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## Morlais Project

# Document MOR/RHDHV/DOC/0070: Statement of Common Ground – NRW – Marine Mammals

Applicant: Menter Môn Morlais Limited

Document Reference: PB5034-ES-SoCG-MM

Document MOR/RHDHV/DOC/0070: Statement of Common Ground – NRW  
– Marine Mammals

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Morlais Document No.:  
MOR/RHDHV/DOC/0070

Status:  
Live

Version No:  
D1.1

Date:  
July 2019

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<b>Revision History</b>			
<b>Date</b>	<b>Rev.</b>	<b>Summary of Changes</b>	<b>Issue Purpose</b>
24/05/19	0.1	First draft for review by Menter Môn	For comment
12/06/19	0.2	Draft for approval by Natural Resources Wales	For approval
22/07/19	1.0	Second draft for review by Menter Môn	For comment
30/07/19	1.1	Second draft for approval by Menter Môn	For approval



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## **1. INTRODUCTION**

### **1.1. THE PROJECT**

1. The Project is being developed by Menter Môn, the applicant, a not for profit social enterprise company. When consented, the Project will have a generating capacity of up to 240 MW of tidal generating capacity.
2. The Project is located within one of several marine energy demonstration zones located around the United Kingdom (UK) coast, which have been leased out by The Crown Estate in a bid to encourage and accelerate the marine energy industry. The Project is located within the West Anglesey Demonstration Zone (WADZ), a zone primarily selected for its tidal resource. Menter Môn has been appointed as the manager of the WADZ by The Crown Estate. In this ES, the WADZ is referred to as the Morlais Demonstration Zone (MDZ).
3. The development of the Project will provide a consented tidal technology demonstration zone, specifically designed for the installation and commercial demonstration of multiple arrays of tidal energy devices. The Project will include permanent communal infrastructure for tidal technology developers which provides a shared route to a local grid connection via nine export cable tails, an onshore landfall substation, and an onshore electrical cable route to a grid connection via a grid connection substation.
4. The Project will be authorised via the following principal consents:
  - A Transport and Works Act Order under the Transport and Works Act 1992; and
  - A Marine Licence under the Marine and Coastal Access Act 2009 (MCAA).

### **1.2. THE DEVELOPER**

5. Development of the MDZ is being led by Menter Môn who have been allocated funding from European Union (EU) Structural Funds prioritised for marine energy in Wales. Menter Môn is a not for profit, third sector social enterprise, delivering socioeconomic development projects across North Wales. Menter Môn's motivation for the Project is to position itself as a community organisation at the centre of renewable innovation, and to establish Anglesey as a marine energy hub, thereby securing maximum added value for the local economy and community.

### **1.3. THE NEED FOR THE PROJECT**

6. Tidal energy is a clean, renewable and highly predictable source of energy. The EU has identified tidal energy, and more widely ocean energy (tidal and wave combined), as having the potential to contribute significantly to climate change reduction, socio-economic and energy security objectives. The Project would present a significant proportion of the Welsh carbon budgets.
7. In allowing long-term commercial demonstration of different technologies and small arrays of tidal devices, the Project is an important step in developing the tidal energy industry within the UK and internationally, with significant potential socio-economic benefits as well as contributing towards the reduction of greenhouse gas emissions and greater security of energy supply.

8. Development of the Project will support those objectives of the 2017 Anglesey and Gwynedd Joint Local Development Plan, aimed at promoting the development of renewable or low carbon energy technologies (Isle of Anglesey County Council and Gwynedd Council, 2017). The Project will prioritise maximising opportunities for local communities directly via employment and indirectly via the establishment of a local supply chain.

#### **1.4. ROLE OF POLICY AND LEGISLATION IN THE DECISION MAKING PROCESS**

9. The ES identifies the key National and European legislative and policy drivers and commitments in areas of climate change and renewable energy which are relevant to the Project. Each technical topic within the ES outlines how the development of the Project will comply with the requirements of national legislation and policy, local plans and technical guidance.
10. The ES provides consideration of the key legislation, including the Well Being of Future Generations (Wales) Act 2015, which promotes improvement of the social, economic, environmental and cultural well-being of Wales. The developers of the Project also have a desire to increase and diversify employment and economic development opportunities across the communities. The Project will have no significant negative impact on health and wellbeing and is expected to have a minor beneficial impact to a number of receptors.
11. National Policy Statements (NPS) are produced by Government and comprise the Government's objectives for the development of projects in a particular sector. Those relevant to the Project give reasons for the policy set out in the statement and include an explanation of how the policy takes account of Government policy relating to the mitigation of, and adaptation to, climate change.
12. The Marine Policy Statement (MPS) supports marine renewable developments and suggests that adaptation and mitigation methods for these technologies may be supported by detailed monitoring programmes and co-ordinated research initiatives, including post deployment of devices. This approach is being followed by Menter Môn, with the intention to supply a detailed environmental monitoring and mitigation plan.
13. Planning Policy Wales (PPW) outlines the Welsh Government's approach to ensuring that the planning system contributes to the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.
14. The draft Welsh National Marine Plan (WNMP) outlines the following aspects that Menter Môn should be undertaking to ensure that the Project is in accordance with the plan:
  - Engage early across and between relevant stakeholders;
  - Apply the general cross-cutting and sector-specific policies set out in this plan to guide proposals;
  - Consider the potential beneficial and adverse impacts of their proposed activity on the economy, society and the environment; minimise adverse effects and maximise opportunities for coexistence and securing multiple benefits;
  - Supply the information required for the relevant public authorities to assess their proposal(s) including fit with relevant planning policy; and

- Ensure that evidence provided is sound and proportionate given the development in question and its associated risks.

## 1.5. PURPOSE OF THIS DOCUMENT

15. Drawing upon experience from Development Consent Order (DCO) applications for major offshore wind farms, Menter Môn is applying a technical working group (TWG) and “statement of common ground” (SoCG) approach to management of key environmental issues for the Morlais Project (hereafter referred to as ‘the Project’) and associated Transport and Works Act Order (TWAO) application. A small number of TWGs have been established to enable technical discussions with experts from relevant stakeholders.
16. The main participants of the TWGs are technical experts drawn from Natural Resources Wales (NRW). This Statement of Common Ground (SoCG) is a ‘live’ document that has been prepared by Royal HaskoningDHV on behalf of Menter Môn to record the outcomes of technical discussions with NRW regarding marine mammals. It has been prepared in accordance with guidance published by the Planning Inspectorate and available from the Assembly Government’s website (Welsh Government, 2019).
17. Paragraph 1 of the Guidance states that SoCG: *are joint statements made by the appellant/applicant and other parties such as the local planning/relevant authority. The aim of the document is to agree factual information and to provide a commonly understood basis for the appellant/applicant; the local planning / relevant authority and/or other parties.*
18. Although not required as statutory documents under Schedule 5 and 6 of the Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006, Menter Môn is submitting SoCG on key technical issues, including ornithology, marine mammals and seascape and landscape visual impact assessment (SLVIA). Although there is no statutory requirement, SoCG are useful tools and their submission is encouraged where a SoCG contributes to an improvement in the quality of the evidence and a reduction in the quantity of material which needs to be considered (Welsh Government, 2019).
19. The purpose of this SoCG is to set out matters which are agreed and not agreed about the application for consent to be made by Menter Môn for the construction and operation of the Project.
20. The aim of this SoCG is therefore to provide a clear position of the state and extent of agreement between Menter Môn, NRW on matters relating to the Project at the time of writing and the SoCG will continue to evolve in the lead up to and during the post application period.
21. The contents of this document and NRW’s views are based on pre-application discussions/submissions which are subject to the submission of the formal application and detailed supporting documents, and NRW’s views and position are therefore subject to change (at least on some aspects).
22. The first draft of the SoCG for marine mammals was provided to NRW by Menter Môn on 12<sup>th</sup> June 2019 for review and comment.



23. The document will be updated as more information becomes available and as a result of ongoing discussions between Menter Môn, NRW and IoACC. Updates are recorded in the “Revision History” table provided on the front page of this document.
24. Once finalised, the SoCG will be submitted to the Welsh Government as part of the formal application by Menter Môn under the Transport and Works Act 1992.
25. This document should be read in conjunction with the relevant technical chapter in the ES; **Chapter 12, Marine Mammals (Volume I** of the ES).

