



Sent via email.

Our ref: SC/12/09

25th March 2013

Dear Gill Lock

SCOPING OPINION UNDER THE MARINE WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2007 (as amended)

SWANSEA BAY TIDAL LAGOON

I am writing in response to your request for a scoping opinion, request dated 30th November 2012, made in accordance with the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) (Marine Works Regulations).

The purpose of the Environmental Impact Assessment (EIA) scoping procedure is to determine what information should be provided in the Environmental Statement (ES).

In reaching our scoping opinion we have considered the requirements of Schedule 3 of the Marine Works Regulations, consulted with the bodies that we consider to have an interest in the project by reason of their environmental responsibility, as required by the Marine Works Regulations and had regard to their comments, and had regard to the information provided in the "Proposed Tidal Lagoon Development in Swansea Bay, South Wales, Environmental Impact Assessment Scoping Report" dated October 2012, produced by Tidal Lagoon Swansea Bay Ltd.

Scoping Opinion

We understand that you have also received a scoping opinion from the Planning Inspectorate (PINS). Any comments outlined within this scoping opinion should be considered in addition to those made by PINS.

We acknowledge the comprehensive nature of the scoping report; however, there are a number of issues that require further investigation or clarification. Annex 1 of this letter sets out the additional information that we consider necessary to be included and/or assessed in the ES for this project.

Our scoping opinion is based on the Scoping Report submitted to us in November 2012 with your request for a scoping opinion. Our scoping opinion does not take into account any changes to the project that may have occurred after this date. The information provided in Annex 1 is not



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a definitive list of the ES / EIA requirements and further information may be required following an application for this project, to ensure a full assessment is carried out.

Please also note that our scoping opinion will be provided to all those bodies that were consulted and will be published on our website and on our Public Register.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Sharon', with a stylized flourish at the end.

Sharon Davies
Marine Consents Officer
Marine Consents Unit

The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)

Scoping Opinion (SC12/09)

1. Summary of the proposal

Tidal Lagoon Swansea Bay Ltd are proposing the construction of a tidal lagoon renewable energy generation scheme in Swansea Bay. The breakwater or seawall of the development will be 9.5km in length impounding 9.3 km² of water.

The lagoon would be designed with an installed capacity of between 250-350 MW and is forecast to generate over 400,000 MWh per annum of renewable electricity. The landward face of the seawall to the lagoon will be set such that the top 3m will be visible at Mean High Water Springs (MHWS) and approximately 12m wall height will be visible at Mean Low Water Springs (MLWS).

The proposed works are likely to consist of:

- Construction of impounding “breakwater or seawall” of approximately 9.5km in length. Constructed with a sand and gravel core using geotextile tubing overlaid with rock armour.
- Turbines set in a single turbine caisson at the seaward side of the wall at around 5-7m below Lowest Astronomical Tide (LAT). These will be built in a line about 400m long and will have a width of about 30m.
- Offshore cabling
- Onshore cabling
- Dredging within the lagoon footprint, with the potential to use this material to construct the “breakwater or seawall”.
- Electricity step up facilities.
- Installation (and subsequent removal) of a cofferdam structure to exclude water to enable works to take place.
- Construction of onshore visitor facilities, access and parking provision
- Potential bridge link to the development.
- Potential visitor facilities upon the “breakwater or seawall”.

2. Location

The proposed project will be carried out within Swansea Bay, south of Swansea Docks within the City and County of Swansea.

3. Issues for consideration

General Comments

We advise that current best industry practice is followed and that the Environmental Impact Assessment is conducted using the following guidelines and set out your EIA accordingly as outlined in the below development;

Guidance for Developers at EMEC Grid-Connected Sites: Supporting Environmental Documentation, EMEC, 2011.

We note that within section 1.3 of the scoping document that “informal pre-scoping discussions have taken place with a number of statutory and non-statutory consultees”. We encourage further discussions with the consultees listed within section 1.3 regarding all relevant aspects of the project. This will help to further inform the EIA and subsequently may streamline the application process. Furthermore, we encourage further consultations are undertaken with water sports organisations and the local fishing communities, including holders of Mussel Fishery Orders west of the proposed development.

We would advise additional sources of information including the Swansea Barrage and Cardiff Bay Barrage impact studies and studies carried out on coastal processes by local Academic Institutions, local biodiversity records held by South East Wales Biodiversity Records Centre (SEWBReC) are used to inform the ES.

As different turbine designs and/ or configurations could have different impacts on marine life we would welcome clarification as to the preferred options for this project is presented at the earliest opportunity. Clarification should be presented within the ES as to whether the overhead gantries (mentioned in section 2.3.5) will sit 8m above the max wall height of 12m and how many of these gantries will be required?

We note that the concrete turbine caissons will either be constructed onshore through the use of dry docks and placed in situ, or built within the cofferdam which allows for all-year construction by isolating the construction area and reducing weather risk. It should be noted that we would advise that the first method would be more favourable in terms of environmental impacts.

We note that a number of the maps and figures are of insufficient scale or quality. Any maps, drawings and illustrations that are produced to describe the project should be designed so that they can be overlaid with maps, drawings and illustrations produced for other sections. Any maps and figures should also be submitted on an appropriately scaled admiralty chart for the area where necessary.

Section 2.3.2 refers to the crest level in relation to Mean High and Low Water Spring level being 3m and 12m above respectively. It is also stated that the eastern breakwater into Swansea Docks is approx. 10.5m above Chart Datum. This would put the proposed crest level of the new works at approx. 7.5m AOD and the Swansea breakwater at a level of Highest Astronomic Tide. It should perhaps be clarified which Swansea breakwater is being referred to as most readers would probably think of the west breakwater which is accessible to the public. The crest level of this breakwater will be significantly higher than the crest level figure declared. To ensure that the correct context is understood, some clarification within the ES should be presented.

A timeline should be produced to detail all aspects of the development including surveying works, submission of draft and formal application documents and phasing of construction. This should be included within the ES.

In terms of the operational lifetime of the development contradictory information is supplied in paragraphs 2.5.1 and 2.6.1 with both 50 and 100 years being quoted. This should be clarified with the ES.

We note that decommissioning will be described in the ES, however you should note that this should detail a worst case scenario, which is likely to be complete removal of all structures. Furthermore, in paragraph 2.6.2 that the impacts of decommissioning of the proposed lagoon for the coastal process assessment will be assumed to have similar impacts as the construction phase. However, the Severn Tidal Power Feasibility Study (STPFS) Strategic Environmental Assessment (SEA) suggested that the effects of decommissioning as well as construction should be investigated as part of any project level modelling work. Therefore, clarification on the rationale for excluding decommissioning activities from the impact assessment modelling for the current project should be provided within the ES.

There are a number of references such as those provided in section 4.6.1 and 4.6.2 are not included within the reference list. Full references should be provided to all sources of information used to inform the scoping report to clearly communicate the source of all evidence used.

Coastal Processes and Sediment Transport

We note that many of the potential impacts and therefore potential assessments required are dependant upon the results of the coastal processes assessments modelling. To ensure that any modelling is fit for purpose, that models used are accurate, well calibrated and validated. CEFAS and the Countryside Council for Wales (CCW) or Natural Resources Wales (NRW) after 1st April 2013 should be consulted prior to the submission of the ES. It is essential that the results of the high level coastal process modelling is provided to ensure that any additional advice can be provided prior to the submission of the ES.

We note from paragraph 3.4.1 that “the marine study area for the assessment and cumulative effects, initial high level coastal process modelling has been undertaken to determine an appropriate area”. The results of the high-level assessment suggest that there should be no far-field effects in the tidal regime area downstream in the Bristol Channel and upstream in the Severn Estuary. However, throughout the document no evidence is provided to support this claim. Similarly ‘For the coastal process assessment the near field study area has been identified as the area between Mumbles Head in the west to Port Talbot in the east and out to the 10m contour’(paragraph 3.4.2), but again no evidence has been provided.

Within the ES the impacts to all coastal process parameters, in addition to the proposed assessment to erosion and accretion should be fully investigated for all aspects of the proposed development.

The Overview of the Dynamics of Swansea Bay (paragraphs 4.6.1.1- 4.6.1.12) is discussed in context of an inner and outer Bay; a map should be provided within the ES to help illustrate this division to avoid misinterpretation.

Within paragraph 4.6.1.2 reference is made to the freshwater inputs to Swansea Bay as illustrated in figure 1; however this information is not clear. A revised figure should be provided to communicate the freshwater impacts more clearly.

The evidence quoted in section 4.6.2 is now a number of years old and although information from the STPFS will also be reviewed as part of the EIA baseline we would wish to stress that any evidence submitted must be timely and relevant to the particular application.

Clarification of the information used to describe the baseline characteristics of waves, tide and currents in paragraphs 4.6.1.9 and 4.6.1.12, and the data sources intended to be used to characterise the baseline wave, tide and current regime (as noted in paragraph 4.6.3.1 and 4.6.3.6) should also be clarified within the ES.

The Lavernock to St Ann’s Head Shoreline Management Plan (SMP2) (available from <http://www.southwalescoast.org/content.asp>) should be considered to help inform the baseline understanding of the coastal environment. Baseline Process Understanding information is provided under Appendix C of the main report found on the web link above.

The SMP2 also contains information regarding the potential future evolution of the coastal environment in association with the SMP2 epochs (0-20 years, 20-50 years and 50-100 years). This information would be appropriate to consider in relation to the potential future changes to baseline regime (i.e. without the proposed tidal lagoon scheme in place) and may help to set the scene for the cumulative impacts assessment.

The SMP2 proposed policy options for the policy units located within the established zone of influence of the proposed development are considered within the coastal process assessment and in the cumulative and in-combination effects assessments.

We note the contents of paragraph 4.6.3.6 however; the baseline understanding of the tidal regime considers extreme tidal conditions in addition to variability between spring and neap tides. Furthermore, as the proposed timescale associated with the baseline understanding of the future form of the seabed and distribution of sediments outlined here is unclear (within point l), clarification on the extent of the timescale should be presented within the ES i.e. what is meant by 'beyond'?

A baseline understanding of river discharge should be provided in the ES for rivers located within the potential zone of influence of the proposed lagoon scheme.

We note information in relation to salinity and temperature was not collected as part of the survey campaign (as noted in paragraph 4.6.3.9), a baseline understanding should be provided of the salinity and temperature regime within the potential zone of influence of the proposed lagoon scheme.

We welcome consideration of potential climate change impacts to the baseline wave and tide regime in the long-term (as described in paragraph 4.6.3.5); however potential climate change impacts should be considered in relation to river discharge i.e. potential increase in rainfall and this assessment should be presented in the ES.

We note the proposed assessment of potential effects listed in paragraph 4.6.5.2 listed a) to m). It is presently unclear whether the potential effects identified for assessment considers potential changes to all of the baseline physical features identified (paragraph 4.6.3.6) and potential impacts to all relevant receptors. The potential for windblown sand on the Swansea Bay promenade and Oystermouth Road should also be assessed within the EIA.

All potential impacts in the zone of influence of the proposed scheme must be fully assessed within the EIA. For example, it is proposed under paragraph 4.6.5.2, g), h) and i) that changes to littoral drift patterns will be assessed in relation to the designated sites listed. However, potential changes to other physical baseline features such as tidal range, wave climate, currents and the wider sediment budget and pathways (not only littoral drift) are also important to consider in relation to designated sites and their features within the zone of influence of the proposed scheme over each development stage (construction, operation and decommissioning periods). This is presently not considered under the proposed assessment.

Furthermore, the assessment of potential effects identified under paragraph 4.6.5.2 (listed a-m) needs to be set out more clearly within the ES in relation to the timescales of the proposed development (i.e. construction, operation and decommissioning periods).

