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Morlais Project

Benthic and Intertidal Ecology Issues Responses to NRW comments

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Introduction

This document provides the Applicant's responses to Natural Resources Wales (NRW) comments regarding ES Chapter 9 Benthic and Intertidal Ecology and associated figures and appendices.

19-22 | Transport and Works Act 1992 Order (TWAO) Objection Comments

19 | We consider that potential impacts on Annex I habitats (EC Habitats Directive) i.e. bedrock reef, biogenic reef and stony reef and Section 7 Habitats (Environment Wales Act 2016) have not been adequately assessed. Of the 42 subtidal sampling stations targeted as part of the 'baseline characterisation' to inform the ES a total of 16 contained biogenic reefs (which would be classified as sensitive habitat); this is an extremely high proportion of positive records over a wide area. Whilst the applicant has acknowledged the presence of the above habitats in the Morlais Demonstration Zone (MDZ) based on limited habitat characterisation surveys, the full extent of potential habitat loss and/or alteration, as well as the viability of the proposed mitigation, has not been accurately presented.

The Morlais characterisation survey (OEL, 2018[1]) was conducted to obtain an understanding of the existing environment within the Morlais demonstration zone (MDZ) in order to enable an assessment of potential impacts of the proposed development on marine habitats to be undertaken. The locations of the samples were not random, but were specifically directed to points of interest identified from the results of the acoustic survey, resulting in skewing of the benthic characterisation samples towards particular features. The relative proportions of sensitive and non-sensitive habitats within the characterisation survey is not considered a proxy for the proportion of those habitats in the wider area. This survey recorded *S. spinulosa* reef within 16 of its 42 sampling stations, determining that "*the quality of the reefs and the levels of 'reefiness' varied between these sample stations, however typically present in 'low' to 'medium' levels of reefiness*" (OEL, 2018[1]). The levels of 'reefiness' were determined following criteria outlined in Gubbay (2007) [2] and summarised in Table 9-15 (ES Section 9.5.7).

The results of this survey were used to determine Valued Ecological Receptor (VER) habitat groups. The methodology of determining the habitat groups is outlined in ES Section 9.5.5, paragraph 66 (NRW ML objection comment 73): "*…habitats with similar physical, biological characteristics as well as conservation status/interest have been grouped together... "* and the biotopes included within each VER habitat group are presented in Table 9-3 of the ES. In addition to this, Figure 9-3 has been updated (NRW ML objection comment 95) to show the sampling stations where *S. spinulosa* reefs were recorded, overlaid on the VER habitat group maps. As can be seen from this updated figure, there is no blanket distribution of reefs throughout VER habitat group 10 (NRW ML objection comments 82 and 84).

The potential impacts on the VER habitat groups has been assessed within the ES. In comparison to the wide extent of the VER group habitats available within the MDZ, any habitat loss (excluding that of confirmed Annex I reefs) will be small and will not represent a significant reduction in the overall amount of these habitat types across the zone (NRW ML objection comment 78). Therefore, it is appropriate that the spatial extent of this impact be assessed as **low**.

The Applicant would be happy to accept (and expects) a condition requiring a further full Annex I reef survey and assessment at a higher resolution post-consent/pre-construction within any Marine Licence issued for this project (NRW ML objection comment 21). This will enable the full extent of *S. spinulosa* reef to be determined closer to actual installation works and will be used to inform the

[1] OEL (Ocean Ecology Limited), 2018. Morlais Demonstration Zone (MDZ) Benthic Ecology Characterisation Survey 2018. Technical Report to MarineSpace, November 2018.

[2] Gubbay, S., 2007. Defining and managing Sabellaria spinulosa reefs: Report of an inter-agency workshop 1-2 May, 2007. JNCC Report No. 445. JNCC, Peterborough. 22 pp.

placing of infrastructure, highlighting areas which should be avoided entirely and areas where micro-siting should be used to minimise impacts on protected habitats (NRW ML objection comment 72 and 88). These surveys will be conducted in line with Gubbay (2007[2]) standards.

Commitment for micro-siting the tidal devices/arrays and related infrastructure as well as the cable route will be included in any future Marine Licence conditions (ML objection comment 21). It is important to note that the ability to micro site Tidal Energy Converters (TECs) is more limited than for Offshore Wind Farms (OWFs), as TECs must be located where the tidal resource is available (additional text has been included within the updated impact assessment: see response to NRW ML objection comment 21). However, as the distribution of reef habitat is patchier than the initial VER habitat mapping would suggest (see updated Figure 9-3 and NRW ML objection comments 82 and 84), micro-siting is likely to be possible throughout most of the MDZ and, therefore, is considered to be an appropriate mitigation measure to reduce the significance of this impact from moderate to minor adverse. Although micro-siting may not be possible in all situations, using it where possible will result in a reduction in the spatial extent of the impact, which is sufficient to bring the effect from moderate to minor adverse (NRW ML objection comment 88).

For further detail, please refer to the response to the following comments contained within this document: NRW TWAO objection comment 21; NRW ML objection comments 67, 69, 72, 73, 78, 82, 84, 86, 87, 88, 89; and NRW ML objection figure comment 95.

20 | We note that, while the preferred option for the cable landfall is Horizontal Directional drilling (HDD), the option of trenching across the intertidal zone has not yet been ruled out. Since a definitive option for the cable landfall has not been identified and the mitigation options are unclear, we are unable to agree with the assessment presented.

ES Section 9.6.1 (Worst Case Parameters) includes Horizontal Directional Drilling (HDD), however the section also considers cable trenching as a worst-case scenario, which will be the method used if the preferred (HDD) is not available. This is noted in Paragraph 91 and Table 9-17.

The value of 7,400 m^2 permanent habitat loss created by trenching across the intertidal zone (presented in Table 9-17) contributes to the overall figure of
2,232,576 m^2 (2.23 km^2) used as the basis of assessment of this impact.

All further references to cable installation take the worst-case parameters (i.e. using trenching) into consideration throughout the assessments. The effects of trenching have been assessed under ES Section 9.6.2.4 (Construction Impact 4: Physical Disturbance to Intertidal Habitats and Species during Landfall Works), as noted in Paragraphs 129 and 134.