## 2. PROJECT DESCRIPTION

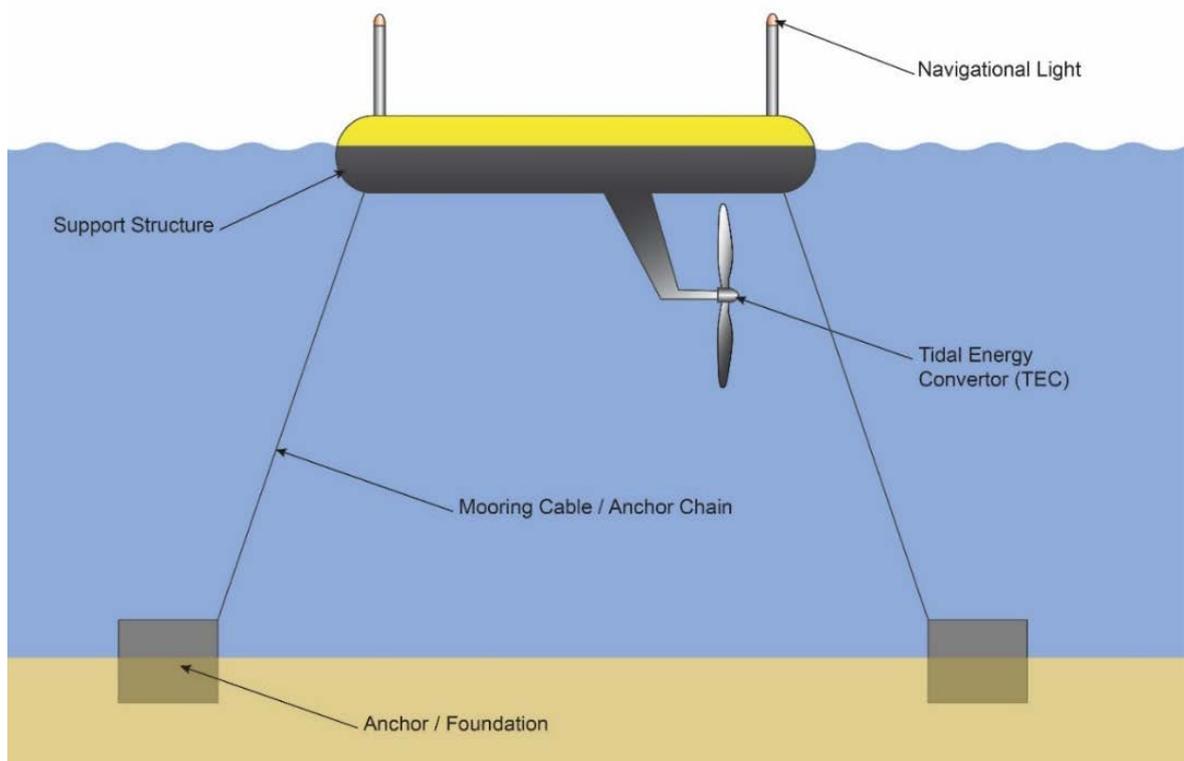
### 2.1. OVERVIEW

27. The Project will provide the supporting electrical infrastructure to connect tidal energy converters (TECs) within the MDZ and export the electricity generated to grid. The Project aims to secure a broad consent envelope, which will encompass a range of tidal device types and technologies with the potential to be installed and operated as part of the Project. The final details of all equipment to be installed, including tidal devices, will be confirmed following consent.
28. The Project comprises two development areas, as follows:
- Offshore Development Area: including all intertidal and offshore areas where offshore infrastructure may be placed and encompassing the MDZ (covering an area of 35 km<sup>2</sup>), and the export cable corridor (covering an area of 4.75 km<sup>2</sup>).
  - Onshore Development Area: including all intertidal and onshore areas where infrastructure may be placed (covering an area of 1 km<sup>2</sup>).
29. As a pre-consented and grid connected commercial demonstration zone, a number of different tidal devices and array configurations may be deployed at the Project over its 37-year lifetime. Tidal devices will be deployed in multiple arrays within the MDZ, to a maximum installed capacity of 240 MW.
30. The key components of the offshore works associated with the include:
- Tidal Devices, TECs and inter-array cables within the MDZ;
  - Up to nine export cable tails (shared with onshore components);
  - Navigation and environmental monitoring equipment;
  - Mooring and foundation structures; and
  - Offshore electrical infrastructure, including submerged, floating or surface emergent hubs.
31. The key components of the onshore works associated with the Project include:
- Cable landfall works, including;
    - Up to nine HDD ducts or trenched equivalents,
    - Up to nine transition pits or bays, and
    - Up to nine export cable tails (shared with offshore components).
  - A landfall substation at Ty-Mawr (hereafter referred to as Landfall Substation);
  - A switchgear building at Parc Cybi (hereafter referred to as Switchgear Building);
  - A grid connection substation at the existing Orthios Eco-Park to the east of Holyhead (the site of the former Anglesey Aluminium works) (hereafter referred to as Grid Connection Substation); and,
  - Onshore cable route between Landfall Substation, Switchgear Building and Grid Connection Substation).

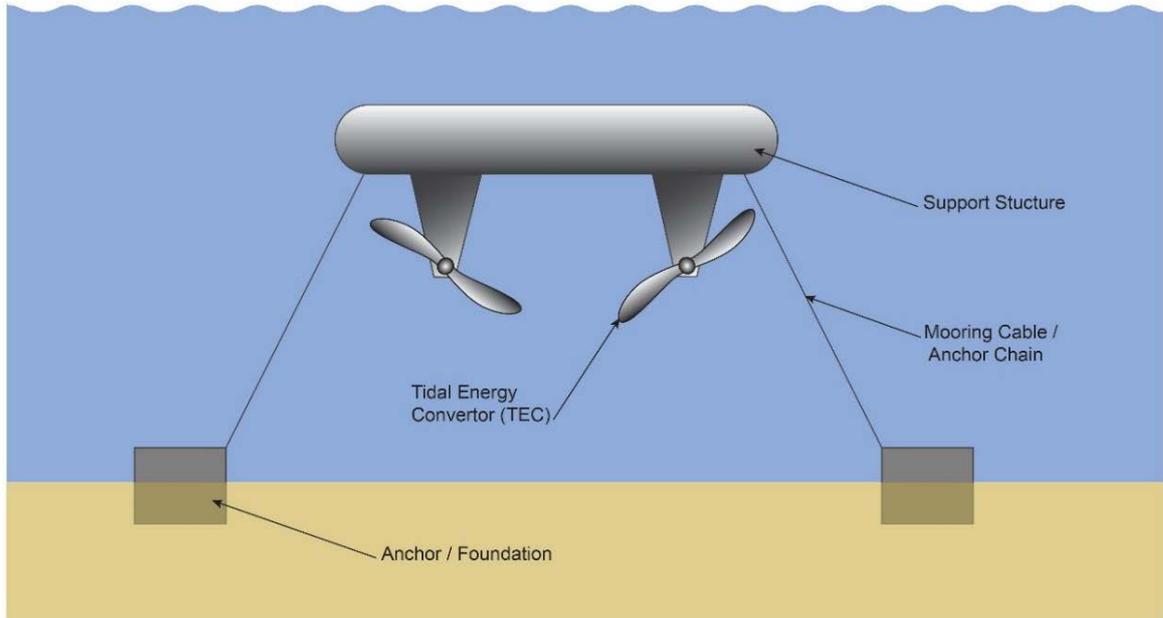
## 2.2. OFFSHORE WORKS

### 2.2.1. Tidal Devices

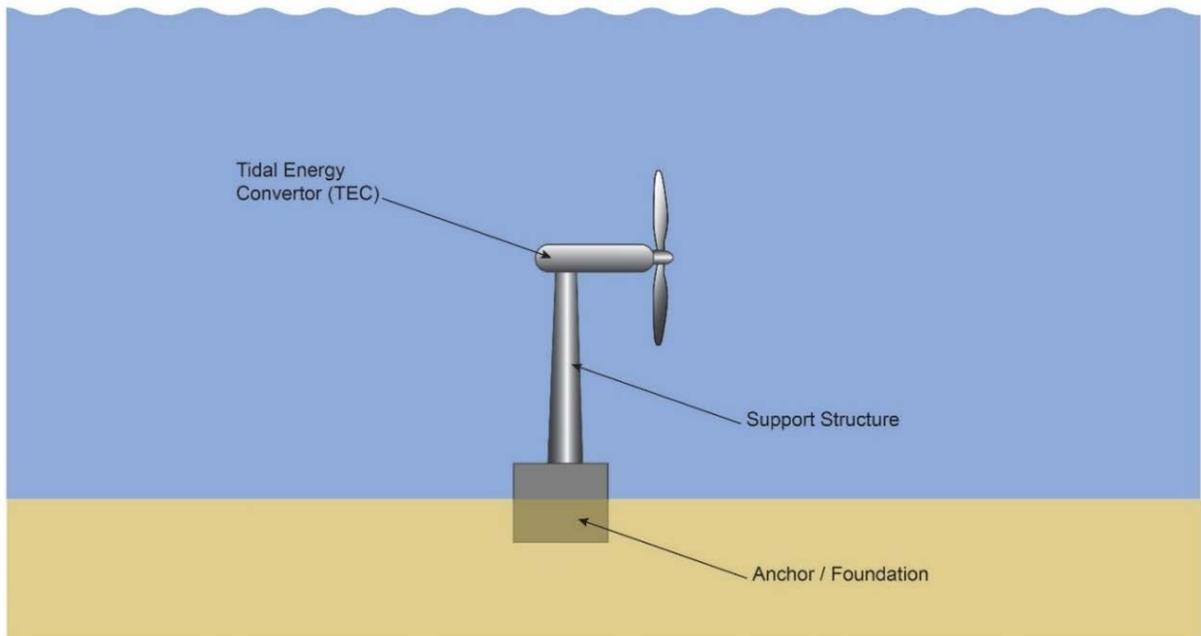
32. Tidal devices comprise of the TEC, the supporting structure, and the anchor or foundation. Several representative tidal technologies have been considered in order to capture the likely range of TECs that may be demonstrated within the MDZ.
33. Using three generic types of tidal device as exemplars shown in **Plate 2-1**, **Plate 2-2** and **Plate 2-3**, the TEC support structure may be seabed mounted and submerged, buoyant and mid-water column or floating. The TECs to be installed will fall into one of two main types as shown in **Plate 2-4** horizontal axis (axial flow) rotors; or vertical axis (cross flow) rotors.
34. Note that the actual form of tidal devices and numbers of TECs supported will differ between the technologies deployed. Following consent award, tidal device developers will be allocated “berths” within the MDZ, within which they will be able to deploy anything from one device to arrays of multiple tidal devices. Repowering is the replacement of one array of tidal devices with another array of tidal devices, normally with a different, newer or / and updated technology. Array deployments will vary in duration; therefore, the allocation of berths will be repeated throughout the life of the Project, as berths become available and are repowered.