Projects identified for cumulative impact assessment discussed under 4.6.5.2 l) need to be more clearly set out within the ES. It is stated that maintenance dredging and the Swansea Bay Campus onshore development will be considered within the coastal process assessment in relation to cumulative impacts. All projects listed under Table 3.4, in addition to consideration of dredge disposal sites within the zone of influence of the scheme should be assessed appropriately within the proposed cumulative assessments.

We welcome the use of appropriate computer modelling tools to investigate potential impacts of the proposed lagoon scheme, including the modelling of siltation rates within the impoundment and note in paragraph 4.6.5.4 that use of a hydrodynamic computer model is proposed. However, the EIA should also assess the requirement for maintenance work and spoil disposal arising from siltation and the potential environmental impact of these operations.

We note from paragraph 4.6.5.6 it is the intention is to take forward modelling work used to support the STPFS SEA but with the model being updated and the grid refined for the lagoon study area. In principle and without prejudice to review of the revised model and predicted impacts, we believe this approach seems sensible. However, several models were used to inform the STPFS SEA and presently it is unclear which STPFS SEA model is intended to be used. This should be clarified within the ES.

Morphological modelling should be undertaken in addition to hydrodynamic modelling to assess potential impacts of the proposed lagoon. The STPFS SEA H&G studies utilised the SANDFLOW, DELWAQ, Intertidal Profile Model and ASMITA models to investigate impacts to a range of morphological processes and features, in addition to TELMAC-2D, MIKE-FM, SWAN, MIKE-SW and CS3X (POL) models used to investigate changes to the hydrodynamic regime. It is unclear at present whether any morphodynamic models will be applied to investigate potential scheme impacts and clarification on this matter should be presented within the ES.

We note from paragraph 4.6.5.7 that model validation will be based upon representing the coastal process conditions observed during the met ocean surveys. However, the report also states that the survey campaign was targeted ‘...for the period when weather conditions were expected to be more adverse’. Model validation should also be performed to replicate less severe ‘normal’ hydrodynamic conditions.

Clarification should be presented within the ES as to whether the requirement for 3D modelling has been considered to investigate potential scheme impacts. The STPFS SEA suggested the use of 3D flow modelling and sediment modelling should be considered should one of the short-listed schemes be taken forward for further assessment. In this instance it may also be beneficial to consider the requirement for such 3D modelling of the proposed lagoon scheme.

We understand that the details of the construction methodology may not be available at present. However, once these details have been finalised it may be appropriate to consider modelling the construction phases to assess potential impacts to the hydrodynamic and morphodynamic regime. The STPFS SEA suggested that if one of the short-listed schemes was to be taken forward, in terms of modelling the effects of construction activities on the hydraulic, sediment and morphology regime should be quantified.

In relation to the overall coastal modelling impact assessment, any uncertainties associated with the input data, modelling tools and model outputs should be clearly documented within the ES.

Sediment contamination

Due to the previous industrial nature of Swansea and its associated Docks we have reason to believe that the sediments within Swansea Bay may be contaminated. This should be fully investigated within the EIA.

We note from paragraph 4.6.1.8 that sample data from the Port Talbot approach channel and the proposed site of the Scarweather Sands wind farm show heavy metal concentrations below Dutch reference levels and the Interim Marine Sediment Quality Guidelines (ISQG). We would highlight that the developer that Scarweather Sands are in a different sediment environment and some distance away from the proposed lagoon site. We are therefore not convinced of its inclusion as a benchmark for this development. We would however, expect to see contaminant levels reported against the CEFAS Action Levels within the ES.

We support the inclusion of particle size distribution and sediment quality samples to be taken from within the Bay as outlined in paragraph 4.6.3.10. However, the proposed surveys only cover a limited number of sites and all the areas of seabed likely to be disturbed by the proposals should be appropriately covered by sample sites. Sites should also be sampled to the appropriate depth below the surface and at suitable intervals. We advise that you should consult CEFAS to produce a detailed and acceptable sampling plan that covers site number and location, depth intervals and a suite of determinands.

There is a potential for munitions to be present within the Bay due to the targeting of Swansea during World War II. The developer should be mindful of this whilst undertaking any works within Swansea Bay.

Sediment Resources and Dredging

We note the contents of paragraph 2.4.2 with regards to the proposed construction method. The ES should contain additional detail on this point and include an assessment of the type and volume of material that may be used, plus a description of any likely treatments such as de-watering and associated impacts. In addition, further information should be provided on the sourcing of embankment materials, specifically sand, including the volumes required, the volumes available from within the lagoon footprint and details of how any shortfall will be addressed.

We welcome the recognition of the potential for significant impacts to be caused by the sourcing and import of rock armour for the lagoon walls. All environmental impacts of this activity should be fully assessed within the EIA.

Paragraph 2.4.2 states that “some removal of soft material to lay solid foundations”. This point should be expanded upon within the ES to include an estimate of the volumes involved, its quality and an assessment as to its suitability for disposal.

We note from paragraph 4.6.5.2(e) that there may be potential dredging requirements for the approach to Swansea Docks, the River Neath and upstream marina. This assessment should also include the approach to Port Talbot as it is also within the study area.

Furthermore, we note under point 4.6.5.2 f) that an assessment of sediment accumulation and potential maintenance dredging requirements will be undertaken. An assessment of the disposal of any maintenance dredging should be undertaken to inform the ES.

The ongoing maintenance regime for the lagoon structure including what maintenance may be involved, who will be responsible for the ongoing works and maintenance dredging and what safeguards are in place should the lagoon change ownership should be outlined within the ES.

There is potential to damage the Swansea WWTW outfall during any dredging scheme proposed in all phases of the development. This should be investigated within the ES, along with any proposed schemes on how to protect the outfall from the potential effects of dredging.

It is a marine licensable activity to carry out any form of dredging, so this should be considered when setting out what specific activities will require a marine licence in relation to the overall project.

Water Framework Directive

We note that there is little information provided with regards to the European Water Framework Directive (WFD). Currently a number of water bodies in the area that are failing to achieve their WFD target of good status/potential. As part of the EIA the impacts of the scheme on the status/potential of all water bodies that may be affected must be assessed.

Through this assessment the development must show no deterioration in status/potential within any affected water body (unless the scheme qualifies for consideration under Article 4.7 of the WFD). The EIA must also detail mitigation measures that more than compensate for any deteriorating impacts, so that overall the development contributes to enhancing the status/potential of the affected water bodies.

Mitigation measures could include utilising the surrounding area for habitat creation, for example, salt marsh habitats, and nursery areas for juvenile fish. However, please note that this list is not exhaustive; you are encouraged to contact the Environment Agency Wales (EAW) (NRW after 1st April 2013) with regards to appropriate WFD related mitigation schemes.

Water Quality:

We note that the proposed lagoon will enclose the outfall from the Swansea Waste Water Treatment Works (WWTW). The potential exists for storm sewage, final effluent or a combination of both to sit in the lagoon for a protracted period of time. This could be further exacerbated if there is a problem with the WWTW. We strongly advise that you liaise with EAW (NRW after 1st April 2013) and Welsh Water with regards to this issue. The effects of the WWTW and/or any changes to the WWTW outfall are fully assessed within the ES.

We note from paragraph 4.7.3.4 that discharge from the outfall is UV disinfected under normal conditions. However, even with the works operating normally, the UV disinfection only reduces the bacterial content and does not eliminate it. The dosage of UV has been calculated taking into account the dispersion patterns in Swansea Bay and the lagoon would fundamentally change this process.

The proposed development could also have major implications for both chemical and bacterial water quality within Swansea Bay, which as a WFD water body is already failing to meet statutory EU targets. The ES should assess any deterioration in WFD status (as discussed within the previous section). Potential mitigation measures relevant to the water quality aspect of WFD that may be explored include improvements to the existing sewer network, provision of additional storage to reduce spills and the removal of surface water from the sewerage system. This list is not exhaustive and you may wish contact EAW (NRW after 1st April 2013), Welsh Water, the City and County of Swansea and other 3rd Sector Organisations who may be aware of other alternative mitigation measures for deterioration in water quality.

Disturbance of sediments during the construction and operation phases has the potential to impact on bacterial water quality within the Bay, specifically on shellfish and bathing waters. This is due to bacteria within the sediments and increased turbidity resulting in lower bacterial die-off from natural UV radiation. Investigation should be carried out within the EIA to establish any impact from the development both during construction and continued operation, in compliance with Bathing Water Directive and the EC Shellfish Water Directives.

There are a number of paragraphs within section 4.7 to which additional/more up to date information is available which can be utilised to inform the ES. These are as follows:

Paragraph 4.7.1.1 we understand that the revised Bathing Water Directive will be implemented in 2015, however, the 4 year rolling data period started in the 2012 bathing water season. Therefore the revised Bathing Water Directive standards should be taken into consideration within the ES.

Paragraph 4.7.2.2, Table 4.1 states that that Aberavon Sands and Swansea Bay designated bathing waters passed guideline standards in the 2011 bathing water season. This is incorrect; these beaches only passed the Imperative Standards. This should be corrected for the ES.

Paragraph 4.7.2.7 states that routine water quality data will be sought from EAW (NRW after 1st April 2013) and CEFAS. Additional data may also be obtained from the City and County of Swansea and Smart Coasts Project who hold a wealth of useful data which should be used to inform the ES.

Paragraphs 4.7.2.8, 4.7.4.1 and 4.7.4.5, we note that the developer has proposed to base the EIA water quality assessment on methodology currently adopted for UK bathing water assessment by Intertek METOC. We would advise that this model is built on extensive field validation data. In order to adequately assess the impact of the lagoon on marine water quality in the EIA the model will need to be supported by additional validated data.

The Smart Coasts = Sustainable Communities Project, funded by INTERREG are producing a black box model and 3D hydrodynamic model to predict bathing water quality in Swansea Bay. For further information on this project you should contact EAW (NRW after 1st April 2013), City and County of Swansea, Aberystwyth University and Dwr Cymru/Welsh Water. This model is

based on extensive field studies which include proven changes within current speed and direction throughout the water column. The 3D model is a more appropriate method for understanding hydrodynamics within the Bay and any changes in microbial water quality. Therefore we suggest that the use of a 3D model for water quality assessment is explored to inform the ES.

Paragraph 4.7.3.2 we are aware that the Swansea WWTW has operational conditions relating to the composition of the final effluent, specifically the levels of heavy metals and other such contaminants. The enclosure of the outfall may result in the effluent plume not being fully discharged and therefore there is a potential risk for accumulation of contaminants within the sediment and water column. This should be fully investigated/modelled within the ES.

Paragraph 4.7.3.4 presents assumptions related to bacterial water quality which should be expanded upon within the ES. Does the phrase “under normal operating conditions” mean “dry weather flow” i.e. the flow entering the works during dry weather and the final effluent leaving the works during dry weather. The assumption that the bacterial signal from the works does not affect bather water quality would completely depend on the efficacy of the UV works at any given time. Recent tracer studies have proven that effluent discharged from the storm works does reach the designated bathing water at Swansea Bay. The dispersion of final and storm water effluent should be fully addressed within the ES.

Paragraphs 4.7.3.5, 4.7.3.6, 4.7.3.10 and 4.7.3.11 – we note the content of these paragraphs and advise that to determine whether the described assets are operating as designed the assessment must be based on actual field validation data in order to comply with the Urban Waste Water Treatment Directive and Bathing Water Directive.

Paragraph 4.7.3.8 – we support the inclusion of two long sea outfalls at Swansea WWTW and Afan WWTW in a water quality assessment. However, the presence of the Baglan Pumping Station overflow long sea outfall also has the potential to impact the designated bathing waters during storm conditions. The impact of the lagoon on the dispersion of the discharge plume from these outfalls must be investigated within the EIA.

Paragraph 4.7.3.9 – we understand the Mumbles Head Outfall may not operate as permitted and that it appears that the dispersion of storm sewage may be suboptimal. This should be assessed within the EIA.

