2024

DJP Abertafol (CERDS) Water Framework Directive

EcoVigour Integrated Environmental Management

NetworkRail

DYER & BUTLER A part of MGroupServices

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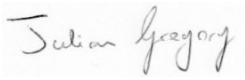
Authorised by	Julian Gregory		12/2024

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Disclaimer

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1. INTRODUCTION

1.1.1 EcoVigour was instructed by Dyer & Butler – Rail Division to undertake a Water Framework Directive Assessment (WFD) for proposed maintenance works to the Abertafol DJP Underbridge, A493, Aberdovey Gwynedd, Grid Ref: SN 67034 97596.

1.1.2 The purpose of this report is to assess the impacts of the scheduled works associated with the Proposed Scheme against the WFD parameters for the Dyfi Lower Estuary (Dyfi and Leri), its associated tributaries, the Cardigan Bay North Coastal Area, Aberdyfi Bathing Waters and the Meirionnydd Groundwater Area. This assessment includes a summary of the current local conditions and, where appropriate, identifies mitigation measures for any likely significant effects (LSE) that may arise as part of the construction and operation of the Proposed Scheme.

1.1.3 This WFD Assessment is required to demonstrate that the proposed works will not result in deterioration in the water body status of the Dyfi & Leri Estuary and adjoining water bodies or prevent them from meeting their Water Framework Directive objectivise.

1.1.4 There are several watercourses flowing into the estuary. The principal rivers are the Afon Dyfi from the NE, the Afon Einion from the south, the Afon Pennal from the north and the Afon Llyfnant from the east.

1.1.5 All of these enter the estuary upstream of the structure. The Afon Leri enters the estuary from the south near the mouth of the estuary approximately 5km downstream of the site. The Afon Ddu enters the estuary from the south approximately 2.5km downstream of the site.

1.1.6 The estuary discharges into Cardigan Bay North, which includes the Aberdyfi and Aberdyfi Rural Bathing Waters.

1.2 PROJECT BACKGROUND

1.2.1 Network Rail engineers have highlighted the structure (DJP Railway Underbridge) at Abertafol as requiring timely remedial measures to correct a lateral fissure from become a serious defect, which runs along the spine of the masonry arch. Network Rail have commissioned the principal contractor (Dyer & Butler Ltd) to undertake the structural remedial measures and apply for all required consents on their behalf.

Figure 1: View of masonry underbridge arch.

1.2.2 The Underbridge remedial works are scheduled to be undertaken over a 14-day period during 2025. Access to the structure will be through third party land, via an existing access gate connected to the nearby A493, linking Machynlleth to Aberdovey.

1.2.3 Standard best practice will be required in relation to compound and the work site set up as part of the Environmental Management Plan (EMP) implemented by the Principal Contractor during the construction Phase of the project.

1.2.4 The EMP and HRA will reference each other to ensure all measures are clearly disseminated and enacted. The project EMP serves the same purpose as a Construction Environmental Management Plan (CEMP) only the terminology is different on rail projects. Note: some rail projects will reference a Environmental & Social Management Plan (ESMP) instead of a CEMP.

1.2.5 EMP/ESMP's are produced closer to the project start date, as confirmation of personnel and allocation of resources are not traditionally finalised until a month before the start date. Consequently, a completed ESMP is not currently available, however an example ESMP has been attached in Appendix B.

2. INTRODUCTION TO THE WATER FRAMEWORK DIRECTIVE

2.1 THE WATER FRAMEWORK DIRECTIVE

2.1.1 The Water Framework Directive (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).

2.1.2 It was not possible to achieve good status of all water bodies by 2015; therefore, outstanding water bodies have objectives set for 2021 or 2027. Interim assessments were undertaken in 2018.

2.1.3 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). These revokes and replace The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (subject to transitional provisions in article 38 of the 2017 Regulations).

2.2 SCOPE OF THIS ASSESSMENT

2.2.1 All new activities in the water environment need to take account of the requirements of the WFD. For a project or activity to be compliant with the WFD, it should demonstrate that:

- There is no risk of it causing a deterioration of the status of any element, in addition, for groundwater, it will limit or prevent the input of pollutants;
- There is no risk of it preventing WFD protected areas from achieving their objectives;
- It will not jeopardise any waterbody from achieving good status/potential; and
- It will contribute to the protection, enhancement and restoration of waterbodies.

2.2.2 This WFD Assessment considers all activities that will take place as part of the proposed scheme, during both construction and operation, and identifies the potential risks associated with these activities and the WFD receptors that are at risk.

2.2.3 The NRW guidance includes detailed screening criteria that can be used to determine whether a proposed activity is not likely to cause a deterioration in the status of a waterbody. This includes a list of activities that in general will not cause a deterioration, such as 'temporary' works that do not normally last more than six months and are not likely to have a residual impact on a waterbody. The guidance also lists other physical works and defines screening thresholds for each; these thresholds help to determine whether any activity presents a risk to a waterbody and any requirements for further assessment. However, these thresholds are for guidance only and expert judgement is required to determine if a proposed activity may have an impact on a waterbody.

2.2.4 Published guidance also states that the assessment must consider the potential for impacts on the following:

- Protected Areas – these are defined under Article 6 of the Directive.
- Priority Habitats – these are 'habitats of principal importance for conservation and biodiversity', which are defined under Section 41 of a Natural Environmental and Rural Communities (NERC) Act 2006 in England and Section 7 of the Environment (Wales) Act 2016 in Wales.
- Invasive non-native species (INNS) – assessment of INNS is required if a development could cause the introduction or spread of INNS to a waterbody.

2.2.5 A detailed Compliance Assessment would be required if it cannot be concluded that the scheme would not cause deterioration or inhibit the objective status of a waterbody. Further to this and in line with WFD requirements, there would be a need to apply the Article 4.7 test to seek approval for progression of the scheme if after the full WFD

2.3 Determination of Good Status

2.3.1 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).

2.3.2 The chemical quality refers to environmental quality standards for river basin specific pollutants. These standards specify maximum concentrations for specific water pollutants. The WFD works 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 chemical status of surface waters is therefore classified as good or fail.

2.3.3 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.

3. ASSESSMENT METHODOLOGY

3.1 METHODOLOGY

3.1.1 This WFD Assessment was completed using the following methodology:

- The 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 works to meet the WFD objectives;
- A Consultation with relevant authorities;
- The review of the proposed works and the potential impacts to the identified surface and groundwater bodies; this involves identifying the impacts that could reduce the WFD status and affect the ability of the water bodies to meet the objectives of the WFD;
- The consideration of mitigation that can be included in the design, and
- The provision of an assessment of residual risks.

3.1.2 This assessment has been prepared using the following WFD screening/scoping assessment guidance:

- Guidance for assessing activities and projects for compliance with the Water Framework Directive, OGN72, Version 1.1, May 2017, Natural Resources Wales.
- Advice Note 18: The Water Framework Directive, Version 1, June 2017, The Planning Inspectorate. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/06/advice_note_18.pdf
- Local Authority services and the water environment: Advice note on the Water
- Framework Directive, Natural Resources Wales. Available at: https://naturalresources.wales/media/2627/wfd-docs-eng.pdf
- Water Framework Directive assessment: estuarine and coastal waters – How to assess the impact of your activity in estuarine (transitional) and coastal waters for the Water Framework Directive (WFD), 9 November 2017, Environment Agency.
- Available at: https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters.

4. DESCRIPTION OF THE PROPOSED ACTIVITIES

4.1 SITE CONTEXT

4.1.1 The project is situated between along the North shore of the Afon Dyfi Estuary (Grid Ref: SN 66065 97223). No formal project compound is to be utilised; however a towed welfare unit or mobile welfare vans will be used. These will either be parked/placed within the existing A493 layby, or with the opening of the field to the northeast of the structure (dependent on third party landowner agreements). The figure below illustrate the sites location in relation to the wider area and PLAS SAC.

