2025

Afon Wen
Reactive Remedial Works

Appropriate Assessment (AA)

EcoVigour
Integrated Environmental Management

NetworkRail

MGroupServices

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Disclaimer

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1. INTRODUCTION

1.1 ASSESSMENT BACKGROUND

1.1.1 This document provides information to support an Appropriate Assessment under The Conservation of Habitats and Species Regulations 2017 (hereafter referred to as the 'Habitats Regulations') of proposed remedial works to the Afon Wen Coastal Defences, to be undertaken by MGroup, on behalf of Network Rail (NR).

1.1.2 Afon Wen Coastal Defences – Reactive Remedial Works are scheduled to address recent failures to the lower sheet pile revetment protecting the concrete toe of the defence alignment. The failure has likely caused an internal scour pocket to form, which has resulted in depressions appearing within the upper rail corridor. MGroup have been commissioned to undertake the remedial measures at the earliest opportunity, while undertaking continuous monitoring of the asset, should an emergency occur.

1.1.3 Afon Wen coastal defences are situated along the south facing shore between Hafan y Mor and Criccieth (West to East). Along this defence length, the closest designated SAC boundary runs parallel and overlaps the defence alignment. The SSSI boundary also overlaps the defence footprint.

1.1.4 The main statutory designated sites (In order of proximity) which require consideration under the Habitats Regulations has been identified as:

- Lleyn Peninsula and the Sarnau – Special Area of Conservation (SAC) – (onshore/offshore)
- Northern Cardigan Bay – Special Protection Area - (SPA) – (offshore)

1.1.5 There are several other designated sites within proximity to the project which are discussed further in the following sections. Note, the rail defences also abuts the:

- Glanllynnau a Glannau Pen-Y-Chain I Gricieth – Site of Special Scientific Interest (SSSI) – (onshore/offshore)
- West Wales Marine - Special Area of Conservation (SAC) – (offshore)

1.1.6 This document will be reviewed by the MGroup engineer teams, before being approved and issued along with the final design to be presented to the legislator ahead of construction.

1.1.7 Following review and acceptance, this document will form part of a formal Marine License Application (Band 2).

1.1.8 EcoVigour Ltd have been commissioned to produce these documents for MGroup Ltd, the principal contractor, working on behalf of Network Rail to undertake this Appropriate Assessment.

1.1.9 Under the requirements of the European Council Directive 92/43/EEC 'The Habitats Directive', it is necessary to consider whether projects or plans may have significant effects upon areas of nature conservation importance designated/classified under the Directives. This requirement is translated into UK law through the 'Habitats Regulations'.

2. Legislative Context

2.1 Overview

2.1.1 This document provides information to support an Appropriate Assessment under the Habitats Regulations of the proposed works by MGroup Ltd on behalf of Network Rail at Afon Wen.

2.1.2 The Habitats Directive, transposed into UK legislation through the Conservation of Species and Habitat Regulations (2017) (Article 6 of European Council Directive 92/43/EEC), any plan or project not directly connected with, or necessary to, the management of a European designated site but likely to have a significant effect, either alone or in combination with other plans or projects, shall be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives.

2.1.3 If the Appropriate Assessment concludes that the proposed works may have an adverse effect on the integrity of a European Site, or that such an effect cannot be ruled out (in line with the recognised precautionary principle) avoidance and mitigation measures to avoid such an effect must be considered.

2.1.4 If it cannot be concluded that the proposed works will not have an adverse effect upon the integrity of the site(s), further measures and assessments would be required. Potentially in the form of compensation.

3. Methodology

3.1 Overview

3.1.1 This assessment has been produced in-line with Habitats Regulations guidance published by the JNCC (2010), English Nature (now Natural England) (2001) and the Countryside Council for Wales (now Natural Resources Wales) (2008).

3.1.2 Additionally, there are SAC and SSSI's within a wider proximity to the project which will be discussed in further detail within the scoping-out section below.

3.1.3 Non-Statutory sites such as Ancient Semi Natural Woodland (ASNW), Local Nature Reserves (LNR) and National Nature Reserves (NNR) are within proximity to the rail asset. However, do not directly boarder the proposed works and are unlikely to be impacted by supporting works such as compound locations. These will not require further discussion.

3.1.4 This Appropriate Assessment (AA) will focus on the potential likely significant effects (LSE) of the rail asset refurbishment on the Afon Wen Defence line, Special Area of Conservation (SAC), Special Protection Area (SPA).

3.1.5 The first stage of an Appropriate Assessment is the Test for Likely Significant Effects (TLSE). As this is the early stage of the project and no formal methodology of construction has been finalised. This assessment will focus on the proposed designs, potential impacts to the designated site, within the context of current coastal policy and annex features.

3.1.6 A further assessment within this document, would be required to assess the project methodology, once known, against the Nature 2000 conditions.

4. Description of The Proposed Design

4.1 Project Context

4.1.1 The Afon Wen Rail Sea Defences are located along the south facing shore of the North Cardigan Bay, with the asset itself protecting and supporting the Dovey Junction to Pwllheli (DJP) line. The rail line represents the only remaining national rail link connecting this region of Northwest Wales to the wider UK network.

4.1.2 The defence includes significant areas of rock armour, reinforced steel pile at the toe of masonry sloped defences and beach groins. Agricultural land and large waterbodies are situated behind the defence. The bodies of water form a component of the SSSI designation.

4.1.3 Recent significant damage has been sustained to the lower sheet pile revetment at Afon Wen. Resulting in scour pockets and internal voiding within the upper rail corridor. Urgent remedial measures have been requested by Network Rail asset teams. MGroup have been commissioned to undertake the repairs at the earliest opportunity.

4.1.4 The failure currently affects roughly a 40m of the sea defence, but the working area may extend up to 60m to ensure a secure repair.

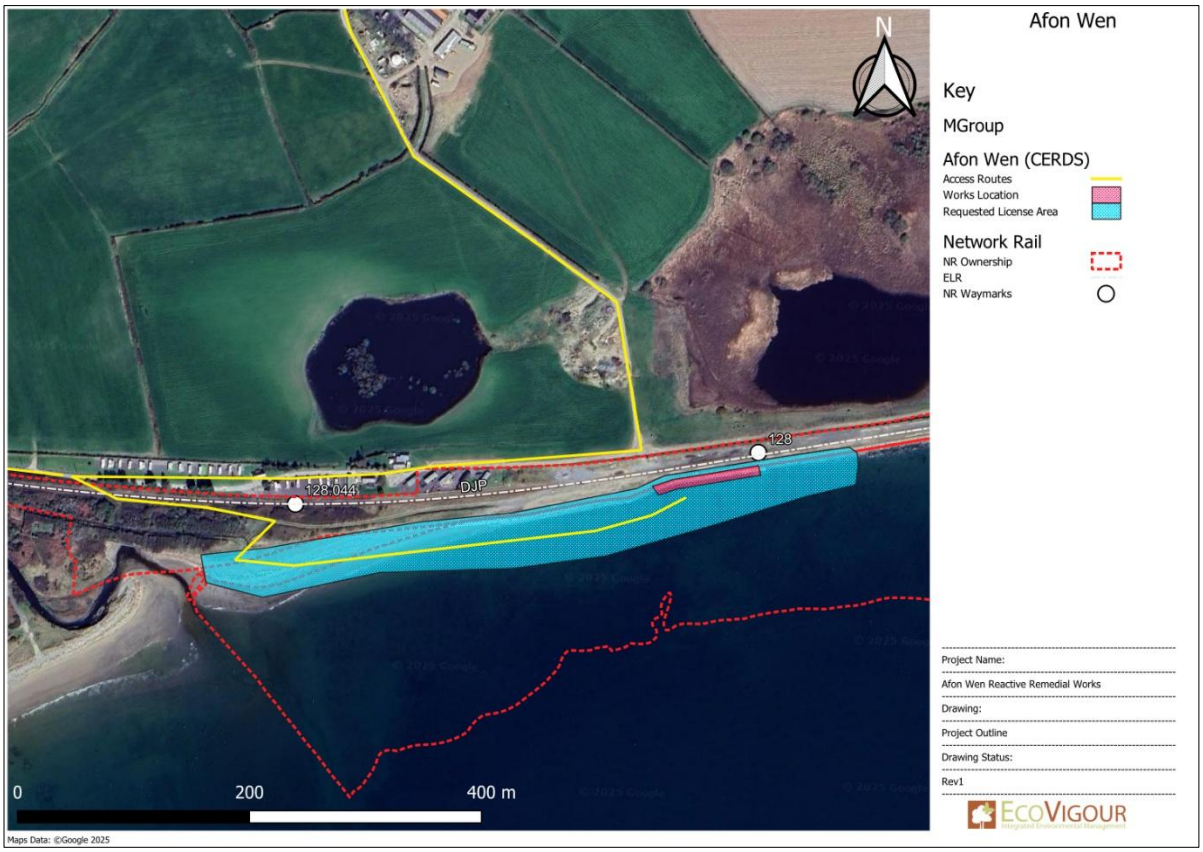

Figure 1: Main works location (OS Map).