21 | Clarification is required on the following:

- **whether the applicant is planning to micro-site the devices and related infrastructure as well as the cable route; and**
- **the distinction between construction impacts and operational impacts (initial placement of project infrastructure) for benthic habitats and species.**

The Applicant confirms that, as far as practical from an operational and tidal resource perspective, micro-siting will be used for the TECs and related infrastructure, as well as the cable route. It is expected that a commitment for micro-siting (within operational and resource constraints) will be included in the Marine Licence conditions. Therefore, detailed site assessment for sensitive habitats and the specific site selection for each of the TECs/arrays will take place post-

consent/pre-construction. It is important to note that micro-siting for TECs is more limited than for Offshore Wind Farms (OWFs), as TECs must be located where the tidal resource is available.

The pre-consent survey was conducted to support the identification of possible protected habitats and species and to provide a baseline characterisation of the offshore site and surrounding area. Therefore, additional surveys (post-consent/pre-construction) will be conducted at a high resolution. These surveys will provide the full extent of the habitat types and will be used to inform the placing of infrastructure, highlighting areas which should be avoided entirely and areas where micro-siting should be used to minimise impacts on protected habitats.

Micro-siting will be used on all project infrastructure, including the tidal devices/arrays and the export cable. It is important to note that micro-siting may not be possible in all situations, as the export cable has limited flexibility and the Tidal Energy Converters (TECs) must be located where the tidal resource is available. Where micro-siting cannot be used, a degree of habitat damage and/or loss may occur. The pre-construction survey results will be utilised to ensure that the footprint of the impact is kept to a minimum, avoiding prime areas or areas of increased sensitivity. The total extent of the habitat damage and/or loss after micro-siting will be much lower than that if micro-siting was not used at all. Therefore, implementing micro-siting as a mitigation measure will result in the magnitude of effect being no greater than **low**.

The construction impacts are associated with the initial impacts associated with development and placing of the tidal devices, and associated infrastructure and works. The operational impact 'initial placement of project infrastructure' refers to the loss of benthic habitat throughout the lifetime of the project due to the physical presence of the tidal devices and associated infrastructure. This impact has been assessed alongside the impacts associated with repowering of the tidal devices, as although the impacts are similar to construction, this will occur during the operation phase of the project.

22 | Until a full and detailed Invasive Non-Native Species (INNS) Biosecurity Risk Assessment is submitted, it is not possible for us to comment on the effectiveness of the INNS Management Plan and activity-specific mitigation may be required to minimise the risk of ingress and spread of marine INNS.

The need for an Invasive Non-Native Species (INNS) risk assessment is accepted. However, it is proposed that an INNS risk assessment will be completed at the post-consent stage as the final design of the project develops. It is therefore expected that the need for an INNS risk assessment will be included as part of eventual Marine Licence conditions.

See also: NRW ML objection comment 77.

67-92 | Marine Licence Objection Comments

67 | Potential impacts on Annex I habitats (EC Habitats Directive): bedrock reef, biogenic reef and stony reef and Section 7 Habitats (Environment Wales Act 2016) have not been adequately assessed. Whilst the applicant has acknowledged the presence of these habitats in the MDZ based on limited habitat characterisation surveys, the full extent of potential habitat loss and/or alteration, as well as the viability of the proposed mitigation, has not been accurately presented.

See response to the NRW TWAO objection comment 19.

68 | NRW Advisory is concerned that there is a lack of adequate coastal processes modelling to determine any impacts to habitats and species outside of the immediate footprint of the project. This concern includes any potential impacts to adjacent beds of *Musculus discors*, *Mytilus edulis* and *M. modiolus* beds (Section 7 habitats).

Coastal processes modelling has been carried out (HR Wallingford, 2020[6]). The results of the modelling predict that the project is likely to have little impact on residual sediment transport, and any changes would be localised. Changes in sediment transport and bed level changes may occur just west of Holy Island, directly around the turbine area, however no changes are predicted in the wider area. The modelling predicted that sediment movement rates may decrease by up to 10-20% per year, however this is within natural variation due to climatological changes. Minor changes to the direction of sandbanks may occur, however these changes would also be within natural variation. No changes outside the range of natural variation due to climatological changes are likely to occur for any *Musculus discors*, *Mytilus edulis*, and *Modiolus modiolus* beds (that may be outside of the MDZ/immediate footprint of the project) as a result of development within the MDZ, and no likely significant effect is determined.

69 | The subtidal habitat characterisation surveys undertaken do not adequately assess the range and extent of sensitive habitats of conservation importance, which makes it difficult to assess the range of impacts and effectiveness of the proposed mitigation (see paragraph 67 above).

The Morlais marine habitat characterisation surveys were conducted to obtain an understanding of the existing environment, including the range and extent of sensitive habitats of conservation importance. The data produced from this survey has, in our opinion, achieved this objective. Following consent, a full Annex I reef survey and assessment will be conducted to inform pre-construction and consideration of any micro-siting that may be required to avoid any reef features (see also: NRW TWAO objection comment 19).

70 | Table 9-3: Whilst there is multibeam information for the Offshore Scoping Zone, biotopes, Valued Ecological Receptor (VER) groups, Drop Down Video (DDV) stations and habitat types for this area these should also be shown on Figure 7-2, Volume II, ES in order to understand any likely impacts in this area.

The Applicant suggests this is best shown in the relevant Chapter 9 figures as the DDV is of most relevance to benthic ecology rather than Metocean Conditions and Coastal Processes (Chapter 7). The DDV locations have been added to updated versions of Figure 9-1 and Figure 9-2, provided with this submission.

71 | Table 9-3: Section 7 marine habitat records are not discussed in section 9.5.7 of the ES, Volume I as stated, although they are mentioned in section 9.5.1. However, the potential impacts on these have not been adequately discussed in the ES and NRW Advisory therefore upholds our previous scoping comment.

During the characterisation survey, 42 ground-truthing stations were targeted and sampled across the MDZ, buffer area and proposed cable corridors. At every ground-truthing station, a drop-down camera was deployed to collect sea bed imagery. In addition, grab sample data has now been acquired from SEACAMS which further supports the substrate characterisation in the ES. The presence of several habitats of conservation importance in the wider survey area were recorded, including the three Annex I reef habitats: bedrock reef, biogenic reef and stony reef (OEL, 2018[1]).