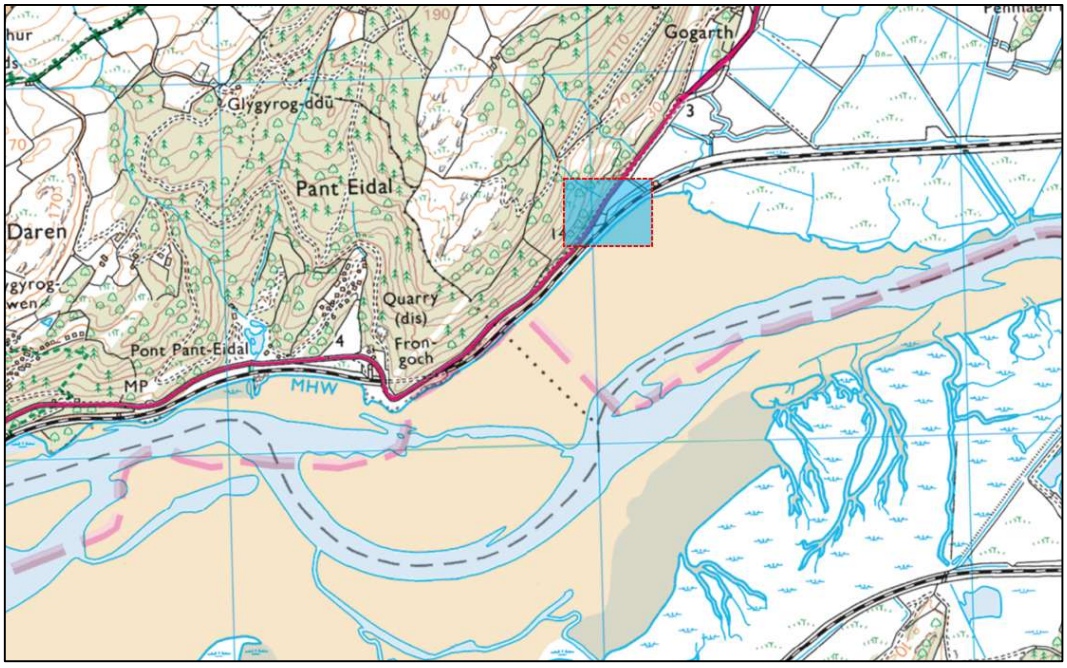

Figure 2: OS Map Location.

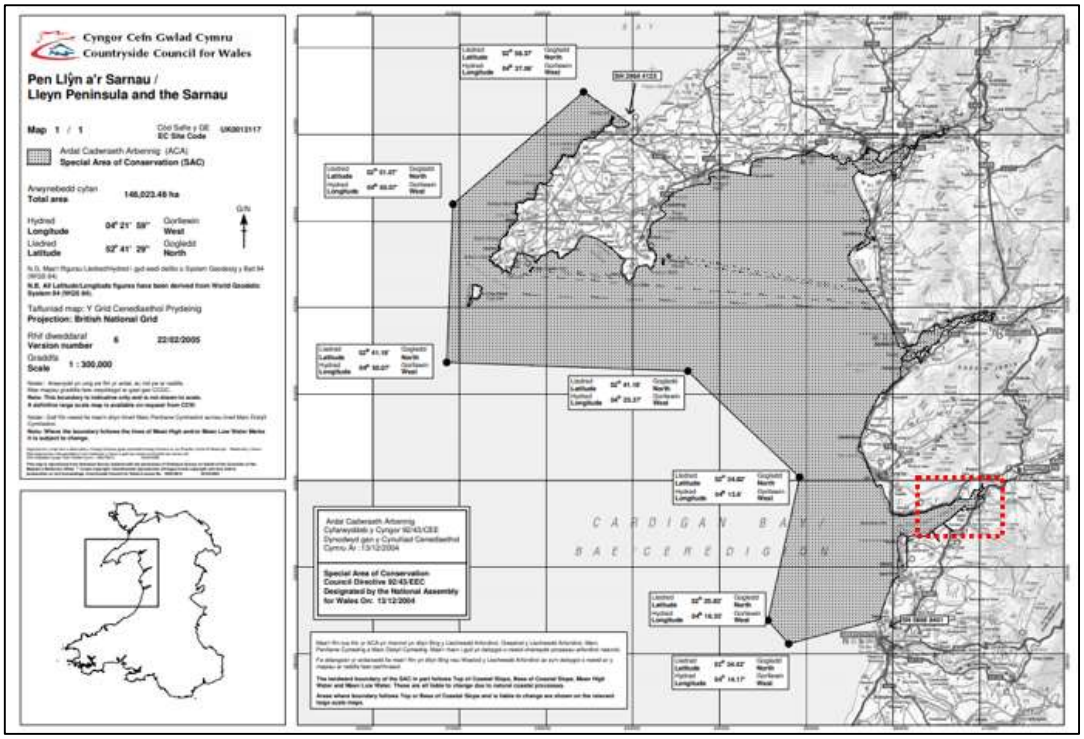

Figure 3: Approx area of works within wider PLAS context.

Figure 4: Project Layout.

4.2 METHOD OVERVIEW – MASONARY WALL REPAIRS

4.2.1 The timing of the works is based around 8-10hour shift patterns, 08:00 – 18:00. During daytime working only within low tide conditions.

4.2.2 The project works will be monitored by an Environmental Clerk of Works (ECoW) to ensure abidance to the HRA conditions, undertaking supervision duties when required and undertaken audits. The ECoW has the authority to abort site operations in the event works are causing disturbance to bird species. E.g., during sensitive early morning foraging periods.

4.2.3 Mixing equipment will consist of a 110v paddle mixer, 3.5kVa generator and mixing buckets. The pieces of equipment can be moved by hand when required. Pointing materials will be mixed in accordance with manufacturer's instructions.

4.2.4 Drilling equipment used for pinning the fracture into place will be powered by the same 3.5kVa generator.

4.2.5 Prefabricated Access Suppliers' and Manufacturers' Association (PASMA), towers will be used to provide elevated platforms for working on the upper walls. These will be erected and dismantled during each shift.

4.2.6 Operatives will place polythene protection to base of sea wall/embankments at the areas of works, in order to capture any arisings from the maintenance.

4.2.7 Existing loose mortar will be removed using hand tools and collected where possible.

4.2.8 Operatives will document each section of works, on completion of pointing and pinning, operatives will collect dropped pointing materials and will remove from the working area.

4.2.9 Final demobilisation and removal of welfare, vehicles and equipment.

4.3 SUPPORTING WORKS

Site Welfare - Delivery/Setup

4.3.1 No formal compound is required to support the works. Welfare will be provided using mobile welfare vans. These will be moved to suitable locations as the project requires. There are several laybys available along the A493 to support the works.

Access

4.3.2 Access to the underbridge will be on foot only, with no vehicles entering the estuarine environment.

Emergency Plans

4.3.3 The contractor will ensure that emergency pollution control plans above standardised spill control plans are prepared prior to the commencement of the project.

Emergency Plan Fundamentals:

- Any disabled or malfunctioning equipment within or near the channel environment will be immediately checked for any potential release of hydrocarbons, and if discovered, spill kits and trays will be used immediately.
- The on-call emergency engineer provider will be requested to attend site in the event that the fault cannot be resolved by the operator. As all equipment is accrued by hand, any faulty equipment will be carried out of the marine environment.
- NRW and the on-call Environmental Clerk of Works will be contacted immediately and made aware of the emergency and risk of a pollution event.

5. BASELINE CONDITIONS

5.1 WDF STATUS OF WATERBODIES

5.1.1 Data on the location and status of WFD waterbodies and WFD Protected Areas has been obtained from the Water Watch Wales website (Waterwatchwales.naturalresourceswales.gov.uk) and the Multi-Agency Geographic Information for the Countryside (MAGIC) website (magic.defra.gov.uk/MagicMap.aspx)

5.1.2 The following WFD surface waterbodies are in proximity of the proposed scheme: Dyfi & Leri Estuary (GB511006407000) the Afon Dyfi (tidal limit to Twymyn) (GB11006404830) from the NE, the Afon Leri – Lower (GB110064043570) from the south adjacent to the mouth of the estuary the Afon Einion (GB110064043610) from the south. The Afon Pennal (GB110064048360) flows into the estuary from the south and the Llyfncht (GB110064048250). Works will only be undertaken within the Dyfi & Leri Estuary and with the exception of the Afon Leri, impacts on the other waterbodies are unlikely, even on a rising tide.

5.1.3 Table 3 (below) presents summary information on the current WFD status of each of the constituent quality elements of the waterbodies downstream of the works. This information has been obtained from the Water Watch Wales website. Each of the quality elements will be assessed to determine whether the proposed scheme has the potential to adversely affect their status.

5.1.4 Only one groundwater waterbody, the Meirionnydd (GB41002G203200), is located within the project area. It has a Quantitative Status of Good and a chemical status of Poor, giving it an overall status of Poor. The potential for the proposed scheme to impact groundwater is considered in Section 6.

Table 1: Summary of the WFD status of the rivers / watercourses flowing into the Dyfi & Leri Estuary and connected water bodies.