4.2 PROJECT DESIGN OVERVIW

4.2.1 The proposed design includes masonry repairs, replacement rock armour components and sheet pile replacement. The figures below illustrate the design footprint and new proposed alignment. Full size design drawings are available in the attached appendices.

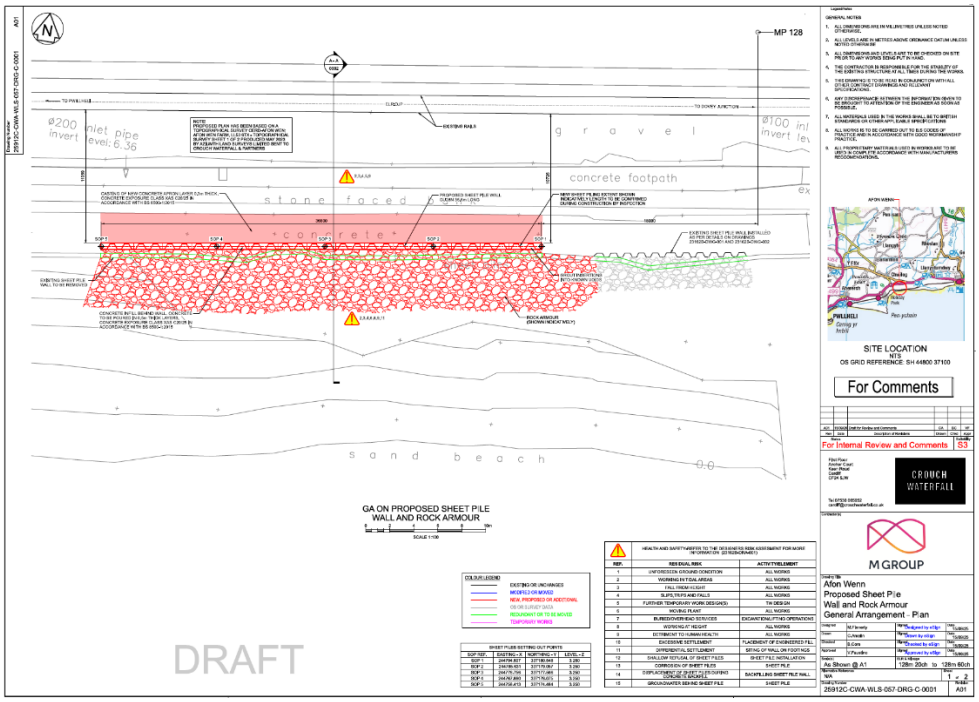

Figure 2: Drawing illustrating new rock armour extent (red) near northern rail crossing.

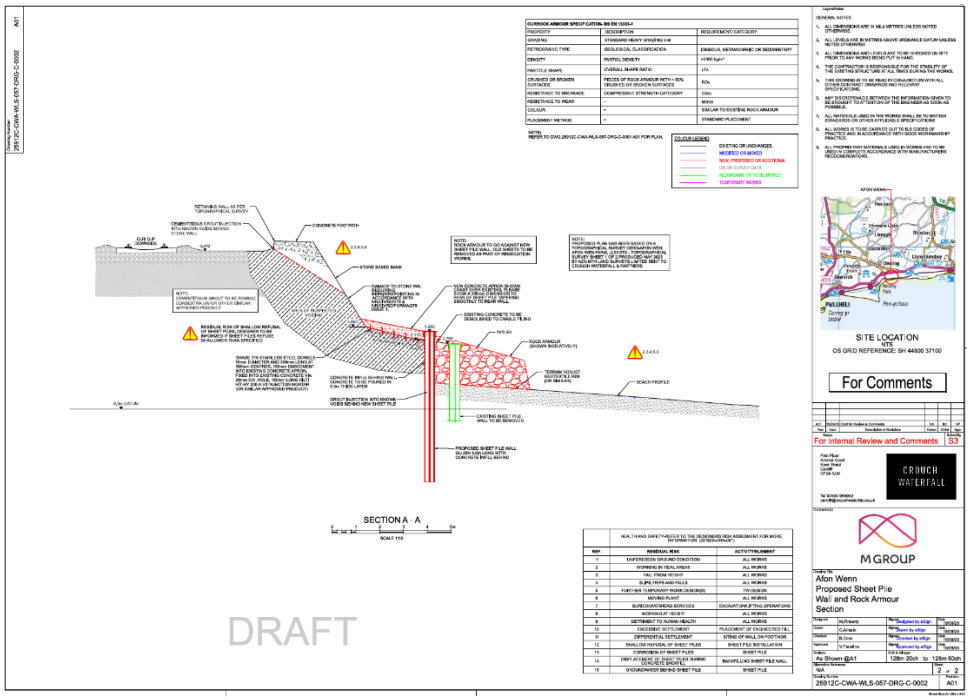

Figure 3: New rock armour extent along southern section.

4.3 METHODOLOGY

4.3.1 Access to the works area will be via adjacent access road from the local landowner, with compounds and material storage set up within Network rail sidings. Access to the beach area will be possible along existing tracks down to the beach, connected by the existing rail crossing within the adjacent caravan park.

4.3.2 All refuelling points will be set up within the compound a minimum of 10m away from any watercourse / coastline with extinguishers and spill kits locally stored, all COSHH regulations adhered to with bunded containers and warning signage.

4.3.3 Plant access and designated walking routes will be set up using marker posts and site access plans distributed and briefed to all operatives on induction, all works are programmed for low tide working and towable lighting towers will be placed providing access egress lighting across the shoreline, these will be removed at the end of each shift. Signage will also be placed at the start of each shift giving information to other beach users of works.

4.3.4 Where required, lighting of the work site will be via lighting towers placed track side and shining down to prevent unnecessary light spill.

4.3.5 13-25t excavator with wide low-pressure tracks fitted to reduce ground pressure and reduce rutting will be used for concrete excavation and sheet pile installation, then the stacking of rock armour in front of the replaced sheet piles all these works carried out working from the beach side.

4.3.6 A 6-8 tonne dumper with wide floatation tyres will be used for transporting spoil from the beach side to the compound tip and bringing the rock armour onto the beach for sheet pile protection.

4.3.7 All plant machines will be modern and fit for purpose with a provable maintenance schedule and all current industry noise reduction fitted.

4.3.8 All plant will run on bio diesel and use bio oil grease to lower the risk of pollution, spill kits will be supplied on all machines along with spill kits placed around the work site for emergency use should a spill occur, both plant vehicles will also be fitted with plant nappies in case of pipe failure, during all works carried out beach side an industry competent plant fitter will be on site in case of breakdown.

4.3.9 All existing sheet piles and concrete spoil will be removed from site. Sheet piles to match existing will be installed using the excavator on the beach, then the rear of the sheet piles will be back filled and compacted to design specification.

4.3.10 A concrete pump will be used for concreting the capping this will be parked track side with no access to the beach and allow controlled flow of concrete to the back of the sheet piles, the installation of the concrete will be programmed to commence as the tide retreats to allow maximum curing time of the concrete before contact with the sea.