Paragraph 4.7.4.2 – we welcome the inclusion of key monitoring locations outlined within this paragraph. A monitoring point within Queen’s Dock should also be included. Queen’s dock is the location of a mussel farm therefore it is imperative that any impacts are fully understood for both current and future users.

The EIA should also include an assessment of all permitted discharges into the proposed area and its zone of influence, copies of environmental permits issued by EAW (NRW after 1st April 2013) can be obtained from their public register. This can be accessed, by appointment with EAW (NRW after 1st April 2013) Monday to Friday (except bank holidays) between 9.30am and 4.30pm.

All comments with relation to water quality should be incorporated into Table 4.3, Summary of Proposed Modelling for Marine Water Quality Assessment and presented within the ES.

We note from paragraph 4.18.3.5 that there may be potential for water-sports facilities within the lagoon. Should this be the case the EIA must investigate the effect of any changes in water quality on the proposed water-sports users.

The EIA should also contain an inland water features survey which includes groundwater, surface waters and groundwater dependent ecosystems. This should consist of:

- Potential changes in water level and its associated impacts
- Potential effects on water quality including saline intrusion. This should consider the possible impact on any water abstraction points on Crymlyn Bog SSSI and SAC.

Ecology

We note that a number of ecological surveys are proposed to inform the ES, the following general advice should be applied to all surveys to be conducted, however more detailed advice with regards to particular surveys is provided in the sections outlined below.

Ecological surveys should be conducted prior to the development of detailed plans, to enable an assessment of the level of risk posed by the development. The surveys should be conducted at an appropriate time of year by a suitably experienced surveyor using recognised survey methodology.

Generally, these surveys and risk assessment should:

- Identify any rare, declining, protected or otherwise important flora, fauna or habitats within the site
- Assess the importance of the above features at a local, regional and national level
- Identify impacts of the scheme on those features
- Propose mitigation for any adverse ecological impacts or compensation for loss
- Demonstrate how the development will avoid adverse impacts
- Proposed wildlife habitat enhancement measures
- Propose post-project appraisal, management plans and management responsibilities with details of how biodiversity enhancement will be incorporated into the development and maintained over the long term.

We note that the contents of table 3.1 regarding the potential value of ecological receptors. Please be advised that the marine context OSPAR habitats and species should be specifically mentioned alongside those listed in Annexe 1 of the Habitats Directive. Please see http://www.ospar.org/documents/dbase/decrecs/agreements/0806e_ospar%20list%20species%20and%20habitats.doc

Further clarification should be provided within the ES by what is meant by the term "site" in table 3.2. It is currently unclear whether this refers to a designated site or to a geographic area. Please also note that the "major negative" impact descriptor in this table doesn't refer to species.

Intertidal and Subtidal Benthic Ecology

The ES must provide information about the direct impact from the footprint of the development on the subtidal and intertidal habitats within Swansea Bay. Also a clear picture of the indirect impacts on species and habitats should be presented, either due to changes in tides, remobilisation of contaminated sediments, accidental spillages and/or smothering by sediments. The EIA should also assess the potential direct and indirect impacts and the disruption to present habitat connectivity from the footprint of the development, the affect of access/machinery across the intertidal habitat or from the change in sediment deposition or the additional dredging which may be required.

We note that a site walkover is proposed to assess the intertidal habitat to inform the ES as the there information available in the biotope maps produced by CCW for this area. The survey conducted by CCW for these areas was conducted between 2001 and 2003 and as such a walkover survey is not considered sufficient to assess the habitat that will be lost due to the construction of the lagoon. Therefore, a full survey of the intertidal area should be conducted for the ES, using the methodology described in the CCW Intertidal Biotope Mapping Survey (Brazier *et al.*, 2007). The ES must establish how much of the intertidal habitat will be lost or compromised or lost both directly or indirectly by the development.

We welcome the proposal to undertake benthic surveys, as outlined in Table 4.4, appendix 4.1 and paragraph 4.8.2.3. However, clarification on the proposed methodology should be presented within the ES.

It is recommended the sampling should be conducted following the guidance below for benthic sampling which is considered best practice for projects of this nature;

Ware, S.J. & Kenny, A.J. 2011. Guidelines for the Conduct of Benthic Studies at Marine Aggregate Extraction Sites (2nd Edition). Marine Aggregate Levy Sustainability Fund, 80pp.

The 30 benthic samples proposed are not considered to provide sufficient information to adequately address the effects of the development on the benthic ecology of the area. More grab samples should be collected both within and outside of the lagoon footprint and that replicates are collected at each site in order to provide an accurate assessment. The number of reference sites should be increased and chemical analysis should be carried out on the reference samples.

The changes in tidal, wave and sediment dynamics will be the most important factors affecting marine ecology in the immediate area and further afield. The study area and scope for marine ecological assessments will need to be related to what is predicted to happen physically in the environment in the long term, not just related to the location of the tidal lagoon. Although it is important to characterise the tidal lagoon project area, it is also vital to assess the potentially affected area further from the project as this will be where long term changes will be taking place. In section 4.8.2.2 "It is proposed to undertake a further baseline benthic survey once consents for the lagoon have been approved and prior to construction work commencing". It should be clarified whether the survey will take account of physical survey data and modelling to satisfy the concerns with regards to the possibility for long term changes.

Furthermore, with regards to the proposed epifaunal beam trawls the number stated in 4.8.2.4 should be increased to inform the ES.

We note from paragraph 4.8.3.2 that there is a potential for lagoon wall and associated rock armour to be recolonised by additional intertidal habitat. The ES should provide clarity on which habitats may be created and the species that may be found to be associated.

We acknowledge the reference to the various UK Biodiversity Action Plan (BAP) priority habitats and species (section 4.8.1.9 and table 4.5) which are also listed for Section 42 of the Natural Environment of Rural Communities (NERC) ACT 2006 as being "of principle importance for the purpose of conserving biodiversity in Wales". However, greater detail of specific habitats and species number and extent are required to be assessed in the EIA based on the proposed survey, in order to establish effective monitoring and potential mitigation processes.

We note from section 4.9.3.5 that "At present it is proposed to contain the lagoon cables within the main seawall structure of the lagoon or within existing river crossingsShould these proposals change an assessment on elasmobranchs [sic] from the cable will be included in the EIA". Please be advised that if this is the case then the potential impacts of the revised cable route and any burial, rock armouring etc. on the benthic ecology would also have to be included.

Spawning Areas, Recreational and Commercial Fisheries

The scoping report does not cover in adequate detail the direct and indirect impacts which may arise on marine, estuarine and migratory fish population and their habitats. Further details and clarification of the surveys proposed to assess potential impacts should be presented in the ES.

Direct impacts on resident and migratory fish through construction, operation and decommission stages of the lagoon should be assessed in the EIA. Including loss and/or damage through impingement and entrainment of all life stages of marine, estuarine and migratory fish populations, both locally and migrating to and from rivers near to the development and further afield. As a minimum this assessment will need to consider the approach and discharge velocities generated by the turbines, the swimming ability of the individual fish species, risks of blade strikes and other mechanical damage/loss through the build and operation of the lagoon development.

We note from paragraph 2.5.2 that trash screens are proposed as part of the development. Further information should be provided to detail the overall dimensions of the screens, mesh size and antifouling consideration, along with loss and/or damage of fish species, including eel through impingement.

Indirect affects are also proposed to be assessed within the ES. The indirect impacts should be assessed for estuarine and migratory fish populations, both locally and migrating to and from rivers near to the development and further afield. This should include a assessments of; the disruption and/or delay to migration patterns resulting from changes to currents/tidal circulation (in particular displacement of freshwater flows from the nearby Tawe and Neath Rivers) and sedimentation processes, flows into/out of turbines and/or changes in water quality being released through the turbines (from a 'plume' effect), feeding, loss of habitat and loss through additional predation pressures, as well as loss of juvenile fish becoming entrapped inside the lagoon.

The potential for noise, vibration and light during construction and operation to displace fish from migration routes should also be assessed. Salmon can detect and respond to underwater noise and their audiograms have been well documented (Nedwell et al., 2004). Salmon are considered to be hearing generalists that are able to hear frequencies in the low to infrasound ranges at threshold levels of around 95 to 130 dB re 1µPa in the region of 10Hz to 380Hz. Small fish i.e. smolts are generally considered to be most vulnerable to noise impacts (Hastings & Popper, 2005). Furthermore, salmon appear to be sensitive to artificial light and the lagoon structure will have some lighting e.g. for safety as outlined in section 2.4.7. For further information on this we advise you consult the following literature.

<http://www.wildlandscpr.org/biblio-notes/effects-artificial-lightingwildlife> for a review of literature on this topic.

Nedwell, J.R., Langworthy, J. & D. Howell D (2004) Assessment of sub-sea acoustic noise and vibration from offshore wind turbines and its impact on marine wildlife; initial measurements of underwater noise during construction of offshore windfarms, and comparison with background noise.

Subacoustech. <http://www.subacoustech.com/information/publications.shtml>

Hastings, M.C. & A.N. Popper (2005) Effects of sound on fish. California Department of Transportation Contract 43A0139 Task Order, 1.

[http://www4.trb.org/trb/crp.nsf/reference/boilerplate/Attachments/\\$file/EffectsOfSoundOnFish1-28-05\(FINAL\).pdf](http://www4.trb.org/trb/crp.nsf/reference/boilerplate/Attachments/$file/EffectsOfSoundOnFish1-28-05(FINAL).pdf)

The European eel (*Anguilla anguilla*) is a critically endangered species and has Global Red List status as well as being a BAP species. Under the EC Eel Regulations (2009) screening is required on abstractions and discharges to sea out to 6 nautical miles (6 nm). No reference is made to the European eel within the scoping report; this must be fully assessed in the ES.

We note from table 4.10 that shads, lampreys and salmon are listed as being Habitats Directive species and listed for the Special Area of Conservation (SAC) Rivers, Severn, Usk and Wye but we these species also occur in local rivers, such the Tawe, Neath and the Afan and the potential impact of these local populations should also be considered.

Allis shad, sea lamprey, salmon and several species of elasmobranch are also on the OSPAR List of Threatened and Declining Habitats and Species and therefore the EIA must include an assessment of the impacts on this species if they are found within the study area.

In addition, we would advise that sea trout is a BAP species occurring in all South Wales rivers. Both salmon and sea trout migratory stages are protected under the Salmon and Freshwater Fisheries Act 1975 Section 14, which requires intakes out to 6 nm to be screened to prevent ingress of fish.

We wish to inform you that a number of fishery information sources have now been superseded and the most up to date information should be used to inform the ES.

Firstly, the Fishery Sensitivity Maps in British Waters (Cefas 1998) stated in paragraph 4.9.1.7 have now been superseded by Ellis, J.R., Milligan, S.P., Readdy, L., Taylor, N. and Brown, M.J. 2012. Spawning and nursery grounds of selected fish species in UK waters. Sci. Ser. Tech. Rep., Cefas Lowestoft, 147: 56 pp.

Secondly, the second UK Offshore Energy SEA (paragraph 4.9.1.7) has now been published and may contain more up to date information on all potential receptors including fish and fisheries, this is available at: http://www.offshore-sea.org.uk/site/scripts/consultation_download_info.php?downloadID=16

The site of the works is adjacent to spawning grounds for sandeel and sole and within nursery areas for monkfish, herring, plaice, sandeel, sole, spotted ray, thornback ray, tope and whiting. The effects of all phases of the development, both directly and indirectly on these spawning grounds should be assessed within the ES.

Paragraph 4.9.2.4 states that 'it is proposed to undertake 7 beam trawls for epifauna which will also be used to determine the presence of demersal fish and shellfish in the area'. It should be noted that these trawls will only capture juveniles and will not sample adults or pelagic species and further targeted surveys may be required.