Waterbody name, ID, Type, Management Catchment, River Basin District.	Hydro-morphological designation	Current overall status & objectives	Biological elements	Physico-chemical elements	Water body Protected Area Links
Dyfi & Leri (GB511006407000) Type: Transitional (Estuary) Man Catchment: Meirionnydd Transitional Coastal RBD: Western Wales Area Name: WA North	Not designated as heavily modified Morphology = Not High Hydrological Regime = Not High	Current overall status = Moderate; Objective = Good by 2021 Current ecological status = Good; Objective = Good by 2021 Current chemical status = Fail; Objective = Good by 2021	Fish = Not assessed Macroalgae = Good Phytoplankton = Not assessed Opportunistic Macroalgae = High Invertebrates = High Infaunal Quality Index = High Salt Marsh	Dissolved oxygen = High Dissolved Inorganic Nitrogen – High Annex 8 Chemicals = High Copper = High Zinc = High Cadmium = High Brominated diphenylether (BDPE) Calc = Moderate Benzopyrene = High Hexachlorobutadiene = High Hexachlorobenzene = high Mercury = High Fluoranthene = High Lead = High Nickel = High	Protected Area = Yes Bathing Waters = Yes Special Protection Area = No Drinking Water Protected Area = No Special Area of Conservation = Yes Nitrate Vulnerable Zone = No Shellfish Water = Yes
Cardigan Bay North (GB621009600000) Type: Coastal Man Catchment: Western Wales TraC RBD: Western Wales Area Name: WA North		Current overall status = Moderate; Objective = Good by 2021 Current ecological status = Good; Objective = Good by 2021 Current chemical status = Fail (TBT); Objective = Good by 2021	Fish = Not assessed Macroalgae = High Phytoplankton = High Rocky Shore Macroalgae= High Opportunistic Macroalgae = High Invertebrates = Good Infaunal Quality Index = Good Imposex = Good	Dissolved oxygen = High Dissolved Inorganic Nitrogen – Good Annex 8 Chemicals = High Arsenic = High Copper = High Iron = High Zinc = High Cadmium = High Brominated diphenylether (BDPE) Calc = Moderate Hexachlorobutadiene = High Hexachlorobenzene = high Mercury = High Fluoranthene = High Lead = High Nickel = High	Protected Area = Yes Bathing Waters = Yes Special Protection Area = No Drinking Water Protected Area = No Special Area of Conservation = Yes Nitrate Vulnerable Zone = No Shellfish Water = Yes

Waterbody name, ID, Type, Management Catchment, River Basin District.	Hydro-morphological designation	Current overall status & objectives	Biological elements	Physico-chemical elements	Water body Protected Area Links
Dyfi – tidal limit to Twymyn (GB110064048390) Type: River Man Catchment: Meirionnydd RBD: Western Wales Area Name: WA North	Not designated as heavily modified. Morphology = Not High Hydrological Regime = Not High	Current overall status = Moderate; Ecological = Good; Chemical = Fail; Objective = Good by 2021 Current ecological status = Good; Objective = Good by 2021 Current chemical status = Good; Objective = Good by 2021	Macrophytes and Phytobenthos = Good Macrophytes Sub Element = Good Phytobenthos Sub Element = Good Fish = Not assessed Macroalgae = High Phytoplankton = Not assessed Opportunistic Macroalgae = High Invertebrates = High Infaunal Quality Index = Good	Dissolved oxygen = High pH = High Dissolved Inorganic Nitrogen – Good Ammonia (Phys-Chem) = High BOD = High Phosphate = High Annex 8 Chemicals = High Arsenic = High Copper = High Iron = High Zinc = High Manganese = High Benzo (b) and (k) fluoranthene = High Benzo (ghi) perelyene and indeno (123-cd) pyrene = High Cadmium = High Fluoranthene = High Lead = High Nickel = High Aldrin, Dieldrin, Endrin & Isodrin = High para - para DDT = High TBT Annex 10 = Moderate Temp = High AWIC = High	Protected Area = Yes Bathing Waters = No Special Protection Area = No Drinking Water Protected Area = No Special Area of Conservation = Yes Nitrate Vulnerable Zone = No Shellfish Water = No
Meirionnydd (GB41002G203200) Type: Groundwater Man Catchment: Meirionnydd Ground Water RBD: Western Wales Area Name: WA North		Current overall status = Poor; Current Quantitative status = Good Current chemical status = Poor.			Protected Area = Yes Special Protection Area = Yes Drinking Water Protected Area = Yes Special Area of Conservation = Yes Nitrate Vulnerable Zone = No

6. WATER FRAMEWORK DIRECTIVE ASSESSMENT: SCOPING FOR ACTIVITIES IN ESTUARINE AND COASTAL WATERS

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

6.1 SECTION 1: HYDROMORPHOLOGY

6.1.1 The first stage is to consider if there is hydromorphology at risk from your activity.

Table 2: Summary table to find out the hydromorphology status of the water body, if it is classed as heavily modified and for what use.

Consider if your activity:	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	There will be no changes to the below MHWS sections of the structures. During construction scaffold and a crash deck will be erected below the structure, and removed at the end of each shift. The works will therefore not impact the hydromophology of the estuary or the watercourse.
Could significantly impact the hydromorphology of any water body	Please see above - No impacts on any other water bodies.
Is in a water body that is heavily modified for the same use as your activity	The estuary is considered to be heavily modified. To the south area areas of salt marsh but beyond these is a large bund and drainage ditch along which is constructed a railway. Where the railway moves inland, it is replaced by a track along the top of the bund. Beyond this is low lying agricultural land, criss crossed by a series of drainage ditches. This land could have been recovered from the sea in the past. At the works location, on the norther side of the estuary, the railway forms the sea wall, although the land rises steeply from the railway with the A493 being the next linear feature.

6.2 SECTION 2: BIOLOGY, HABITAT & FISH

6.2.1 The second stage is to consider if habitats, Biology and Fish Species are at risk from your activity. The figures and tables below illustrate and discuss the features present within the relevant units.

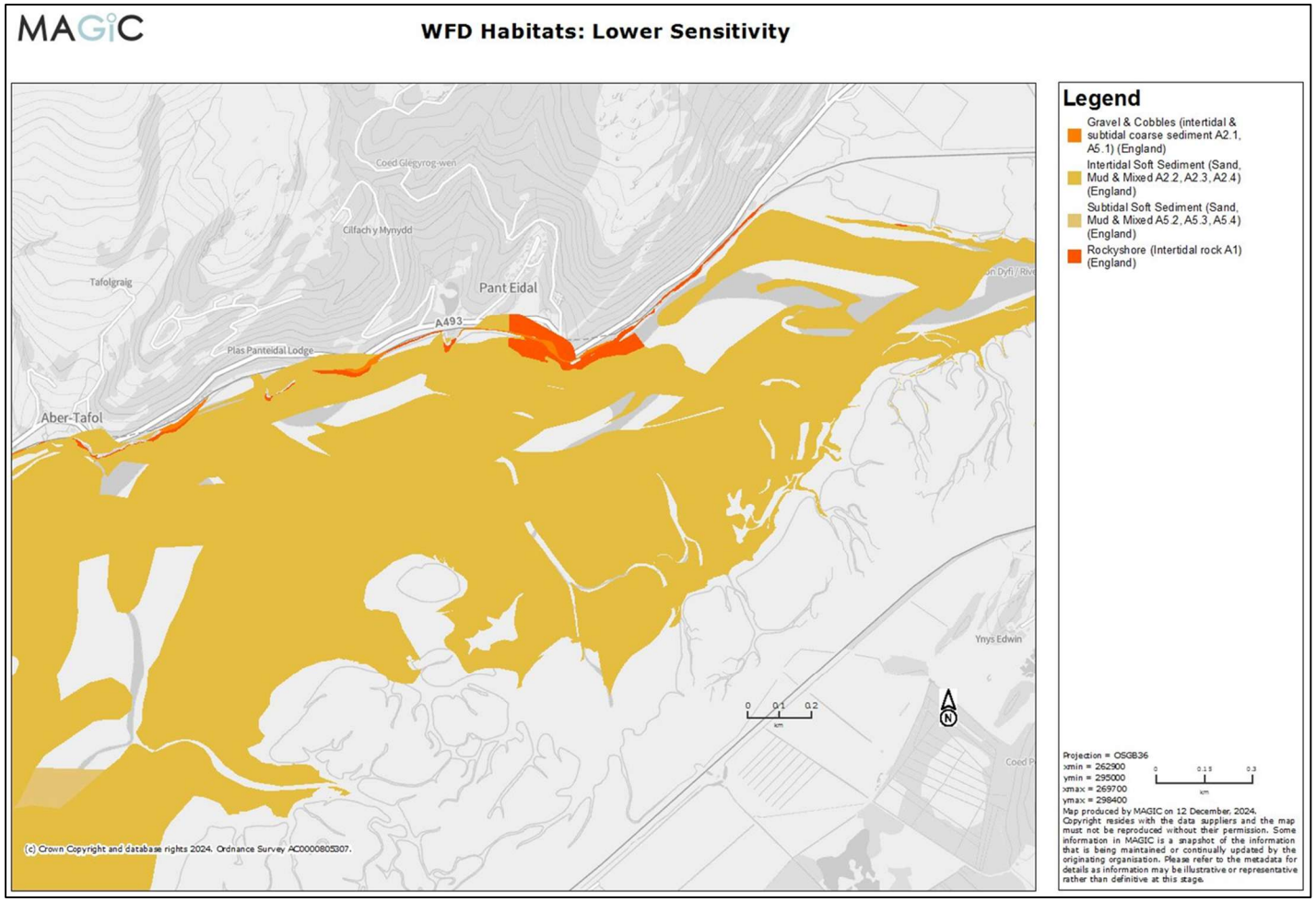

Figure 5: WFD Habitat Lower Sensitivity (www.magic.gov.uk)