4.3.11 Concrete capping will be replaced using a rapid set or greater mix of concrete, with stainless steel dowels resin fixed in situ to join the slabs together with a fibre additive added to the mix to replace steel reinforcement and prevent future delamination of the concrete, concrete will be trowel finished to all edges and brush finish to surface. The stacking of rock armour will be carried out as final works using local sourced rocks and placed in a random style to match existing rock armour along the beach.

4.3.12 Once completed, all temporary works elements will be demobilised and removed from the site, with the Marine License handed back to NRW.

5. DESIGNATED SITES WITHIN PROXIMITY TO SITE

5.1.1 There are several statutory designated sites within proximity to the defence line.

5.1.2 Site of Special Scientific Interest:

- Glanllynnau a Glannau Pen-Y-Chain I Gricieth – Site of Special Scientific Interest (SSSI)

5.1.3 Special Area of Conservation:

- Lleyn Peninsula and the Sarnau – Special Area of Conservation (SAC)
- West Wales Marine – Special Area of Conservation (SAC)

5.1.4 Special Protection Area:

- Northern Cardigan Bay (SPA)

5.1.5 They will not be considered further in this assessment in terms of design, however as indicated within the first section of this document, they must be reassessed against a project methodology, once this has been further developed.

5.1.6 In terms of direct interaction with designated site boundaries, no portion of the defence alignment is in direct contact with the defined statutory designated site boundaries. The PLAS SAC is 100m offshore at it's closest point to the defence line. The SPA is 1.5km offshore, while the West Wales Marine is 15km offshore.

5.1.7 The West Wales Marine (SAC) site boundary is located a significant distance away from the structure, however due to the highly mobile Annex II feature (1351: Harbour Porpoise – Phocoena Phocoena), it will be discussed further in the sections below.

5.1.8 Consequently, the Lleyn Peninsula and the Sarnau (SAC), West Wales Marine (SAC) and Northern Cardigan Bay (SPA) sites will be discussed further in their own sections below.

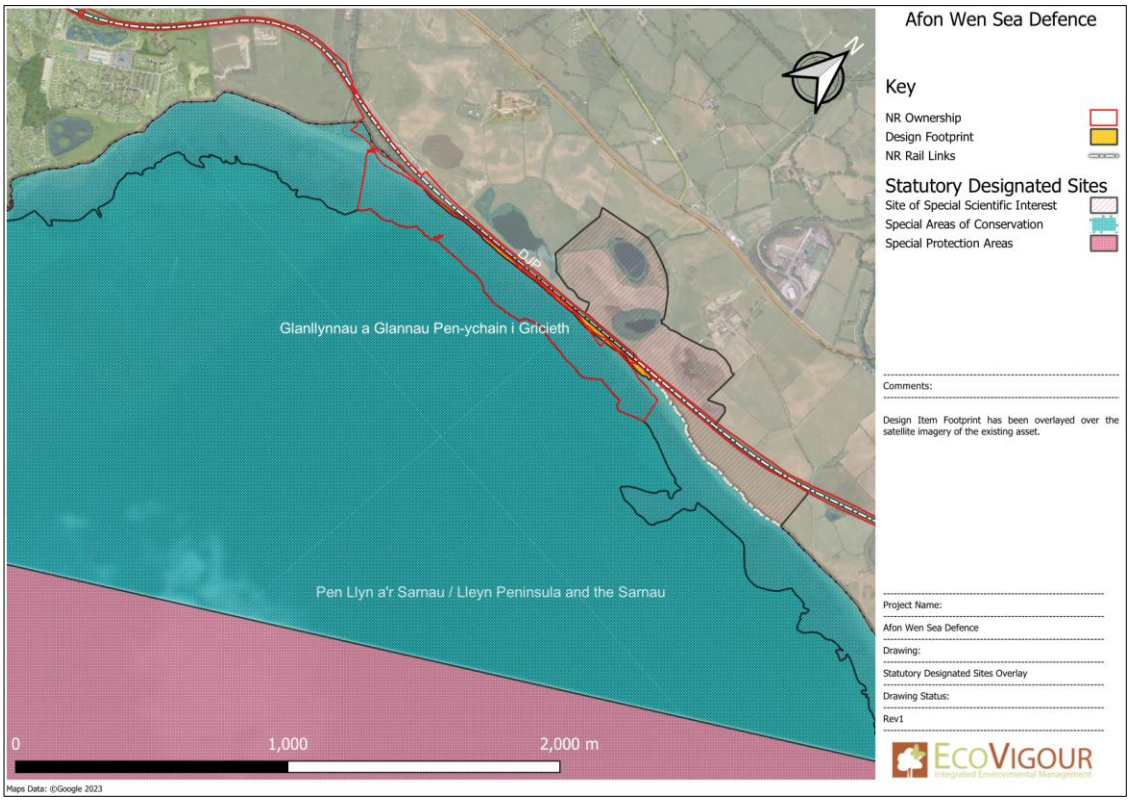

Figure 4: Statutory Sites in relation to design.

6. LLEYN PENINSULA AND THE SARNAU (PLAS) SAC

6.1.1 The Lleyn Peninsula and the Sarnau SAC is comprised of sea, coast and estuary that supports a wide range of marine habitats and dependant wildlife. The nature of the seabed and coast including the range of environmental conditions present vary throughout the SAC - See figure below for project location in relation to the SAC boundary. For the qualifying habitats and species listed in the table below (table 1), the Lleyn Peninsula and the Sarnau SAC is one of the best areas in the United Kingdom.

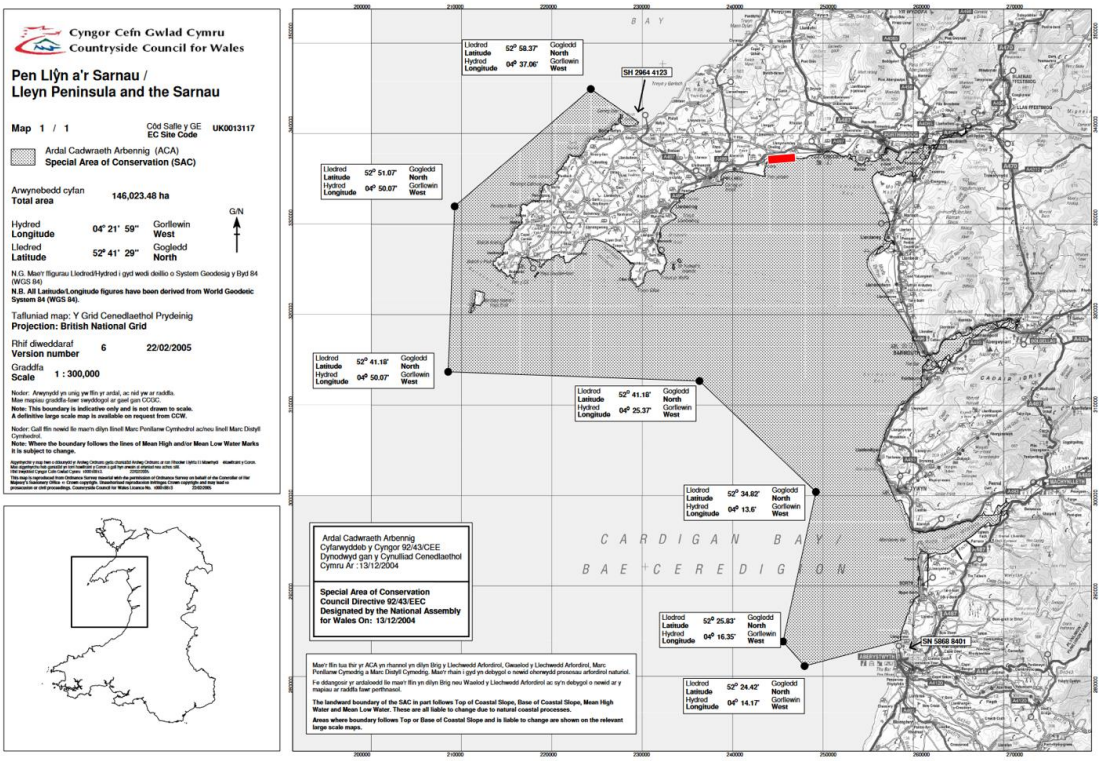

Figure 5: Location of design in relation to wider SAC.