CEFAS and EAW (NRW after 1st April 2013) should be kept informed of the results of any assessments carried out for migratory fish.

The ES should also consider the cumulative effects upon migratory fish populations of the Swansea and Cardiff barrages when assessing impacts on migratory fish species. The report should reference and refine the important work done for the STPFS SEA project in assessing impacts on marine, estuarine and migratory fish populations, particularly relating to the effects at population levels over the projected life span of the project.

The ES should also detail appropriate mitigation, in the event that significant impacts cannot be avoided such as the loss of migratory fish runs for the recreational angling on the local rivers Tawe, Neath and Afan and also impacts within the estuarine and marine environments. Potential mechanisms for mitigation could be funding for improved access, habitat creation within the freshwater environment or habitat creation elsewhere under the Habitat Foregone Methodology.

Shellfisheries

We note the information presented in paragraph 4.8.1.12 with regards to native oyster *Ostrea edulis*, however a more recent survey of the distribution and abundance of native oysters in Swansea Bay, commissioned in 2010, which found evidence of this species at 18 sites around the bay (see Woolmer, A.P. 2011. Drop down video of native oyster habitat in Swansea Bay, South Wales. CCW Contract Science Report No: 958, 30 pp.). Furthermore, an application for a 35 ha oyster fishery Several Order in Swansea Bay is currently being considered by Welsh Government.

As well as being a BAP species *Ostrea edulis* is also on the OSPAR List of Threatened and Declining Habitats and Species and therefore the EIA must include an assessment of the impacts on this species.

The site of the works is also within long term class B *Mytilus* sp. bivalve production area and we would expect to see an assessment of the impacts on these species within the EIA.

In reference to section 4.8.3.4 concerning mitigation measures for the potential oyster restoration project in Swansea Bay. Any such restoration attempt would depend heavily not only on having sufficient habitat type to encourage spat settlement (natural or introduced cultch

material), but also, water quality has been shown to be a major factor in determining the survival/reproduction success of adult oysters. Any mitigation against suspended sediment and or/water quality issues would have to coincide with temporal management processes taking place as part of the oyster restoration project i.e. timing for laying cultch material, spawning of adult oysters, spat settlement etc.

Marine Mammals

We note the summary of the marine mammals present in the area as outlined in table 4.6. However, Harbour Porpoise are considered to be very common in the area of Swansea Bay and that Grey Seals are a common feature of the Gower and Swansea Bay. Neither of these species are highlighted as a consideration for further investigation within the EIA, however, the impact on these species must be assessed in detail within the EIA. It should also be noted that cetaceans, including Harbour Porpoise are European Protected Species and are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (The Habitats Regulations). Further general advice with regards to European Protected Species legislation can be found in Annex 3 of this response.

The 2nd Edition of the Atlas of the Marine Mammals of Wales (Baines, Mick E. and Evans, Peter G. H Evans, and Countryside Council for Wales. *Atlas of the Marine Mammals of Wales*. Bangor: Countryside Council for Wales, 2012) should be consulted for the ES to provide the most up to date and comprehensive work on the area. Table 4.6 should also be updated with data from the Atlas rather than the SMRU (2005) data currently summarised. The Atlas shows that harbour porpoises are very common in the area and a 24-month, pre-construction baseline of monitoring data associated with Scarweather Sands Offshore Wind Farm (Pierpoint, 2008a) confirmed this and also reported a relatively high proportion of harbour porpoise pods in Swansea Bay included calves (19% overall) (Pierpoint, C. (2008a). A two-year pre-construction baseline of harbour porpoise activity at Scarweather Sands Offshore Wind Farm. Report to E.ON Renewables and DONG Energy by RPS Group, 103 p.)

Grey seals do haul on Gower (Worm's Head). Seals are frequently seen off the south Gower coast and within Swansea Bay (Swansea marina, mouth of the Tawe). Grey seals should be considered during construction work in relation to noise impacts; although impacts are likely to be minimal, precautionary measures should be considered within the EIA. For further guidance please see JNCC guidance "*Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise*". Although developed for offshore wind farm construction purposes, this document provides sound guidelines in terms of minimising and mitigating noise impacts on marine mammals in general.

We believe further acoustic survey work should be undertaken to assess the impact of marine mammals. This should be carried out using CPODs rather than TPODs. We would advise that you contact CCW (NRW from 1st April 2013) with regards to the survey methodology and sources of baseline data.

Furthermore, the cumulative effects of construction with the Atlantic Array should be considered, especially for harbour porpoise.

Ornithology.

There are several ornithological issues that may be associated with the development. It the proximity to statutory sites and for their importance for birds, such as Blackpill Site of Special Scientific Interest (SSSI) together with several other coastal SSSI's, including Crymlyn Burrows SSSI and Kenfig SSSI/Kenfig Pool and Dunes National Nature Reserve (NNR). Also inland, Crymlyn Bog SSSI/Crymlyn Bog and Pont y Sais NNR. We note from section 4.11 that the proposed development site provides also an over-wintering and a passage site for a large number of waders.

There is a possible adverse impact upon the shorebirds such as those representing features of the Blackpill SSSI. The development proposal may exclude birds and other wildlife through

producing noise, creating a physical barrier, resulting in avoidance, and effective exclusion from food resources through the loss of intertidal habitat.

The above possible adverse impacts may be applied to a range of birds (including features of the SSSI's). Impacts may occur during installation, operation, decommissioning and routine maintenance operations. With respect to the disturbance impact, the ES should investigate seasonal use of the development site by foraging shorebirds and terrestrial birds as all activities will cause disturbance which should be mitigated by appropriate timing of activities.

The proposed survey methods deployed are considered suitable. However, the bird survey period of six months is inadequate. The bird surveys were conducted over a winter period of October 2011 to March 2012. It is welcomed that surveys have been undertaken for overwintering birds, as aggregations have been recorded in this area, particularly of Great Crested Grebe and divers such as Red-throated Diver and Great Northern Diver. It should also be noted that records have also been reported of Velvet Scoter, Common Scoter and Teal and a roost of Redshank has been recorded in the Neath Estuary/Brunel Dock and these should be discussed within the ES.

We note from paragraph 4.11.2.1 that counts have been undertaken on an annual basis at both Blackpill SSSI and Neath Estuary for over 20 years. However, these regular counts are of the high tide roosts, the low tide counts which will of major importance for this EIA, are done less regularly. This must be fully assessed within the EIA. .

We note the contents of paragraph 4.11.2.4 and agree that survey work should be compatible with BTO WeBS low tide and high tide data. However the EIA must quantify what will be lost in terms of area for low tide feeding and high tide roosts as a result of this plan/project. We therefore advise that two years of monthly low tide surveys and WeBS core counts are carried out to get interannual variation and up to date data. The last low tide counts were completed in the winter of 2007-08. It is also essential to continue with the ancillary counts of significant concentrations and movements of birds across the survey area.

For example, please note the peak counts at Blackpill SSSI of ringed plover and sanderling (notified features of interest), can occur outside the winter period. For example, the peak WeBS count of ringed plover in the 2008/2009 occurred in September. Therefore, it is important that interannual surveys are undertaken to inform the ES.

Furthermore, other species of importance are found to use the area in spring/summer such as Osprey which regularly utilise this area in these months, and Shelduck which also breed in the area, therefore these species should be assessed in the EIA.

Please also be advised that Sanderling and Ringed Plover are qualifying features of Blackpill SSSI not just "...of particular note" as stated in paragraph 4.11.1.1.

The area of the proposed development has had had high aggregations of Sanderling in past counts. These areas could be used as supplementary feeding as well as the Blackpill SSSI for the birds and therefore the loss of this habitat could potentially have an effect on the numbers in the SSSI. This needs to be acknowledged and considered within the EIA.

Furthermore, please be advised that there is an important breeding colony of Kittiwakes at Mumbles; the only UK colony breeding on a man-made structure (Mumbles Pier). These must be considered within the EIA.

Within Appendix 4.2 in the coastal bird survey details we would welcome clarification within the ES as to what is meant by 'significant movement'.

Designated sites

Whilst the proposed scheme is not within a designated site there are number of designated sites that may be affected by the proposed development.

Whilst the site is not within a European designated site we note that a number of sites may be effected by the proposed development as outlined in table 4.10, including but not limited to Kenfig SAC, Carmarthen Bay and Estuaries SAC, Wye SAC and Usk SAC. However, Crymlyn Bog SAC and Ramsar should also be included within this table, which lies inland c. 1km at nearest point to indicative east seawall and may potentially be impacted by the impounded water in the lagoon increasing the area of influence of a saline wedge under any fresh groundwater in the area, which may lead to saline intrusion towards Crymlyn Bog. The southern boundary of this SAC includes the Tenant canal.

A clear zone of influence should be identified, including change in sediment processes, potential impacts to migratory fish species and the potential to impact Natura 2000 sites further afield.

We note the inclusion of the Severn Estuary SAC within table 4.10 with a proposed additional assessment on migratory fish. There is also a potential for sediment processes to change within the Severn Estuary SAC, this will only be confirmed through the coastal processes assessment and therefore this should be included within the table 4.10.

We welcome the recognition of the potential for this project to impact upon European and Ramsar sites and the proposal to include within the EIA information sufficient to allow a Habitats Regulations Assessment (HRA). However, a clear zone of influence should be identified including changes to sediment processes and potential impacts to migratory fish. Further information on the high level coastal processes modelling report is needed before we can consider the proposal to screen the Carmarthen Bay and Estuaries SAC / SPA and Burry Inlet SPA / Ramsar sites out of the HRA for this project. Crymlyn Bog SAC must also be included in the HRA screening assessment.

Further general guidance with regards to HRA can be found in Annex 2 of this response.

There are also a number of nationally designated sites that may be affected by the proposed development as outlined in paragraph 4.13.1.5. This list is not considered to be complete and should also include.

- Crymlyn Bog SSSI, SAC, Ramsar and National Nature Reserve (NNR) (as previously described)
- Pant y Sais fen SSSI, NNR, LNR (also a constituent part of Crymlyn Bog SAC, Ramsar)
- Earlswood Road Cutting and Ferry Boat Inn Quarries SSSI - this is a geological site, but it lies reasonably close to the proposed cable route just before it crosses the River Neath.

These sites should also be included within Table 4.7.

In the case of Crymlyn Burrows SSSI, we require information to be presented within the ES not just on how the site will be affected by any changes in coastal processes but by the entire construction process. Table 4.7 states that this site is approximately 2 km from the proposed development. Comparison of the location of the proposed seawall and the boundary of Crymlyn Burrows SSSI indicates this distance will be closer to 500 m at the nearest point.

Local Biodiversity

There are a series of UK BAP habitats and species within the Bay. The project one way or another will have an effect on them and this needs to be fully investigated within the ES.

We note that paragraph 4.8.3.6 and table 4.5 detail the UK BAP and nationally important habitats to be considered within the EIA. We would also advise that species of local importance and NERC Act, Section 42 species are included within this list.

In relation to the assessment of coastal processes we would all of the dune systems are appropriately considered in Neath Port Talbot (NPT), including Crymlyn Burrows, Baglan Dunes, Aberavon and Margam Burrows. All of these dune systems are UK and NPT BAP/Section 42 habitats and support uncommon/BAP/Section 42 species, such as Sea Stock. The Baglan Dune system is of particular importance as this is understood to be one of the only accreting systems in South Wales. In addition, these coastal dune systems are also of significant importance for coastal defence. Impacts should be assessed for all of these systems.

In relation to the intertidal and sub-tidal benthic ecology section please note that in relation to the NPTBAP marine habitats and species (with the exception of harbour porpoise) have not been included to date due to a past lack of information and expertise in this area. This should not be interpreted as an absence of such species and habitats. This gap will hopefully be addressed in future versions of the NPTBAP.