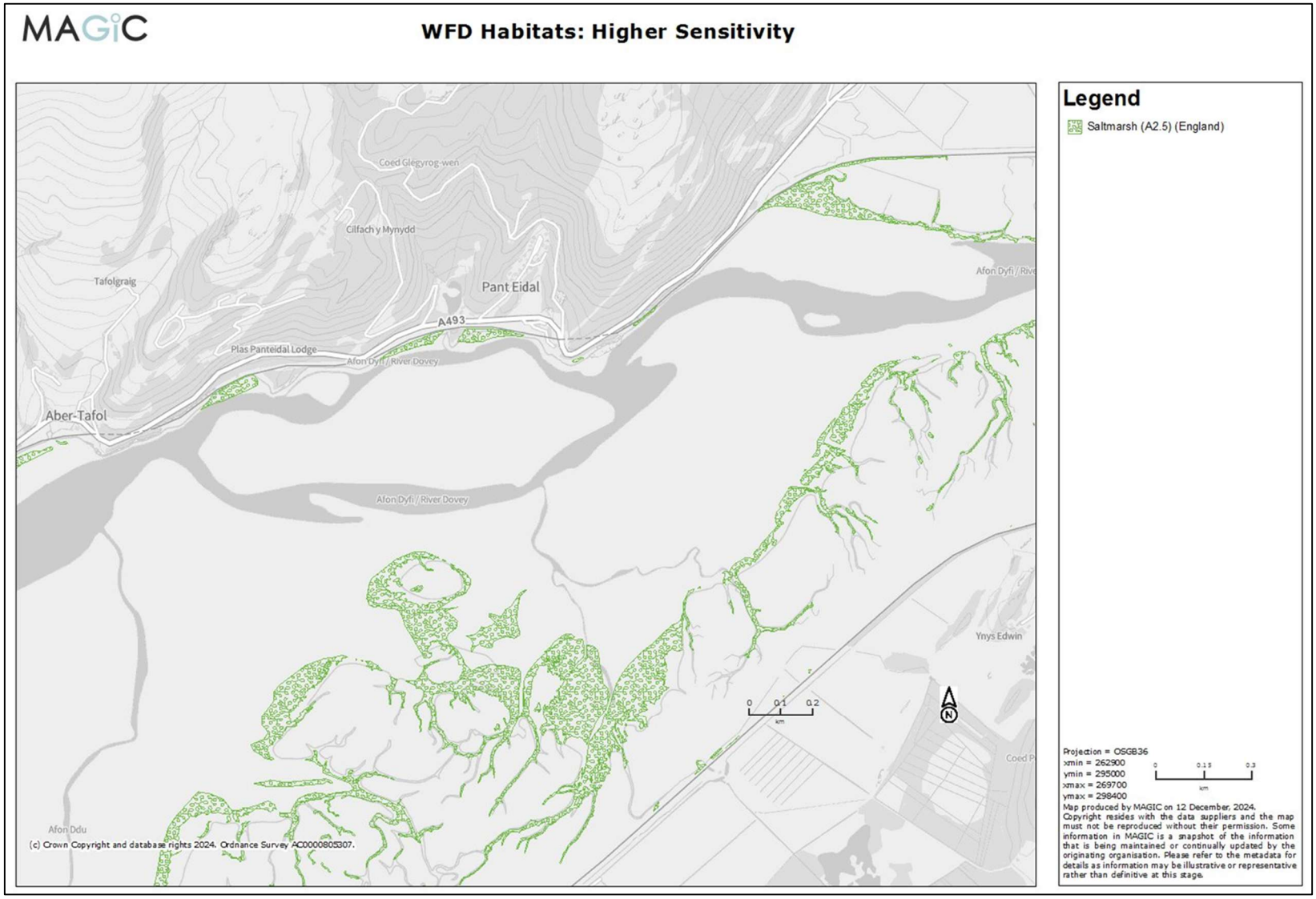

Figure 6: WFD Habitat Higher Sensitivity (www.magic.gov.uk)

Habitats with potential to be impacted by the scheme are discussed in detail within the DJP Abertafol - Habitat Regulations Assessment EV002135-HRA-1.

Table 3: Water body summary table and Magic maps, or other sources of information if available, to find the location and size of these habitats.

Area Name & ID	**Dyfi & Leri (GB511006407000)**		
Higher sensitivity habitats		**Lower sensitivity habitats**	
Potential Impacts	**Habitat Type**	**Potential Impacts**	**Potential Impacts**
Mussel Beds (Modiolus modiolus, Mytilus edulis & others) (A1.22, A2.72, A5.62, A4.24, A3.361)	Potential for indirect impacts due to chemical and hydrocarbon emissions from the works, if sufficient controls are not put in place.	Gravel & Cobbles (intertidal & subtidal coarse sediment A2.1, A5.1)	Potential for indirect impacts due to chemical and hydrocarbon emissions from the works, if sufficient controls are not put in place.
		Intertidal Soft Sediment (Sand, Mud & Mixed A2.2, A2.3, A2.4)	Direct impact in the form of vehicle movement over this harder substrate to access the structure Potential for indirect impacts due to chemical and hydrocarbon emissions from the works, if sufficient controls are not put in place.
		Subtidal Soft Sediment (Sand, Mud & Mixed A5.2, A5.3, A5.4	Potential for indirect impacts due to chemical and hydrocarbon emissions from the works, if sufficient controls are not put in place.
		Rockyshore (Intertidal rock A1)	Direct impact in the form of vehicle movement over this harder substrate to access the structure Potential for indirect impacts due to chemical and hydrocarbon emissions from the works, if sufficient controls are not put in place.

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

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

Table 4: Biology.

Consider if the footprint[4] of your activity is:	Biology habitats risk issue(s)
0.5km^2 or larger	The total deck area of the structure is approximately 80m^2 and hence the worksite will be considerably below 0.5km^2.
1% or more of the water body's area	The estuary covers an area of approximately 1,500ha. The footprint of the works is therefore less than 1% of the estuaries area.
Within 500m of any higher sensitivity habitat	Works will be undertaken within the following designated sites: ♦ Dyfi Site of Special Scientific Interest (SSSI). ♦ Pen Llyn a'r Sarnau / Lleyn Peninsula and the Sarnau (PLAS) Special Area of Conservation (SAC). ♦ Aber Dyfi Special Protection Area (SPA). ♦ Cors Fochno and Dyfi RAMSAR. The impact of the works on the SSSI and SAC are considered in the sections below.
1% or more of any lower sensitivity habitat	