**Plate 2-1 Generic Tidal Device Exemplar 1 – Floating or Surface Emergent Tidal Device, Comprised of TEC, Support Structure, Mooring Cables / Anchor Chains and Anchors / Foundations**



**Plate 2-2 Generic Tidal Device Exemplar 2 – Mid Water Column Tidal Device, Comprised of TEC, Support Structure, Mooring Cables / Anchor Chain, and Anchor / Foundation. Note this device is shown facing into direction of current flow**



**Plate 2-3 Generic Tidal Device Exemplar 3 – Seabed Mounted Sub Surface Tidal Device with TEC Supporting Structure and Foundation**

35. **Plate 2-4** shows the two generic forms of TEC that may be mounted on the generic tidal device exemplars shown in **Plate 2-1** to **Plate 2-3**. These may be either horizontal axis or vertical axis TECs.

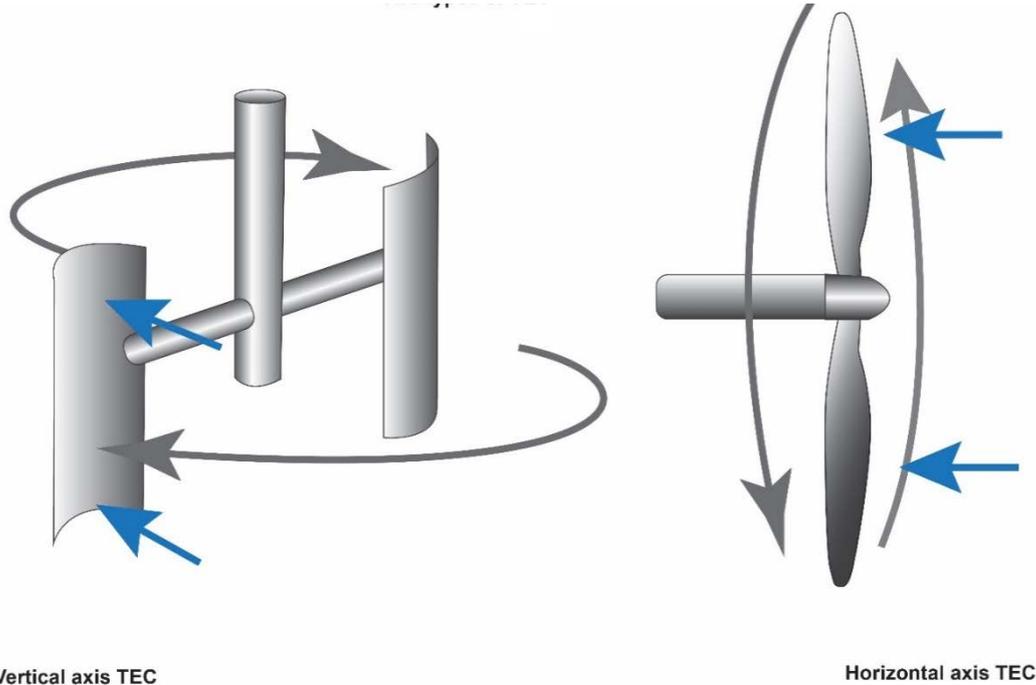


Plate 2-4 Illustration of Horizontal and Vertical Axis TEC Types

### 2.2.2. Export Cables

- 36. From the arrays of tidal devices, electricity will be transmitted via subsea inter-array cables to an offshore hub or other connection point(s), from which subsea export cables will connect to export cable tails in the nearshore, with the export cable tails continuing to landfall.
- 37. On reaching shore the export cable tails will be joined to underground onshore cables via an underground transition pit or bay, near to the point of landfall.

### 2.3. ONSHORE WORKS

- 38. Landfall will be located within the bay on the western coast of Holy Island known as Abraham's Bosom. There are two main methods which could be used for cable installation at landfall; Open cut trenching, or HDD.
- 39. HDD is the preferred option to achieve landfall. However, if HDD is not found to be feasible, possible alternative methods consist of cutting of shallow trenches with an excavator / rock cutter; installation and pinning of ducting and/or subsea cable with a split-pipe to the cliff face, across the foreshore region, all within a trench where possible.
- 40. The Landfall Substation will house the connection between the offshore export cables and the onshore cable to a grid connection substation. The landfall substation location is within currently farmed land, in the area of Holy Island known as Penrhos Feilw.
- 41. The preferred option for the onshore cable route is for it to be excavated into the local road network where possible. Where constraints such as a narrow road or existing services within the road do not allow, the cable will be installed within land/fields adjacent to the road. From



the landfall substation location, the majority of the onshore cable route follows the minor road network to towards the A55 and Holyhead to Bangor rail line.

42. At certain locations where specific features need to be crossed or avoided, such as the A55 and Holyhead to Bangor rail line, trenchless techniques such as drilling under the feature would be used to install ducts, minimising environmental impacts and disruption.
43. Menter Môn propose to construct a grid connection substation to convert the electricity produced by the demonstration zone into a format that can be accepted by the existing energy supply. The cable would be routed from the Landfall Substation, via trenching to a 33kV Switchgear Building at Parc Cybi then to the Grid Connection Substation at Orthios Eco-Park to the east of Holyhead (the site of the former Anglesey Aluminium works). Connection to existing electricity network will be through existing infrastructure at the Grid Connection Substation. Although the infrastructure at the Switchgear Building is not sufficient to accommodate the full project capacity, this will offer an additional connection to the local electricity network.

#### 4. RECORD OF CONSUTLATION

44. The preparation of this SoCG has been informed by a programme of discussions between Menter Môn and NRW. The relevant meetings are summarised in **Table 4-1** and the outline of topics covered relevant to SoCG discussions for marine mammals are shown in **Table 4-2**.

**Table 4-1 Marine Mammals Technical Meeting Details**

<b>Meeting / Date / Attendees</b>	<b>Agenda</b>	<b>Documents sent to NRW prior to meeting</b>
TWG First Meeting 27/10/19 NRW	Assessment Approach <ul style="list-style-type: none"> <li>▪ Project background</li> <li>▪ Review of project design envelope</li> <li>▪ Species, reference populations and management units</li> <li>▪ Scale of assessment</li> <li>▪ Density estimates, species parameters and dive profiles</li> <li>▪ Approach to Collision Risk Modelling (CRM)/Encounter Rate Modelling (ERM)</li> <li>▪ Appropriate avoidance rates</li> <li>▪ Use of population modelling</li> <li>▪ Interim Population Consequences of Disturbance (iPCoD)</li> <li>▪ Approach to assessment / potential impacts</li> <li>▪ Cumulative assessment</li> <li>▪ Phased deployment</li> </ul>	<ul style="list-style-type: none"> <li>▪ 180919 NRW PDE Technical Note</li> <li>▪ Proposed Approach to Marine Mammal Assessments</li> <li>▪ Presentation slides: Mammal 1st Tech Meeting_271118</li> </ul>
TWG Second Meeting 19/02/19 NRW	Assessment Parameters <ul style="list-style-type: none"> <li>▪ Overview of tidal device design envelope</li> <li>▪ Tidal device parameters</li> <li>▪ Collision risk models: ERM and CRM</li> <li>▪ Environmental parameters: water depth and current speed</li> <li>▪ Marine mammal species: density estimates and reference populations</li> <li>▪ Marine mammal parameters: body length and width; and dive profiles and parameters</li> <li>▪ Avoidance rates</li> </ul>	<ul style="list-style-type: none"> <li>▪ Morlais Marine Mammal Technical Report_250119 – draft information / update for NRW</li> <li>▪ Presentation slides: Morlais Marine Mammal TWG2_190219</li> </ul>
TWG Third Meeting 11/03/19 NRW	Summary of Preliminary Assessment Outcomes <ul style="list-style-type: none"> <li>▪ Summary of density estimates and reference populations for species and Special Areas of Conservation (SACs) used in the assessment</li> <li>▪ Overview of assessments for Environmental Statement (ES) and Habitats Regulations Assessment (HRA), including underwater noise, disturbance, barrier effects, changes in prey/habitat loss and collision risk</li> <li>▪ Population Consequences of Disturbance (PCoD) – update</li> <li>▪ Proposed approach to monitoring and mitigation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Presentation slides: Morlais Marine Mammal TWG 3rd Meeting 100519 – with initial assessments</li> </ul>