The Section 7 habitat 'subtidal sands and gravels' was identified within the MDZ, and recorded under the SS.SCS.CCS biotope (circalittoral coarse sediment). The subtidal sands and gravels habitat, or derivatives thereof, was recorded in 23 of the 42 sampling stations, under the EUNIS habitats 'circalittoral coarse sediment' (A5.14) and 'sublittoral sands' (A5.2) and corresponds largely with the Annex I stony reef habitat (JNCC, 2016a[3]).

The Section 7 habitat 'fragile sponge and anthozoan communities on subtidal rocky habitats' has previously been recorded in the area and was recorded in 9 sample stations in the characterisation survey. This habitat corresponds to derivatives of the CR.HCR.XFa biotope (mixed faunal turf communities) (JNCC, 2016b[4]) and therefore has been assessed alongside this within the Annex I stony reef habitat (VER habitat group 9).

References to and assessment of Annex I stony reef habitat are also applicable to the Section 7 habitats found within the MDZ: subtidal sands and gravels, and fragile sponge and anthozoan communities on subtidal rocky habitats. We believe therefore that Section 7 habitats have been assessed appropriately.

72 | In addition to the above the ES does not adequately discuss the potential impact on *Sabellaria* reef as no estimate of the abundance (e.g. %cover) and 'reefiness' of this habitat recorded as part of the characterisation surveys has been presented. This information is required to facilitate the interpretation of any likely impacts on this receptor.

Table 9-15 (Gubbay, 2007[2]) outlines the criteria for determining 'reefiness', Para. 76 of the ES states that "*the quality of the reefs and the levels of 'reefiness' varied between these sample stations, however typically present in 'low' to 'medium' levels of reefiness*".

The timing of phased installation is currently unknown, however following consent, pre-construction habitat surveys will be conducted at a high resolution. These surveys will provide the full extent of *S. spinulosa* reef and will be used to inform the placing of infrastructure, highlighting areas which should be avoided entirely and areas where micro-siting should be used to minimise impacts on protected habitats. The surveys will be conducted in line with Gubbay (2007) standards. The risk to *Sabellaria spinulosa* reef has been appropriately assessed as part of the application. The assessment considers a worst-case scenario with regards to habitat extent and infrastructure placement (see also: ML comment 86) and takes into consideration mitigation measures, including pre-construction surveys to inform habitat presence and extent and therefore, micro-siting of infrastructure.

73 | Limited information as to how the Valued Ecological Receptors were produced has been presented. Whilst we understand the process as detailed in Sections 9.4.1.1 and 9.4.1.2 the calculations used to determine what falls into which Habitat group would be a worthy addition. Figure 7-2 is very different in comparison to Figures 9-1 and 9-3 (which show 100% of the MDZ is either Habitat VER group 9 or 10 [rocky reef and biogenic reefs]). This makes it difficult to assess likely impacts on sensitive habitats of conservation importance and we therefore request further clarification on this.

The methodology of determining the Valued Ecological Receptor (VER) habitat groups is outlined in ES Section 9.5.5, paragraph 66: "*For the purpose of this environmental impact assessment, habitats with*

[3] JNCC (Joint Nature Conservation Committee), 2016a. UK Biodiversity Action Plan Descriptions Subtidal Sands and Gravels. From: Maddock, A. (ed.) UK Biodiversity Action Plan; Priority Habitat Descriptions, 2008.

[4] JNCC (Joint Nature Conservation Committee), 2016b. UK Biodiversity Action Plan Descriptions Fragile sponge and Anthozoan Communities on Rocky Habitats. From: Maddock, A. (ed.) UK Biodiversity Action Plan; Priority Habitat Descriptions, 2008.

similar physical, biological characteristics as well as conservation status/interest have been grouped together. Consideration was also given to the inherent sensitivities of different habitats, such that habitats and species with similar vulnerability and recoverability, often as a result of similar broad sediment types and species complements, were grouped together. The biotopes and Annex I habitats within the MDZ have been split into 12 broad community and habitat types. These 12 Valued Ecological Receptors (VERs) represent the benthic and intertidal biological environment in and around the MDZ, and the impacts associated with this project have been assessed against these groups". The biotopes included within each VER habitat group are presented in Table 9-3 of the ES.

See also: NRW TWAO objection comment 19.

Figure 7-2 provided with the ES was based on existing subtidal habitat mapping from the European Marine Observation and Data Network (EMODnet) website[5] and does not relate to the new geophysical and sea bed sediment data collected for this assessment by OEL which is presented in Chapter 9. Therefore, there is the potential for a mis-match between the existing and new data. Figure 7-2 has now been updated to include the EUNIS and Annex I habitat mapping based on the information collected during the benthic survey (supported by the geophysical survey).

Figure 9-1 displays EUNIS habitat data and Figure 9-3 shows the distribution and extent of the VER habitat groups as mentioned in ES Section 9.5.5.

74 | Table 9-12: NRW Advisory acknowledges that the biotopes have been arranged by EUNIS Code. However, separating the biotopes recorded in the subtidal survey from those recorded in the intertidal survey (even if there is repetition), would facilitate interpretation of biotopes present.

The Applicant believes that the table in its current format is appropriate. The A1, A2 and B3 EUNIS codes are all intertidal biotopes, and the A3-A5 codes are subtidal biotopes.

75 | Table 9-18, Construction Impact 1 - Physical disturbance to benthic habitats and species and temporary habitat disturbance: The impacts on the Annex 1 reef habitats have been ascribed a 'Low' magnitude. Due to the importance of these habitats, NRW Advisory considers that a 'Medium' magnitude would be more appropriate, which would result in a 'Moderate' adverse significance of effect. In terms of mitigation we seek clarification on whether all the infrastructure will be micro-sited or just the cable (para. 101), to assess the validity of this mitigation measure. Furthermore, the potential impact on 'Stony reefs' as a result of all stages (construction, operation and decommissioning) has not been adequately discussed.

The importance of the habitat is taken into consideration when assessing the sensitivity and 'value' of the receptor (Table 9-5 of the ES), and therefore does not contribute to determining the magnitude of the effect on the receptor. The magnitude is determined by taking the scale, duration, frequency and reversibility of the impact into consideration (see Table 9-6 of the ES). Therefore, the ascribed **Low** magnitude is considered appropriate.