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

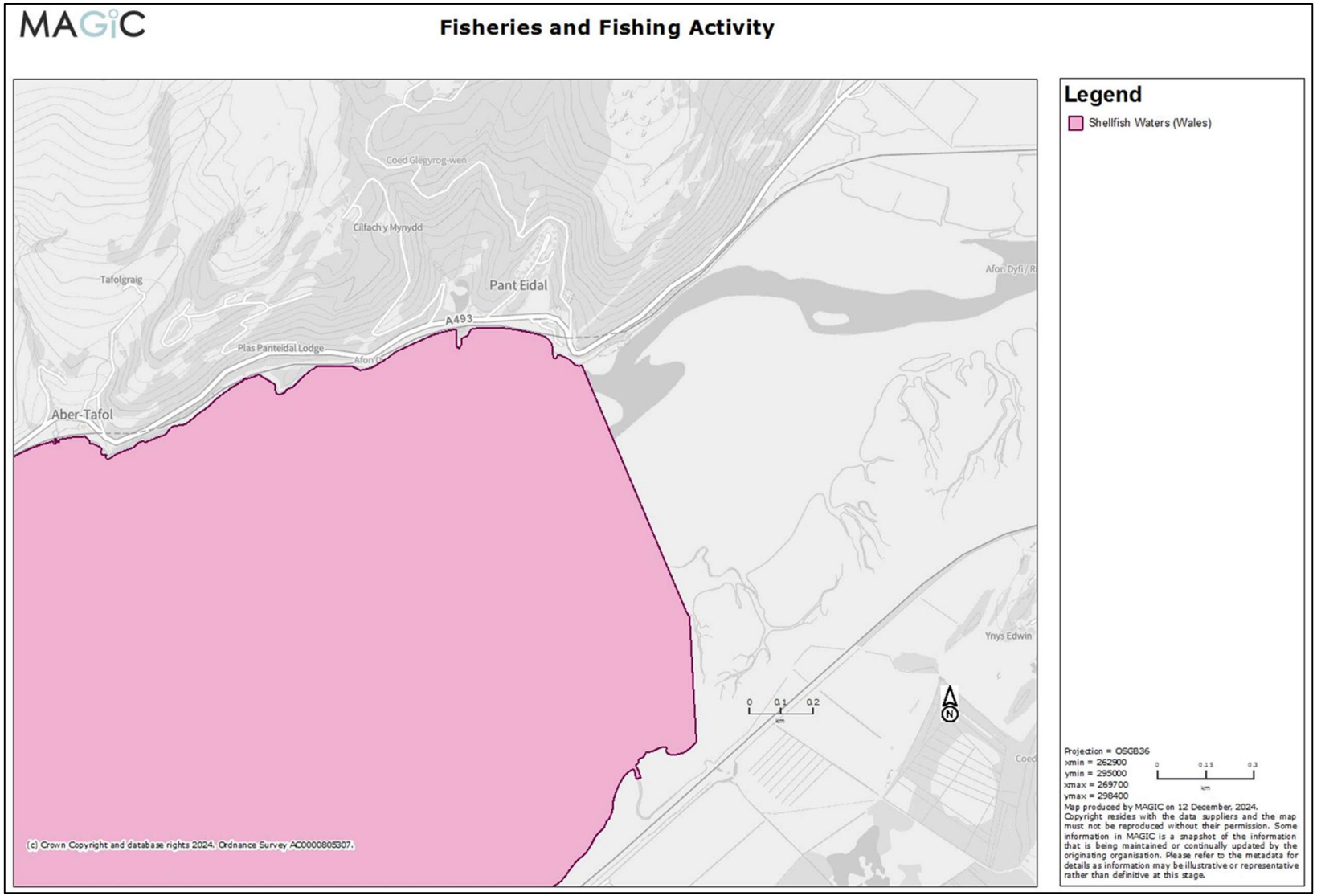

Figure 7: Location of Fisheries and Fishing Activity in proximity to works (downstream of structure).

6.3 DESIGNATED SITES WITHIN THE INFLUENCE OF THE DYFI & LERI ESTUARY

6.3.1 There are several statutory designated sites within proximity to the project.

Site of Special Scientific Interest:

- Dyfi Site of Special Scientific Interest (SSSI).
- Coed y Gofer (SSSI)

Special Area of Conservation:

- Pen Llyn a'r Sarnau / Lleyn Peninsula and the Sarnau (PLAS) Special Area of Conservation (SAC).

Special Protection Area:

- Aber Dyfi Special Protection Area (SPA).

RAMSAR:

- Cors Fochno and Dyfi RAMSAR.

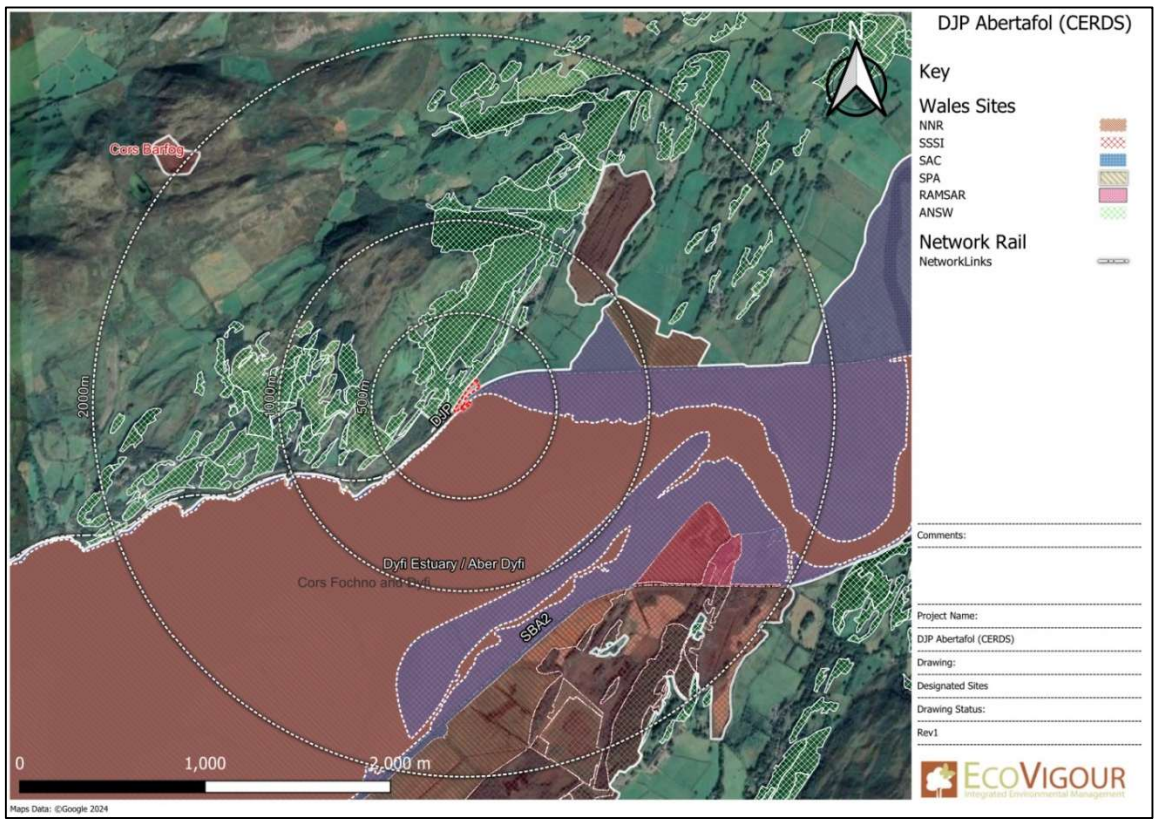

Figure 8: Designated sites in proximity to structure.

6.3.2 As Coed y Gofer SSSI is designated for it's in situ biological features and is a significant distance away from the project, it will not be considered further in this assessment.

6.3.3 In regard to the SPA and RAMSAR sites, as the main features overlap, these two designations will be discussed within the same section.

6.3.4 The West Wales Marine (WWM) SAC boundary is outside of the project boundary but is however connected via the Dyfi estuary. Although this site will not be discussed specifically, this assessment does acknowledge the importance of the marine site and consequently, the mitigative measures to be implement for the project will ensure the protection of the key habitat and species features outlined within the WWM conservation objectives.

7. DYFI SSSI

7.1.1 The Dyfi estuary is designated as a SSSI due to its diverse biological and geological features. It is outstanding for the size, range and the quality of its habitats and their transitions, and for its botanical, entomological and ornithological interest.

7.1.2 The estuary of the River Dyfi includes a range of habitats, with river channels and creeks, and extensive areas of sandbanks, mudflats and saltmarsh, including by far the largest area of saltmarsh in Ceredigion.

7.1.3 Within the Site Management Statement (SMS), the features below are listed which form the overall status of the designated site:

- Post-glacial geology
- The Estuary
- Saltmarshes
- Sand-dunes
- Estuarine raised bogs
- Lower Plants
- Higher Plants
- Otter populations
- Wintering wildfowl populations
- Breeding bird assemblage
- Reptile assemblage
- Invertebrate assemblage of bog/wetland habitats
- Invertebrate assemblage of dune habitats

7.1.4 From the available habitat data and on-site walkovers, the relevant habitat from the SMS in proximity to the project area are:

- The estuary
- Intertidal mud flats
- Salt marsh
- Rock outcrops

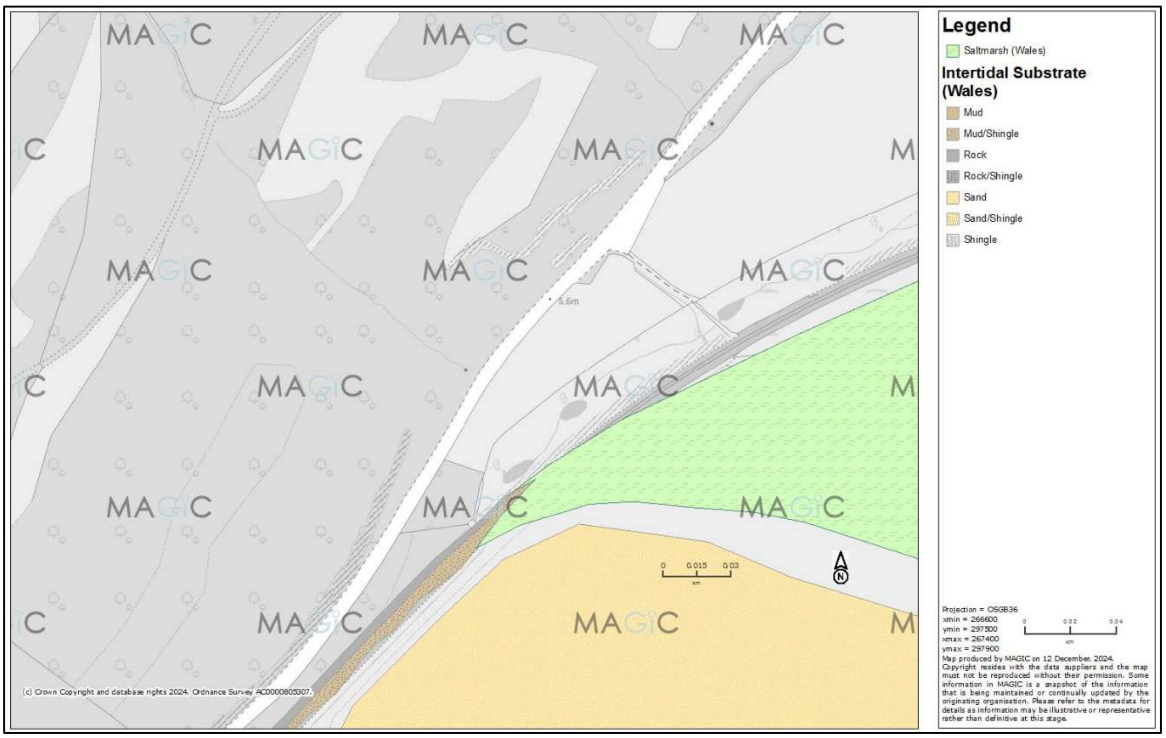

Figure 9: Habitats within proximity to remedial works.

7.1.5 The figures below provide a visual summary of the walkover. This is not an extensive collection of the images collected from the survey. Additional images are available upon request.

Figure 10: Estuary side of underbridge.

Figure 11: Sea Defence Wall of DJP Rail Line.

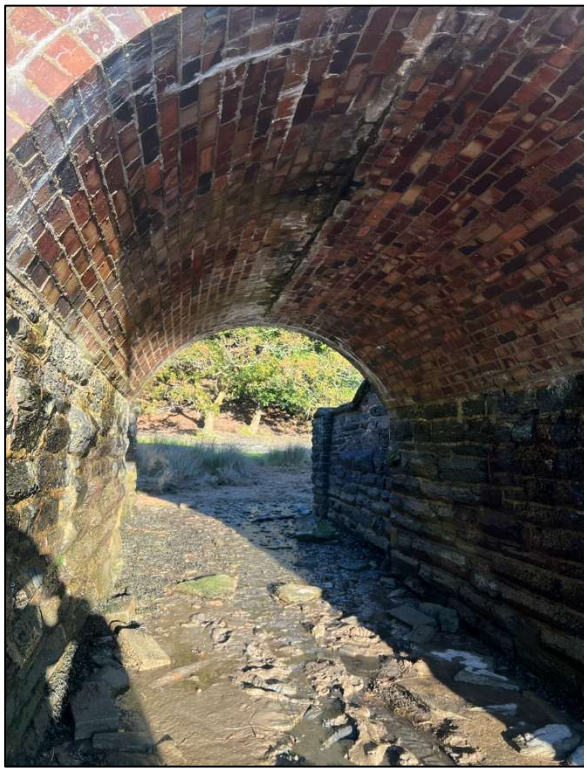

Figure 12: Masonry Arch of underbridge, with stress fracture observed.

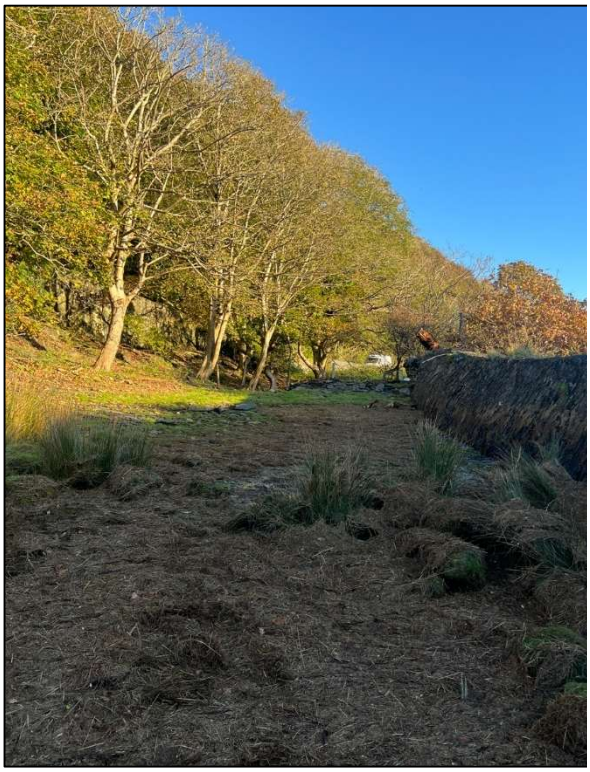

Figure 13: Visible strandline on the landward side of the survey area.

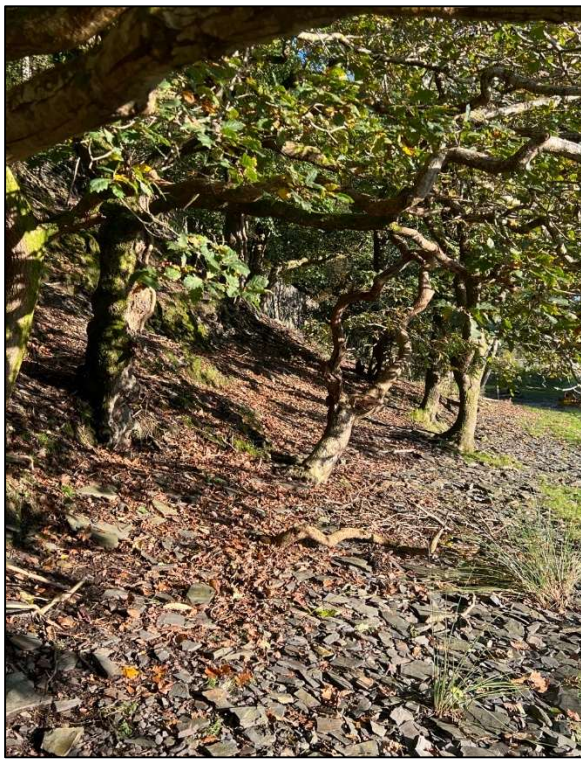

Figure 14: Woodland interface with strand intertidal extents.

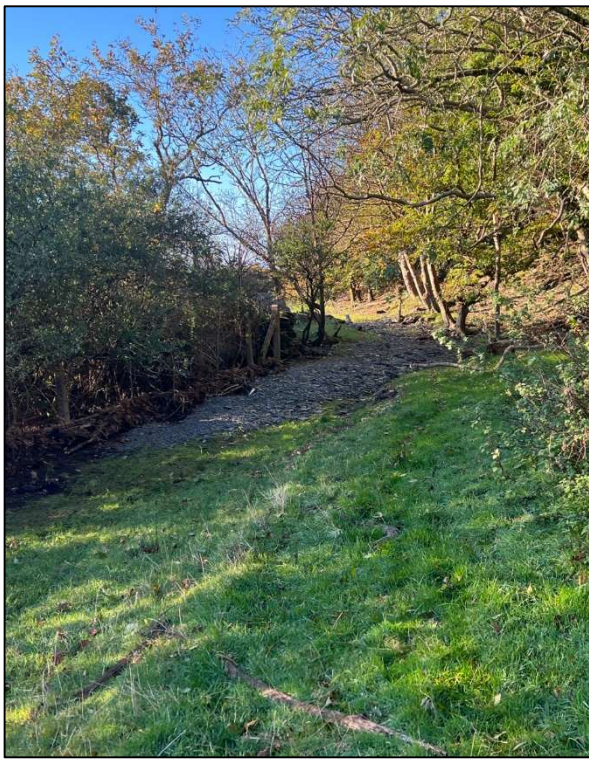

Figure 15: Edge of field to area influenced by tides.