**Table 4-2 Statement of Common Ground – Marine Mammals – Natural Resources Wales**

Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
<b>Environmental Impact Assessment (EIA) – Existing environment</b>					
1. Species to be considered in baseline environment	27/11/18 First TWG Meeting	The proposed marine mammal species to be included are: harbour porpoise, bottlenose dolphin, Risso's dolphin, minke whale, grey seal and harbour seal.	NRW agrees with the species proposed for the assessment but recommends that common dolphin should also be included.	Agreed	It is agreed by both parties that the species proposed for the assessment are appropriate.
	19/02/19 Second TWG Meeting	Common dolphin was added in the Second Technical Meeting.	NRW agrees with the species proposed for the assessment.		
2. Data sources	27/11/18 First TWG Meeting	SEACAMS data and boat survey data (Natural Power, NP) collected for the project will be used to derive density estimates harbour porpoise. Other data sources and information to be considered in the marine mammal assessments include but are not limited to: Small Cetaceans in the European Atlantic and North Sea (SCANS), Inter-Agency Marine Mammal Working Group (IAMMWG), Joint Cetacean Protocol (JCP), Sea Mammal Research Unit (SMRU) seal-at sea maps, Special Committee on Seals (SCOS), NRW reports.	NRW indicated that the data sources outlined are acceptable, and flagged other data as follows: <ul style="list-style-type: none"> <li>NRW will provide details of a grey seal census (pop census) that has been completed and further reports on the seal community.</li> <li>NRW will also provide details of bottlenose dolphin (BND) monitoring report (2018). This is still draft but can be shared with the most recent data for the population.</li> </ul>	Agreed	NRW have provided the reports and these will be incorporated into the marine mammal baseline information.
3. Data sources cut-off	27/11/18 First TWG Meeting	It is agreed that there is a need to use the best data available at time of assessment, but that the assessment cannot wait for data sets to become available in 2019.  Consideration of fresh evidence after submission may not be appropriate and has been rejected by independent regulators when proposed for other UK projects.	NRW suggested that assessments may need to be considered again post submission should the revised MUs be published after submission and noted that the density estimates and populations used at the moment may not be accurate.	Ongoing	A cut off point for review of further data was agreed as the next meeting date (19/02/19).  NRW advise that it may be useful to test if new MU population figures available soon (based on SCANS III)



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
					fundamentally change the conclusions.  It is agreed that when further data on the MU populations is available, the assessments will be updated during post application clarifications and available during enquiry if required.
4. Harbour porpoise density estimates and reference population	27/11/18 First TWG Meeting	Population estimate from Celtic and Irish Seas (CIS) Management Unit (MU) of 104,695 and density estimate from SEACAMS 2018 of 0.8/km <sup>2</sup> proposed.	NRW noted that 0.8 from SEACAMS is a little low and suggest considering what densities can be derived from JCP.  NRW have revised the density estimate from SCANS-II for harbour porpoise. NRW will share information while the MUs are updated.	Ongoing	It is agreed by both parties that the reference population and density estimate proposed for the assessment is appropriate at the time.  The revised CIS MU estimated based on revised SCANS-II was provided by NRW in response to 1 <sup>st</sup> TWG meeting minutes. However, as this has not yet been published or updated for the other species it was agreed that the reference populations should be based on IAMMWG (2015)  NRW advise that new reference populations
	19/02/19 Second TWG Meeting	SEACAMS' data is considered to be the best available data for the site. This was updated in January 2019.  The mid-point of the density range of 0.783 /km <sup>2</sup> will be used.  If required the assessment can put in upper and lower estimates, however, it could be included as an example within an Appendix in order to represent the variation.	NRW stated it would be best to use the SCANS II estimates as this is available for all of the species.		



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
					<p>will be available imminently for HP and BND and it may be prudent to check that the conclusions do not change by using updated reference populations.</p> <p>It is agreed that when further data on the MU populations is available, the assessments will be updated for examination.</p>
5. Bottlenose dolphin density estimates and reference population	<p>27/11/18 First TWG Meeting</p> <p>19/02/19 Second TWG Meeting</p>	<p>Population estimate from Irish Seas (IS) MU of 397 and density estimate from SCANS-III Block E of 0.008/km<sup>2</sup> proposed.</p> <p>In order to determine a more appropriate density estimate the areas of the two SACs were combined with the area covering the MDZ and the maximum number of bottlenose dolphin within that area was used to provide a density estimate for the area of 0.02/km<sup>2</sup>.</p>	<p>NRW is not comfortable using the SCANS-III data as this gives a particularly low-density estimate, more suited for offshore bottlenose dolphins than resident populations. Suggested use of the latest monitoring report for Cardigan Bay BND SAC (2018 in draft) to update these estimates.</p> <p>NRW agreed that the reference population is reasonable and that the number of the Irish Sea area should be used.</p> <p>NRW confirmed that if the maximum number of bottlenose dolphins has been used this should be sufficient and this estimate is reasonable.</p>	Ongoing	<p>It is agreed by both parties that the reference population and density estimate proposed for the assessment is appropriate at the time.</p> <p>NRW advise that new reference populations will be available imminently for HP and BND and it may be prudent to check that the conclusions do not change by using updated reference populations.</p> <p>It is agreed that when further data on the MU populations is</p>



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
					available, the assessments will be updated for examination.
6. Risso's dolphin density estimate and reference population	27/11/18 First TWG Meeting	Population estimate of 1,090 and density estimate of 0.031/km <sup>2</sup> from SCANS-III Block E proposed.  There have been no recorded sightings of Risso's dolphins in the project surveys. Very few were recorded in the Irish Sea area during SCANS-III surveys.	NRW suggest that further densities can be derived from the JCP.  Post-meeting note – NRW conducted a survey off Holyhead deep and recorded Risso's dolphins in the area. Data should be available from SeaWatch Foundation.	Agreed	It is agreed by both parties that the reference population and density estimate proposed for the assessment is appropriate.
	19/02/19 Second TWG Meeting	Updated reference population of 8,794 based on JCP data for the Celtic and Greater North Sea (CGNS) MU.	NRW agree with approach.		
7. Minke whale density estimate and reference population	27/11/18 First TWG Meeting	Population estimate from CGNS MU of 23,528 and density estimate from SCANS-III Block E of 0.017/km <sup>2</sup> to be used.	NRW agreed that the data proposed are the best available.	Agreed	It is agreed by both parties that the reference population and density estimate proposed for the assessment is appropriate.
8. Grey seal density estimate and reference population	27/11/18 First TWG Meeting	Population estimate from grey seal South and West England and Wales MU of 6,000 and density estimate for MDZ from Russell <i>et al.</i> (2017) of 0.28/km <sup>2</sup> proposed.	NRW noted that new grey seal data will be available late in 2019, but this will be too late for this project. NRW therefore confirmed that the proposed density estimates from Russell <i>et al.</i> (2017) is appropriate.  NRW noted that the grey seal pup count has more than doubled in the most recent North Wales report.	Agreed	It is agreed by both parties that the reference population and density estimate proposed for the assessment is appropriate.
	19/02/19	Density estimate for grey seal has been reviewed and updated to 0.155/km <sup>2</sup> based on latest seal-at sea maps (Russell <i>et al.</i> , 2017).	NRW agreed with this approach.		



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
9. Harbour seal density estimate and reference population	27/11/18 Second TWG Meeting	Population estimate from harbour seal Wales count of 50 and density estimate from Russell <i>et al.</i> (2017) of 0.0008/km <sup>2</sup> proposed.	NRW agreed with this approach.	Agreed	It is agreed by both parties that the reference population and density estimate proposed for the assessment is appropriate.
	19/02/19 Second TWG Meeting	It is proposed to use the same values as suggested in the first technical working group meeting.	NRW agreed with this approach.		
10. Common dolphin density estimate and reference population	19/02/19 Second TWG Meeting	No common dolphin were recorded within the SCANS-III survey block E. A density of 0.374/km <sup>2</sup> was recorded for block D to the south of block E.  Based on the assumption that common dolphins from block D could also be distributed in block E, density estimate of 0.218 common dolphin per km <sup>2</sup> was derived based on areas of blocks D and E (83,460km <sup>2</sup> ) and density of 0.374/km <sup>2</sup> recorded for block D.  The Morlais development area is located in the CGNS MU. The abundance of common dolphin in the CGNS MU is 56,556.	NRW agreed with this approach.	Agreed	It is agreed by both parties that the reference population and density estimate proposed for the assessment is appropriate.
<b>Impact Assessment</b>					
11. Construction and Installation impacts	27/11/18 First TWG Meeting	Construction and installation impacts include: <ul style="list-style-type: none"> <li>▪ Underwater noise and disturbance;</li> <li>▪ Potential barrier effects from underwater noise;</li> <li>▪ Potential collision risk with construction vessels;</li> <li>▪ Potential disturbance at haul out sites e.g. from vessels moving to and from the site and the cable landfall;</li> <li>▪ Potential changes in water quality e.g. increased suspended sediments, or any accidental release of contaminants; and</li> </ul>	NRW suggested that the assessment needs to consider that the physical presence of vessels may also be a barrier during construction, as well as UW noise effects.  NRW noted that the assessment should demonstrate there will be no physical injury through noise.  NRW suggested that changes to habitat of marine mammals, prey species and indirect effects to these species needs to be considered.	Agreed	All agreed the potential construction and installation impacts to be assessed in the EIA and HRA.  NRW suggestions and considerations have been taken into account.