Invasive Non Native Marine Species

We fully support the submission of a biosecurity and invasive species risk assessment covering both the construction and operational phases of the development and the proposed mitigation methods (as outlined in paragraph 4.8.4.1). However, it is not stated which of these measures will be incorporated into the proposed management/mitigation plan, this should be established within the ES.

We also welcome the proposal to undertake an INNS risk assessment for the operational phase of the project. There is a high risk associated with the introduction of a large artificial surface (the lagoon seawall) which presents an ideal settlement surface for potential INNS, whether present already in Swansea Bay or not, to get a foothold over native species, therefore having a negative effect on local biodiversity in the future.

Furthermore, identification and mitigation of the risks associated through other types of equipment and/or machinery used in the various phases of the development for example diving equipment, cranes and dredgers should be presented within the ES.

The EIA should also consider possible management mitigation measures to prevent settlement of invasive non native marine species in line with current projects such as Urbane (Urban Research on Biodiversity on Artificial and Natural coastal Environments) <http://urbaneproject.org.project>.

Flood Risk

The scoping report does not address concerns with regards to flood risk, with the only reference to flood risk being within the outline cumulative effects in table 3.4. The site is located within zone C2 as referred to under TAN 15 Development and Flood Risk (July 2004). Our Flood Map information also confirms that the site is at risk of flooding from tidal inundation.

The EIA conducted should be supported by a full Flood Consequence Assessment (FCA) and detailed hydraulic monitoring to demonstrate that the lagoon and its associated infrastructure are compliant with TAN 15. The FCA should consider both on and offshore facilities, breach scenarios, climate change for the lifetime of development and also show no detriment to third parties.

The criteria for the FCA, which should normally be undertaken by a suitably qualified person carrying an appropriate professional indemnity, are given under Section 7 and Appendix 1 of TAN 15. For further details we advise that you contact EAW (NRW after 1st April 2013).

Any changes in the tidal regime as a result of the project should be assessed with regard to outflows form ordinary watercourses and what impact that may have on their associated flood risk and what measures will be put in place to mitigation/compensation for any increase in risk.

Marine Noise Assessment

We note the proposal to undertake baseline underwater noise survey as stated in section 4.16.2.6. We advise you contact CEFAS to discuss the requirements for underwater noise baseline study and assessment at the earliest opportunity.

Historic Environment:

The methodology proposed to assess the historic resource in section 4.15 would appear appropriate in this case; however, it is noted that the work will follow the 1999 version of the Institute for Archaeologists Standard for Archaeological Desk-based Assessment. This standard has recently been revised and it is expected that assessment be in accordance the version adopted by the Institute in 2012.

It should be noted that it may become apparent that further investigation including archaeological evaluation could be required to be undertaken prior to the determination of the application if significant archaeological features are identified during the compilation of the desk-based study.

Pollution Prevention:

We welcome the proposal to carry out a risk assessment for the accidental release of contaminants during construction and ongoing maintenance and to incorporate these into a Marine Pollution Contingency Plan (MPCP). However, the potential impact of the use of chemicals associated with the operation of the lagoon should also be addressed within the ES, for example any oils/lubricating agents or anti-fouling substances used on the turbines or surrounding infrastructure.

Navigation and Safety

We note that the proposed works lies partly within the Harbour Limits of the Port of Swansea and the Port of Neath Harbour Limits. The works also have the potential to affect commercial navigation around to the ports of Swansea, Neath and Port Talbot.

The ES should supply detail on the possible impact on navigational issues for both Commercial and Recreational craft including, Collision Risk, Navigational Safety, Visual intrusion and noise, Risk Management and Emergency response, Marking and lighting of site and information to mariners, the risk to drifting craft in adverse weather or tidal conditions impact on fishing activity, impact on leisure users.

We note that a Navigational Risk Assessment (NRA) will need to be submitted in accordance with MCA guidance document MGN 371 Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response Issues. Guidance on UK Navigational Practice, Safety and Emergency Response Issues.

We also advise that the NRA is submitted in accordance to the MCA guidance document MGN 372 and the DTI/DfT/MCA Methodology for Assessing Wind farms, of particular concern will be potential impact on leading marks for both Swansea and Neath.

The proposed shipping and navigation study should include radar and manual observations in addition to AIS data to ensure vessels of less than 300gt are captured.

The assessment of the effect on the offshore human environment should also include recreational and other sport activities.

Particular consideration within the ES will need to be given to the implications of the site size and location on SAR resources and Emergency Response & Co-operation Plans (ERCOP).

Neath Port Authority have presented concerns over the long term possibility of drifting sand accumulating against the outside of the structure, plus the impact it would similarly have on altering the pattern of sand movements on the adjoining Crymlyn Burrows beach. Both these situations represent a potential serious future hazard for the safe navigation of vessels. Without prejudice to the outcome of any marine licence application made, you should be aware that if the project proceeds, we understand that the Port will be seeking written guarantees that should these sand movements present a future problem for the Port, the lagoon owners will be responsible for the rectification of the problem in perpetuity.

The effect of the structure on the wave patterns along the entrance to the existing docks. This is particularly important for smaller craft using Swansea Marina and potentially the new Prince of Wales Dock Marina. Traditionally the entrance to the River Tawe estuary has been well protected and is well aligned for running into the harbour in bad weather conditions. Given the proposed height of the lagoon walls the wave patterns outside could become difficult for smaller craft entering during bad weather. This could have a negative impact in socio-economic terms for the marina operators and this should be assessed within the EIA.

The ES should also include details of the design capacity for repairs and maintenance should the lagoon be damaged by passing shipping.

Waste Management

We note from the scoping report that waste management has not been taken into consideration. For a development of this scale a waste management plan for the control, management, storage and disposal of demolition waste / excavated material should be undertaken to support the proposals this should also include any details of pollution prevention controls to be implemented. This should be included within the ES. We advise that the waste hierarchy in a priority of prevention, re-use, recycling before considering other recovery or disposal options.

We advise that excavated material arising from site remediation or land development works can sometimes be classified as a waste. Further guidance on how waste is classified and best practice for its handling, transport, treatment and disposal can be found on the following link: <http://www.environment-agency.gov.uk/business/topics/waste/default.aspx>

If any controlled waste is to be removed off site, then the site operator must ensure that a registered waste carrier is used to convey the material off site to a suitable permitted facility. In addition, the Environmental Protection (Duty of Care) Regulations 1991 for dealing with waste materials are also applicable for any off-site movements of waste. The waste producer has a duty of care to ensure all materials removed go to an appropriate permitted facility and all relevant documentation completed and kept in line with the regulation.

Seascape, Landscape and Visual Assessment

We note that a draft Zone of Visual Influence has been undertaken by the City and County of Swansea Local Authority; as such the City and County of Swansea would welcome the opportunity to assist in the final determination of the zone of visual influence, viewpoints and landscape character areas. Tourism and the waterfront areas of Swansea and Gower are of vital importance to the economy and regeneration objectives of the City and region. The topography of the County is such that there will be significant elevated views of the proposal.

There will also be elevated viewing locations from within Neath Port Talbot and key viewpoints from the east. Therefore we advise that you also discuss with Neath Port Talbot County Borough Council in identifying the zone of visual influence, the visual receptors and key viewpoints from within its administrative boundaries.

In terms of the overview of the existing situation as established in 4.14.1.1 the Gower Heritage Coast should be added the list of areas designated for landscape.

We support the use of Landmap to aid the assessment of landscape as discussed in paragraph 4.14.1.5, however, we would expect to see all 5 layers within the study area mapped and assessed within the ES, not just the visual and sensory.

With regards to the list presented in paragraph 4.14.1.7 a number of additions should be presented in the ES. Within sub point iii) The Wales Coastal Path, scenic, high level/long distance walking routes should be assessed and within point vii) not only the navigational lighting needs consideration: the proposal should assess any other light effects that are likely to form part of the development e.g. the scheme will include buildings at various locations and scales.

We are broadly in agreement with the assessment methodology outlined in section 4.14., but must emphasise the need for the assessment to fully incorporate, and be cognisant of, the theory and practice of the following key best practice guidance as listed below:

1. Guidelines for Landscape and Visual Impact Assessment, LI and IEMA, 2002 2nd ed. (3rd edition due in March 2013).

2. LANDMAP Information Guidance Note 3, CCW, May 2010 - although this guidance was developed with wind energy in particular in mind the principles are directly transferable. It is essential that applicants use the 2012 version of LANDMAP. There is now full coverage of Wales apart from some built up areas of Swansea and Cardiff. It will be expected that all five layers are utilised for any landscape character studies. The five GIS datasets can be accessed from CCW's website <http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/gis-download--welcome/gis-boundary-downloads.aspx>

To understand the background etc the applicant should read the relevant method document <http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/landmap/landmapmethodolgy.aspx>

3. Guide to best practice in seascape assessment, Countryside Council for Wales [CCW], Brady Shipman and Martin, University College Dublin, 2001.

4. Guidance on the assessment of the impact of offshore wind farms: seascape and visual impact, DTI, 2005

5. Visual Representation of Windfarms Good Practice Guidance, 2006, SNH - for guidance on production of visualisations.

6. Visualisation standards for wind energy developments, Highland Council, January 2010 - more up to date advice on visualisations developed to try and ensure that photomontages etc and panoramas actually represent the situation on the ground

7. Photography and photomontage in landscape and visual impact assessment, Landscape Institute advice note 01/11.

You should also be aware that the context to the development is the European Landscape Convention [2000], ratified in UK 2006 which provides us with our definition of landscapes and that all landscapes matter. Attached (in Annex 4 of this response) is a draft guidance note produced by CCW and submitted to Natural England for inclusion in the (as yet unpublished) updated methodology for Landscape Character Assessment, which should be considered.

There are also number of additions or alterations to section 4.14.4.2 what should be addressed within the EIA:

4.14.2.10 d) should read 'data on Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales'.

4.14.2.13 please add 'landscape' after 'seascape'.

4.14.2.15 please includes 'Landscape' in section– and subsection title.

a) The Seascape, landscape and visual assessment (SLVIA) should be approached in the same manner as any other landscape character assessment – that is - as a rigorous characterisation exercise using all five layers of LANDMAP as its basis within the study area and incorporating the seascape data.

b) Please add 'including at night' to this bullet

h) Please add '*including the All Wales Coastal path*' to this bullet

j) Please clarify within the ES what is meant by "*character areas will be based upon an analysis of LANDMAP aspect areas using all 5 layers*".

Table 4.8 – add landscape to Seascape assessment in the title.

We advise you contact CCW (NRW after 1st April 2013) with regards to the inclusion of viewpoints to characterise the significance of dark skies to the locality to those proposed in paragraph and an expansion of the total number of viewpoints to be assessed.

We would welcome clarification as to how Cultural Heritage will be dealt with within the ES. It is important that there is adequate cross referencing between the SLVIA chapters and the Cultural Heritage and Archaeology. Coastal character (landscape and seascape) is influenced by a variety of natural processes and human interactions over time, as are human perceptions and values held towards the place. An understanding of character is therefore required that recognises the dynamic processes and time depth that influences the character. The effects on character should therefore draw on the results of the changing coastal processes, cultural heritage / historic seascapes and activities parts of the EIA.

Cumulative Impacts

We support the inclusion of a list of cumulative impacts within the ES as outlined in table 3.4. However, this may not be an exhaustive list of currently proposed local development.

The cumulative assessment must also, for example, take into account:

- Any dredge disposal sites located within the zone of influence of the potential scheme
- Any on-shore wind turbine applications within the zone of influence of the current scheme, for example there are currently wind turbine applications registered in the planning system for Swansea Docks, Port Talbot Docks and above Margam.
- Swansea Barrage and Cardiff Barrage
- Construction of the Southern Access Road to Coed Darcy Urban Village, crossing nearby Crymlyn Bog. This, we advise, should be discussed with Neath Port Talbot Local Authority, if relevant to time schedules and transport impact assessments.