6.2 PLAS ANNEX FEATURES OVERVIEW

Table 1: Annex I & II features of the PLAS SAC.

EU Code	Feature
Annex I habitats that are a primary reason for selection of this site	
1110	Sandbanks which are slightly covered by sea water all the time
1130	Estuaries
1150	Coastal lagoons (* Priority feature)
1160	Large shallow inlets and bays
1170	Reefs
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site	
1140	Mudflats and sandflats not covered by seawater at low tide
1310	Salicornia and other annuals colonizing mud and sand
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
8330	Submerged or partially submerged sea caves
Annex II species present as a qualifying feature, but not a primary reason for site selection	
1349	Bottlenose dolphin (Tursiops truncates)
1355	Otter (Lutra lutra)
1364	Grey seal (Halichoerus grypus)

6.2.1 As the projected refurbishment works occur directly within the SAC, it is necessary to identify the Annex I & II features that will be found directly within the project footprint.

6.2.2 Annex II species will be assumed as these species are highly mobile. The Annex I habitat however are discussed in the following subsections.

6.3 ANNEX I HABITAT WITHIN PROJECT AREA

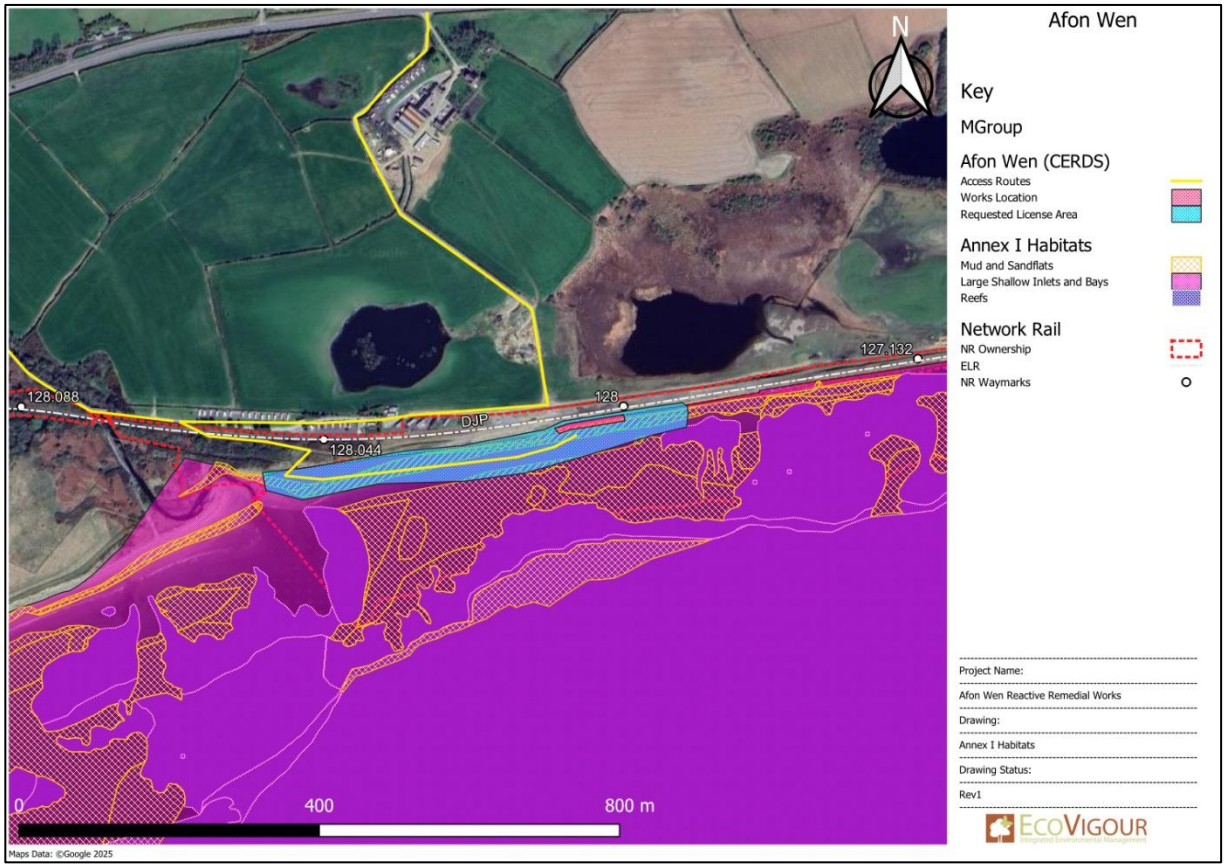

Figure 6: PLAS SAC Habitat Map.

6.3.1 Using the available data from the CCW (now NRW) Designated Habitat Map (Figure above), the relevant Annex I Habitats in relative proximity to the project footprint are:

- 1160 Large shallow inlets and bays.
- 1170 Reefs.
- 1140 Mudflats and sandflats not covered by seawater at low tide.

6.3.2 Adjacent to, but not within the footprint of the design, habitat 1140 is present along the foreshore of the site, at lower tidal reaches. This band of habitat although not technically within the mapped SAC boundary area, is present nonetheless.

7. NORTHERN CARDIGAN BAY / GOGLEDD BAE CEREDIGION SPECIAL PROTECTION AREA

7.1.1 Northern Cardigan Bay SPA occupies the northern half of Cardigan Bay on the west coast of Wales. Several rivers flow into the northern part of Cardigan Bay including the Dwyfach, Glaslyn/Dwyryd, Wnion, Dysynni, Leri, Mawddach and Dyfi.

7.1.2 The coastline is dominated by rocky cliffs and shores with occasional sandy beaches and estuaries. Where estuaries flow into northern Cardigan Bay, the sea quickly becomes in excess of 20m deep, where elsewhere it remains shallow (less than 10m in depth) for up to 20km offshore.

7.1.3 These shallow areas are sub-tidal shingle reefs, known as the sarnau. All three of the sarnau lie roughly north-east to south-west and are presumed to be formed from glacial deposits left at the end of the last ice age.

7.1.4 These shallow reefs are important ecological habitats within the Northern Cardigan Bay (Gogledd Bae Ceredigion) SPA and are important features of the Pen Llŷn a'r Sarnau (SAC), designated under the EC Habitats and Species Directive.