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
		<ul style="list-style-type: none"> <li>Potential changes in prey availability e.g. underwater noise, disturbance, temporary loss of seabed habitat, increased suspended sediment concentrations and sediment re-deposition.</li> </ul>	<p>Scottish Government has a web tool for assessing impacts of tidal arrays.</p> <p>NRW flagged that the 2015 report by Carol Sparling (Sparling <i>et al.</i>, 2015) has an assessment matrix.</p> <p>NRW agrees that those listed should be included and not excluded. This is not necessarily exhaustive, however, and any other impact pathways to be assessed are welcomed, although NRW believes the key pathways have been identified.</p>		
12. Operation and Maintenance (O&M) impacts	27/11/18 First TWG Meeting	<p>O&amp;M impacts include:</p> <ul style="list-style-type: none"> <li>Underwater noise and disturbance;</li> <li>Potential collision risk with O&amp;M vessels;</li> <li>Potential changes in water quality e.g. any accidental release of contaminants;</li> <li>Potential changes in prey availability e.g. underwater noise, disturbance, loss of seabed habitat, introduction of hard substrate (e.g. foundations, cable and scour protection), changes to water quality and electromagnetic fields (EMF);</li> <li>Potential EMF effects;</li> <li>Potential barrier effects;</li> <li>Potential for entanglement with moorings for devices; and</li> <li>Collision risk with tidal devices.</li> </ul>	<p>NRW flagged that potential for bottlenose dolphin collision with a tidal device is the biggest concern. The death of one animal would be unacceptable for Cardigan Bay SAC.</p> <p>CSIP do not undertake seal post-mortem (PM), only cetacean PM. Post consent monitoring may need to widen PM of marine mammals, and potentially use citizen science and reporting to bolster recording of strandings.</p> <p>NRW agrees that those listed should be included and not excluded. This is not necessarily exhaustive, however, and any other impact pathways to be assessed are welcomed, although NRW believes the key pathways have been identified.</p>	Agreed	<p>All agreed the potential O&amp;M impacts to be assessed in the EIA and HRA.</p> <p>NRW suggestions and considerations have also been taken into account.</p>
13. Decommissioning	27/11/18 First TWG Meeting	<p>Decommissioning impacts include:</p> <ul style="list-style-type: none"> <li>Underwater noise and disturbance;</li> <li>Possible increased collision risk with vessels;</li> <li>Potential changes in water quality; and</li> </ul>	<p>NRW agrees that those listed should be included and not excluded. This is not necessarily exhaustive, however, and any other impact pathways to be assessed are welcomed,</p>	Agreed	<p>All agreed that decommissioning impacts will be the</p>



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
		<ul style="list-style-type: none"> <li>Potential changes in prey availability.</li> </ul>	although NRW believes the key pathways have been identified.		same or less than construction impacts.
14. Potential cumulative impacts and in-combination effects	27/11/18 First TWG Meeting	<p>Cumulative Impacts and In-combination Effects include:</p> <ul style="list-style-type: none"> <li>Underwater noise and disturbance;</li> <li>Collision risk with tidal devices;</li> <li>Possible increased collision risk with vessels; and</li> <li>Potential changes in prey availability.</li> </ul> <p>Proposed projects and plans to include are: Wylfa Newydd Power Station; Minesto Holyhead Deep; and Holyhead Port Expansion.</p> <p>This list will be reviewed and updated throughout the EIA and HRA process.</p>	<p>NRW request that loss of feeding habitat and loss of access to habitat be considered in the assessment.</p> <p>Also, to include cumulative and in combination projects from throughout the MU, or provide justification for screening them out.</p> <p>NRW suggest that Tidal Lagoon Swansea should be included.</p> <p>NRW agrees that those listed should be included and not excluded. This is not necessarily exhaustive, however, and any other impact pathways to be assessed are welcomed, although NRW believes the key pathways have been identified.</p>	Ongoing	<p>All agreed the potential cumulative and in-combination impacts to be assessed in the EIA and HRA are appropriate.</p> <p>NRW suggestions and considerations have also been taken into account.</p> <p>Full details of the HRA screening with justification for the projects and plans screened in and out are provided in the HRA report.</p>
15. Impact assessment methodology	27/11/18 First TWG Meeting	Matrix approach proposed to standardise impact assessment, with due reference to recent guidance, including CIEEM (2018) guidance on ecological impact assessment.	<p>Sparling <i>et al.</i> (2015) also use a matrix to indicate significance of impact and this an accepted approach by regulators.</p> <p>There was a lack of detail presented on the content/structure of the matrices so NRW was unable to come to a view whether these will be acceptable. The definition of receptor sensitivity was challenged at the meeting as it did not fully consider all steps presented in Sparling <i>et al.</i> to define sensitivity.</p> <p>NRW requested that the assessment clearly link the impact pathway and magnitude back to the population estimate and assessments (possible use of PCOD, Population Viability Analysis (PVA), Potential Biological Removal (PBR).</p>	Ongoing	NRW suggestions and considerations have also been taken into account, with full details of the matrix approach is provided in the ES and PVA has been conducted and included as a separate Appendix with the ES chapter.



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
16. Underwater noise assessment	27/11/18 First TWG Meeting	<p>Potential underwater noise impacts will be determined from a desk-based review and assessment, based on:</p> <ul style="list-style-type: none"> <li>▪ The latest information from other tidal projects in the UK and overseas;</li> <li>▪ Other development projects with similar noise sources and environmental conditions; and</li> <li>▪ Best available current research.</li> </ul> <p>The increase in noise across the whole project will be assessed as linear as devices are added.</p> <p>The proposed approach will include:</p> <ul style="list-style-type: none"> <li>▪ Maximum predicted impacts areas, based on the WCS, will be used to estimate the potential number of individuals that could be affected, based on the species density estimates.</li> <li>▪ The number of individuals of each species that could be affected will be considered as a proportion of appropriate the reference population.</li> <li>▪ The duration of any underwater noise will be based on the WCS for each type of activity / underwater noise source.</li> </ul>	<p>NRW request that the assessments undertaken present the area of harbour porpoise habitat that could be impacted.</p> <p>Operational noise monitoring will be very beneficial for this project and informing future projects.</p> <p>NRW agreed that this approach is likely to be acceptable.</p>	Agreed	<p>All agreed approach to the assessment of underwater noise is assessment.</p> <p>All agreed that a post construction monitoring programme would be able to monitor the operational noise and the ambient noise to provide proper context for ongoing phased development. Further details of the proposed underwater noise monitoring are provided in the EMMP.</p>
	10/05/19 Third TWG Meeting	<p>National Oceanic and Atmospheric Administration (NOAA) guidance (NMFS, 2018) does not present specific criteria for disturbance, therefore, Temporary Threshold Shift (TTS) has been used as a proxy for disturbance.</p> <p>Previous studies (e.g. Wylfa Newydd project) the Lucke <i>et al.</i> (2009) criteria has been used, however, predicted ranges are similar to the TTS ranges used.</p> <p>A very precautionary approach has been undertaken.</p>	<p>NRW acknowledge that there is not much more information to go on but will consider whether this is appropriate. NRW considers that disturbance should be more accurately assessed than using TTS as a proxy.</p>	Addressed	<p>ES provides clarification of and justification for the approach used for underwater noise disturbance assessments.</p>



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
	10/05/19 Third TWG Meeting	The assessment is based on arrays rather than individual tidal devices as individual marine mammals would be disturbed by the closest turbine they approach rather than all individual turbines within the array.	NRW agreed that multiplication of devices is not most accurate. But would be good to see how the assessment arrived at what is termed full deployment.	Addressed	ES provides details and justification for approach.
17. Vessel collision risk	27/11/18 First TWG Meeting	<p>The number of marine mammals that could be at risk of collision with vessels will be assessed based on the number of animals that could be present in the development area(s) including offshore cable corridor and vessel routes.</p> <p>The assessment will take into account a precautionary 5% increase collision risk, in that 5% of the animals in the areas where there could be increased vessels and vessel movements could be at increased collision risk.</p> <p>Maximum potential number of individuals that could be affected will be based on the relevant species density estimates and considered as a proportion of appropriate the reference populations.</p>	NRW is comfortable with the approach although it is very precautionary.	Agreed	All agreed with precautionary approach to assessment of vessel collision risk.
18. Disturbance to seal haul-out sites	27/11/18 First TWG Meeting	<p>Haul out locations will be identified from relevant reports, publications and data sources and determining the potential for seal haul-out sites at or near the Morlais site and potential vessel routes.</p> <p>Haul out locations will be mapped in relation to the Morlais site and potential for any disturbance at seal haul-out sites assessed for all relevant activities (onshore and offshore) including any vessel movements to and from the site.</p> <p>Areas of potential disturbance will be determined based on type of activity, potential effect (visual/acoustic) and location and sensitivity of seals, including time of year (breeding/moulting).</p> <p>Numbers of seals that could be affected will be estimated based on actual counts at the haul-out</p>	<p>NRW agree with approach.</p> <p>NRW confirmed that the breeding and pupping season for grey seal is Aug-Dec with a peak in Oct-Nov, but this is extending.</p>	Agreed	All agreed with approach to assessment of disturbance to seal haul-out sites.