We strongly advise that you contact the local planning authorities to ensure all relevant projects are included in the cumulative assessment.

Mitigation and Monitoring

The ES should detail any mitigation and monitoring as much as possible. We advise that you enter into discussion with organisations such as CEFAS, EAW, CCW (NRW from 1st April 2013), RSPB and relevant local authorities with regards to any proposed mitigation and monitoring programme.

Any proposed post consent and post construction monitoring scheme should be fully outlined within the ES. A clear and reasoned justification for each component of any monitoring programme of direct, indirect, local and far reaching affects of the proposed scheme must be included within the ES. This should also include the specific objective of each element of the monitoring programme, identification of suitable reference sites within and outside the water body, a clear description of methodology and consideration of statistical tests to be applied to the data. Frequencies of survey, seasonal and annual variation and replicates per site need to be considered for the entire monitoring programme.

There may be opportunities for habitat creation but any suggestions must look also at where these will be. It is not necessarily mitigation if one habitat is substituted for another.

Other issues for consideration:

- Tenure of the seabed - We note that the landowner of the sea bed out to 12 nm within this area is the Crown Estate. We advise you contact The Crown Estate regarding this issue.
- Terrestrial Noise - The proposed content of the noise impact assessment as outlined in section 4.16 appears to be satisfactory. We advise that you contact the relevant local authorities to assist in the identification of noise receptors and the potential impacts on existing sensitive neighbouring uses from the proposed development and existing noise impacts from neighbouring uses and sites with planning permission.
- Highways and Transport - in terms of the onshore transport assessment, we note from paragraph 4.17.2.1 that the ES will rely on the existing baseline data from the City and County of Swansea. It is considered likely that traffic will be generated from the east during and post construction and, as such, baseline data should also be ascertained from Neath Port Talbot County Borough Council, with a view to assessing the likely traffic impact of the development on its infrastructure during construction and operation in addition to that of the City and County of Swansea.

A construction method statement together with a route (or routes) for construction traffic should also be considered, together with a parking strategy and public transport provision and links during the operation phase of development should be provided within the ES.

In terms of construction / waste management, full details of pollution prevention controls to be implemented at all stages of development and details of waste materials used on site / imported etc. should be provided and assessed.

- Air Quality - An air quality assessment, including details of NO_x levels during construction, should be included in the ES. Potential receptors are residential properties within the vicinity of the site together with water resources and local ecology. The ES should take into account consented schemes in the vicinity, not least the University Campus. The impact of the development and transportation on local air quality in relation to Crymlyn Bog SAC and Crymlyn Burrows SSSI also needs further consideration.

You should be mindful of the presence of the Air Quality Management Areas (AQMA) at Margam and Hafod and should any impacts be identified these should be fully assessed with the EIA. We advise you contact the relevant Local Authorities regarding this issue.

- Terrestrial Ecology - We fully support the requirement to undertake an extended phase 1 habitat survey as proposed in section 4.13, including protected species. However, in addition to this, Section 42 species and local and UK BAP species should also be identified and addressed within the ES.

We note that the terrestrial development will take place upon Brownfield sites. It should be recognised that Brownfield sites may also qualify as a BAP habitat, as assessed under the criteria for "Open Mosaic Habitat on previously developed land" The ES should identify habitats which have been identified as being the quality to be "Open Mosaic Habitat" and appropriate mitigation, enhancement and if necessary compensatory measures identified.

Brownfield areas regularly support breeding birds such as Lapwing, Ringed Plover, Wheatear and Little Ringed Plover therefore breeding surveys should be undertaken for any terrestrial land take/impacts.

Furthermore, the potential for impacts on Baglan Burrows should also be assessed as part of the EIA. Further information on the biodiversity interest of this area can be obtained from the Neath Port Talbot Local Authority Ecologist.

With regards to paragraph 4.13.2.2 we support the proposed desk based assessment and walkover survey and advise this be discussed and agreed beforehand with the City of Swansea Local Authority Planning Ecologist, for example for advice as to whether the survey may also need to include ground nesting birds.

The indicative cable route as presented will impact upon numerous BAP habitats/ habitats that would meet Site of Importance for Nature Conservation (SINC) criteria and areas that support BAP/S42 or uncommon species. It should be noted that the Fabian Way road verge is managed as a 'conservation verge' and supports significant botanical interest and the brownfield sites close to the National Grid sub-station in the Baglan Energy Park also support rare or uncommon botanical species. In addition, many brownfield sites in the area support bird species such as Lapwing and Ringed Plover. Therefore, for some locations along the proposed route, once confirmed, more detailed survey should be undertaken, particularly in relation to plants and birds to inform the ES. You are also advised that Dr Charles Hipkin of Swansea University be contacted for botanical records.

A terrestrial non-native species and biosecurity management plan should be included within the EIA.

Terrestrial Contamination - there is little information on the land areas that are to be used for ancillary purposes, for example the control/maintenance buildings and associated pipeline and electricity cables however, the scoping report indicates that Brownfield land within Swansea Docks will be utilised. Land affected by contamination should be a key consideration of the EIA, as outlined in Chapter 13 of Planning Policy Wales – Minimising and Managing Environmental Risks and Pollution, within Planning Policy for Wales. Chapter 13.7.1 states:

"Planning decisions need to take into account:

- the potential hazard that contamination presents to the development itself, its occupants and the local environment; and
- the results of a specialist investigation and assessment by the developer to determine the contamination of ground and to identify any remedial measures required to deal with any contamination"

A preliminary risk assessment should be provided for all land areas to be utilised within the application boundary. The breadth of information required can be found on the Environment Agency's Guiding Principles on Land Contamination, which is available from <https://publications.environment-agency.gov.uk/pdf/GEHO1109BRGY-e-e.pdf>.

- Economy, Tourism and Recreation – consideration of any longer term changes as a result of changes in coastal processes and the effect this may have on the "character" uses of areas and as such the effects on economy, tourism and recreation must be fully assessed within the ES.
- Grid connection –the location of the grid connection and proposed cable route should be outlined within the ES.
- Planning Policy and Context – we note the contents of section 4.5, however we advise that the list of policies relating to renewable energy to be reviewed in the ES should be amended as follows:

- The Planning Policy Wales document referred to in d) should be: Edition 5 Nov 2012
 - Please include TAN12 Design (2009).
 - As the proposed development will be located entirely in Wales, we suggest references to Planning Policy Guidance Notes 20, 22 and 25 are removed. Also, please be advised that PPG notes 20 and 22 have been superseded in England by the National Planning Policy Framework (2012).
 - Delete (n) Regional Planning Guidance, South West Wales Strategic Planning Group (April 2000).
 - Add to (o) 'and any relevant supplementary guidance'.
 - we would advise that the Shoreline Management Plan under point q) has been updated and we refer you to the 2011 document.
 - Please add 'Interim Marine Aggregates Dredging Policy', Welsh Government (Nov 2004) to the list of policies and plans to be reviewed in this chapter of the ES.
- Additional Permits or permissions required - It should be noted that the following permits may be required. However, this list is not exhaustive and purely to be aware of.

Under the terms of the Water Resources Act 1991, an Impounding Licence may be required for the impounding of any watercourse, ditch or stream (e.g. by dam, weir etc.). This should be considered if the developer intends to alter or divert any existing watercourses during the construction phases. The developer should also be aware that they may need to apply for a licence if they intend to alter any existing impoundments.

Under the terms of the Water Resources Act 1991 an Abstraction Licence may be required for the abstraction of water from any inland water or underground strata. The developer should consider this if water is needed to be abstracted for any purpose, such as use in concrete manufacture, or for dust suppression. Abstractions for dewatering purposes are currently exempt from an Abstraction Licence; however, this exemption is likely to be removed in the near future.

Under the Water Resources Act 1991 and Regional Byelaws a Flood Defence Consent will be required for any works in, under, over or 7 metres of a main river. You may wish to contact the Environment Agency (NRW from 1st April 2013) with regards to this.

We advise you contact the Environment Agency in order to discuss which/if any Environmental Permitting (England and Wales) Regulations 2010 may be required for the proposed development.

If any waste is to be used on site, the developer will be required to obtain the appropriate waste exemption or environmental permit from the Environment Agency (or as of 1 April 2013, Natural Resources Wales).

Permissions of Section 28G authorities will also be required in respect of Crymlyn Burrows Special Site of Scientific Interest (SSSI). Consequently duties arising under Section 28I of the Wildlife & Countryside Act 1981 (as amended; most recently by the Countryside & Rights of Way Act 2000) will also apply.

Please also consider Schedule 3 of the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) which sets out information to be included in an Environmental Statement.

ANNEX 2

Additional general guidance provided by the Countryside Council for Wales (CCW) that you may wish to consider.

The comments below outline key matters that CCW consider will need to be taken into consideration as part of an Environmental Impact Assessment (EIA) and included in the report submitted alongside an marine renewable energy application.

1. SCOPING FOR AN ASSESSMENT OF ENVIRONMENTAL IMPACTS

The Environmental Impact Assessment (EIA) should include sufficient information to enable the planning authority to determine the extent of any environmental impacts arising from the proposed scheme on ecological and landscape interests and the public's access to the countryside.

Evaluation of the impacts of the scheme should include: direct and indirect; secondary; cumulative; short medium and long term; permanent and temporary; positive and negative, and construction (including impacts of construction site access) operation and decommissioning phase impacts on the nature conservation resource, landscape and public access.

Key concerns for CCW are potential impacts on mammals, birds, seascapes and sensitive habitats, and, although it is not necessary to address these issues in full at the scoping stage, it is helpful to explore some of these issues in some detail. For example, the report should outline how potential activities associated with the development (e.g. construction activities, increased presence and activity of construction/maintenance vessels, cable laying etc) may affect coastal processes, result in habitat loss or otherwise affect sensitive habitats and species. The report should also describe how these might be mitigated to avoid significant effects. Although it is often not possible to draw final conclusions about this issue, more detailed examination in the scoping report would provide a better basis for assessing the need for further work during the pre-application stage; particularly in relation to satisfying the requirements of consents (such as the Marine Act licence) that would also need to be obtained before submitting an application to the Planning Inspectorate (PINS).

2. GUIDANCE

Useful information relevant to tidal lagoon and other marine developments and activities is available, and we would recommend that the developer refers to these documents in conducting the EIA. In particular we would encourage reference to:

- Severn Tidal Power Feasibility Study Conclusions & Summary Report October (2010)
http://www.decc.gov.uk/en/content/cms/meeting_energy/wave_tidal/severn_tidal_power/severn_tidal_power.aspx

- The supporting assessments and technical Severn Tidal Power Feasibility Study documents
http://webarchive.nationalarchives.gov.uk/20110523172013/http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/severn_tidal_power/severn_tidal_power.aspx

A broad range of information specific to offshore renewable energy developments has also been drawn together by the Offshore Energy Strategic Environmental Assessment and this will be supplemented by the Offshore Energy SEA2. <http://www.offshore-sea.org.uk/site/index.php>

For landfall of export cables and grid connection along the Welsh coastline, and other potential terrestrial impacts of the proposed development, the following policy guidance and documents would need to be taken into consideration:

- Welsh Assembly Government (March 2002). *Planning Policy Wales*. Welsh Assembly Government, Cardiff.

- Welsh Assembly Government (September 2009). *Technical Advice Note 5 - Nature Conservation and Planning*. National Assembly for Wales, Cardiff.
- Welsh Office Circular 11/99: *Environmental Impact Assessment (EIA)*.
- Welsh Assembly Government (2005). *Technical Advice Note 8 – Planning for Renewable Energy*. Welsh Assembly Government, Cardiff.
- Welsh Assembly Government (1998). *Technical Advice Note 14 – Coastal Planning*. Welsh Assembly Government, Cardiff.
- Welsh Assembly Government (2005). *Ministerial Interim Planning Policy Statement 01/2005 Planning for Renewable Energy*. Welsh Assembly Government, Cardiff.