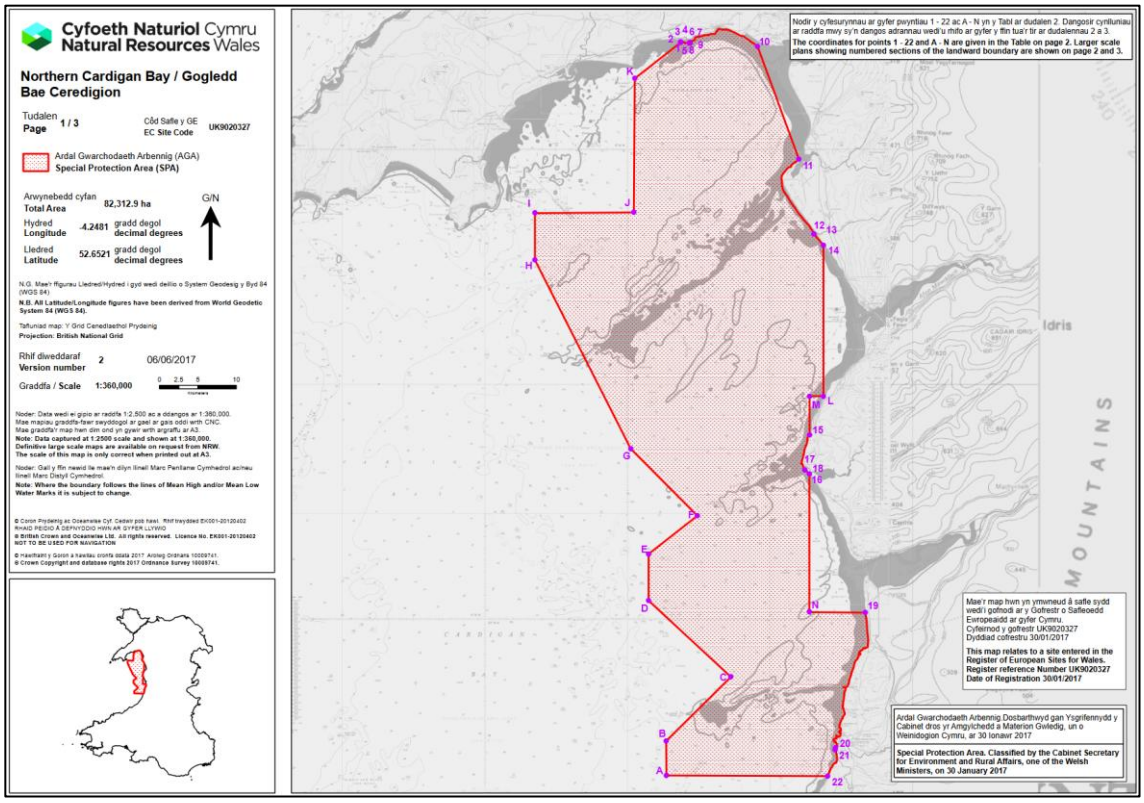

Figure 7: Northern Cardigan Bay (Gogledd Bae Ceredigion) SPA.

7.1.5 As indicated in the previous section, the defined boundary of the SPA is 1.5km from the defence alignment, however given the highly transient nature of wader species, indirect impact vectors should be considered.

8. West Wales Marine (WWM) SAC

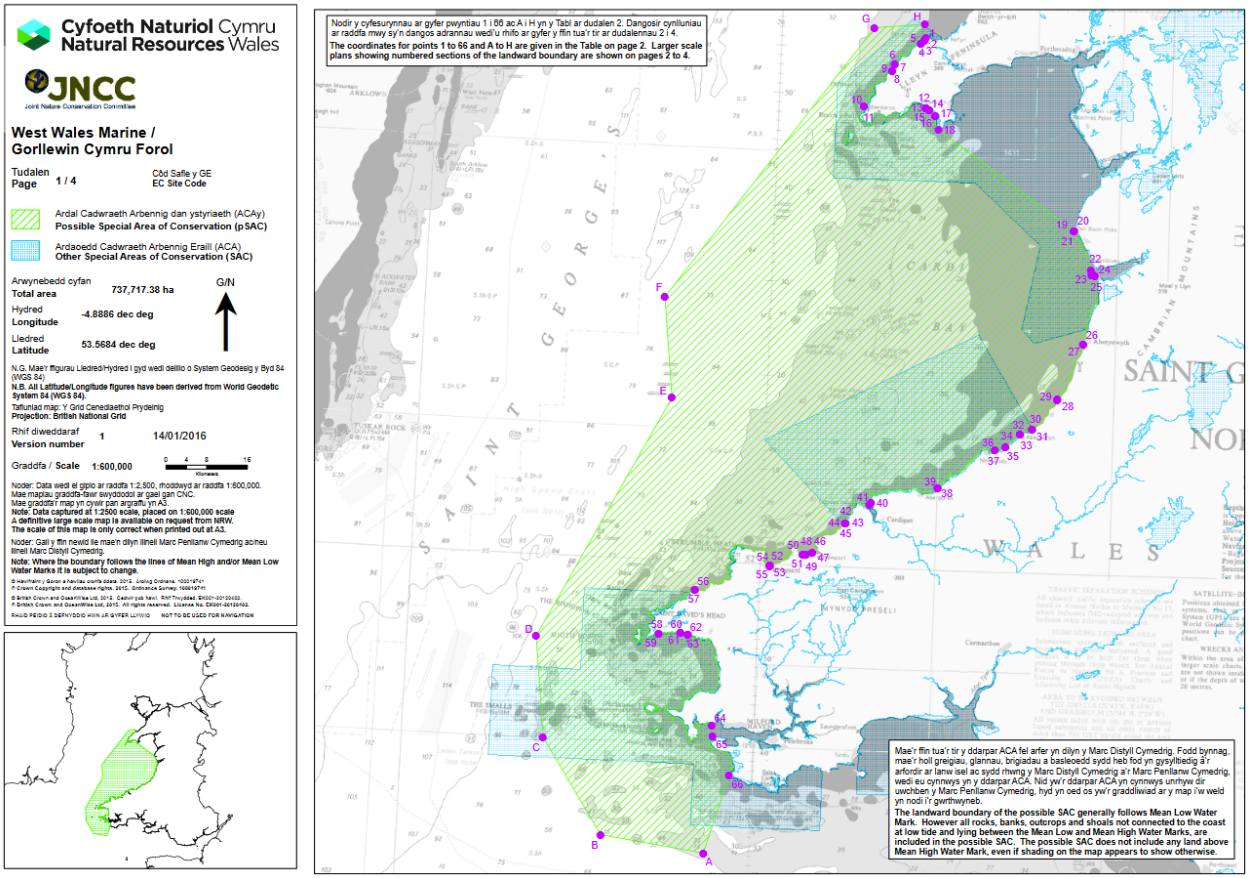

Figure 8: WWM SAC Location.

8.1.1 Designated in February 2019, the site is now at full SAC status. The Conservation Objectives (COs) and Advice on Activities (AoA) are set out for the West Wales Marine, Annex II (reason for designation) species harbour porpoise (Phocoena phocoena).

8.1.2 The site covers both inshore (within 12 nautical miles of coast) and offshore (beyond 12 nautical miles of coast) waters where Natural Resources Wales (NRW) and the Joint Nature Conservation Committee (JNCC) have respective advisory responsibilities.

8.1.3 The boundary of the SAC has been defined based on population modelling and habitat mapping. The range is based from winter and summer population movements. Given the WWM distance from Afon Wen, the site does not require further scrutiny at this stage.

9. GLANLLYNNAU A GLANNAU PEN-Y-CHAIN I GRICIETH - SSSI

9.1.1 This site is of special interest for its geological and marine biological features. It consists of an 8km length of shoreline with nationally and regionally important intertidal communities between the headlands at Pen-y-chain and Criccieth Castle.

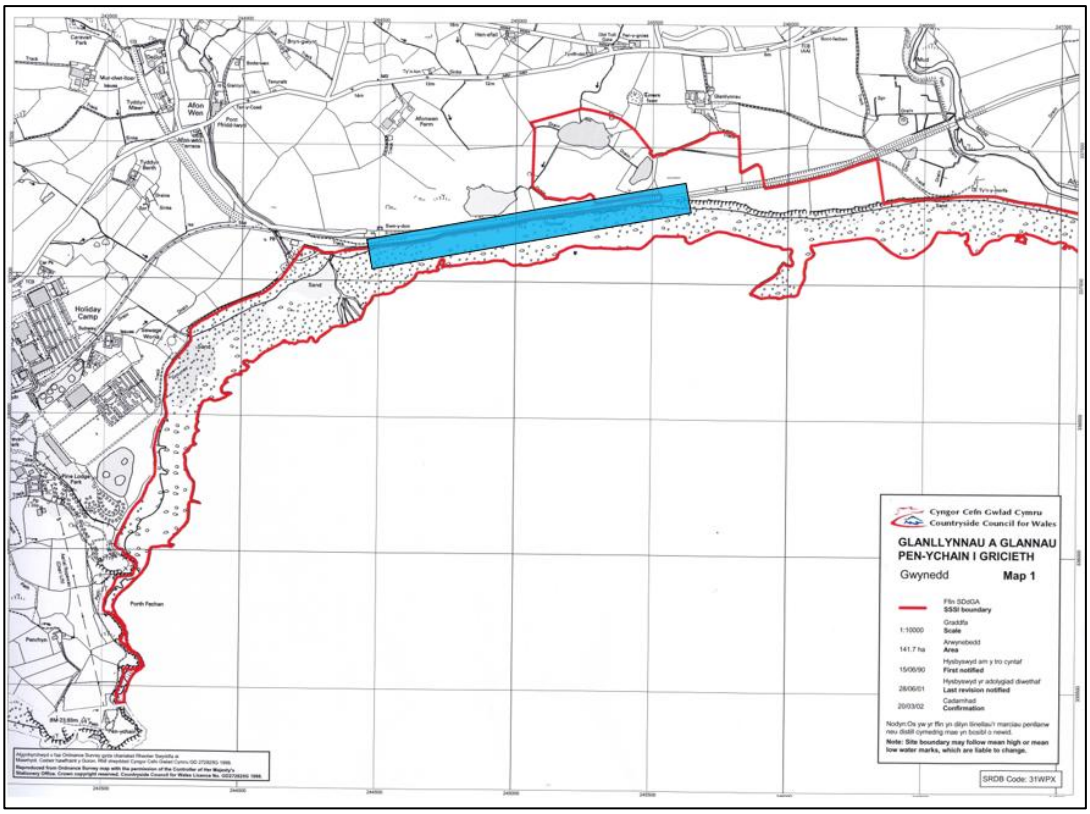

Figure 9: Defence area within context of SSSI.