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
		sites, if available. Number of animals will then be assessed as a percentage of the relevant reference population and percentage of designated site(s) population that could be affected.			
19. Changes in water quality	27/11/18 First TWG Meeting	The assessment will be based on the maximum potential area that could be affected by any changes to water quality, from any accidental release of contaminants or increased suspended sediment.  The maximum potential number of individuals that could be affected will be based on the relevant species density estimates and will be considered as a proportion of appropriate the reference populations.	NRW had no comments.	Agreed	All agreed with approach
	10/05/19 Third TWG Meeting	No potential impacts from water quality due to hard substrate and energetic environment.	NRW had no comments.	Addressed	All agreed with approach to assessment of EMF effects.
20. EMF effects	27/11/18 First TWG Meeting	There are potential pathways for effects from EMF from the presence of inter-array cables within the site and export cables within the offshore cable corridor during operation.  The assessment will be based on the maximum potential area that could be affected by any EMF from cables during operation.  The maximum potential number of individuals that could be affected will be based on the relevant species density estimates and will be considered as a proportion of appropriate the reference populations.	NRW agree with approach.	Agreed	All agreed with approach to assessment of EMF effects.
21. Changes in prey availability	27/11/18 First TWG Meeting	The assessment will be based on the maximum potential area for any changes in prey availability.  The maximum potential number of individuals that could be affected will be based on the relevant species density estimates and will be considered as a proportion of appropriate the reference populations.	NRW don't feel that they can comment yet as the process for assessment is in progress. A review of other studies will feed into this.	Addressed	ES provides details and rationale for the approach to the assessment, with cross to results of relevant assessments from other chapter(s).



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
22. Risk of entanglement	27/11/18 First TWG Meeting	<p>The level of risk of entanglement varies with species and will take into account factors include such as body size; flexibility of movement; ability to detect mooring lines and ropes; and feeding ecology of the species.</p> <p>The parameters for the types of mooring lines that will be considered in the assessment will take into account maximum number of anchor lines; anchor line thickness; anchor line material; anchor line length; and if the lines are taught or loose and moving in the water column.</p>	NRW agree with approach.	Agreed	All agreed with approach to assessment of entanglement effects.
	10/05/19 Third TWG Meeting	<p>To date, there have been no recorded instances of marine mammal entanglement from mooring systems of renewable devices or similar mooring lines.</p> <p>As a precautionary approach, the potential magnitude of effect has been based on the on the relative risk assessment for marine mammals and mooring scenarios by Benjamins <i>et al.</i> (2014).</p>	NRW requested information on how mooring lines and devices will be checked to ensure there is no snagging of discarded nets, ropes or other debris on the mooring lines which could increase the risk of marine mammal entanglement.	Addressed	ES provides details on regular maintenance operations to ensure no entanglement of discarded nets, ropes or other debris on the mooring lines which could increase the risk of marine mammal entanglement.
23. Barrier effects	27/11/18 First TWG Meeting	<p>Underwater noise during construction and operation, and the physical presence of the tidal arrays and underwater infrastructure, could have the potential to create a barrier effect, preventing movement or migration of marine mammals between important feeding and / or breeding areas, or potentially increasing swimming distances if marine mammals avoid the site and go around it.</p> <p>The assessment of any barrier effects will take account of the maximum potential area of (i) potential noise impacts and (ii) the tidal arrays and underwater infrastructure, in particular the predicted extent towards the coastline. The maximum duration of any barrier effects will also be considered.</p>	NRW agree with approach.	Agreed	All agreed with approach to assessment of barrier effects.



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
		The maximum potential number of individuals that could be affected will be based on the relevant species density estimates and will be considered as a proportion of appropriate the reference populations.			
	10/05/19 Third TWG Meeting	The assessment for any barrier effects from physical presence of tidal arrays and infrastructure has been based on indicative spacings and potential area of the tidal arrays	NRW requested further information on how this was assessed.	Addressed	ES provides details on spacings and size of devices used in the assessment of potential physical barrier effects.
<b>Modelling</b>					
24. Collision risk models	27/11/18 First TWG Meeting	Both Encounter Rate Modelling (ERM) and Collision Risk Modelling (CRM) will be undertaken, using the Scottish National Heritage (SNH) spreadsheets and guidance (SNH, 2016).  If / where necessary, these will be modified to take into account the different kinds of turbines.	NRW is happy with this approach.	Agreed	It was agreed by both parties that the proposed assessment methodology is appropriate.
	19/02/19 Second TWG Meeting	Difference in the models and the parameters used result in different results for different devices and scenarios.  Therefore, the collision risk assessments will be conducted using both the ERM and CRM for all marine mammal species.			
25. Tidal device parameters	27/11/18 First TWG Meeting	Potential tidal devices for the marine mammal encounter and collision risk assessment have been grouped based on: <ul style="list-style-type: none"> <li>▪ Different rotor diameters, including related parameters for number of rotors per device, rotor width, blade chord width and rotation speed; and</li> <li>▪ Position of in the water column of the rotors.</li> </ul> The different 'indicative' device types are based on the worst-case parameters for all the different types of devices within each group (e.g. not actual device type)	NRW is happy with this approach, if the rationale can be clearly presented.	Agreed	It was agreed by both parties that the methodology is acceptable.



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
		but envelope of parameters to cover all potential parameters).			
	19/02/19 Second TWG Meeting	<p>Reviewing and refining the tidal design envelope to cover the types of devices that could be deployed.</p> <p>Currently looking at nine tidal device scenarios / envelopes for marine mammals:</p> <ul style="list-style-type: none"> <li>▪ large floating turbines</li> <li>▪ small floating turbines</li> <li>▪ floating spar</li> <li>▪ seabed mounted</li> <li>▪ surface</li> </ul>	NRW is happy with this approach, if the rationale can be clearly presented.	Agreed	It was agreed by both parties that the methodology is acceptable.
26. Environmental parameters	19/02/19 Second TWG Meeting	<p>Water depths across the site range from approximately 30-50m.</p> <p>For deployment of arrays, the MDZ may be spilt into a series of zones, with water depth varying in the different zones, for example:</p> <ul style="list-style-type: none"> <li>▪ Across the majority of zones the water depth is generally 30-35m;</li> <li>▪ Across some zones water depths are mainly 30-40m, with some deeper areas of 40-45m.</li> </ul> <p>Assessments based on average water depth where device will be deployed.</p> <p>Water depths, locations and position in the water column will be considered for the different types of tidal devices that could be deployed.</p> <p>Current speed will vary throughout the tidal cycle. The assessment, where possible, will take into account:</p> <ul style="list-style-type: none"> <li>▪ Different current speeds in tidal cycle (current analysis all based on mean speed).</li> </ul>	NRW is happy with this approach, noting that worst cases should be considered, and the worst case may not be the fastest current for some speed limiting devices.	Agreed	It was agreed by both parties that the methodology is acceptable.