With regards to infrastructure micro-siting, see NRW TWAO objection comment 21, first bullet point.

Stony reef is assessed under VER group 9, see paragraph 95 of the ES "*Following the process of assigning each biotope to a VER group, habitat group 9 (High energy infralittoral and circalittoral rock/ coarse sediment with Annex I stony/bedrock reef) and 10 (Circalittoral* Sabellaria *reefs – Annex I biogenic reefs) were the most frequently occurring groups in the subtidal region*". VER habitat group 9

[5] https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/

has been assessed alongside VER habitat group 10. The assessment takes a worst-case scenario into consideration and assesses the impact on the MDZ as a whole (i.e. using the sensitivity assessment for the more sensitive VER habitat group 10 – Annex I biogenic reefs).

VER habitat group 9 has been assessed appropriately for all pressures throughout the application:

- **9.6.2.1** Construction Impact 1: Physical Disturbance to Benthic Habitats and Species and Temporary Habitat Disturbance (VER habitat groups 9 and 10 assessed together, assessing the total footprint of habitat loss within the MDZ);
- **9.6.2.2** Construction Impact 2: Increased Suspended Sediment Concentration and Sediment Deposition (similarly to Construction Impact 1, VER habitat groups 9 and 10 are assessed together);
- **9.6.2.3** Construction Impact 3: Release of Pollutants Due to Accidental Events (paragraph 124);
- **9.6.2.5** Construction Impact 5: Potential Introduction/Spread of Invasive Non-Native Species (MDZ assessed as a whole, however a detailed INNS survey will be undertaken pre-construction);
- **9.6.3.1** Operational Impact 1: Long Term Loss of Benthic Habitat via (a) Initial Placement of Project Infrastructure and (b) Repowering (VER habitat groups 9 and 10 assessed together; paragraph 148);
- **9.6.3.2** Operational Impact 2: Changes in Hydrodynamic and Inter-Related Effects on Benthic Ecology (VER habitat groups 9 and 10 assessed together; assessment refers back to ES Section 9.6.2.2);
- **9.6.3.3** Operation Impact 3: Introduction of New Habitat in the Form of Project Infrastructure;
- **9.6.3.4** Operational Impact 4: Temporary Physical Disturbance of Seabed Caused by Maintenance Activities and Repowering (VER habitat groups 9 and 10 assessed together; paragraph 172);
- **9.6.4.1** Decommissioning Impact 1: Physical Disturbance to Habitats and Species and Temporary Habitat Loss (VER habitat groups 9 and 10 assessed together; refers back to ES Section 9.6.2.1);
- **9.6.4.2** Decommissioning Impact 2: Increases in Suspended Sediment Concentration and Subsequent Deposition (VER habitat groups 9 and 10 assessed together); and
- **9.6.4.3** Decommissioning Impact 3: Permanent Loss of Habitat (VER habitat groups 9 and 10 assessed together).

76 | Table 9-21, Construction Impact 4 - Physical disturbance to intertidal habitats and species during landfall works: NRW Advisory does not agree with the downgrading from a 'moderate' adverse to 'minor' adverse residual impact since a definitive option for the cable landfall has not been identified and the mitigation options are unclear. While the preferred option for the cable landfall is Horizontal Directional Drilling (HDD), the option of trenching across the intertidal zone has not been ruled out. Therefore, we are unable to agree with the assessment presented.

See also: NRW TWAO objection comment 20.

Horizontal Directional Drilling (HDD) is the preferred method of cable installation, however the Applicant understands that it may not be feasible to use this method. Post consent/pre-construction surveying will be conducted to assess the feasibility of HDD for cable laying at landfall. Where HDD is not feasible, trenching methods will be used instead. Therefore, cable trenching cannot be ruled out as a means of cable installation.

With regards to mitigation measures, these apply to cable trenching. Detailed methodology of installing will be produced and signed off pre-construction. The methodology will agree an appropriate method of backfilling the cable trenching and replacing any substantially sized boulders after

installation. The methodology will also outline procedures to minimise the physical impact and spatial extent of the footprint, including measures such as restricted working corridors for vehicles and personnel.

77 | Section 9.5.8: It is not clear whether any marine invasive non-native species (INNS) were recorded as part of the site characterisation study. It would have been useful to include and/or clarify the results in this section rather than simply provide a list of marine INNS present in Wales. It would have also been appropriate to refer to the 'Marine Invasive non-native species priority monitoring and surveillance list for Wales' which would provide an up to date assessment of the high-risk species.

No INNS were recorded during the characterisation survey. Following consenting of the development, at the pre-construction stage, a full detailed INNS risk assessment will be undertaken. At present, due to the uncertainty of the specific infrastructure devices to be developed, equipment to be used and their origins, it is not possible to conduct a full INNS risk assessment. It is expected that a requirement for the risk assessment will be included in the Marine Licence conditions.

78 | Section 9.6.2.1, paragraph 96: NRW Advisory feels that the following statement is slightly unfounded: "the impact is of a scale that would be barely noticeable from monitoring…" as this would depend on the nature and scale of any monitoring programme. NRW Advisory questions the assessment of "low level of overall temporary habitat disturbance or loss that will occur in the construction phase", particularly considering Chapter 4, para. 264 of the ES Volume I which states "it is anticipated that the tidal devices/arrays may be replaced several times within the 37-year project life". Therefore, it is not possible to agree with the assessment of a 'Low' magnitude of impact.

The text cited by NRW is referring to the spatial extent and the frequency of the impact. In comparison to the wide spatial extent of the VER group habitats available within the MDZ, any habitat loss (excluding that of confirmed Annex I reefs) will be so small as to not be a noticeable loss of overall habitat types. Therefore, it is appropriate that the extent of the impact be assessed as **Low**.

In addition to this, "*…would occur occasionally*" is a reference to Chapter 4, Paragraph 264 cited by NRW. Over the 37-year project life, the tidal devices will be replaced several times during re-powering, up to an equivalent of 50% of the devices being replaced and repositioned. This replacement rate is not of a significant frequency to result in anything above a **Low** magnitude of effect. The risk assessments throughout the application take replacement of 50% of the devices into consideration, thus assessing a worst-case scenario on all receptors.