9.1.2 There is a list of potential damage vectors to the designated site highlighted within the SMS Potentially Damaging Operations (PDO) list. Below are the likely activities considered relevant to the proposed design.

Table 2:PDO list from NRW Designated Site Finder Tool.

SMS Ref No:	Type of operation
11.	Destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, moss, lichen, fungus, leaf-mould, turf or peat.
19.	Erection and repair of sea defences or coast protection works, including cliff or landslip drainage or stabilisation measures.
21.	Destruction, construction, removal, rerouting, or regrading of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, including soil and rock exposures.
22.	Storage of materials.
23.	Erection of permanent or temporary structures or the undertaking of engineering works, including drilling or the laying, maintenance or removal of pipelines and cables, above or below ground.
24.	Modification of natural or man-made features (including cave entrances) and clearance of boulders, large stones, loose rock or scree and the battering, buttressing or grading of geological exposures.
26.	Use of vehicles or craft.

9.2 Observed Habitat Present within Design Footprint

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

Figure 10: View of lower defence area of Afon Wen.

Figure 11: Shingle beach habitat during low tide.

Figure 12: Refreshed rock armour towards the most easterly section of the defence.

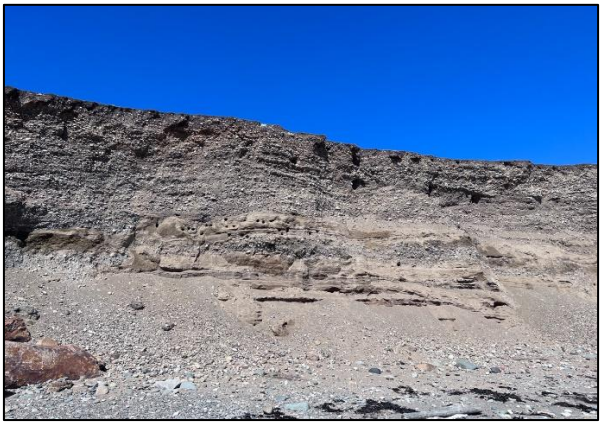

Figure 13: Sand Martin colony further east of new rock armour.

Figure 14: Habitat behind sea wall within rail corridor.

Figure 15: Additional sheet pile protected defence toe.

10. PHYSICAL PROCESSES

10.1 RELEVANT POLICIES WITHIN THE SHORE MANAGEMENT PLAN 2 (SMP2)

10.1.1 As part of the Appropriate Assessment, it is necessary to compare the proposed works against the long-term policies outlined within the Shore Management Plan 2 (SMP2). Within the SMP2 there are several policy units relevant to this section of coastline.

10.1.2 The defences are contained within the most north easterly section of Policy Unit PU 12.24 (DZ 12 Mochras to Pen ychain)

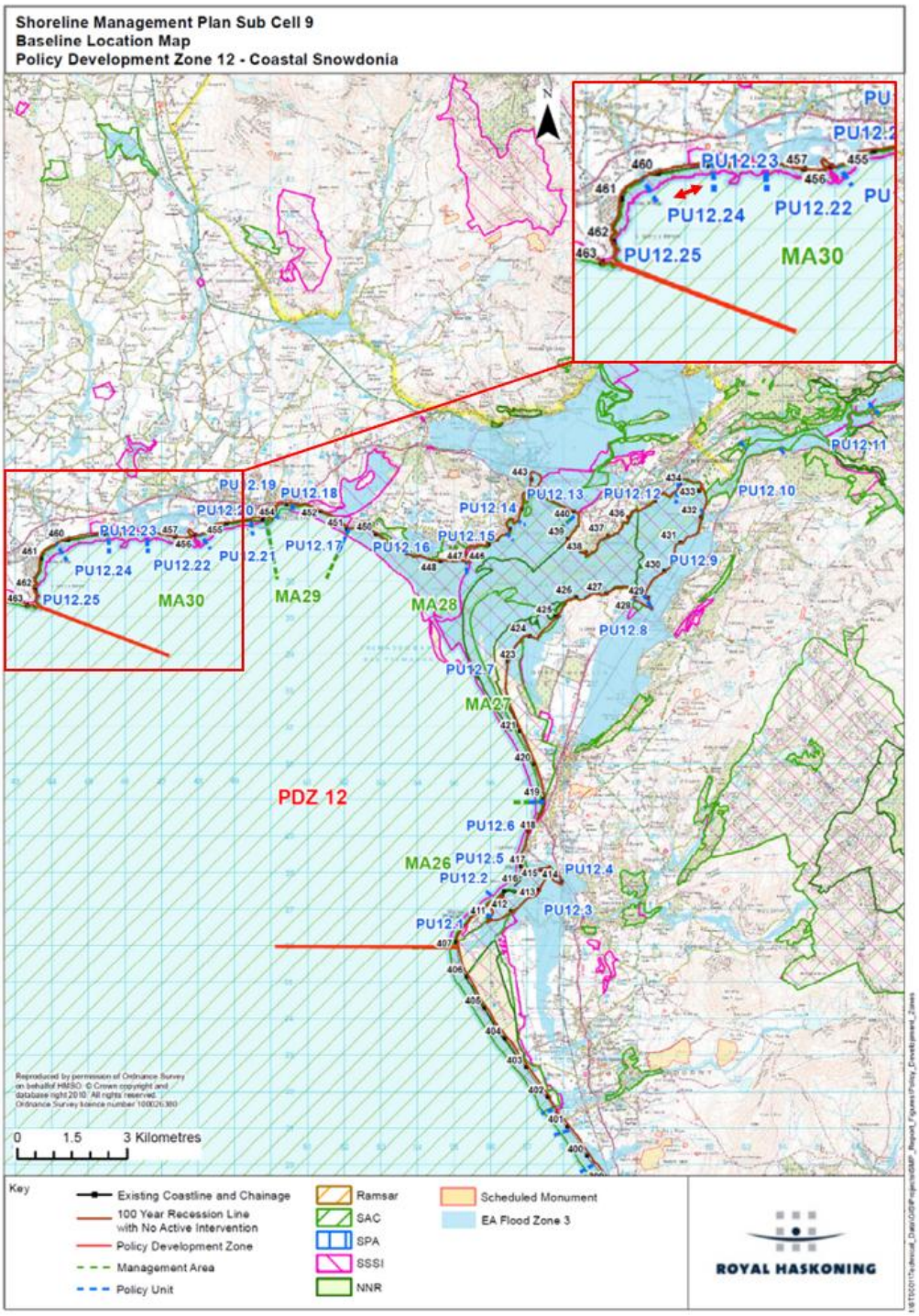

Figure 16: SMP2 - Policy Units

10.1.3 Management units are defined within epochs, with Epoch 1 referring to periods from present to 2025, Epoch 2 referring to years between 2025-2055 and Epoch 3, 2055-2105.

10.1.4 As part of the SMP2, the chosen policies are measured against the potential economic impacts, social and environmental impacts projected over the course of those epochs.