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
		<ul style="list-style-type: none"> <li>How current speed affects the rotation speed (rpm) of the different devices (e.g. some run at relatively constant speed and others vary with current speed).</li> </ul>			
27. Marine mammal size parameters	27/11/18 First TWG Meeting	<p>The following lengths and body widths are proposed:</p> <ul style="list-style-type: none"> <li>Harbour porpoise – 1.48m and 0.32 m;</li> <li>Bottlenose dolphin – 2.57 m and 0.64 m;</li> <li>Risso's dolphin – NA;</li> <li>Minke whale – 8.8 m and 2.2 m;</li> <li>Grey seal – 1.86 m and 0.42 m; and</li> <li>Harbour seal – 1.41 m and 0.43 m.</li> </ul> <p>There is currently no or limited suitable data for Risso's dolphins, so the proposed approach is to use bottlenose dolphin as a proxy.</p>	NRW suggested there may be available data for Risso's from UK stranding data and that there is evidence that the harbour porpoise stranded around Wales are slightly larger than the values proposed.	Ongoing	Appendix 12.2 with ES presents the rationale for the values used and data sources used, including Welsh stranding records
	19/02/19 Second TWG Meeting	<p>Technical note issued to NRW, outlining the parameters to be used in the collision risk assessments (25/01/2019).</p> <p>Different marine mammal parameters for body length and width have been reviewed from a range of different sources, including UK and Welsh strandings data.</p> <p>This data is currently being further reviewed and refined to determine the parameters to be used in the collision risk assessments.</p> <p>If required, additional assessments can also be conducted and presented in an Appendix to take into account any variations in the parameters for each species, such as maximum, mean or median, and minimum values.</p>	<p>NRW states that minimum values should also include neonates.</p> <p>NRW not clear whether the UK figures included the Welsh figures.</p>		<p>ES presents the rationale for the values used, where possible and relevant, the values used have been taken from the SNH (2016) guidance, so they are consistent with other studies.</p> <p>An examination of minimum, mean and maximum values is presented in Appendix 12.2 of the ES.</p> <p>NRW would need to see the rationale for values used and</p>



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
					recommend using CSIP stranding data.
28. Marine mammal swim speeds and dive times	27/11/18 First TWG Meeting	<p>The following mean swim speed (a), mean dive time (b) and mean surface times (b) are proposed:</p> <ul style="list-style-type: none"> <li>▪ Harbour porpoise – 1.4 m/s (a), 26.2 s (b), 3.9 s (c);</li> <li>▪ Bottlenose dolphin – 1.7 m/s (a), 25.8 s (b), 3.7s (c);</li> <li>▪ Risso’s dolphin – NA;</li> <li>▪ Minke whale – 2.1 m/s (a), 87 s (b), 3.5 s (c);</li> <li>▪ Grey seal – 1.8 m/s (a), 297 s (b), 165 s (c); and</li> <li>▪ Harbour seal – 1.8 m/s (a), 180s (b), 39.5 s (c).</li> </ul> <p>There is currently no or limited suitable data for Risso’s dolphins, so the proposed approach is to use bottlenose dolphin as a proxy.</p>	The use of maximum, minimum and average values for parameters should be explored to determine the worst-case for the assessments.	Addressed	ES presents the rationale for the values used, for the values and data sources used, where possible and relevant, the values used have been taken from the SNH (2016) guidance, so they are consistent with other studies.
29. Avoidance rates	27/11/18 First TWG Meeting	<p>Avoidance rates of 0%, 50%, 90%, 95%, 98% and 99% will be considered for all species during the assessment.</p> <p>However, it is initially proposed that the assessment of the potential impacts and effects is based on the following avoidance rates:</p> <ul style="list-style-type: none"> <li>▪ Harbour porpoise – 98%</li> <li>▪ Bottlenose dolphin – 98%</li> <li>▪ Risso’s dolphin – 98%</li> <li>▪ Minke whale – 95-98%</li> <li>▪ Grey seal – 98%</li> <li>▪ Harbour seal – 98%</li> </ul>	<p>NRW suggested that 0% avoidance is not probable but useful for context.</p> <p>Seals have a higher probability of habituation to a noise source than cetaceans and reiterated that there is no evidence for how dolphins respond to Acoustic Deterrent Devices (ADDs).</p> <p>NRW request that range of avoidance rates are presented and follow these through the modelling to show theoretical impacts.</p> <p>NRW suggest it would be useful to have the two extremes presented as a technical note or as an appendix.</p> <p>NRW are working towards providing advice on the acceptable levels of mortality for marine mammal species</p>	Ongoing	Both parties agreed with proposed approach.



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	19/02/19 Second TWG Meeting	The approach will be revised to use the 98% avoidance rates for all species in the assessments, with the range of avoidance rates of 0%, 50%, 90%, 95%, 98% and 99% presented in an Appendix.	NRW agree with approach confirmed it would be useful to see the ranges in the appendices.	Agreed	Both parties agreed with proposed approach.
30. Potential level of effects for collision risk – cetaceans/pinnipeds	27/11/18 First TWG Meeting	Population effect levels from Collision Risk in marine mammal species are proposed as follows: <ul style="list-style-type: none"> <li>▪ High (&gt;1% of reference population);</li> <li>▪ Medium (0.1% - 1% of reference population);</li> <li>▪ Low (0.01% - 01% of reference population); and</li> <li>▪ Negligible (&lt;0.01% of reference population).</li> </ul> The reference populations will be reviewed using the up to date data.	NRW suggested that the HRA should use the population numbers provided in Special Area of Conservation (SAC) official designation documentation, not necessarily the most up to date information. The Habitats Regulation 35 document is the conservation objective document and the one used to determine the health of the site.  NRW note that the collision risk calculations would require the most up to date information, but the resulting numbers would need to be compared against the values presented in the SAC documentation/conservation objectives, i.e. the number when the site was designated or what is presented in the Conservation Objectives.	Agreed	Both parties agreed with proposed approach.
	19/02/19 Second TWG Meeting	Eversheds legal advice is that the most up to date population numbers available should be used.  Bottlenose dolphin threshold reduced to >1 individual following last meeting.  This will therefore be the determining factor in the number and types of devices that could be deployed in a phased approach.	NRW agrees with approach but advises that the number in the site notification is used as the comparison point.	Agreed	Both parties agreed with proposed approach.
31. Population modelling	27/11/18 First TWG Meeting	It is proposed to use the interim Population Consequences of Disturbance (iPCoD) model to assess any potential population impacts from collision risk with the tidal arrays at Morlais.	NRW agrees with approach.	Agreed	Both parties agreed with proposed approach.
	10/05/19	Currently not able to use PCoD for the ES and HRA assessments as planned as there is a bug in the	NRW requested that other population models should be reviewed as they have concerns	Addressed	RHDHV is currently reviewing the use of



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
	Third TWG Meeting	latest version. MM suggest that when the issues have been fixed PCoD can be used as part of the ongoing development of the monitoring and mitigation plan. If it is fixed sooner then it will be included in ES and HRA assessments.	regarding the high predicted numbers for full deployment		other available population models.
32. CRM/ERM Results	10/05/19 Third TWG Meeting	<p>Worst-case parameters have been used to define the Project Design Envelope (PDE) in terms of the device parameters. It should be acknowledged that the assessment is highly precautionary.</p> <p>The scenarios assessed are (i) 30MW of each device category and (ii) 240MW for the full build scenario.</p> <p>It is currently proposed that the Morlais tidal arrays would be installed in phases. The first phase could be 40MW of tidal devices, with up to 30MW for each type of device category; however, the deployment of 40MW of tidal devices may take several years to build out. Therefore, the 40MW deployment can be viewed as staged, for the purposes of assessment, with the opportunity for review at appropriate increments.</p> <p>An approach based on deployment, monitoring and adaptive management, with review at appropriate increments that can be directly related to collision risk to marine mammals, especially bottlenose dolphin, in that no more than one bottlenose dolphin would be at risk.</p>	<p>22/05/19 NRW follow-up letter to Menter Môn: NRW recommends that further consideration is given to an initial test phase of deployment of the scale provided in the Third TWG Meeting presentation, subject to NRW being satisfied with the predicted collision risk figures for the other cetacean and seal species.</p> <p>A smaller test phase with reduced collision risk for cetacean and seal species could potentially offer a solution to allow progress if sufficient monitoring was put in place via an adaptive management plan to inform whether relevant Marine Licence conditions could be discharged before further devices were deployed.</p>	Ongoing	<p>Taking into account the recommendation from NRW, the assessments in the ES and HRA have been based on scenario options where the collision risk, without mitigation, would be less than one bottlenose dolphin per year.</p> <p>The EMMP will outline the proposed monitoring and mitigation for the phased deployment.</p> <p>The mitigation and monitoring plan to reduce the collision risk of marine mammals with operational turbines will be developed in the pre-construction period so that it can be based upon best available information, methodologies, industry best practice, latest scientific</p>



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
					<p>understanding, current guidance and detailed project design.</p> <p>The approach would be based on deployment, monitoring and adaptive management, with regular reviews of the installation at appropriate deployment increments directly related to collision risk to marine mammals, specifically bottlenose dolphin, to ensure that no more than one bottlenose dolphin per year could be theoretically at risk of collision.</p> <p>NRW advise that it is important to also highlight the potential collision risk of harbour porpoise given the MDZ is within the NAM porpoise SAC.</p>
<b>Habitats Regulations Assessment (HRA)</b>					