79 | Section 9.6.2.4, paragraph 132 indicates that there is intertidal area within the MDZ. This should perhaps read as "present in the export cable corridor" rather than the MDZ per se. Clarification is required on this statement as it is NRW Advisory's interpretation that no intertidal area is located within the MDZ.

The Applicant would like to clarify that NRW Advisory's interpretation is correct in that there is no intertidal area within the MDZ.

80 | Section 9.6.2.4, paragraph 133: NRW Advisory notes the "definite" rather than "possible" presence of Annex I bedrock reefs in the intertidal cable landfall area, as well as the possible presence of Section 7 mudflat and sandflat habitat. However, we agree with the overall assessment of 'moderate' adverse impact.

Noted that NRW agree with the overall assessment.

81 | Section 9.6.2.5, paragraph 140: NRW Advisory considers that the main risk with marine INNS is likely to be the increased use of Holyhead port/marina for the project potentially leading to the spread of the Carpet Sea Squirt *Didemnum vexillum* to the project area and/or or other areas. It should also be noted that new bare, artificial substrate presents a preferential surface for opportunistic settlement by marine INNS as well as a possible 'stepping stone effect' (2014, Adams *et al.*) in relation to marine renewable energy devices and marine INNS; this has not been identified in the ES. This therefore places even greater emphasis on effective implementation of measures contained in the 'Invasive Non-Native Species Management Plan'. Until a full and detailed completed INNS Biosecurity Risk Assessment is submitted, it is not possible to comment on the effectiveness of the INNS Management Plan and activity-specific mitigation may be required to minimise the risk of ingress and spread of marine INNS.

See NRW TWAO objection comment 22.

82 | Section 9.6.2.5, paragraph 97 appears to contradict previous information contained in Chapter 8 (paragraph 76) that confirms presence of biogenic reef as a result of the camera survey data and results.

It is assumed that NRW has quoted Chapter 8 in the objection comment in error. The response is made with reference to paragraph 76 of Chapter 9, and not Chapter 8.

Paragraph 97 states that "*Habitat group 10 represents the group which contains possible areas of biogenic Annex I reef (*Sabellaria *spp.)*". Whilst reef was identified in the sampling stations listed in paragraph 76 (of Chapter 9), habitat group 10 is not limited to these specific sampling stations (see updated Figure 9-3; Marine Licence figure comment 95), but also includes areas outside of them. Therefore, as biogenic reef habitat has not been confirmed across the entirety of the habitat group 10 area, it is correct to state that the group contains possible areas of biogenic Annex I reef.

83 | Section 9.6.3: The distinction between 'construction impacts' and 'operational impact a) Initial placement of project infrastructure' is confusing and clarification is sought on this. For benthic habitats and species, assessing the likely impact would be easier if these were presented together.

See NRW TWAO objection comment 21, second bullet point.

84 | Section 9.6.3.1 - Operational Impact 1: Long Term Loss of Benthic Habitat via (a) Initial Placement of Project Infrastructure and (b) Repowering: In the absence of an accurate assessment of the benthic habitats present in the MDZ it is not possible to agree with the downgrading from 'Moderate' adverse to 'Minor' adverse. The assessment is based on a proposal to conduct post-consent, pre-construction surveys to 'micro-site' project infrastructure. However, in the absence of detailed habitat surveys it is not possible to assess whether the mitigation approach is feasible based on the scale of the proposal and extent of habitats of conservation importance present.

Figure 9-3 has been updated to show the sampling stations where *S. spinulosa* reefs were recorded overlaid on to the VER habitat group maps. As can be seen from this updated figure, there is not blanket distribution of reefs throughout VER habitat group 10. As the distribution of reef habitat is patchier than the VER habitat mapping would suggest, micro-siting will be possible throughout most

of the MDZ and therefore micro-siting is considered to be an appropriate mitigation measure to bring the significance of the effect down from moderate to minor adverse.

See also: NRW TWAO objection comment 21, first bullet point.

85 | Section 9.6.3.1, paragraph 144 states: "repowering of up to 50% of the berths may take place". It is not clear how this estimate has been calculated. Chapter 4, para. 264 of the ES, Volume I states "*it is anticipated that the tidal devices/arrays may be replaced several times within the 37-year project life*". NRW Advisory requests clarity on this point to be able to fully assess the potential impacts.

Over the project lifespan, it is expected that the tidal devices will require replacing (re-powering) several times. It is not likely that 50% will require re-powering, however an arbitrary value of "*up to 50%*" has been used as a conservative assumption in order to produce an appropriate assessment based on a worst-case scenario. The applicant is content for any consent to be conditioned to constrain repowering to a limit of 50% of construction.

86 | Section 9.6.3.1, paragraph 149: The applicants' own admission that "*It has not been possible to provide an accurate calculation of the loss of each Valued Ecological Receptor (VER) due to the current unknown location of devices and therefore VERs which will be impacted*" highlights NRW Advisory's difficulty in assessing any impacts to benthic and intertidal ecological features.

The assessment has been carried out using a worst-case scenario (i.e. the maximum number of each type of device that could be installed to total 240 MW capacity; Table 9-17 of the ES). Appropriate mitigation measures will be implemented alongside pre-construction surveys, as have been detailed throughout the ES and this document (see TWAO comments 19, 21; and ML comments 69, 72, 75, 76, 84, 85, 86, 88, 89), and therefore the Applicant is confident that the overall assessment of benthic and intertidal ecological features is appropriate.

87 | Section 9.6.3.1.1, paragraph 152 states: "Following these surveys, micro-siting of the cable would be used to mitigate impacts". Clarification is sought as to whether the applicant is planning to micro-site the devices and related infrastructure as well as the cable route.

See NRW TWAO objection comment 21, first bullet point.

88 | Section 9.6.3.1.1, paragraph 152 also states: "Following consent, preconstruction surveys will be carried out to check for the presence of any rare or protected habitats and species, including Annex I (EC Habitats Directive) and Section 7 (Environment Wales Act 2016) habitats which may be classified as reef features. Following these surveys, micro-siting of the cable would be used to mitigate impacts to these receptors where possible. This would inform areas which should be avoided and areas which infrastructure should not be placed." The wording 'where possible' indicates that this approach is not definitive, therefore NRW Advisory disagrees with the subsequent downgrading of the effect from 'moderate' to 'minor' adverse in Table 9-23.

