate	2019 - Supports Good 2022 - Supports Good	2019 – Moderate 2022 - Moderate	No Data	2019 – Fail 2022 - DNRA	2019 – Fail 2022 - DNRA
Taw/Torridge	Moderate	2019 – Moderate 2022 - Moderate	2019 - Good 2022- Good	2019 - Supports Good 2022 - Supports Good	2019 – Moderate 2022 - Moderate	2019 – High 2022 - High	2019 – Fail 2022 - DNRA	2019 – Fail 2022 - DNRA
Horwood Stream	Moderate	2019 – Moderate 2022 - Moderate	2019 – Moderate 2022 - Moderate	2019 - Supports Good 2022 - Supports Good	2019 - Good 2022- Good	No Data	2019 – Fail 2022 - DNRA	2019 – Fail 2022 - DNRA
Huntshaw Water	Moderate	2019 – Moderate 2022 - Moderate	2019 – Moderate 2022 - Moderate	2019 - Supports Good 2022 - Supports Good	2019 – Moderate 2022 - Moderate	No Data	2019 – Fail 2022 - DNRA	2019 – Fail 2022 - DNRA



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Water body	Overall Water Body	Ecological	Biological quality elements	Hydro-morphological supporting elements	Physico-chemical quality elements	Specific Pollutants	Chemical	Priority Hazardous Substances
Gammaton Lower Reservoir	Moderate	2019 – Moderate 2022- Moderate	2019 – Moderate 2022-Moderate	No Data	2019 – Moderate 2022-Moderate	2019 – High 2022 - High	2019 – Fail 2022 - DNRA	2019 – Fail 2022 - DNRA
Gammaton Upper Reservoir	Moderate	2019 – Moderate 2022 – No Data	2019 – Moderate 2022 – No Data	No Data	No Data	No Data	2019 – Fail 2022 - DNRA	2019 – Fail 2022 - DNRA
Water body	Overall Water Body	Quantitative					Chemical	
Torrige and Hartland Streams	Poor	Good	No Data	No Data	No Data	No Data	Poor	No Data
<b>'Overall' Status</b>	<b>Moderate</b>	<b>Moderate</b>	<b>Moderate</b>	<b>Supports Good</b>	<b>Moderate</b>	<b>High</b>	<b>Fail</b>	<b>Fail</b>

DNRA - Does Not Require Assessment

## 1.6 Screening Assessment

1.6.1 A screening exercise has been undertaken to determine which waterbodies should be considered further, regarding the potential effects of the Proposed Development from a WFD perspective.

### Waterbodies to be Screened in

1.6.2 Due to the nature of the Proposed Development, water body catchments which fall within the Onshore Infrastructure Area will be screened into the assessment of potential effects. Water body catchments which fall within the 250 m and 1 km buffer zones, but do not encroach on the Onshore Infrastructure Area boundary will be screened out.

1.6.3 It is expected committed mitigation measures adopted within the maximum design scenario (such as Pollution Prevention Plans (PPPs), Construction Environmental Management Plans (CEMPs) and Landscape and Ecological Management Plans (LEMPs)) will ensure the existing conditions are maintained. The scoping exercise will include assessment as to how impacts to hydrology will be prevented through committed mitigation measures.

1.6.4 Outcomes of the screening assessment are presented within **Table 1.12**.

**Table 1.12: Water body screening exercise outcomes**

Water body	Screening exercise outcome	Reason
Barnstaple Bay (ID: GB610807680003)	Screened in	Water body is located within the Onshore Infrastructure Area.
Kenwith Stream (ID: GB108050014500)	Screened in	Tributaries of the water body are located within the Onshore Infrastructure Area.
Upper River Yeo (Bideford) (ID: GB108050014470)	Screened out	The water body is not located within the Onshore Infrastructure Area. It is expected proposed mitigation measures adopted as part of the Proposed Development will prevent contamination to surface waters within the water body catchment.
Lower River Yeo (Bideford) (ID: GB108050014400)	Screened out	The water body is not located within the Onshore Infrastructure Area. It is expected proposed mitigation measures adopted as part of the Proposed Development will prevent contamination to surface waters within the water body catchment.
Taw/Torridge (ID: GB540805015500)	Screened in	Tributaries of the water body are located within the Onshore Infrastructure Area.
Horwood Stream (ID: GB108050014510)	Screened in	Tributaries of the water body are located within the Onshore Infrastructure Area.
Huntshaw Water (ID: GB108050014440)	Screened in	Tributaries of the water body are located within the Onshore Infrastructure Area.
Gammaton Lower Reservoir (ID: GB30844781)	Screened out	The Lake Water body is not located within the Onshore Infrastructure Area.