10.1.5 The table below, outlines the long-term preferred policy.

Table 3: Relevant Policy Unit description.

Policy Unit		**Policy Plan**			
		2025	**2055**	**2105**	**Comment**
PDZ 12.24	Afon Wen	HTL	MR	MR	This might not preclude local private management of defences subject to normal approvals.
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention, MR – Managed Realignment					

10.1.6 The proposed design does not fall entirely within the remit of maintenance or hold the line principles.

10.1.7 Within the Strategic Environmental Assessment (SEA) of the SMP2, policy preferences are assessed against the potential impacts from Coastal Squeeze. Within Appendix B of the SEA. In regard to Subtidal reefs within PDZ 12, these comprise of bedrock reef and biogenic reefs. The HTL policies are located along the back of the shingle foreshore of PU 12.24 (epoch 1) where settlements or roads are to be protected.

10.1.8 The Epoch 1 HTL policy will see a decrease in the area of shingle beach intertidal habitat as a result of sea level rise in the short term (epochs 1 and 2). However, this is projected to be alleviated by MR in the long term. As shingle is removed from the beach, material may settle within the subtidal reefs, however, given that it is shingle material rather than sand, it is unlikely that the subtidal reefs will be smothered. Instead, the shingle material may result in increasing the extent of the reefs in the long term. MR in the long term would ensure that coastal squeeze would not be an issue, as reef habitat will be able to respond naturally to sea level rise.

10.1.9 The majority of the coastline within PDZ 12 comprises large stretches of sandflats, some areas of saltmarsh, with the remaining coastline comprising shingle beaches. The area of habitat relevant to policy 12.24 (HTL/MR/MR), broadly contains shingle/sand patches at the foreshore. The HTL epoch 1 policy is predicted to result in the loss of intertidal habitat as a result of coastal squeeze, though no further loss for has been estimated beyond Epoch 1 within 12.24.

10.1.10 The projections of loss of intertidal habitat is summarised below.

Table 4: Estimate habitat loss (SEA-SMP2).

BAP Habitat - Predicted Intertidal BAP Habitat Extents at Risk									
Policy Unit	**Type**	**2025**	**2055**	**2105**	**Name**	**Total within PU (ha)**	**BAP Habitat Area at Risk (ha)**		
							Epoch 1	**Epoch 2**	**Epoch 3**
12.24	Intertidal Sand	HTL	MR	MR	Afon Wen	15.71	0.2		

10.1.11 Importantly, the initial loss is believed to compensated by allowing natural coastal processes to take place once managed realignment occurs. Therefore, there is no available loss projections beyond Epoch 1, as it is assumed the MR policies will occur.

10.1.12 The current repairs proposed within this Epoch do not deviate from the Welsh Governments memorandum on repairs to existing coastal assets. The document does not make any strategic predictions for future maintenance into the next epochs and how those will interact with preferred long-term policies.

11. Assessment of Potential Impacts Resulting from Specific Activities and Proposed Mitigation Measures – Afon Wen

This section outlines the receptors of potential damaging vectors as a result of the proposed works and proposes appropriate mitigative measures to ensure that there is not a significant likelihood of impacts.

11.1 Annex I Habitats – Impacts & Mitigation

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Estuarine habitat	SAC/ SSSI	Loss of habitat from project activities.	Overall, there will be a short-term impact to the estuarine habitat during the entire project. Vehicle movement will be restricted to the existing haul roads where possible, shingle and sand bar habitat below the structure. Mudflats and saltmarsh will be avoided at all time, unless movement around existing groynes is required. Plant machinery will not deviate from the designated routes at any time. Personnel will walk along the available public footpath or access routes. No walking over the saltmarsh is permitted. Plant machines are only permitted for access and egress to their specific work areas and not undertake unnecessary movements to collect material. Additional measures will include regular periodic (i.e. daily) visual assessment of the mudflat and sandflat feature, particularly the area of stable mud habitat. This is to ensure that the area does not become visually impacted i.e. rutted or compacted in specific areas as a result of vehicle access across the intertidal area. Regular images of this area will be submitted (to the relevant NRW specialist) for review. The contractor will remain diligent to any signs of visual impact on this habitat with immediate consolation with NRW to ascertain the most appropriate and feasible way to mitigate impact, should signs of damage to this habitat become apparent. Potential mitigation options (if required) may include some sort of matting or runners to spread the weight of vehicle and equipment and ensure that the habitat remains uniform, unrutted and not overly compacted.	Negligible likelihood of significant impacts.

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Salt marshes (also part of estuarine habitat)	SAC/SSSI	Loss of habitat from project activities.	No loss of habitat is projected in relation to these works.	Negligible likelihood of impacts.
Reefs	SAC/SSSI	Loss of habitat from project activities.	Unlikely to occur as reef habitat is located outside of project works locations and access routes to the failed sea defence. Direct impacts unlikely, although pollution events could impact these features indirectly. The latter being addressed with appropriate GPP guidance and best practises.	Negligible likelihood of impacts.
Mudflats and sandflats not covered by seawater at low tide – muddy gullies in the Mawddach estuary	SAC/SSSI	Loss of habitat from project activities.	Mobile habitat is anticipated to regenerated readily, with re-establishment likely to occur over 1-2 years following completion of reactive works.	Negligible likelihood of impacts.

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
All identified within the project area and proximity.	SAC/SSSI	Contamination of the estuary from spillage of hydrocarbons during refuelling of rail mounted plant and equipment or due to equipment failure.	All plant machinery movement will occur within the confines of the rail corridor. No movement of plant machines along the estuary bed is required to support the metallic works. No refuelling of plant machinery or equipment will occur within the estuary habitat. All items of static plant 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.	Negligible likelihood of impacts with mitigation in place.

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
			Plant Machinery will only operate in low tide conditions and will be removed from the estuary ahead of the rising tide. Provision will be made to remove broken down plant / vehicles or plant and vehicles which become bogged down. No refuelling of plant machinery or 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. Plant 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. The project EMP will support this document with the relevant copies of GPP's available on site and references to the EMP which supports this document. 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. Plant will also be available to remove contaminated ballast from site if required. All machinery entering the estuary will undergo regular checks and only use approved biodegradable oils. The contractor will develop and emergency response plan in the event a machine becomes stranded in the estuary from mechanical failure. Equipment will be available to syphon the fuel from the disabled machine in order to reduce the potential release of hydrocarbons into the estuary. Please see emergency machine protocol within the EMP. contain an inventory of response equipment to be maintained on site.	

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
All identified within the project area and proximity.	SAC/SSSI	Contamination of the estuary from release of concrete.	Works will only occur during low tide conditions. Concrete used will be a rapid drying marine standard which will have cured by the time the tide returns to the working area. Covers around rapid dry concrete are to be in place for several hours at a time and are not long-term features.	Negligible likelihood of impacts with mitigation in place.
All identified within the project area and proximity.	SAC/SSSI	Release or spread of INNS into the estuary	All machines and equipment will undergo biosecurity control measures before entering the estuarine environment. Please see attached Biosecurity Management Plan in Appendix A.	Negligible likelihood of impacts with mitigation in place.