Pre-construction surveys would be used to identify specific locations of rare or protected habitats and species. The survey results would allow determination of which areas should be avoided and areas in which infrastructures should not be placed. To avoid these areas, micro-siting would be used, however it is noted that micro-siting will not always be possible, especially in the case of re-routing the cable due its lack of flexibility. Although micro-siting may not be possible in all situations, using it where

possible will result in a reduction in the spatial extent of the impact, which is sufficient to bring the effect from moderate to minor adverse.

89 | Section 9.6.3.1.1: While NRW Advisory acknowledges and welcomes the approach to mitigating the potential impacts through micro-siting of devices and cables, which will include pre-construction surveys to check for the presence of rare or protected habitats and species (including Annex 1 habitats), of the 42 subtidal sampling stations targeted as part of the 'baseline characterisation' to inform the ES (undertaken by OEL, 2018) a total of 16 stations contained biogenic reefs (which would be classified as sensitive habitat). This is an extremely high proportion of positive records over a wide area, and without further assessment and detailed survey of the MDZ (including cable transport areas), NRW Advisory questions the validity of the proposed mitigation in being able to avoid sensitive habitats given the scale of the proposed development. Sensitive habitats other than biogenic reef may also be present.

See previous comment responses, primarily NRW TWAO comment 19, but also NRW ML comments 69, 72, 84, 86.

The characterisation survey was conducted to obtain an understanding of the baseline environment. The locations of the samples were not random but were specifically directed to points of interest identified from the results of the acoustic survey, resulting in skewing of the benthic characterisation samples towards particular features. The relative proportions of sensitive and non-sensitive habitats within the characterisation survey is not considered a proxy for the proportion of those habitats in the wider area. Following consent, a full Annex I reef survey and assessment will be conducted to inform pre-construction and consideration of any micro-siting that may be required to avoid any reef features. These surveys will be conducted at a higher resolution/finer scale and will be conducted in line with Gubbay (2007) standards.

Figure 9-3 has been updated to show the sampling stations where *S. spinulosa* reefs were recorded overlaid on to the VER habitat group maps. As can be seen from this updated figure, there is not blanket distribution of reefs throughout VER habitat group 10. As the distribution of reef habitat is patchier than the VER habitat mapping would suggest, micro-siting is likely to be possible throughout most of the MDZ and therefore is considered to be an appropriate mitigation measure to bring the significance of the effect down from moderate to minor adverse.

An assessment has now been carried out based on the total area of each habitat group within the MDZ and considering a worst-case scenario for each group, where 100% of the infrastructure is placed on each habitat (for additional text within the ES, see response to Marine Licence objection comment 86).

90 | In terms of micro-siting NRW Advisory suggests incorporating a "buffer zone" around the infrastructure to account for any potential changes to physical processes which may lead to changes in hydrodynamic regime (that may affect colonisation etc., scour and/or sedimentation), rather than simply accounting for the footprint of the device base and related infrastructure. In the absence of any buffering around sensitive habitats, physical process modelling would be needed to identify these indirect effects. The area of these buffer zones should be included in the loss of habitat calculations.

Physical processes modelling has been carried out (HR Wallingford, 2020[6]). The results of this modelling show that any changes in hydrodynamic flow, waves, or sediment transport are likely to be negligible. The report determined that any changes would be localised and would be within natural variation due to climatological variations. Therefore, it is determined that implementation of a buffer zone to account for changes in hydrodynamic regime is not required.

91 | Section 9.6.4.1, paragraph 177: We advise that HDD is used for the landfall cables to avoid impacts on Annex 1 and Section 7 habitats.

Noted, and HDD is the applicant's preferred method of landfall. However as previously stated, trenching has not and cannot be ruled out as there is potential for HDD to be unfeasible in certain areas. Pre-construction surveying and detailed assessment will confirm this. If trenching is to be used, appropriate mitigation measures will be outlined in a methodology statement prior to construction beginning.

92 | Section 9.6.5: In terms of cumulative impacts, the only other project listed is Minesto Holyhead Deep array. However, the applicant should also be aware of other developments including the Holyhead Port Expansion, which may have temporal and spatial overlap. Furthermore, the final decision on Wylfa Newydd is still to be determined. These projects should be incorporated into the cumulative impact assessment.

Chapter 26 'Cumulative, Transboundary and In-Combination Impact Assessment' provides more detail on the cumulative impact assessment section (Section 9.6.5) included within Chapter 9 'Benthic and Intertidal Ecology'. Chapter 26, paragraph 40 outlines the rationale behind screening Wylfa Newydd and the Holyhead Port Expansion out of the Cumulative Impact Assessment (CIA): "*As observed within Chapter 9, Benthic and Intertidal Ecology, the majority of impacts which are associated with benthic ecology are restricted to the immediate footprint of the Project. Therefore, it is only projects that will affect the same area of seabed, or more generally, the same local resource of benthic habitats that require consideration. The only identified project is Minesto's Holyhead Deep project*".

93-95 | Marine Licence Objection Comments (Figures)

93 | Figure 7-2: It is unclear how the habitat types shown in Figure 7-2 have been determined. Therefore, more detail is required as the information present appears to under-represent the extent of *Sabellaria* habitat (Annex 1 biogenic reef and Section 7 Habitat) present. Review of the raw species data shows notable abundance of *Sabellaria* at stations 2, 3, 4, 5, 6, 8 etc.

Figure 7-2 provided with the ES was based on existing subtidal habitat mapping from the EMODnet website and does not relate to the new geophysical and sea bed sediment data collected for this assessment by OEL which is presented in Chapter 9. Therefore, there is the potential for a mis-match between the existing and new data. Figure 7-2 has been updated to include the EUNIS and Annex I habitat mapping based on the information collected during the project benthic survey (supported by the geophysical survey).

Locations where *Sabellaria* reef was recorded during the project benthic survey are shown in the updated Figure 9-3 as *Sabellaria* reef is of most relevance to Chapter 9, Benthic and Intertidal Ecology.