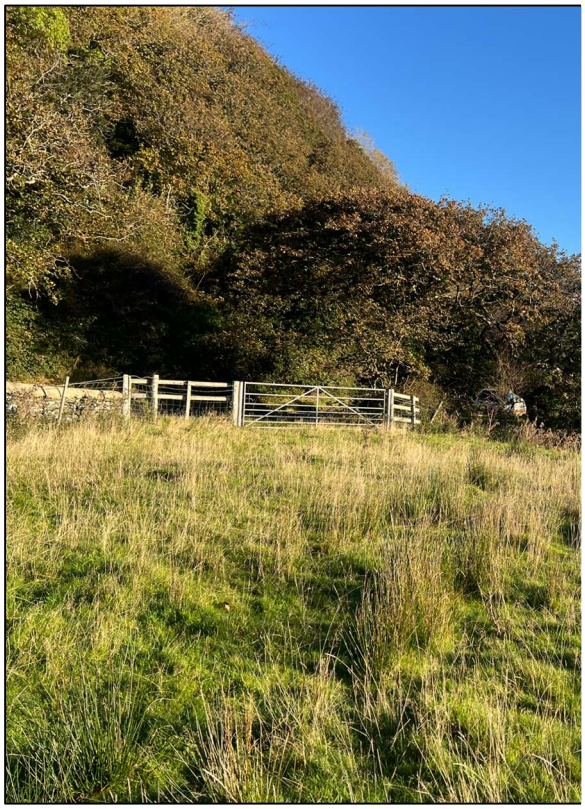

Figure 16: Gate allowing access to field and structure.

Figure 17: Mammal and wader prints within exposed mud at low tide.

Table 5: Potential fish species 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:	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	Works will be restricted to the defence structures during lower tide conditions, with no physical impediment to fish passage along the estuary. The works are indicated to take a single day to complete and consequently, are unlikely to impact any important seasons.
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)	Please refer to information above. Works will not cause a barrier to migrating fish species.
Could cause entrainment or impingement of fish	No identified impacts.

7.2.1 Stage 3 - Consider if water quality is at risk from your activity.

Table 6: Water body summary table to find information on phytoplankton status and harmful algae.

Consider if your activity:	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)	**Sediment Release:** There is potential for a small amount of sediment release from the rising tide and from scour due to water being discharged from the headwall between repairs or sediment mobilised during personnel access to the soft substrate below the structure. This would not add any materials to the marine environment but may re-mobilise deposited materials. **Use of Hydrocarbons:** No refuelling of equipment will occur within the estuary. All items of static equipment will be placed within a plant nappy when not in use. Fuelled equipment will be checked for defects and leaks prior to the start of each shift. Within the compound, a refuelling procedure will be implemented, whereby plant nappies will be placed beneath fuelling apertures during fuelling and refuelling will only be undertaken by designated, trained individuals using equipment specifically designed for that purpose. Network Rail have a spillage plan and specialised contractor in place to respond to and clean up spills. **Impact Assessment –** To assess the potential impacts of these activities, the following should be considered: Fuel powered equipment will be used on the viaduct within the estuary and hence there is a heightened risk of hydrocarbon release due to leaks of fuels and oils. The contractor will refer to guidance from: ♦ GPP 2 - Above ground oil storage tanks, ♦ GPP 5 - Works and maintenance in or near water, ♦ GPP 7 - Safe storage – The safe operation of refuelling facilities, ♦ GPP 21 - Pollution incident response planning, ♦ GPP 22 - Dealing with spills, ♦ GPP26 - Safe storage – drums and intermediate bulk containers.

Consider if your activity:	Water quality risk issue(s)
	This includes controls for the operation of equipment using biodegradable hydraulic oil (where this is within the manufacturers permitted specification), the re-fuelling of equipment, inspection and maintenance routines to identify defects which could result in the release of liquids, biosecurity protocols, silt mitigation procedures, waste management procedures. The ESMP also includes details on incident response and reporting, including hydrocarbon spills, remediation and reporting to NRW. **Conclusion:** Provided detailed mitigation plans are developed as part of the Task Specific Method Statements, in line with the broad guidance above, risks to water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns have therefore been assessed as low.
Is in a water body with a phytoplankton status of moderate, poor or bad	**N/A (No Data)**
Is in a water body with a history of harmful algae	**N/A**

Table 7: Assessing whether 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:	**Water quality risk issue(s)**
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	**Impact Assessment:** Chemicals which will be taken into the estuary as part of the works will be: ▪ Hydrocarbons within machinery. **Conclusion:** Provided the project complies with the measures set out within the ESMP, which in turn contains guidance from the relevant GPPs, the risk of release of hydrocarbons and cementitious materials is low.
It disturbs sediment with contaminants above Cefas Action Level 1	**Impact Assessment:** There is a low risk of sediment release from the silt material beneath the bridge during the personnel movements and placing of PASMA tower footings. This is likely to be very small scale and short duration. **Conclusion:** Risks from sediment release are negligible.

Table 8: Assessing whether project falls within mixing zone.

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	Water quality risk issue(s) /Assessment of Risk / Mitigation Proposals.
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	The works are maintaining an existing asset.

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

7.3 SECTION 4: WFD PROTECTED AREAS

7.3.1 Stage 4 is to 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

Table 9: Location of protected areas in your water body (and adjacent water bodies) within 2km of your activity.

Consider if your activity is: Within 2km of any WFD protected area[6]	Protected areas risk issue(s)
- Lleyn Peninsula and the Sarnau (SAC).	The works will be undertaken within the Lleyn Peninsula and the Sarnau (SAC). It is not anticipated that there will be any direct impacts on the SAC but without sufficient controls in place, there is potential for the release of deleterious materials from the works. This is considered within the following sections and also in the Habitat Regulations Assessment for the scheme.
Aberdyfi / Aberdyfi Rural Designated Bathing Waters	There is potential for impacts from the works due to the following: - Impacts are unlikely due to the scale and relatively low impact of the proposed works. Mitigation will be implemented as described above. - Reference has been made to GPP 2: Above ground oil storage tanks, GPP 5: Works and maintenance in or near water and PPG 6: Working at construction and demolition sites, GPP 7: Safe storage – The safe operation of refuelling facilities, GPP

Consider if your activity is: Within 2km of any WFD protected area[6]	Protected areas risk issue(s)
	21: Pollution incident response planning, GPP 22: Dealing with spills, GPP26: Safe storage – drums and intermediate bulk containers in the preparation of the ESMP.
Shellfish Waters	Impacts and proposed mitigation will be the same as for the Designated Bathing Waters area, above.

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

7.4 SECTION 5: INVASIVE NON-NATIVE SPECIES (INNS)

7.4.1 Stage 5 is to consider if there is a risk your activity could introduce or spread INNS.

7.4.2 Risks of introducing or spreading INNS include:

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

Table 10: Risk from INNS.

Consider if your activity could:	INNS risk issue(s)
Introduce or spread INNS	No INNS have been identified within the worksite. The risk of introducing INNS into the estuary environment will be controlled through Biosecurity Best Practice - Equipment to be used within and adjacent to the estuary will be subject to the Check, Clean, Dry process and will be treated with an aquatic safe disinfectant such as Virkon S. A Biosecurity Management Plan has been prepared for the project, which assesses the risk from INNS and proposes mitigation for this. Please refer to Appendix A.

7.5 SUMMARY OF WFD PRE-ASSESSMENT FINDINGS

Table 11: Summary of Pre-Assessment Stage Findings.

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	There is a temporary risk to hydromorphology due to the presence of the temporary scaffold, supporting the crash deck. During the works cycle, the lower elements of this will fall within the tidal range 3 times but the crash deck itself will be 0.6m above the highest anticipated tide. In the permanent situation the temporary propose beneath the bridge will be removed and the soffit level of the new bridge will be approximately 160mm higher than the existing.	Mitigation to be out in place to minimise impacts – Please refer to Table 15 for proposed mitigation.
Biology: habitats	No identified impacts on habitats, provided adequate pollution control measures are put in place i.e. sealed crash deck beneath the structure, controls on the storage and use of hydrocarbons and chemicals, controls on the use of cements, grouts and concrete.	Mitigation to be specified within the Social and Environmental Management Plan (ESMP)
Biology: fish	No identified impact. There will be no physical blocks to fish migrating through the estuary/river. Key impacts on fish will therefore be noise and vibration from works and the use of a equipment near channel. As the works will occur during low tide, noise and vibration will not be transmitted directly into the water column.	As above
Water quality	Potential impacts to water quality has been assessed in **Error! Reference source not found.**	Mitigation for these potential impacts is described within Table 15.
Protected areas	Works will be undertaken within the Dyfi & Lynfi SSSI and Lleyn Peninsula and the Sarnau (SAC)	Working procedures and mitigation to be put in place to minimise potential for sediment release and hydrocarbon release. Mitigation described in Table 15.
Invasive non-native species	A Biosecurity Management Plan has been developed for the project, which includes INNS. Please refer to Appendix A.	Please refer to Biosecurity Risk Assessment

7.5.1 The WFD guidance stipulates if a pre-assessment has not identified any receptors at risk during scoping, you don't need to continue to the impact assessment stage and your WFD assessment is complete.

7.5.2 However, if the pre-assessment identifies one or more receptors at risk during scoping, you should continue to the impact assessment stage.

Table 12: Water Framework Directive (WFD) Assessment for the Meirionnydd groundwater waterbody.