11.2 Annex II Species – Impacts & Mitigation

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Aggregations of non-breeding birds such as Red Shank & Snipe	SSSI	Noise Disturbance / Visual Disturbance / Habitat Destruction.	Project activities will create a source of light and noise over 6-10 hours during the day. Times will vary due to the variation in the tide and weather. As working hours are not continuous there will be periods where birds are not disturbed by site activities. However, it is likely that local bird populations are habituated to a level of disturbance from human activities, due to large numbers of pedestrians being present throughout the year (peak being summer). The Saltmarsh habitat adjacent to the access route / compound is heavily grazed and thus does not provide an abundance of nesting locations / foraging opportunities. Consequently, the project is unlikely to significantly impact these species.	Negligible likelihood of impacts with mitigation in place.
Individual wintering birds	SSSI	Noise Disturbance / Visual Disturbance / Habitat Destruction.	It is unlikely that these works will have a long-term impact on overwintering birds present within the SSSI area.	Impact Not Likely to be Significant
Otters	SAC & SSSI	Noise Disturbance / Visual Disturbance / Habitat Destruction.	Toolbox Talks (TBTs) will inform site personnel on identifying the Annex II Species. No otter holts have been noted to date within proximity to the structure, access route or Morfa Compound area. The project does not represent a hard boundary preventing access to the wider estuary by this species. Habitat impact is limit, however there may be a temporary impact to prey species disturbed by ongoing works. It is not anticipated that these works will have an impact on the population. Additionally, no equipment will be left in such a manner that an animal could become snared and trapped within the working area.	Impact Not Likely to be Significant, with appropriate mitigation

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
			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 contractor will abide by the Gwynedd Marine Code of Conduct. Salmon, which are a prey of Otter will not be prevented from travelling up the estuary during the project. Although there will be an elevated human presence around the structure, it is unlikely that this will present an impassable barrier to salmon migrating to spawn. Directional lighting measures as with those proposed for bat species will be implemented for Otter population to limit disturbance. Task specific lighting will be used, and the use of flood lights will be avoided. Steps should be undertaken to ensure that otters, mammals and birds do not become trapped within working and storage areas. This will take the form of compound barriers reaching ground level and attachments to gates to prevent access by otters or other mammals such as badgers from entering the compounds.	
Bottle Nose Dolphin	SAC	Noise Disturbance / Visual Disturbance / Habitat Destruction.	See above. It is likely that this species is habituated to a level of marine traffic along this section of estuary as a result of the nearby fishing dock and leisure craft using the estuary. Additionally, as this is an active railway, consistent levels of vibration, noise and visual disturbances are already emitted from this area.	Impact Not Likely to be Significant, with appropriate mitigation
Grey Seal	SAC	Noise Disturbance / Visual Disturbance / Habitat Destruction.	See above.	Impact Not Likely to be Significant, with appropriate mitigation

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Fish Assemblage	SAC/SSSI	Noise Disturbance / Visual Disturbance / Habitat Destruction.	The majority of in/above channel works will be undertaken outside of the fish spawning season for migratory fish such as salmon, trout and eel (mid Oct – Mid April) but will fall within the spawning season for several species of fish which are offered protection under the Natural Environment and Rural Communities Act. Spawning periods for these species are generally between March and July. Works within the estuary in relation to the steel works are not programmed until April, avoiding March, which is a peak month. No works within the designated sites will occur until formal assent has been granted by Natural Resources Wales. Works will be undertaken within the bay during the start 2025 spawning seasons for protected and migratory fish. Mitigation of impacts from these works will be difficult but the largest mitigating factors are: ♦ The works will not present a barrier to the permanent flowing portion of the estuary below the metallic structure. During high tide, it will be possible for fish to migrate along multiple portions of the structure without coming into proximity to any tasks being undertaken at that particular moment. ♦ Works within the estuary during low tide at bed level will be localised and low impact and will not involve deep excavation or dredging. ♦ Night works are likely during rail blockades. Task lighting will be designed to illuminate the works area but limit light spill into the estuary. This will be achieved through the use of LED flat glass luminaires set at a low level to the defences.	Impact Not Likely to be Significant, with appropriate mitigation

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Fish Assemblage	SSSI	Contamination of the estuary from spillage	See comments under estuarine habitat and reference to project EMP.	Impact Not Likely to be Significant
Individual fish species (e.g., Salmon)	SAC/ Ramsar/ SSSI	Contamination of the estuary from spillage	See comments under estuarine habitat and reference to project EMP.	Impact Not Likely to be Significant
Blue Mussels		Contamination of the estuary from spillage and increased sediment loading.	See comments under estuarine habitat and reference to project EMP.	Impact Not Likely to be Significant
Vascular plant assemblage associated with salt marsh (part of estuarine habitat)	SAC/ SSSI	No impact	See comments under estuarine habitat.	No impact
All aquatic species	SAC/ SSSI	Contamination of the estuary from pilling and use of hydraulic actuated equipment.	Any spill or failure in the line will be immediately addressed following best practice pollution controls as those indicated above, in line with GPPS. Arisings will be controlled as described in the method statement and the section above (habitats).	Impact Not Likely to be Significant, with appropriate mitigation

12. Potential In-Combination Effects

12.1 Overview

12.1.1 It is necessary to consider the potential for significant effects from this project in-combination with other plans or projects.

12.1.2 In addition, the plan or project must have been subject to an HRA, which has confirmed that the plan or project is not likely to have a significant effect or demonstrates that the effects have been sufficiently assessed so as to be reasonably understood.

12.1.3 The assessment of in-combination effects must also focus on other projects that have the potential to cause the same types of effects as the proposed maintenance (so that these effects may occur in-combination) and where similar potential impact pathways may exist.

12.1.4 Therefore, this assessment has focused on other projects that could give rise to noise, visual or physical impacts on the SAC species and does not consider projects that could cause different effects.

13. Known Projects Within The Wider Area

13.1.1 There is currently no known large-scale project in a proximity to the proposed maintenance areas which could cause in combination effects.

13.1.2 However, should NRW have other upcoming Marine licenses in place that are soon to be undertaken or currently being undertaken, then the project will be undertake at a period that achieves the least in-combination impacts possible.

14. HRA Conclusion

14.1.1 Encountering Annex II species during the project is a possibility, however it is likely that these occurrences will be highly infrequent. The contractor will abide by the Gwynedd Marine Code in relation to encounters with species such as Otter, Bottlenose Dolphin and Grey Seal, avoiding as much as possible any close contact with these species.

14.1.2 Work schedules will work around the tides and weather conditions predominantly. The working pattern will, generally be organised on a 5–6-day calendar with Saturdays and/or Sundays off. The hours of those days will favour daylight hours, however there will be night working (normally Saturday nights) with the occasional mid-weeknights due to possession access (e.g., periods where rail equipment can be moved from other areas).

14.1.3 The overall footprint of the project is relatively low and is largely limited to the footprint of the structure.

14.1.4 Pollution control measures and emergency response plans will allow for robust controls over hydrocarbon pollution events, which are unlikely. These are further detailed in the attached Environmental Management measures within Task Briefs, which references GPP supporting documentation.

14.1.5 Fish species are also unlikely to be heavily impacted with the limited scale of the works in relation to spawning and nursery habitat, combined with the duration of the works falling outside a significant portion of most sensitive species spawning periods.

14.1.6 At no point will the permanently flowing portion of the estuary/bay be impeded. Migrating fish species will have the vast majority of the estuary to navigate freely during the project as whole.

14.1.7 Regarding long term SMP2 policy and Coastal Squeeze. As the project concerns only the correction of failures, in line with resent similar repairs, the works currently coincide with the understanding of defence maintenance, in a Hold the Line policy context.

14.1.8 Mobilisation of sediment is likely to be highly limited as only a very limited amount of machines will come into contact with the estuary/bay bed during low-tide and will essentially beach in-situ, reducing the likelihood of agitating the bed and sediment.

14.1.9 Biosecurity measures in place at the compound will make sure that all equipment and vehicles delivered to site have been cleaned and disinfected prior to deployment into the SAC/SSSI environment. This forms part of the guidance outlined in the Biosecurity Risk Assessment & Management Plan (see appendix A).

14.1.10 Potential otter movement within the area will always be assumed, however he location of the works in relation to otters in unlikely to impact overall habitat availability.

14.1.11 Lighting control and robust compound fencing will lower disturbance to species such as otter and bats, while the appropriated fencing will prevent local badgers or otters entering the compound area and potentially become trapped or in a state of panic.

14.1.12 From the available information, it is not evident that the Annex I Habitat & Annex II Species that compromise the designate sites overall, will be significantly impacted during the proposed refurbishment. There will be a temporary reduction in available habitat and quality during the project undertaking and a short period of re-establishment afterwards. Viewing scope of this project, this assessment suggests that Likely Significant Impacts the PLAS SAC is unlikely.

15. Appendix A - Biosecurity Management Plan & Risk Assessment

16. Appendix B – Technical Documents

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