A range of guidance on consenting and assessment process exists. Some important sources of guidance have been highlighted below but project proposers may need to refer to additional guidance depending on the development that is under consideration.

- PINS Guidance & Advice
<http://infrastructure.planningportal.gov.uk/legislation-and-advice/>
- MMO/Welsh Government Guidance & Advice on Marine Licence process
<http://www.marinemanagement.org.uk/licensing/marine.htm>
<http://wales.gov.uk/topics/environmentcountryside/consmanagement/marinefisheries/licencing/marinellicence/?lang=en>
- CCW Guidance on EIA and Habitats Regulations procedures
<http://www.ccw.gov.uk/landscape--wildlife/managing-land-and-sea/environmentalassessment.aspx>
- Judd, A. (2012). Guidelines for data acquisition to support marine environmental assessments for offshore renewable energy projects.
<http://www.marinemanagement.org.uk/licensing/groups/documents/orelg/e5403.pdf>
- IEEM (2010) *Guidelines for Ecological Impact Assessment in Britain and Ireland: Marine and Coastal*; [http://www.ieem.net/docs/Final EcIA Marine 5 Aug 2010.pdf](http://www.ieem.net/docs/Final_EcIA_Marine_5_Aug_2010.pdf)
- Briggs, JHW and White, S (2009) *Welsh seascapes and their sensitivity to offshore developments*. CCW Policy Research Report no. 08/5.

3. DESCRIPTION OF THE PROJECT

The entire scheme should be described in detail. This description should cover construction, operation and decommissioning phases and include detailed, scaled maps and drawings as appropriate.

We would expect the description to include:

- The purpose and physical characteristics of the proposal
- Location, development size and configuration of the development including flexibility of the site layout and details of the connection to the National Grid
- Structures and foundations to be used, the location and size of offshore platforms, the number, location and route of subsea cables, depth of cable burial, and details of scour protection and/or cable armouring to be used
- Spatial 'footprint' and other physical features of the project
- Procedures for good working practices
- Resource use, including waste, minerals and energy
- Identification of appropriate pollution contingency and emergency measures
- Timing of all works and contingency plans, should slippage in the programme occur;

- Details of noise levels from all relevant activities involved in the construction, maintenance and decommissioning of the project
- Details of construction works including methodology, location and extent of construction sites construction access/working corridors and stock piling sites
- Quantity and content of any discharges from the development site
- Details of the disposal of any surplus dredged material e.g. material displaced from laying turbine foundations or cable trenching and burial
- Maintenance requirements of structures
- Maintenance of any habitats within the development site
- Identification of appropriate contingency plans for any emergency incidents on the site.

CCW recommend that the decommissioning phase is also included within the scope of the EIA, so far as this might be practical, since when structures pass their operational life it would be expected that they will be removed from the site and recycled or disposed of in an environmentally sound manner.

Ancillary development

Offshore renewables projects bring with them their own related developments, often referred to as ancillary development. These may be constructed and operated by a different developer and could be assessed as a separate project, but are inextricably linked to the original project. The cumulative impacts of the project and ancillary development could potentially be significant. Failure to consider ancillary development would risk underestimation of the environmental impacts of the project.

Information on ancillary development associated with the project, which may be controlled by another developer, should therefore be obtained where possible at the scoping stage. This information will enable potential indirect and cumulative impacts and impact interactions arising from that development to be considered as early as possible in the EIA. If insufficient information is available to allow an assessment, this should be reported in the Environmental Statement to ensure that it is considered as part of the decision-making process.

Illustrations within the Environmental Statement

We recommend that any maps, drawings and illustrations that are produced to describe the project should be designed such that they can be overlaid with maps, drawings and illustrations produced for other sections of the EIA such as biodiversity. For example, it is particularly important that deployment locations can be shown in relation to benthic habitat survey maps, to ensure that Annex 1 habitats and other benthic features of conservation concern are not impacted.

4. DESCRIPTION OF BIODIVERSITY

The EIA must include a description of all the biodiversity interests within and in the vicinity of the proposed development, together with an assessment of the significance of any likely impacts.

Consideration of potential far-field effects on natural resources and wildlife interests must also be made, and if relevant, the significance of any impacts assessed.

4.1 THE SITE AND ITS ENVIRONMENT

The assessment should include a description of the aspects of the environment likely to be affected by the development; including the flora, fauna, soil, water, air and the inter relationship between these. Of particular relevance to this scheme are:

Statutory Nature Conservation Sites

The EIA should consider the likely impacts on statutory nature conservation sites (SSSI, SPA, SAC, Ramsar sites) in the vicinity of the proposed development. Digital boundaries for statutory sites may be obtained from CCW's website (www.ccw.gov.uk).

European sites (SAC and SPA) and Ramsar sites.

Specific information about these sites including citations explaining the reasons for their notification, maps showing the extent of the notified site, and their conservation objectives is

available from CCW's website (www.ccw.gov.uk). These will be needed in order to consider and assess the impacts of the development, and provide the determining authority with the relevant information so that they may assess the proposals in accordance with the requirements of Regulation 61 of the Conservation of Habitats and Species Regulations 2010 (as amended, hereafter referred to as the 'Habitats Regulations').

General information about European sites and Ramsar sites is available on the Joint Nature Conservation Committee's (JNCC) website (www.jncc.gov.uk). Some details are also given regarding the notified features of sites, however it should be noted that this information may not be accurate and up to date and therefore we would advise reliance on the original legal documentation for the notification of such sites, which we can supply.

Sites of Special Scientific Interest (SSSI)

Full information about each SSSI including the following is available from CCW's website:

- Citation – which detail the reasons why the site has been notified;
- List of Potential Damaging Operations – listing the operations that could potentially damage the site;
- Map – showing the extent of the notified site;
- Site Management Statement – setting out the management required to maintain the notified features of the site; and
- Favourable condition status information about the site.

Full details should be provided of the likely impacts of the proposals on the notified features of these sites and their significance, along with comprehensive information about the measures that will be put in place to, in priority order:

- avoid damage to SSSIs;
- mitigate for any unavoidable damage to SSSIs; and
- compensate for any unavoidable SSSI damage that cannot be mitigated for.

Habitats Regulations Assessment

Proposed developments likely to significantly affect European sites (SAC, SPA), either alone or in combination with other plans or projects, require special consideration by the competent authority under Regulation 61 of the Habitats Regulations. As a matter of Government policy, the same applies to Ramsar sites. Competent authorities may only permit proposals where they will not adversely affect the integrity of European sites or Ramsar sites.

The process of assessing a development proposal for possible effects on European sites (and Ramsar sites) is known as Habitats Regulations Assessment (HRA) and it takes into account the conservation objectives of the site(s) concerned. It is an additional requirement to Environmental Impact Assessment; however, the information contained within the Environment Statement may be of relevance and be used in the HRA.

The HRA process is a two stage process, the first stage being a 'test of Likely Significant Effects' to establish whether the proposals are likely to result in significant effects on European sites or Ramsar sites.

If this establishes that significant effects are likely, or there is uncertainty whether significant effects are likely to result, then an appropriate assessment of the implications of the activity for the integrity of the site(s) is required.

CCW recommends that sufficient information is provided in support of an application for these proposals in respect of both the EIA and HRA processes. This should include all of the measures that will be implemented to prevent damage to the European sites and/or Ramsar sites in the vicinity of the proposed development. The potential far-field effects of any development on sites and their species and/or habitat features should be fully assessed by the EIA.

European Protected Species

Certain species listed in Annex IV(a) of the Habitats Directive and whose natural range includes any area in Great Britain are legally protected under the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations') and Offshore Marine Conservation (Natural Habitats &c) Regulations 2010 (Offshore Marine Regulations). The Regulations prohibit the deliberate capture, injury, killing or disturbance of any wild animal of a European Protected Species (EPS), which in UK waters consist of several species of cetaceans (whales, dolphins and porpoises), turtles, and Atlantic Sturgeon.

Developments likely to compromise the legal protection afforded these species will invariably require a licence from the Welsh Government to do so lawfully, subject to certain criteria being complied with. Further details about the legislation concerning European Protected Species and the relevant licensing provisions are provided in Annex 3 to this response.

If European Protected Species are likely to be affected by the proposed development, the Environmental Statement will need to include comprehensive details of all the mitigation that will be put in place to maintain the favourable conservation status of the population(s) concerned.

Nationally Protected Wildlife & Habitats

The Environmental Impact Assessment should consider the potential impacts of the proposals on wildlife, in particular those that are:

- Notified features of statutory nature conservation sites within or in the vicinity of the proposed development;
- Legally protected through the provisions and schedules of the Wildlife and Countryside Act 1981;
- Listed on relevant local Biodiversity Action Plan(s);
- Listed as priority species for Wales under Section 42 of the Natural Environment and Rural Communities Act 2006.

An assessment of the developments potential effect on wildlife should consider both direct (e.g. damage or disturbance) and indirect (affects on habitats or other resources such as food), should consider each of the three potential risks for each bird species that uses the site.

Section 42 / UK BAP

In addition to considering impacts on designated conservation sites and species groups of key concern, additional species and habitats listed under Section 42 of the Natural Environment and Rural Communities (NERC) Act (2006) are important for the conservation of biological diversity in Wales, and it is expected that these would also be considered within the EIA. Information about habitats and species listed under Section 42 of the NERC Act may be found on the Wales Biodiversity Partnership website (www.biodiversitywales.org.uk).

Impacts on Section 42 species and habitats are to be considered where they occur within and outside designated sites. Where they occur within a designated site, an assessment of impacts on Section 42 species or habitats needs to be separate from any assessments related to the designated site.

4.2 POTENTIAL MITIGATION AND ENHANCEMENT MEASURES

With respect to nature conservation interests that could be affected by the development, it is only possible at this stage to advise on general mitigation measures. We would welcome the opportunity to discuss this issue in greater detail during the development of the project. In order of priority, the scheme should seek to:

- avoid damage to interests within the area that will be affected by the proposed development;
- mitigate any damage that cannot be avoided; and
- compensate for any unavoidable damage that cannot be mitigated for.

The Environmental Statement should include a detailed description of all the measures that will be implemented to avoid, mitigate and if necessary, compensate for any significant adverse effects on the environment. These measures should be relevant and proportionate to the nature and scale of the likely adverse impacts. Such measures could, for instance, address the location, and timing of construction, methods of construction and modes of operation.

4.3 MONITORING AND SURVEILLANCE PRE-, DURING AND POST-CONSTRUCTION

Given the need to predict the likely impacts of the development to inform the ES the need for continued monitoring and assessment is likely to be important and should form a part of any proposal. We therefore recommend the EIA include details of a monitoring programme that allows confirmation or otherwise of the predictions made during the EIA.

Monitoring should also be linked to any necessary contingency plans and adaptive management. It may be necessary to amend construction procedures if the monitoring programmes identify adverse impacts linked to construction or post-construction activities and CCW would wish to be consulted on the development of these plans.

5. DESCRIPTION OF THE SEASCAPE AND VISUAL IMPACTS

The EIA must include a description of all the existing landscape and seascape interests within the vicinity of the proposed development. These should include protected landscapes, historic landscapes, and assessments of the seascape character potentially impacted by the development.

In conducting the Landscape, Seascape and Visual Impact Assessment (LSVIA), we would recommend the developer refer to the recent CCW policy research report on seascapes in Wales and their sensitivity to offshore developments in Wales

. We would also encourage the developers to consult with ourselves and other consultees and stakeholders to consider, and if necessary resolve, landscape and seascape issues associated with the development.