WFD elements	Assessment
Chemical status	Temporary impacts during construction No identified impacts Permanent effects during operation No predicted impacts from the operation of the rail structure as it is not proposed to amend the finished level of the railway and hence no excavation will be required and hence no new conduits between the rail track and ground water will be formed. Assessment outcome No adverse effects on the chemical status of the groundwater body have been identified and therefore this is scoped out of further assessment.
Quantitative status	Temporary impacts during construction No interaction with groundwater during construction. Permanent effects during operation No predicted impacts from the operation of the rail structure. Assessment outcome Effects to the quantitative status of the groundwater body have been scoped out of further assessment.

8. PROPOSED PROJECT MITIGATION

8.1 CONSTRUCTION PHASE MITIGATION

8.1.1 In Table 15 below, measures have been set out detailing mitigation to be implemented to minimise the potential project impacts.

Table 13: Proposed Mitigation Matrix.

Potential Hazard	Mitigating Circumstances / Mitigation Measures	Likelihood of Impact with Mitigation
Estuarine habitat - Loss of habitat from project activities.	During the project, all welfare, storage, parking and general works will occur within third party agricultural fields and the immediate area below the structure during low tide only. No Annex I habitat removal is required.	Negligible likelihood of significant impacts.
Salt marshes (also part of estuarine habitat) - Loss of habitat from project activities.	No loss of habitat is projected to occur as all site access takes place landward of the proposed works. No vehicle or pedestrian access into the nearby saltmarsh habitats upstream of the works is to occur.	Negligible likelihood of impacts, with suitable mitigation in place.
Reefs - Loss of habitat from project activities.	No works are proposed within the estuary, with all works confined to the lower rail corridor and adjacent field.	Negligible likelihood of impacts.
Mudflats and sandflats not covered by seawater at low tide – muddy gullies in the Estuary - Loss of habitat from project activities.	No works are proposed within the estuary, with all works confined to the lower rail corridor and adjacent field.	Negligible likelihood of impacts.
Release of contaminative chemicals from sediments within the estuary	No works are proposed within the estuary, with all works confined to the lower rail corridor and adjacent field.	Negligible likelihood of impacts with mitigation in place.
Contamination of the estuary from spillage of hydrocarbons during refuelling of plant and equipment or due to equipment failure.	No works are proposed within the estuary, with all works confined to the lower rail corridor and adjacent field. No refuelling of equipment will occur within the estuary habitat. All items of static plant will be paced within a plant nappy when in use or being stored. Equipment will be checked for defects and leaks prior to the start of each shift. A refuelling procedure will be implemented, whereby plant nappies will be placed beneath fuelling apertures during fuelling and refuelling will only be undertaken by designated, trained individuals using equipment specifically designed for that purpose.	Negligible likelihood of impacts with mitigation in place.

Potential Hazard	Mitigating Circumstances / Mitigation Measures	Likelihood of Impact with Mitigation
	Network Rail have a spillage plan and specialised contractor in place to respond to and clean up spills. The Contractor will develop and implement an Emergency Awareness and Response Plan. This will describe how spills will be contained and cleaned up. The emergency plan will appoint an Incident Coordinator, define roles and responsibilities during an incident, detail response procedures and contain an inventory of response equipment to be maintained on site. All machinery on site will undergo regular checks. If oil leaks or damage to hydraulic hoses is noted, plant and machinery will be removed from the site and isolated within the site compound with containment measures beneath the leak, until it has been repaired and signed off by a competent person.	
Contamination of the estuary from release of concrete.	Concrete used will be a rapid drying marine standard. No concrete / cementitious materials will be stored in areas within the tidal range of the estuary.	Negligible likelihood of impacts with mitigation in place.
Aggregations of non-breeding birds Noise disturbance / Visual Disturbance / Habitat Destruction.	Project activities will create a source of light and noise over 8-12 hours during the day. Times will vary depending on specific tasks. Working hours will be between 07:00-19:00 As working hours are not continuous there will be periods where birds are not disturbed by site activities during the early mornings and night. It is likely that local bird populations are habituated to a level of human activities, due to the proximity of the A493 and Abertafol further west. The Saltmarsh habitat adjacent to the structure is relatively small. This is not to insinuate that the habitat insignificant in isolation, however in relation to much larger saltmarsh habitat along the southern shores of the Dyfi estuary, it is likely this area is not an essential component to the overall bird assemblage dependencies.	Negligible likelihood of impacts with mitigation in place.
Individual wintering birds - Noise disturbance / Visual Disturbance / Habitat Destruction.	The works are scheduled to occur within circa March 2025, outside of the important wintering period. GWfG are normally counted November on-wards during winter activity surveys. The works are anticipated to be completed and all site assets removed well in advance of November arrivals of GWfG in significant numbers.	Impact Not Likely to be Significant
Otter - Noise disturbance / Visual Disturbance / Habitat Destruction.	Toolbox Talks will inform site personnel on identifying the Annex II Species. No otter holts, resting up area or evidence (e.g. spraint) have been identified within proximity to the structure to date. The project will not represent a hard boundary preventing access to the wider estuary by this species. Habitat impact is limited, however there may be a temporary impact to prey species (e.g localised fish) disturbed by the elevation in temporary noise outputs, during receding tide conditions.	Impact Not Likely to be Significant, with appropriate mitigation

Potential Hazard	Mitigating Circumstances / Mitigation Measures	Likelihood of Impact with Mitigation
	It is not anticipated that these works will have an impact on the population or conservation objectives. Additionally, no equipment will be left in such a manner that an animal could become snared and trapped within the working area. Should an Otter be encountered during works, personnel will temporarily stand down until the animal has vacated the immediate area under its own volition. The sighting will be reported to the Environmental manager.	
Bottle Nose Dolphin - Noise disturbance / Visual Disturbance / Habitat Destruction.	The structure is a significant distance away from the deeper portions of the estuary that continued to flow during low tides. In addition, the project is scheduled to occur during a lower tidal variation period, constituently it is unlikely this species will be encountered during the project period. Identification of this species will be provided in toolbox talks.	Impact Not Likely to be Significant, with appropriate mitigation
Grey Seal - Noise disturbance / Visual Disturbance / Habitat Destruction.	See above.	Impact Not Likely to be Significant, with appropriate mitigation
Fish Assemblage – Pollution and water quality impacts.	Pollution control and Biosecurity measures implemented as described above will minimise water quality impacts on fish species.	Impact Not Likely to be Significant, with appropriate mitigation
Fish Assemblage - Noise disturbance / Visual Disturbance / Habitat Destruction.	The works will be undertaken towards the end of the fish spawning season for migratory fish such as salmon, trout and eel (mid Oct – Mid April). However, no working below the structure will occur during high tide.	Works have potential to cause a Minor Significant impact.
Fish Assemblage - Contamination of the estuary from spillage	See comments under estuarine habitat	Impact Not Likely to be Significant
Biosecurity	A detailed Biosecurity Plan has been prepared for the project. This includes the following: - All site personnel and site visitors will be informed if any INNS are known to be present on site and that they are jointly responsible for preventing their spread/impacts. They will be made aware of what these species look like so they can avoid it where possible and take appropriate actions. - All site personnel and visitors will be inducted in good biosecurity practices. This will include adoption of the CHECK-CLEAN-DRY campaign (NNSS, 2015). - The CHECK-CLEAN-DRY poster will be displayed in the site office as a reminder of good biosecurity practices: - http://www.nonnativespecies.org/checkcleandry/ - All equipment, tools, vehicles and personal protective equipment (PPE) used on site will be checked for seeds originating from any identified INNS before leaving the area. If seeds from identified invasive species are identified, the items will be cleaned and removed seeds will be destroyed.	Impact Not Likely to be Significant

Potential Hazard	Mitigating Circumstances / Mitigation Measures	Likelihood of Impact with Mitigation
	- The spread of waterborne diseases will be limited through the adoption of the CHECK-CLEAN-DRY campaign. This would entail the use of a suitable disinfectant e.g. Virkon® S Aquatic to decontaminate all machinery and PPE prior to it entering site and upon leaving site. Following application of a suitable disinfectant, machinery and PPE will be allowed to fully dry for at least 72 hours before being used on another aquatic site. The Biodiversity Management Plan can be found in Appendix A.	
Blue Mussels - Contamination of the estuary from spillage and increased sediment loading.	See comments under estuarine habitat.	No impact
Vascular plant assemblage associated with salt marsh (part of estuarine habitat) - No impact	See comments under estuarine habitat	No impact

8. WFD Conclusion

9.1.1 Due to the nature and scale of the works to be undertaken during the DJP Abertafol (CERDS) Underbridge Repairs, providing the mitigation outlined within this document and within this document and the supporting Habitat Regulations Assessment (HRA) is implemented, this project will not prevent any of the water bodies associated with the project from meeting their Water Framework Directive objectives.

9. APPENDIX A - BIOSECURITY MANAGEMENT PLAN & RISK ASSESSMENT