[6] HRW (HR Wallingford Ltd), 2020. Morlais Demonstration Zone Coastal Processes. Report produced by HW Wallingford Ltd for Menter Mon Morlais Limited. Report No.: RT001. 128 pp.

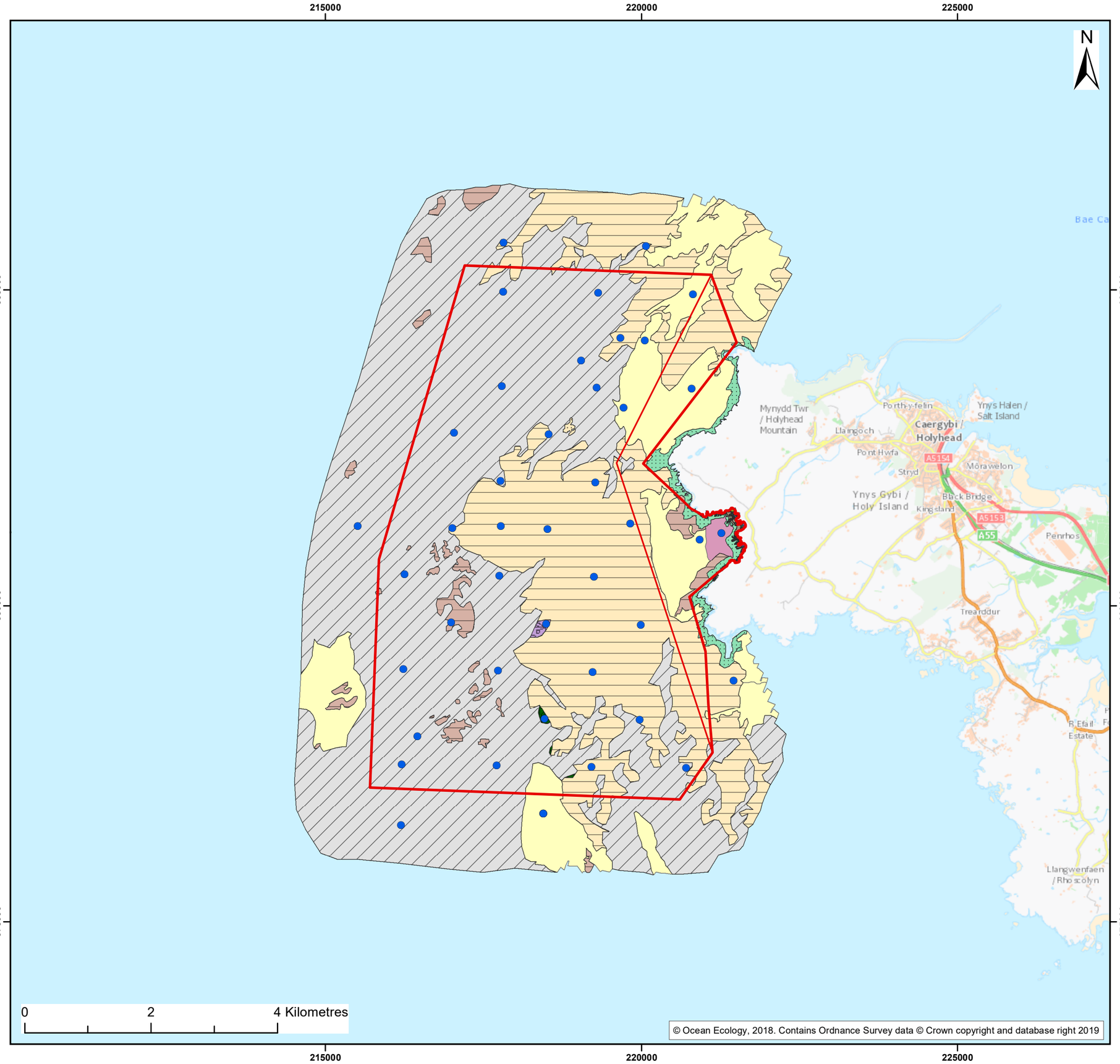
94 | Figure 7-2: The habitat types in the south-east area of the MDZ have been omitted (under stations 4, 22 and 25); therefore, it is not possible to infer the impacts and mitigation measures relevant to this area.

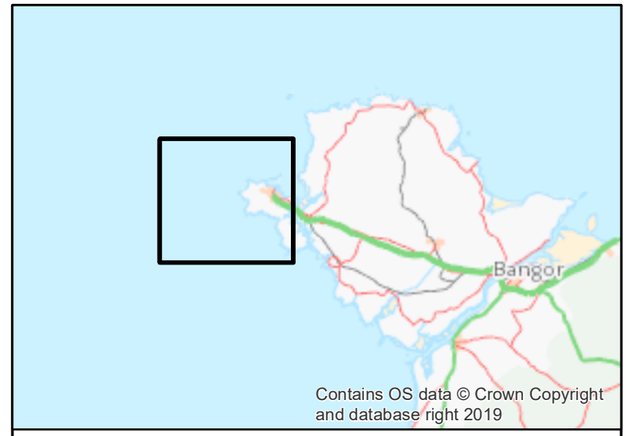
The habitats in these areas are now included on this Figure following the update outlined in response to objection comment 93 above.

95 | Figure 9-3: The EUNIS codes shown in the legend are restricted to those visible on the maps. We acknowledge this has been presented to encompass both the subtidal and intertidal plates, but it would be easier to visualise what is depicted on the maps if there were separate legends for the subtidal biotope map and the intertidal one (so there would be fewer similar colours); this would aid the determination of the main biotopes present.

Figures 9-1 and 9-2 have been updated to group the EUNIS habitats by subtidal and intertidal and include locations of sample stations.

Figure 9-3 has been updated to remove intertidal VERs and include sample stations where *S. spinulosa* reef was present/absent.