We would recommend that both wireframes and photomontages are produced for each viewpoint used in the LSVIA. The views in photographs and photomontages taken to assist with this process should be representative of that observed from each viewpoint and not partially obscured by structures such as buildings, pylons, telegraph poles etc. It would be helpful to have a second set of photos/photomontages included in the ES that superimpose the turbines from this development, and any other developments with a visual impact that already exist or are presently in consideration in the planning process.

CCW Policy Research Report No. 08/5 *Welsh seascapes and their sensitivity to offshore developments*. Briggs, J.H.W. & White, S. (2009). Available at:

<http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/seascapes/seascapeassessment-of-wales.aspx>

6. CUMULATIVE AND IN-COMBINATION EFFECTS

In assessing the potential impacts of the proposed development on ecological and landscape interests, the EIA should consider the potential cumulative and in-combination impacts of this development along with:

- Other marine renewable energy developments in the area that already exist or have planning permission; and
- Proposals for other marine renewable energy developments in the area that are in the public domain and reasonably foreseeable.

Consideration should also be given to other activities and types of developments (whether planned/consented/under construction/operational) that have potential to interact with the proposed development, and should not be limited to other renewable energy developments. It should be noted that it is not only 'major' projects that may have significant impacts on the environment, and interaction between two or more activities/developments can have a multiplicative impact effect.

7. WIDER ISSUES

Period between planning permission and commencement of construction works

Where significant time elapses between the granting of planning permission and the commencement of construction works, we would recommend that appropriate ecological field surveys are undertaken during this period to repeat to update the environmental baseline and

prediction of impacts. We recommend that this aspect is covered in the Environmental Statement for the proposals.

Deviation from policy

If the proposed development will deviate from national and/or local policy, full justification should be provided for this deviation in the Environmental Statement.

ANNEX 3

Guidance provided by CCW with regards to European Protected Species that you may wish to consider.

In UK waters, European Protected Species are:

- Cetaceans (whales, dolphins and porpoises)
- Turtles
- Atlantic Sturgeon (*Acipenser sturio*)

All European Protected Species and the places they use to rest and breed are legally protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations). The Habitats Regulations transpose the requirements of the Habitats Directive (Council Directive 92/43/EEC) into UK law, and the Offshore Marine Conservation (Natural Habitats &c) Regulations 2010 (Offshore Marine Regulations) extend this protection into offshore waters.

Under Regulation 41 of the Habitats Regulations: -

A person commits an offence if he or she:

- a) deliberately captures, injures or kills any wild animal of a European protected species;
- b) deliberately disturbs animals of any such species;
- c) deliberately takes or destroys the eggs of such an animal; or
- d) damages or destroys a breeding site or resting place of such an animal.

Disturbance of animals includes in particular any disturbance which is likely:

- a) To impair their ability
 - (i) to survive, breed or reproduce, or to rear or nurture their young, or,
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate;
- or
- b) to significantly affect the local distribution or abundance of the species to which they belong.

Under S.9(4)(b) and (c) the Wildlife and Countryside Act 1981 (as amended):-

A person commits an offence if he/she intentionally or recklessly

- disturbs any such animal while it is occupying a structure or place which it uses for shelter or protection; or
- obstructs access to any such structure or place.

Where the legal protection afforded European protected species under the Habitats Regulations is likely to be compromised by a proposed development, the development may only proceed under a licence issued by the Welsh Government (WG). Under Regulation 53(2) of the Habitats Regulations, WG may issue licences for the purposes of:

‘preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature, and beneficial consequences of primary importance for the environment.’

Furthermore, a licence can only be issued by WG if the following two conditions are also met:

- That there is ‘no satisfactory alternative’ (Regulation 53(9)(a)), and that
- ‘the development will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range’ (Regulation 53(9)(b)).

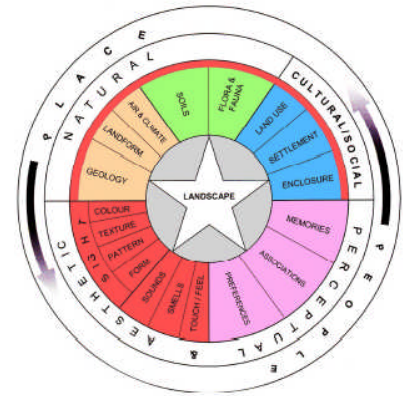
In addition, Regulation 9(5) of the Habitats Regulations confirms that all competent authorities, in exercising any of their functions, must have regard to the provisions of the Habitats Directive so far they may be affected by the exercise of those functions.

ANNEX 4

Draft Guidance note produced by CCW and submitted to natural England for inclusion in the (as yet unpublished) updated methodology for landscape character assessment. LANDMAP (Wales)

LANDMAP is the formally adopted approach for landscape assessments in Wales and is advocated by the Welsh Assembly Government. It is a complete, all-Wales GIS-based landscape information resource where characteristics, qualities and influences on the landscape are recorded as 5 themed spatial layers as follows:

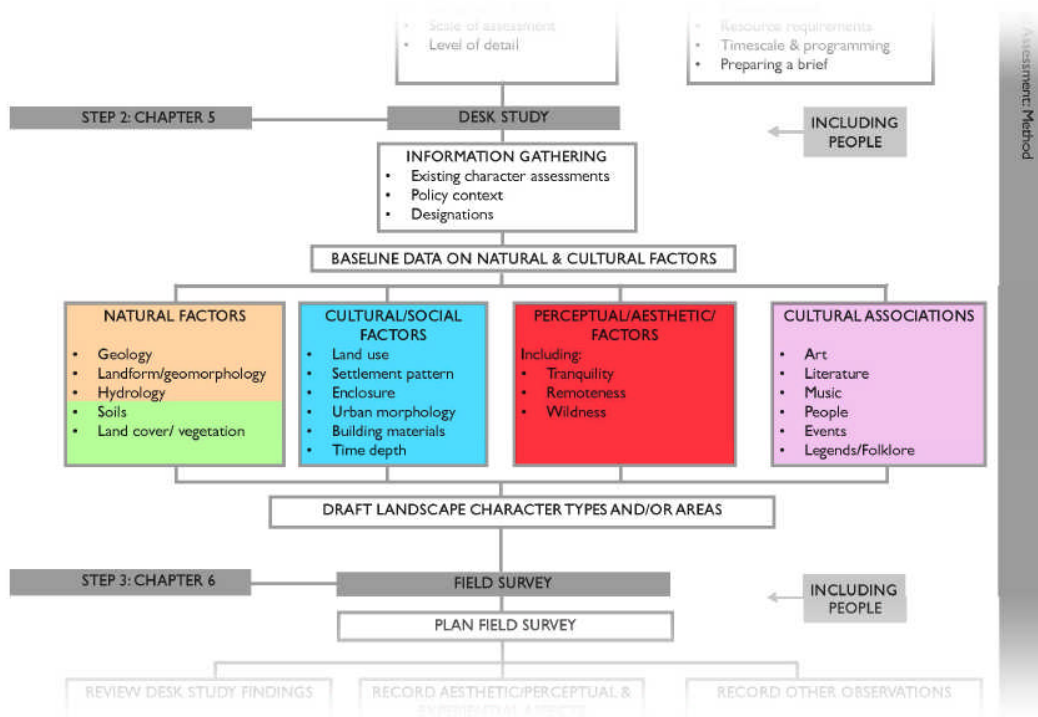
1. Geological Landscape
2. Landscape Habitats
3. Historic Landscape
4. Visual & Sensory
5. Cultural Landscape.



From the unique perspective of each layer:

- Geographically discrete areas are identified and mapped by their landscape qualities and characteristics.
- Accompanying survey records document those qualities and characteristics in addition to management recommendations and criteria-based evaluations.

Though some terminology differs to LCA, the colour-coded LCA wheel and flow diagrams here show how the LANDMAP layers relate to LCA and therefore where they feed information into the sequential LCA process.



Right: for each geographically distinct area the aspect survey records collectively provide several pages of description, classification, management and evaluation information.

Project and Summary	
Project Name	Landscaping
Location	
Project Description	Located at 1740 (Site Located at) (Project Name) (Project Number) (Project Address) (Project City) (Project State) (Project Zip) (Project Phone) (Project Email) (Project Website) (Project Notes)
Project Status	(Project Status) (Project Date) (Project Time) (Project Location) (Project Address) (Project City) (Project State) (Project Zip) (Project Phone) (Project Email) (Project Website) (Project Notes)
Project Details	(Project Details) (Project Date) (Project Time) (Project Location) (Project Address) (Project City) (Project State) (Project Zip) (Project Phone) (Project Email) (Project Website) (Project Notes)
Project Summary	(Project Summary) (Project Date) (Project Time) (Project Location) (Project Address) (Project City) (Project State) (Project Zip) (Project Phone) (Project Email) (Project Website) (Project Notes)

The LANDMAP website hosts information on the LANDMAP methodology, provides access to all quality assured LANDMAP Information either through the interactive on-line GIS or as a download of GIS maps and surveys for use on your pc. LANDMAP guidance notes and newsletters are also available. Visit <http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/landmap.aspx>

Some planning authorities have produced landscape character areas based upon the five LANDMAP layers. This offers the dual advantage of being able to look at the character areas in conjunction with finer scale LANDMAP baseline data underneath as this often helps to reveal the patterns of characteristics, qualities and influences that underlie their recognition.

Wrexham County Borough Council has used LANDMAP information in the creation of its landscape character areas:

[illegible]

ANNEX 5

Additional comments provided by the Neath Estuary Group that you may wish to consider that have not been included in our scoping opinion.

The Neath Estuary Group queries the assertion that this is an 'offshore generating station'. Whilst it is not clear whether or not the legislation defines 'offshore', in technical, coastal process and practical terms this development cannot be defined as offshore. The works are shore connected and are located in the inter-tidal zone. In relation to the fundamental method of energy generation, it would be inefficient to invest in any works that would not be subject to tidal variation or works significantly below Lowest Astronomical Tide level. Clarification is therefore requested in respect of the approval, consents and administrative process for the overall and specific elements of the scheme.

The impounding breakwater or seawall will be 9.5km long and the turbines will be set at the deepest point along the wall which is stated as being 5-7m below Lowest Astronomical tide level which would equate to a level of minus 10m-12m AOD. This would result in a construction height of between 17.5m and 19.5m. It is assumed that the environmental benefits would be assessed and balanced against the environmental cost of construction. The following crude assessment has been undertaken in order to get an overview of the project scale and cost.

The cross sectional area at the deepest part of the bund would be approx. 1,000m². The armouring is very difficult to assess but is likely to be approx. 300m². As there is insufficient time to undertake detailed calculations based upon survey data, the above figures have been applied to just above 70% of the total length (disregarding 30% of the construction length to allow for construction height variation). It should be noted that the core fill may be excavated from within the basin and the proximity of excavation to the inside toe of bund construction will be important. The core fill volume could be around 5million cubic metres and the defence armouring around 2million cubic metres. The sources of both will probably be critical to the environmental and cost effectiveness of the project. It should be noted that the majority of the primary armouring will not be available from Welsh quarries. It is more likely that armouring over a significant proportion of the works would be concrete, which could be produced with materials from local quarries but there may be high environmental costs that would need to be taken into account. The financial cost of this option would also be substantially increased compared to natural armour stone.

It is noted that it is intended to use sand from within the basin to form the core of the bund. This will be a challenging and risky engineering project but feasible at a price. It is assumed that a geotechnical investigation will confirm the availability of sand fill.

If core and armour stone was available locally, then the cost for the construction of the defence bund could be in the region of 300million. However, importing material from overseas and/or using concrete armouring would increase this figure. It is therefore important to scrutinize the proposal in more detail at an early stage and it is considered that detail should be provided of the assessment of the quantities, sources and indicative costs of the various types of materials to be used in construction.

Whilst the cost of the development is not necessarily an issue for the ES, the source of material, its transportation and its sustainability credentials are matters for consideration.