<b>Water body</b>	<b>Screening exercise outcome</b>	<b>Reason</b>
Gammaton Upper Reservoir (ID: GB30844798)	Screened out	The Lake Water body is not located within the Onshore Infrastructure Area.
Torrige and Hartland Streams (ID: GB40802G800600)	Screened in	Water body catchment is located within the Onshore Infrastructure Area.

## Impacts to be Screened in

- 1.6.5 For the purpose of this assessment, open cut trenching will result in largest compound footprint and largest area of disturbance (compared to HDD) at the landfall. This represents the maximum design scenario in terms of potential for runoff, spillage and direct disturbance to water bodies (where present). However, HDD or alternative trenchless techniques will be used to construct the landfall and major crossings, including waterbodies such as the River Torrige and other riparian watercourses.
- 1.6.6 In terms of areas affected by the Onshore Infrastructure Area, the maximum design scenario is represented by the largest working areas and number of trenches, which arise from the construction of the Proposed Development.
- 1.6.7 The below key impacts have been identified:
- The impact of contaminated runoff on the quality of waterbodies during construction and decommissioning phases.
  - The impact of habitat disturbance during construction, operation and maintenance and decommissioning phases.
  - The impact to flows/quantity, physical processes and hydromorphology of waterbodies during construction, operation and maintenance and decommissioning phases.

## Potential Improvements

- 1.6.8 The current status of the Proposed Development means that the design inclusive of mitigation measures will continue to evolve prior to application. Feedback from the consultation at PEIR stage will facilitate ongoing discussion with the EA to ensure that the work is designed appropriately from hydrological and ecological perspectives. The applicant will demonstrate that the proposals will be structurally sound and not constitute an increase in flood risk.
- 1.6.9 The scope of work is focused upon the Onshore Infrastructure Area as part of the Proposed Development which is adjacent to several waterbodies.
- 1.6.10 Options for improvement work are restricted by the land within the Proposed Development Draft Order Limits. The potential to form partnerships could be considered as the design of the Proposed Development evolves.
- 1.6.11 As the Proposed Development will intersect several watercourses, this poses the unique opportunity of providing improvements to the watercourses and surrounding water environment. It is likely that many of these potential improvements will coalesce with the measures outlined within the South West RBMP.

- 1.6.12 The potential improvements that could be considered as part of the Proposed Development include:
- Mitigate physical modifications to watercourse channels by promoting habitat restorations via riparian planting and river restoration;
  - Enhance watercourse connectivity by installing wildlife corridors and fish passes;
  - Implement processes to avoid pollution or siltation of the watercourses;
  - Install mechanisms to assist with the removal of pollutants and enable the planted vegetation to filter the water;
  - Enhance the geo-morphology of the watercourse channel within the vicinity of the development to promote natural flows and levels; and
  - Assess the presence of invasive species and implement measures to promote their eradication and introduction.
- 1.6.13 Volume 2, Chapter 3: Hydrology and Flood Risk of the PEIR, outlines potential impacts of the development and provides greater detail on potential mitigation options.

## 1.7 Summary and Conclusions

- 1.7.1 A screening exercise has been completed to determine which waterbodies should be considered further, regarding the potential effects of the Proposed Development from a WFD perspective.
- 1.7.2 It is considered likely that the current WFD status of the waterbody reaches, which are within proximity of the Onshore Infrastructure Area, are similar to the overall classifications for the waterbodies, given the characteristics of the local catchment and channel surrounding the Proposed Development. An assessment of the local conditions has been provided.
- 1.7.3 The Proposed Development has the potential to provide both local mitigation and local improvement techniques to be incorporated into the detailed design.
- 1.7.4 Inclusion of such techniques has been evaluated to offer potential for a beneficial effect resulting in some localised improvement, but insufficient to increase status class at water body scale.
- 1.7.5 The scoping assessment will be undertaken post-PEIR stage, reflecting the refinement of the Proposed Development's design inclusive of adopted mitigation measures. Subject to the outcome of the updated scoping exercise, the requirement for a detailed assessment will be evaluated.

## 1.8 References

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