Legend:

- Morlais Demonstration Zone
- Offshore Development Area
- ROV drop locations

Annex I Habitats

- Reef - Bedrock
- Reef - Bedrock / Stony
- Reef - Bedrock / Stony / Biogenic
- Reef - Stony / Biogenic

Intertidal Habitat

A1.1	A1.213	A1.4461
A1.111	A1.2141	A1.451
A1.112	A1.311	A2.111
A1.1131	A1.3141	A2.2
A1.1132	A1.411	B3.111
A1.123	A1.412	B3.1131
A1.125	A1.413	B3.1132
A1.212	A1.444	

Subtidal Habitats

A3.1	A4.13 / A4.22
A3.1111	A5.13 / A4.22
A3.1112	A5.14
A3.2111	A5.14 / A4.22
A4.11 / A4.13	A5.2
A4.13	A5.23

Client: morlais / MENTER MÔN

Project: morlais ANGLESEY MARINE ENERGY

Title:

EUNIS and Annex I Habitats across the Offshore Development Area

Figure:	Drawing No:				
9-1	PB5034-ES-009-001				
Revision:	**Date:**	**Drawn:**	**Checked:**	**Size:**	**Scale:**
04	26/03/20	IW	LP	A3	1:60,000

Co-ordinate system: British National Grid

MarineSpace

Making Sense of the Marine Environment ™

220500
221000
221500
381500
381000
380500
N
Bangor
Contains OS data © Crown Copyright and database right 2019
Gorsgoch Farm
0
0.15
0.3 Kilometres
© Ocean Ecology, 2018. Contains Ordnance Survey data © Crown copyright and database right 2019

Legend:

- Morlais Demonstration Zone
- Offshore Development Area
- ROV drop locations

Annex I Habitats

- Reef - Bedrock
- Reef - Bedrock / Stony

Intertidal Habitat

A1.1	A1.213	A1.4461
A1.111	A1.2141	A1.451
A1.112	A1.311	A2.111
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A1.1132	A1.411	B3.111
A1.123	A1.412	B3.1131
A1.125	A1.413	B3.1132
A1.212	A1.444	

Subtidal Habitats

A3.1	A4.13 / A4.22
A3.1111	A5.13 / A4.22
A3.1112	A5.14
A3.2111	A5.14 / A4.22
A4.11 / A4.13	A5.2
A4.13	A5.23

Client: morlais / MENTER MÔN

Project: morlais ANGLESEY MARINE ENERGY

Title:

EUNIS and Annex I Habitats within the landfall locaction of Abraham's Bosom

Figure: 9-2

Drawing No: PB5034-ES-009-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
04	26/03/20	IW	LP	A3	1:5,000

Co-ordinate system: British National Grid

MarineSpace

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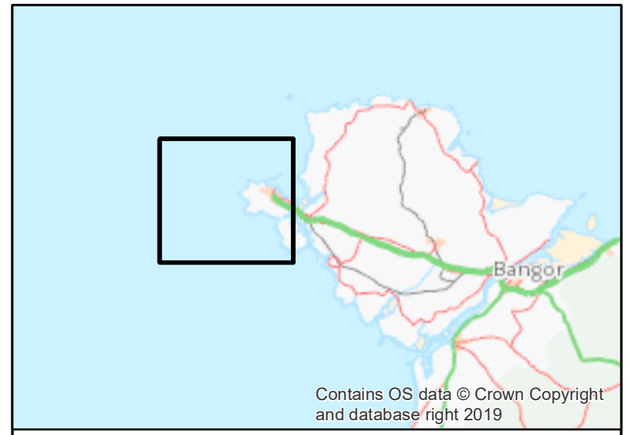
215000
220000
225000
385000
380000
375000
N
Bae Ca
Mynydd Twr / Holyhead Mountain
Porth-y-felin
Ynys Halen / Salt Island
Llaingoch
Caergybi / Holyhead
Pont Hwfa
A5 154
Morawelon
Stryd
Ynys Gybi / Holy Island
Black Bridge
Kingsland
A5 153
A55
Penrhos
Trearddur
R Efail Estate
Llangwenfaen / Rhoscolyn
0
2
4 Kilometres
© Ocean Ecology, 2018. Contains Ordnance Survey data © Crown copyright and database right 2019



Contains OS data © Crown Copyright and database right 2019

Legend:

- Morlais Demonstration Zone
- Offshore Development Area

Characterisation survey samples

- Sabellaria Reef Absent
- Sabellaria Reef Present
- Habitat Group 9: High energy infralittoral and circalittoral rock/ coarse sediment with Annex I stony/bedrock reef
- Habitat Group 10: Circalittoral Sabellaria reefs – Annex I biogenic reefs
- Habitat Group 11: Sublittoral and infralittoral sands and muddy sands

Client: morlais / MENTER MÔN

Project: morlais ANGLESEY MARINE ENERGY

Title:

Valued Ecological Receptor groups within the subtidal area – based on Ocean Ecology (2018)

Figure:	Drawing No:				
9-3	PB5034-ES-009-003				
Revision:	**Date:**	**Drawn:**	**Checked:**	**Size:**	**Scale:**
05	20/03/26	IW	LP	A3	1:60,000

Co-ordinate system: British National Grid

MarineSpace

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With regards to ongoing consultation with NRW on the terrestrial ecology and landfall works, NRW commented that there is a need to assess whether any qualifying SSSI features are present in the intertidal area: rockpools, caves and overhangs under boulders

The area of potential works associated with export cable routes from the upper intertidal across the supralittoral (splash zone) do not interact with any of the notified habitats or species of the Glannau Ynys Gybi / Holy Island Coast SSSI. The SSSI is notified for the following features, and therefore, there are no marine (intertidal) notified features listed for the Glannau Ynys Gybi / Holy Island Coast SSSI:

- Precambrian rocks exposed in costal cliffs and cliff-top grassland;
- Vegetated coastal cliffs and cliff-top grassland;
- South Stack (Spathulate) fleawort;
- Golden hair lichen;
- Ciliate strap lichen;
- Assemblage of some vascular plant including pale heath violet, golden samphire, rock sea-lavender, and Portlant surge;
- Chough *Pyrrhocorax phyyhocorax*;
- Maritime heath;
- Lowland dry heath;
- Lowland wet heath;
- Spotted neck-rose; and
- Silver studded blue butterfly *Plebejus argus*.

Glannau Ynys Gybi SSSI has other habitats/earth science features that contribute to the special interest, including rockpools, overhanging rock, gullies and underboulder communities and their associated flora and fauna. These are key components of the special interest of the site and therefore will be avoided where possible, however there is not statutory mechanism by which they are protected within the SSSI.