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
33. Harbour porpoise	27/11/18 First TWG Meeting	European Designated Sites to be considered for harbour porpoise are: <ul style="list-style-type: none"> <li>▪ Gogledd Môn Forol / North Anglesey Marine Site of Community Importance (SCI);</li> <li>▪ Gorllewin Cymru Forol / West Wales Marine SCI;</li> <li>▪ Dynesfeydd Môr Hafren / Bristol Channel Approaches SCI;</li> <li>▪ North Channel SCI; and</li> </ul> Rockabill to Dalkey Island SAC (Ireland).	NRW noted that in addition to the sites listed in the discussion paper, there are further sites within the MU that are not covered in the list and are within the jurisdiction of other administrations. For example, 15 SACs have harbour porpoise listed as part of their designation within the MU.	Ongoing	Full details of the justification for the sites screened in and out are provided in the HRA.  The assessments in the HRA have been based on the SAC sites screened in for bottlenose dolphin, harbour porpoise, grey seal and harbour seal. However, as the assessment have been based on the reference populations for the relevant MUs and OSPAR region, consideration has also been given to other sites within these areas.
34. Bottlenose dolphin	27/11/18 First TWG Meeting	European Designated Sites to be considered for bottlenose dolphin are: <ul style="list-style-type: none"> <li>▪ Llŷn Peninsula and the Sarnau SAC / Pen Llŷn a'r Sarnau SAC; and</li> <li>▪ Bae Ceredigion / Cardigan Bay SAC.</li> </ul>	No comments.		
35. Grey seal	27/11/18 First TWG Meeting	European Designated Sites to be considered for grey seal are: <ul style="list-style-type: none"> <li>▪ Llŷn Peninsula and the Sarnau SAC / Pen Llŷn a'r Sarnau;</li> <li>▪ Bae Ceredigion / Cardigan Bay SAC;</li> <li>▪ Sir Benfro Forol / Pembrokeshire Marine SAC;</li> <li>▪ The Maidens SAC (Northern Island);</li> <li>▪ Lambay Island SAC (Ireland); and</li> <li>▪ Saltee Islands SAC (Ireland).</li> </ul>	NRW note that there are 21 sites for grey seal in this MU. The ones listed are the most appropriate ones.  Closest sites and the sites with the largest population (Pembrokeshire) should be included in the assessment.		
36. Harbour seal	27/11/18 First TWG Meeting	European Designated Sites to be considered for harbour seal are: <ul style="list-style-type: none"> <li>▪ Murlough SAC (Northern Ireland);</li> <li>▪ Strangford Lough SAC (Northern Ireland); and</li> <li>▪ Lambay Island SAC (Ireland).</li> </ul>	NRW note there are 19 sites for harbour seal in the MU. There are no Welsh sites so NRW have no further comment.		



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
37. All species	10/05/19 Third TWG Meeting	The full list of sites within the MUs and OSPAR region were reviewed in the HRA screening. During this assessment, some of those have not been screened in for a Likely Significant Effect (LSE).  HRA results demonstrate, with mitigation measures in place, no adverse effect on site integrity	NRW wish to ensure that other SACs, such as harbour porpoise from French sites and sites from the west coast of Ireland, are included.	Ongoing	As outlined above, the assessments in the HRA have been based on the SAC sites screened in for bottlenose dolphin, harbour porpoise, grey seal and harbour seal. However, as the assessments have also been based on the reference population for the harbour porpoise MU, bottlenose dolphin MU and OSPAR region for grey and harbour seal, consideration is therefore also given to other SAC sites within these areas.
38. All Species	22/05/19 NRW follow-up letter to Menter Môn:		NRW wish to reiterate the advice from our EIA Scoping Opinion (paragraph 0.6 of Scoping opinion SC1804, issued on 11/07/18) that, without wishing to prejudice the HRA or consenting processes, should it not be possible to identify a package of measures that would avoid or mitigate the effects of the proposal and avoid adverse effects on the integrity of European protected sites it may be necessary to consider the proposal under Regulation 64 of the Conservation of Habitats and Species Regulations ("IROPI").	Ongoing	As previously outlined, the EMMP will outline the proposed monitoring and mitigation for the phased deployment.  The approach would be based on deployment, monitoring and adaptive management, with regular reviews of the installation at appropriate



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
			NRW recommend that these matters are discussed with the Planning Inspectorate/Welsh Government prior to submission.		<p>deployment increments directly related to collision risk to marine mammals, specifically bottlenose dolphin, to ensure that no more than one bottlenose dolphin per year could be theoretically at risk of collision.</p> <p>Menter Môn is committed to using effective, proven and appropriate mitigation methods based on the latest scientific evidence. Therefore, is confident that the proposed package of measures in the EMMP would avoid or mitigate the effects and avoid adverse effects on the integrity of European protected sites.</p> <p>Menter Môn plan to discuss with the Planning Inspectorate/Welsh Government prior to submission.</p>
<b>Mitigation and Management</b>					
39. Monitoring of potential noise	27/11/18	The potential use of ADDs as mitigation was discussed. It was noted that although they are	NRW noted that it is important to consider the potential for collisions between devices and	Ongoing	The proposed approach would be to



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
impacts / Mitigation of collision risk	First TWG Meeting	effective against seals and there is evidence that they are also effective for harbour porpoise, there is no direct evidence of efficacy of ADD for dolphin species.	marine mammals, and to do so we need to monitor close range behaviour around devices without deterrence. NRW is mindful that introducing sound that is designed to exclude marine mammals (ADD) can also cause negative effects, so careful consideration of effective monitoring is important.		only activate ADDs when marine mammals come too close to operational turbines and there could be the potential risk of collision. The requirement for the ADDs will be monitored and reviewed as part of the adaptive monitoring, mitigation and management plan, as outlined in the EMMMP.  The underwater noise and potential disturbance from ADDs has been assessed in the ES.  In addition, the proposed underwater noise monitoring would assess the potential effective area of the ADDs.
	10/05/19 Third TWG Meeting	As a precautionary approach, the assessment has been based on an average disturbance range from an ADD of 1km has been assumed for all species. Based on indicative worst case for maximum number of arrays / groups of tidal devices for 240MW deployment, up to 40 ADDs could be required. Realistic duration of ADD activation could be 10 –20 minutes.	NRW suggested that disturbance range should be increased slightly to be precautionous as type of ADD is not known at this point.  NRW requested further detail on type and number of devices.	Ongoing	Disturbance ranges have been reviewed within the ES and will be assessed as part of the ongoing monitoring and mitigation plan.  Further clarification will be provided within the



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
					development of the mitigation and monitoring plan and when the types of devices to be deployed are known.
40. Deployment, monitoring and adaptive management plan	10/05/19 Third TWG Meeting	The deployment, monitoring and adaptive management plan will be developed in the pre-construction period and based upon best available information, methodologies, industry best practice, latest scientific understanding, current guidance and detailed project design.	NRW cannot be fully confident that the proposed mitigation will be effective. As such we may not be able to conclude that significant adverse effects on the integrity of European protected sites could be ruled out without reasonable scientific doubt or that the project would not be detrimental to the favourable conservation status of European Protected Species.	Ongoing	Developing the monitoring and mitigation plan in the pre-construction period will allow for a detailed review and assessment of the most effective and appropriate mitigation methods at that time, based on the latest scientific evidence.  Menter Môn is committed to using effective, proven and appropriate mitigation methods based on the latest scientific evidence.
41. MMMPs	10/05/19 Third TWG Meeting	A Marine Mammal Mitigation Protocol (MMMPs) will be prepared for construction activities were there could be the risk of auditory injury (PTS).	NRW agree with approach.	Agreed	Both parties agreed with proposed approach.
42. Embedded Mitigation	10/05/19 Third TWG Meeting	Menter Môn has committed to several techniques and engineering designs/modifications inherent as part of the project, during the pre-application phase, in order to avoid a number of impacts or reduce impacts as far as possible. This includes not including several types	NRW agree with approach.	Agreed	Both parties agreed with proposed approach.



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
		of devices, restrictions on the position in the water column for some devices and maximum potential number of devices due to the initial collision risk assessments.			
43. Phased approach to installation	27/11/18 First TWG Meeting	A phased approach to installation could be considered to allow monitoring of behaviour and also mitigation of collision risk. The aim will be to answer clear questions about animal behaviour and pathways for impacts, indicated by the impact assessment and thus inform subsequent phases of deployment.	NRW flagged that potential for bottlenose dolphin collision with a tidal device is the biggest concern/limit to consent. The death of one animal per year would likely be deemed unacceptable / biologically unsustainable for Cardigan Bay SAC.  22/05/19 NRW follow-up letter to Menter Môn:  NRW recommends that further consideration is given to an initial test phase of deployment of the scale provided in the Third TWG Meeting presentation, subject to NRW being satisfied with the predicted collision risk figures for the other cetacean and seal species.	Ongoing	As outlined above, taking into account the recommendation from NRW, the assessments in the ES and HRA have been based on scenario options where the collision risk, without mitigation, would be less than one bottlenose dolphin per year.  The approach would be based on deployment, monitoring and adaptive management, with regular reviews of the installation at appropriate deployment increments directly related to collision risk to marine mammals, specifically bottlenose dolphin, to ensure that no more than one bottlenose dolphin per year could be theoretically at risk of collision.



Issue	Date	Menter Môn position	NRW position	Status	Actions (if required)
					NRW advise that it is important to also highlight the potential collision risk of harbour porpoise given the MDZ is within the NAM porpoise SAC.

## 5. REFERENCES

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